4^{th} Annual Meeting

Midwest Bat Working Group
Indiana State University
April 5-6, 2012

Sponsored by:

We Listen. Wildlife Acoustics

Illinois Department of Natural Resources

Organization for Bat Conservation

Cardno JFNew — Shaping the Future

ESI — Environmental Solutions & Innovations, Inc.

Titley Scientific USA

Indiana State University Center for North American Bat Research and Conservation

PROGRAM OVERVIEW

Day 1 – April 5th (Thursday)

8:00 – 10:00am	Breakfast *Sponsored by Cardno JF New*	Dede III
8:00am – 5:00pm	Registration and Vendors	Dede III
10:00 – 10:15am	Welcome	Dede II
10:15 – 10:30am	Nominations	Dede II
10:30 – 11:15am	National and Regional WNS Updates	Dede II
11:15 – 11:30am	WNS Session	Dede II
11:30 – 11:50pm	Wind Update	Dede II
11:50 – 1:30pm	Lunch	On Your Own
1:30 – 2:15pm	Indiana Bat Protocol Update/discussion	Dede II
2:15 – 2:55pm	Acoustic Session 1	Dede II
2:55 – 3:10pm	Break *Sponsored by Titley Scientific*	Dede III
3:10 – 3:55pm	Acoustic Session 2	Dede II
4:00 – 5:00pm	Acoustic Demos	Dede III
7:00 – 10:00pm	Social *Sponsored by OBC and Illinois DNR*	Clabber Girl

- Heavy hors d'oeuvres and cash bar
- Music by B.D. McPike's Acoustic Elegance
- Silent Auction

Day 2 – April 6th (Friday)

7:00 – 8:30am	Board Meeting	Dede II
8:00 – 10:00am	Poster Session *Sponsored by Wildlife Acoustics*	Dede III
8:00 – 10:00am	Breakfast	Dede III
8:00am – 5:00pm	Registration and Vendors	Dede III
10:00 – 11:30am	State Reports	Dede II
11:30am – 12:00pm	Oral Presentations 1	Dede II
12:00-1:30pm	Lunch	On Your Own
1:30-2:30pm	Business Meeting	Dede II
2:30 – 3:30pm	Oral Presentations 2	Dede II
3:30-3:45pm	Break *Sponsored by ESI*	Dede III
3:45 – 4:45pm	Oral Presentations 3	Dede II
4:45 – 5:00pm	Awards, Announcements, Close	Dede II

Meeting Host

Indiana State University
Center for North American Bat Research and Conservation

Detailed Program

Thursday, 5 April 2012

8:00 – 10:00am	**Breakfast** *Sponsored by Cardno JF New*	Dede III
8:00am – 5:00pm	**Registration and Vendors**	Dede III
10:00 – 10:15am	**Welcome** by President Rob Mies	Dede II
10:15 – 10:30am	**Nominations**	Dede II
	WNS and Wind	Dede II
10:30 – 10:55am	**NATIONAL PERSPECTIVE ON CURRENT STATUS OF KNOWLEDGE AND MANAGEMENT OF WHITE-NOSE SYNDROME IN BATS**. A. Froschauer. *U.S. Fish and Wildlife Service, Hadley, MA 01035*	
10:55 – 11:15am	**REGIONAL WHITE-NOSE SYNDROME UPDATE**. R. Geboy. *U.S. Fish and Wildlife Service, Bloomington, IN 47403*	
11:15 – 11:30am	**INVESTIGATIONS INTO THE HOST/PATHOGEN ECOLOGY OF THE BAT DISEASE WHITE-NOSE SYNDROME** E. L. Pannkuk*, D. F. Gilmore, B. J. Savary, and T. S. Risch *Graduate Program of Environmental Science, Arkansas State University, Jonesboro, AR 72401 (ELP, TSR); Department of Biological Sciences, Arkansas State University, Jonesboro, AR (DFG, TSR); Arkansas Biosciences Institute, Jonesboro, AR (BJS).*	
11:30 – 11:50am	**A REVIEW OF BATS AND WIND ENERGY ISSUES IN THE UNITED STATES.** M. R. Schirmacher and C. D. Hein, *Bat Conservation International, Austin, TX, 78746.*	
11:50 – 1:30pm	**Lunch**	On Your Own
1:30 – 2:15pm	**U.S. FISH AND WILDLIFE SERVICE'S PROPOSED REVISIONS TO THE 2007 INDIANA BAT SUMMER SURVEY PROTOCOLS** R. A. KING, M. P. ARMSTRONG AND R. A. NIVER. *U. S. Fish and Wildlife Service, Bloomington Field Office, Bloomington, IN (RAK); U. S. Fish and Wildlife Service, Kentucky Field Office, Frankfort, KY (MPA); U. S. Fish and Wildlife Service, New York Field Office, Cortland, NY (RAN)*	

Acoustics Seminar Dede II

2:15 – 2:35pm **COMPARISON OF ACOUSTIC BAT DETECTORS.** M. R. Schirmacher and C. D. Hein, *Bat Conservation International, Austin, TX, 78746.*

2:35 – 2:55pm **CURRENT METHODOLOGY FOR THE ACOUSTIC IDENTIFICATION OF BAT ECHOLOCATION CALLS.** K. L. Murray, J. Gruver, D. Solick, and M. Clement. *Western EcoSystems Technology, Inc., 408 West Sixth Street, Bloomington, IN 47404 (KLM, MC)*; *Western EcoSystems Technology, Inc., 200 South 2nd Street, Suite B, Laramie, WY 82070 (JG, DS).*

2:55 – 3:10pm Break *Sponsored by Titley Scientific* Dede III

3:10 – 3:25pm **WILDLIFE ACOUSTICS PRODUCT OVERVIEW**. M. Doss

3:25 – 3:40pm **PETTERSSON PRODUCT OVERVIEW**.

3:40 – 3:55pm **TITLEY PRODUCT OVERVIEW**. K. Livengood

Acoustic Demos Dede III

4:00 – 4:20pm **WILDLIFE MATERIALS ACOUSTIC DEMO**. M. Doss

4:20 – 4:40pm **PETTERSSON ACOUSTIC DEMO**.

4:40 – 5:00pm **TITLEY ACOUSTIC DEMO**. K. Livengood

7:00 – 10:00pm **Social** *Sponsored by OBC and Illinois DNR* Clabber Girl

- Heavy hors d'oeuvres and cash bar
- Music by B.G. McPike's Acoustic Elegance
- Silent Auction 7-9pm

Friday, 6 April 2012

7:00 – 8:30am	**MWBWG Board of Directors Meeting**	Dede II
8:00 – 10:00am	**Poster Session** *Sponsored by Wildlife Acoustics*	Dede III
8:00 – 10:00am	**Breakfast**	Dede III
8:00am – 5:00pm	**Registration and Vendors**	Dede III
10:00 – 11:30am	**State Reports**	Dede II
	Oral Presentations 1	Dede II
11:30am – 11:45am	**ACOUSTIC IDENTIFICATION OF INDIANA BATS AND THE VALUE OF VISUAL OBSERVATIONS.** C. Corben, *Columbia, MO*	
11:45am – 12:00pm	**20 YEARS PRESENTING BAT PROGRAMS: HOW TO INSPIRE YOUR AUDIENCE.** R. Mies. *Organization for Bat Conservation, Cranbrook Institute of Science, Bloomfield Hills, MI, 48303.*	
12:00-1:30pm	**Lunch**	On Your Own
1:30-2:30pm	**MWBWG Business Meeting**	Dede II
	Oral Presentations 2	Dede II
2:30 – 2:45pm	**MOVEMENTS MADE BY INDIANA BATS (*MYOTIS SODALIS*) IN THE SOUTHERN APPALACHIAN MOUNTAINS.** K. R. Hammond[1]*, J. M. O'Keefe[1], and S. Loeb[2]. [1]*Department of Biology, Indiana State University, Terre Haute, IN 47809.* [2] *USDA Forest Service, Southern Research Station, Clemson, SC 29634.*	
2:45 – 3:00pm	**APPLICATION AND EVALUATION OF INDIANA BAT HABITAT SUITABILITY MODELS ON INDIANA STATE FORESTS.** B. P. Pauli*, P. A. Zollner, S. Haulton, G. Shao, G. Shao, D. W. Sparks. *Department of Forestry and Natural Resources, Purdue University, IN 47907 (BP, PZ, GS, GS); Division of Forestry, Indiana Department of Natural Resources, IN 46204 (SH); Environmental Solutions & Innovations, Inc., OH 45232 (DS).*	

3:00 – 3:15pm	**LANDSCAPE LEVEL BAT POPULATION MONITORING: EVALUATING THE EFFICIENCY OF MOBILE ACOUSTIC MONITORING ON RIVER AND ROADS.** M. D. Whitby*, T. C. Carter, S. M. Bergeson. *Dept. of Biology, Ball State University, Muncie, IN 47303.*
3:15 – 3:30pm	**HORIZONTAL RESOURCE PARTITIONING BETWEEN SYMPATRIC POPULATIONS OF THE ENDANGERED INDIANA BAT (*MYOTIS SODALIS*) AND THE LITTLE BROWN BAT (*M. LUCIFUGUS*).** S. M. Bergeson*, T. C. Carter, and M. D. Whitby. Department of Biology, *Ball State University, Muncie, IN, 47304.*
3:30-3:45pm	**Break** *Sponsored by ESI* — Dede III
	Oral Presentations 3 — Dede II
3:45 – 4:00pm	**LITTLE BROWN BATS DON'T ALL ROOST IN ATTICS!: EXAMINING THE USE OF NATURAL ROOSTS BY LITTLE BROWN BATS.** S. M. Bergeson, T. C. Carter, and M. D. Whitby. *Department of Biology*, *Ball State University, Muncie, IN, 47304.*
4:00 – 4:15pm	**MODELING THE INDIRECT EFFECTS OF ROAD NETWORKS ON THE FORAGING ACTIVITIES OF BATS**.V. J. Bennett, D. W. Sparks, and P. A. Zollner. *Department of Biology, Texas Christian University, Fort Worth, TX 76129* (VJB); *Environmental Solutions and Innovations, Inc, 4525 Este Ave, Cincinnati, OH 45232* (DWS); *Department of Forestry and Natural Resources, Purdue University, West Lafayette, 47906* (PAZ).
4:15 – 4:30pm	**INDIANA BAT (*MYOTIS SODALIS*) SUMMER HABITAT MODELING IN OHIO** J. Cannon and A. Froehlich. *The Nature Conservancy, Dublin, OH 43017*
4:30 – 4:45pm	**THE EFFECTS OF PRESCRIBED FIRE ON ROOSTING HABITAT OF THE ENDANGERED INDIANA BAT, *MYOTIS SODALIS***. J. M. O'Keefe[1] and S. C. Loeb[2]. [1]Indiana State University, Terre Haute, IN; [2]USDA Forest Service, Southern Research Station, Clemson, SC.
4:45 – 5:00pm	**Awards, Announcements, Close** — Dede II

***Indicates Student Presenter**

ORAL PRESENTATION ABSTRACTS

MODELING THE INDIRECT EFFECTS OF ROAD NETWORKS ON THE FORAGING ACTIVITIES OF BATS

Victoria J. Bennett, Dale W. Sparks, and Patrick A. Zollner. *Department of Biology, Texas Christian University, Fort Worth, TX 76129* (VJB); *Environmental Solutions and Innovations, Inc, 4525 Este Ave, Cincinnati, OH 45232* (DWS); *Department of Forestry and Natural Resources, Purdue University, West Lafayette, 47906* (PAZ).

The negative impacts of road networks on wildlife are of global concern. While the direct mortality of wildlife via roads has been well-documented, we know little about their indirect effects. Using a simulation model parameterized from empirical data, we investigated how roads in proximity to maternity roosts influenced the foraging activities of bats. In a two phase exercise, we first varied the characteristics of a road and surrounding landscape (such as traffic volume, proportion of foraging habitat, etc.) to ascertain whether the road became a barrier or filter to the movement. In phase 2, we simulated the movement patterns of Indiana bats across 32 landscapes. Each emulated an existing maternity roost, associated foraging habitat, and surrounding road network. In both phases, we use a classification and regression tree (CART) procedure to investigate the dynamics between landscape and road characteristics, and the movement of bats. In Phase 1, we determined that roads (with >200 vehicles/km/5 min) restricted bats from accessing a proportion of their foraging range and foraging success was influenced by the amount of accessible habitat. In Phase 2 habitat accessibility was influenced by the configuration of the road network, including the extent, type of roads and road-to-roost distance. Using a foraging success index created in our simulations, we established a foraging threshold above which bats in existing colonies currently persist. This modeling approach has beneficial application in the planning stage of road development and represents an invaluable tool in the ecological design of urban infrastructures.

HORIZONTAL RESOURCE PARTITIONING BETWEEN SYMPATRIC POPULATIONS OF THE ENDANGERED INDIANA BAT (*MYOTIS SODALIS*) AND THE LITTLE BROWN BAT (*M. LUCIFUGUS*).

Scott M. Bergeson*, Timothy C. Carter, and Michael D. Whitby. Department of Biology, *Ball State University, Muncie, IN, 47304.*

Examining the process of resource partitioning within communities containing species that are very similar morphologically (sibling species) is a difficult task. The structure of bat communities is typically studied by examining the ecomorphology of species within the community. However, by definition, any differences in the ecology of sibling species cannot be due to differences in morphology. These species must, therefore, use a different mechanism for partitioning their resources, or else competition would cause populations of either species to decline. The endangered Indiana bat (*Myotis sodalis*) and the little brown bat (*M. lucifugus*) are sibling species and are both abundant in specific areas within the Indiana bat's distribution. In order to determine how these species partition resources we compared the species' foraging ecologies. We conducted radio-telemetry on bats of both species in 2 study areas within southern Illinois during the summers of 2010 and 2011. Radio-telemetry data were analyzed to compare home ranges and habitat selection (at both the landscape and home range level) between the species. Home ranges of little brown bats were determined to be 7x greater than those of Indiana bats. Both species selected for hydric habitats at the landscape level. However, little brown bats selected for additional habitat within their home ranges whereas Indiana bats did not. This difference in foraging strategy between the 2 species is evidence that these sibling species partition resources horizontally, through the selection of foraging habitat, rather than through ecomorphological differences.

LITTLE BROWN BATS DON'T ALL ROOST IN ATTICS!: EXAMINING THE USE OF NATURAL ROOSTS BY LITTLE BROWN BATS.

Scott M. Bergeson, Timothy C. Carter, and Michael D. Whitby. *Department of Biology*, *Ball State University, Muncie, IN, 47304.*

Little brown bats (*Myotis lucifugus*) are known to frequently roost within anthropogenic roosts. However, this abundant species is also found in areas in which barns, churches, abandoned buildings, and other potential anthropogenic roosts are rare. It is reasonable to assume that within these areas little brown bats roost within dead snags, similarly to other Myotis spp. There have been a few studies that have reported little brown bats roosting within trees. However, these studies typically describe only a few little brown bat roost trees or were conducted at the northern extent of the species' distribution. Therefore, we conducted research in order to understand the characteristics of little brown bat roosts trees, within the central portion of their range, and to determine how the species' natural roosts compare with those of another *Myotis sp.* Data was collected on little brown bats and Indiana bats (*Myotis sodalis*) within southern Illinois during the summers of 2009-2011 and within south-central Indiana during the summer of 2007. Radio-telemetry was conducted on female bats of both species in order to locate maternity roosts. Twenty-two and 76 little brown bat and Indiana bat roost trees were located over the duration of the study, respectively. While both species roosted within the same habitats and the same tree species, little brown bats tended to roost in crevice/cavity roosts while Indiana bats tended to roost under exfoliating bark. This frequent use of crevice/cavity roosts by little brown bats may be associated with the species' preference for anthropogenic roosts throughout its distribution.

INDIANA BAT (*MYOTIS SODALIS*) SUMMER HABITAT MODELING IN OHIO

John Cannon and August Froehlich. *The Nature Conservancy, Dublin, OH 43017*

The Indiana bat (*Myotis sodalis*) is a federally endangered species whose range includes most of the eastern half of the United States, yet little is known about summer breeding habitat for this species at the landscape scale in Ohio. Predictive species distribution modeling of summer habitat suitability can serve an important role in prioritizing future survey efforts and identifying priority protection areas. We present a maximum entropy approach (Maxent) to developing a predictive summer habitat model for *Myotis sodalis* within Ohio. Presence-only survey records collected during summer field seasons from 1990 to the present were used as input sample data, and eighteen predictor variables were used as environmental layer inputs. The model was run using 10-fold cross-validation and all feature types (linear, quadratic, product, threshold, and hinge). Receiver-operating characteristic (ROC) analyses indicate an area under the ROC curve (AUC) value for the model of 0.741, and assessment with independent presence and absence data indicates a model accuracy of 78.12%. Our results provide useful information on probability of species presence, the relative importance of predictor variables, and how probability of species presence changes in response to predictor variables. The three most important predictor variables were: the percent of forest within 3 kilometers, the percent of forest within 1 kilometer, and the distance to open habitat patches. Predictor variable response curves indicate that probability of species presence is higher in areas of low percent forest within 3 kilometers, areas of high percent forest within 1 kilometer, and areas further from open habitat patches. Probability of presence was also positively associated with low percent of development within 3 kilometers and a low density of major roads. These results provide valuable information that can serve to guide protection of important summer breeding habitat and direct future survey efforts.

ACOUSTIC IDENTIFICATION OF INDIANA BATS AND THE VALUE OF VISUAL OBSERVATIONS

Chris Corben, Columbia, MO

At a simple level, echolocation calls of Indiana and Little Brown Bats broadly overlap, and are difficult to distinguish, especially from passive recordings. Like many confusing species pairs, they are more distinctive when flying in the open than in clutter. However, Indiana Bats, like many other *Myotis*, tend to hunt along edges and close to clutter, where they will not be emitting the call types which are most readily identifiable. Even in the open, Indiana Bat calls could be closely matched by some Little Brown calls given in less open situations, while a subset of Little Brown calls given in the open are quite distinctive. The two species react differently to clutter, making it difficult to identify Indiana Bats even when flying in the open, unless the context is known. Visual observations can provide that context and when combined with acoustic recordings, will help experienced observers identify Indiana Bats in the field. This approach is commonly employed in Europe, and will ultimately lead to better understanding of identification criteria for this species.

NATIONAL PERSPECTIVE ON CURRENT STATUS OF KNOWLEDGE AND MANAGEMENT OF WHITE-NOSE SYNDROME IN BATS

Ann Froschauer. *U.S. Fish and Wildlife Service, 300 Westgate Center Drive, Hadley, MA 01035*

White-nose syndrome (WNS) has caused unprecedented mortality in hibernating bats in eastern North America. This previously unknown disease has spread rapidly since its discovery in New York in 2007, and poses a threat to hibernating bats throughout the continent. In 2010, DNA indicative of the fungus *Geomyces destructans,* the pathogen demonstrated to cause WNS, was detected on bats as far west as Missouri and Oklahoma. The disease, WNS, and/or the fungus, *G. destructans*, has now been detected on bats at over 200 hibernacula in 20 states and 4 Canadian provinces. An assessment of wintering populations at 42 hibernacula across 5 northeastern states revealed a total loss of 88% of all bats in sites that have been affected for more than 2 years, with colony losses at some sites exceeding 99%. While our understanding of this disease has improved considerably, there are many questions that remain to be answered. The nature of remnant bat populations in the affected area has not yet been determined, and the potential for resistance within affected species has not been demonstrated. We also do not know the actual distribution of *G. destructans* on the landscape and lack the tools to manage the fungus once it becomes established. A coordinated effort is required to manage WNS and conserve North American bats, and there are over 100 state and federal agencies, tribes, universities, institutions, organizations, and private entities involved with the organized response. The *National Plan for Assisting States, Federal Agencies and Tribes in Managing White-Nose Syndrome in Bats,* finalized in May 2011, provides the framework for a coordinated national response.

MOVEMENTS MADE BY INDIANA BATS (*MYOTIS SODALIS*) IN THE SOUTHERN APPALACHIAN MOUNTAINS

Kristina R. Hammond[1]*, Joy M. O'Keefe[1], and Susan Loeb[2]. [1]*Department of Biology, Indiana State University, Terre Haute, IN 47809.* [2] *USDA Forest Service, Southern Research Station, Clemson, SC 29634.*

Management guidelines for protecting Indiana bat habitat are based on the assumption that Indiana bats make fairly short movements (< 8 km) during the summer maternity period (15 May to 15 August). There are few available data on Indiana bat roost area fidelity and movements during this period. On the northern edge of the range, Kurta et al. found that Indiana bat roost changes were mostly under a kilometer but ranged up to 5.8 km, with roost switching occurring every 2.4 days. However, we know little about foraging movements and it is not clear that bats stay in the same focal area all season. Further, reproductive status may be an important factor in how far bats can move though, at present, all bats are given the same consideration. We examined 4 years of Indiana bat (n = 41 bats) tracking data from the southern Appalachian Mountains. Between 11 May and 6 August 2008–2011, reproductive bats (adult females or juveniles) moved as much as 3.8 km between roosts, and 3.8 km between capture site and farthest known roost, which suggests a 8 km radius buffer is adequate. However, our telemetry data suggest bats were shifting the center of their focal areas. Long distance movements were common during the reproductive season, as 19 pregnant or lactating bats were lost after 1 or more roosts were found. With a passive datalogging receiver, we recorded several long-distance foraging bouts ranging from 1 km to 24.5 km (n = 4 bats); the 24.5 km movement was recorded 4 days after the last known roost location. In the southern Appalachians, Indiana bats sometimes make long movements during the reproductive season, which may relate to availability of roost habitat and the ephemeral nature of favored roosts in this region.

U.S. FISH AND WILDLIFE SERVICE'S PROPOSED REVISIONS TO THE 2007 INDIANA BAT SUMMER SURVEY PROTOCOLS

R. ANDREW KING, MIKE P. ARMSTRONG AND ROBYN A. NIVER. *U. S. Fish and Wildlife Service, Bloomington Field Office, Bloomington, IN (RAK); U. S. Fish and Wildlife Service, Kentucky Field Office, Frankfort, KY (MPA); U. S. Fish and Wildlife Service, New York Field Office, Cortland, NY (RAN)*

Over the past year, the U.S. Fish and Wildlife Service (Service) has led a multi-agency team in developing proposed revisions to the 2007 summer survey protocols for determining presence/probable absence of the Federally endangered Indiana bat (*Myotis sodalis*). The revised protocols have been drafted in response to (1) documented declines in mist-netting capture rates of Indiana bats in areas with population declines due to white-nose syndrome; (2) increasing frequency of use of acoustic monitoring at wind-energy projects without standard protocols; (3) the Service's *Indiana Bat Section 7 and Section 10 Guidance for Wind Energy Projects* (2011) advised biologists to incorporate acoustic monitoring into Indiana bat surveys, but did not prescribe any methods; and (4) development of software for automated analysis/identification of Indiana bat calls. The draft revised guidelines employ a phased approach and provide standardized protocols for conducting habitat assessments, as well as acoustic, mist-netting, radio-tracking, and emergence surveys.

Service biologists conducted an internal review of the draft protocols in November 2011. In February 2012, the Service released the draft protocols to the bat working groups in the eastern U.S. and posted them on its Indiana bat website as part of an initial peer review. Comments were received from 57 individuals/groups during the peer-review period. The multi-agency team is currently reviewing these comments. The summer of 2012 will be a pilot year to study the effectiveness of the draft protocols, particularly the new acoustic phase. The Service will continue to require use of the current (2007) mist-netting survey protocols in 2012. However, we encourage (but are not requiring) the addition of acoustic methodologies in 2012, particularly in areas severely impacted by white-nose syndrome. After this summer, the Service will reassess the draft protocols, make improvements, and initiate a public-comment period through a notice in the Federal Register. Based on the input from the public review, the Service will then decide how best to proceed before finalizing any new protocols for the 2013 field season.

20 YEARS PRESENTING BAT PROGRAMS: HOW TO INSPIRE YOUR AUDIENCE

Rob Mies. *Organization for Bat Conservation, Cranbrook Institute of Science, Bloomfield Hills, MI, 48303.*

As the co-founder and Executive Director of the Organization for Bat Conservation, I have traveled around the United States giving presentations at schools, clubs, museums, festivals, and conferences for the last 20 years. Thousands of programs later, I have discovered what makes a great program and what puts people to sleep. A strong digital presentation (images, sound, and video), personal stories from the field or lab, hands-on demonstrations, interactive experiences, and simple ways to get involved will all contribute to an inspiring program that will leave your audience wanting to learn, share, and engage.

CURRENT METHODOLOGY FOR THE ACOUSTIC IDENTIFICATION OF BAT ECHOLOCATION CALLS

Kevin L. Murray, J. Gruver, D. Solick, and M. Clement. *Western EcoSystems Technology, Inc., 408 West Sixth Street, Bloomington, IN 47404 (KLM, MC)*; *Western EcoSystems Technology, Inc., 200 South 2nd Street, Suite B, Laramie, WY 82070 (JG, DS).*

Identification of bat echolocation calls to species is becoming increasingly important in North American bat research, particularly in monitoring the spread and long-term effects of White-Nose Syndrome and in assessing the risk to sensitive bat species posed by wind development. However, bat call identification is a complex process, often made difficult by highly-variable echolocation calls and overlap in call characteristics among species. Recently, several researchers have developed acoustic identification software packages in an attempt to deal with this complexity in a repeatable and accurate manner. I review some of the available acoustic identification software packages and discuss the uncertainties involved with the acoustic identification of bat echolocation calls. I also discuss how factors such as recording situation, incomplete characterization of the acoustic landscape, and call analysis methodology can complicate the process of accurately identifying the echolocation calls of bats. Based on the current state of the science, acoustic surveys should not be viewed as digital analogs to mist-net surveys, but rather as an independent bat survey tool with a unique set of inherent strengths and weaknesses.

THE EFFECTS OF PRESCRIBED FIRE ON ROOSTING HABITAT OF THE ENDANGERED INDIANA BAT, *MYOTIS SODALIS*.

Joy M. O'Keefe[1] and Susan C. Loeb[2]. [1]Indiana State University, Terre Haute, IN; [2]USDA Forest Service, Southern Research Station, Clemson, SC.

In the southern Appalachians, where fire is an important restoration tool for oak-pine forests, Indiana bats (*Myotis sodalis*) roost under bark in tall, low decay conifer snags on upper and middle slopes. Our objective was to determine the effects of prescribed fire on snags in this region. From 2009–2010, we established 21 treatment plots within 7 burn units and 18 control plots in 6 units not slated for burning. Units were in mixed pine-hardwood forests that burned 0 or 1 time(s) in the past 10 years. Five treatment units were burned from March-April 2010 and 2011, with fire temperatures measured in 12 treatment plots; plots were reassessed post-burn. We also measured 36 0.4 ha transects varying in burn history and slope position. Snag characteristics were compared with known Indiana bat maternity roosts (typically pine snags; n = 76, 2008–2011) from the same region. Most pines (~88% of snags observed) were more decayed than known roosts and snag recruitment appears low. Fire temperature and effects on snags varied with weather, ignition method, and slope position; loss of large snags was greatest on upper slopes. Preliminary data indicate large snags are lost and small snags were gained in plots that experienced fire, particularly in hot burns (>100 °C). The loss of large pine snags on upper slopes may be of concern to managers. However, managers should also consider that prescribed fire may be necessary to regenerate oak-pine forests that will serve as roosting habitat for Indiana bats in the future.

INVESTIGATIONS INTO THE HOST/PATHOGEN ECOLOGY OF THE BAT DISEASE WHITE-NOSE SYNDROME

Evan L. Pannkuk*, David F. Gilmore, Brett J. Savary, and Thomas S. Risch *Graduate Program of Environmental Science, Arkansas State University, Jonesboro, AR 72401 (ELP, TSR); Department of Biological Sciences, Arkansas State University, Jonesboro, AR (DFG, TSR); Arkansas Biosciences Institute, Jonesboro, AR (BJS).*

White-Nose Syndrome (WNS) is a fungal disease of bats caused by *Geomyces destructans* and has resulted in the mass mortality of North American cave bats. Two broad groups of molecules implicated in fungal disease include lipids and proteins. Host lipids may be used by the fungus for sensing and attachment, whereas fungal extracellular enzymes have important roles in disease processes. Thus, these two groups of molecules are prime targets of study to elucidate pathogen mechanisms in WNS. The overall objectives of this research are to determine species specific secreted lipid content from bat tissue that may affect *G. destructans* growth and to characterize enzymes secreted by fungi in response to bat tissue that may be vital to its survival and/or pathogenicity. In our studies we extracted and fractionated lipid residue from bat integument. Total lipid content was quantified according to broad lipid class and select groups were analyzed through profiling experiments. Simple plate assays were performed to provide preliminary evidence of *Geomyces* response (either positive or negative growth) to select lipid types. In addition, we isolated secreted enzymes from *G. destructans* in chemically defined aqueous media. Proteolytic enzymes were collected and prepared for biochemical and proteomic studies. Assays performed on crude enzyme extracts provide evidence of strong serine and metalloprotease activities with a broad pH optima of 7-9. Conclusions from these studies will provide baseline data on the molecular makeup of bat skin and offer insights into the pathogenesis of *G. destructans*.

APPLICATION AND EVALUATION OF INDIANA BAT HABITAT SUITABILITY MODELS ON INDIANA STATE FORESTS

Benjamin P. Pauli*, Patrick A. Zollner, Scott Haulton, Gang Shao, Guofan Shao, Dale W. Sparks. *Department of Forestry and Natural Resources, Purdue University, IN 47907 (BP, PZ, GS, GS); Division of Forestry, Indiana Department of Natural Resources, IN 46204 (SH); Environmental Solutions & Innovations, Inc., OH 45232 (DS).*

The Indiana bat is a federally endangered species that inhabits the eastern and central regions of the United States. Due to its low abundances, historically declining populations and the imminent threats of further decline (e.g. white-nose syndrome), a thorough knowledge of the requirements and availability of suitable habitat of the Indiana bat is necessary to protect it from extinction. During the spring and summer, Indiana bats leave their hibernacula and establish maternity colonies in forested landscapes that constitute the site of gestation, parturition, and the rearing and development of offspring. Thus, the identification and promotion of suitable maternity sites is crucial to the maintenance of the species. Three published habitat suitability models have been developed for summer roosting habitat of the Indiana bat in its core range. These models, in varying ways, evaluate the suitability of a location in terms of the potential for Indiana bat roosting and foraging and quantify the importance of each site on a scale from 0 to 1. Using satellite imagery and field surveys, we created maps of state forests classified by forest type and stand age. We then applied previously published habitat suitability indices for the Indiana bat to our maps of Indiana forests. From these suitability maps we identified very few areas (~0.5%) that all models agreed to be important summer habitat for Indiana bats while models predicted contradictory results on a large proportion of the landscape (~31%). We then evaluated the competing indices by assessing the model predictions at current and historic roosts and found that two of the three models performed poorly while the third suffered from circular analysis. Thus, we were able to calculate the accuracy of each model, identify common areas of critical habitat among the models and propose improvements for landscape-scale suitability evaluation for the Indiana bat.

A REVIEW OF BATS AND WIND ENERGY ISSUES IN THE UNITED STATES

Michael R. Schirmacher and Cris D. Hein, *Bat Conservation International, Austin, TX, 78746.*

Bat fatalities have been reported at wind facilities since the early 1970's, but received little attention until 2003, when 1,400–4,000 estimated fatalities were reported at the Mountaineer Wind Energy Center, WV. Given the current installed wind-generating capacity of approximately 40,000 MW, potentially hundreds of thousands of bats are killed by wind development each year. Based on a decade of publicly available post-construction fatality reports, certain patterns have emerged regarding species composition, and timing and conditions under which fatalities typically occur. However, challenges remain with respect to understanding bat behavior around turbines and quantifying population levels. Despite these data gaps, opportunities exist to minimize or, where possible, prevent fatalities. Here we present our current understanding of bat/turbine interactions, provide insight on persistent problems researchers face, and offer potential solutions to resolve this issue.

COMPARISON OF ACOUSTIC BAT DETECTORS

Michael R. Schirmacher and Cris D. Hein, *Bat Conservation International, Austin, TX, 78746.*

Acoustic bat detectors can be a useful tool in assessing the spatial and temporal activity patterns of bats. Several types of detectors are available and understanding their differences is important when making decisions on which system best suits your economic and programmatic needs. Here we review devices offered by 4 of the leading manufactures (Titley Electronics, Binary Acoustic Technology, Pettersson Elektronik, and Wildlife Acoustics), and discuss topics such as data acquisition/processing (i.e., full spectrum or zero-crossing), field of detection, data storage requirements, and costs associated with their devices.

LANDSCAPE LEVEL BAT POPULATION MONITORING: EVALUATING THE EFFICIENCY OF MOBILE ACOUSTIC MONITORING ON RIVER AND ROADS

Michael D. Whitby*, Timothy C. Carter, Scott M. Bergeson. *Dept. of Biology, Ball State University, Muncie, IN 47303.*

Population monitoring is an imperative part of wildlife management, allowing managers to determine population trends, access species status, and set management objectives. Regular monitoring of species, especially those that are susceptible to declines due to low reproductive rates, such as bats, is especially important. Recent range-wide threats (e.g., White-nose syndrome and wind turbines) have emphasized the importance of a coordinated large scale monitoring program for all bat species. However, the increasing demands and decreasing budgets of land managers requires that these efforts be the most efficient and effective possible. During 2010 and 2011 we compared the time investment and species accumulation rates of 3 transects established on roadways under the 2009 national bat monitoring protocol (Britzke and Herzog 2009) to those conducted on the 3 closest navigable rivers. High activity rates for many bat species are often associated with the increased feeding and drinking opportunities offered by water features. Therefore, we hypothesized that mobile acoustic transects conducted on rivers would provide the opportunity to monitor an increased number of species when compared to road transects. While river transects gather more call sequences than those on roads ($p<0.01$), preliminary results indicate that higher variance on boat transects ($p<0.01$) may lead to lower power during trend analysis. We further compare these methods to the more traditional stationary acoustic deployment in order to gain insight into the advantages and disadvantages of each technique.

POSTER PRESENTATION ABSTRACTS

ACOUSTICALLY DETECTING INDIANA BATS: HOW LONG DOES IT TAKE?

Ryan Allen, Shannon Romeling and Lynn Robbins. *Missouri State University, Springfield, MO.*

Recently a new Rangewide Indiana Bat Summer Survey Guidance Draft was released. In the acoustic phase a two-day survey period is proposed. Using acoustic data collected between 2008 and 2011 from four counties and 20 detector sites in northern Missouri, we evaluated this methodology. The chosen sites were consistent with the recommended placement in the Draft document and Indiana bats have been captured at all sites. During the summer survey period (April 15-August 15), we analyzed a total of 1,096 detector nights. During the fall survey period (August 16- October 31), we analyzed 1,152 detector nights. Indiana bats were recorded on 23.45% of the nights during the summer period and 27.86% of the nights during the fall period. The average longest gap in days between Indiana bat detections was 18.25 during the summer and 17.79 during the fall. Data were also broken into bi-monthly periods and then examined for the number of consecutive two-day periods in which at least one Indiana bat was detected. In the summer, this ranged from 5.1% to 49.51% of the available two-day periods and in the fall this ranged from 12.27% to 53.73%. The three highest bi-monthly periods for Indiana bat detection were 8/16-8/31, 9/1-9/15, and 9/16-9/30, all of which are outside the current survey period. Data were analyzed using consecutive 5, 10, and 20 day recording periods as well. Indiana bats were recorded 59.15%, 76.51%, and 89.68% of the time during the summer period and 63.48%, 77.57%, and 91.50% of the time during the fall period, respectively. Results show that two detector nights are insufficient when determining probable absence of Indiana bats. They also indicate that an acoustic survey would be more likely to record Indiana bats if it did not begin until May and continued through September, though some geographic variation is likely.

SURVEYING FOR THE ELUSIVE RAFINESQUE'S BIG-EARED BAT (*CORYNORHINUS RAFINESQUII*) IN SOUTHEASTERN MISSOURI: ONLY THE BEGINNING

Shelly N. Colatskie Assistant Cave Ecologist, Missouri Dept. of Conservation, P.O. Box 180, Jefferson City, MO 65102.
Anthony G. Elliott Wildlife Ecologist, Missouri Dept. of Conservation, 3500 South Baltimore, Kirksville, MO 63501
<u>Bree K. McMurray Endangered Species Biologist, Missouri Dept. of Transportation, P.O. Box 270, Jefferson City, MO 65102</u>
Shannon R. Romeling, Ben Hale, C. Ryan Allen, and Larisa Loros-Bishops and Lynn W. Robbins, Missouri State University 901 S. National Avenue, Springfield, MO 65807

August 11, 2009, a male Rafinesque's big-eared bat (*Corynorhinus rafinesquii* – CORA) was captured at Otter Slough Conservation Area (OSCA) in Stoddard County, Missouri as part of the Southeastern Bat Diversity Network's Bat Blitz. This was the first bat survey on OSCA. The 12g scrotal male was captured in a double high 9m mist net placed in the interior of a small forest block between a road and office building. A 0.5g transmitter was affixed, which allowed tracking to a day-roost in an area building. On August 9, 2011 the Missouri Department of Conservation surveyed OSCA again with more effort. On August 9 three mist nets were placed in the area where the CORA was captured in 2009. One scrotal male CORA was captured in a single high 9m mist net placed in the middle of a dry, wooded swamp. Another site consisted of 4 nets and captured 1 eastern red bat (*Lasiurus borealis*). A 0.6 gram transmitter was placed on the CORA and it was tracked for 10 days. The bat day roosted in a large overcup oak (*Quercus lyrata)* with a cavity halfway up the trunk. Two nights of foraging data were taken and 10 days of homing to the day-roost were completed. Each day of homing, the CORA was found in the same roost tree until the transmitter failed or left the area. Staff searched the entire OSCA on day 10 and the signal was not found. Mist nets set near the roost tree on August 10 captured two eastern red bats and one evening bat (*Nycticeius humeralis*). The two records for CORA at OSCA are half of the records in Missouri. These surveys show that more effort is needed in bottomland hardwood forests of southeastern Missouri. Plans are being developed to survey similar areas during spring 2012.

COMPARISONS OF BAT CALL REPRESENTATIONS IN FULL SPECTRUM AND FREQUENCY DIVISION.

<u>Chris Corben.</u> *Columbia, MO*

FFT and ZCA are two different technologies commonly employed to generate visual displays of bat calls for the purpose of acoustic surveys and species identification. Each method has its advantages and disadvantages, but there is a common belief amongst bat workers that the two are so incompatible that reference calls recorded using one are not useful to those using the other. This poster illustrates that both techniques present very compatible views of the most important bat call features, and that reference calls recorded using one system can be very useful for understanding species identification using the other.

COMPOPARISON OF BODY TEMPERATURE AND MOVEMENTS AMONG REPRODUCTIVE CLASSES OF ROOSTING MYOTIS SODALIS IN THE SOUTHERN APPALACHIANS

Kristina R. Hammond* and Joy M. O'Keefe. *Indiana State University, Department of Biology, Terre Haute, IN 47809*

In the southern Appalachians there is little data on roost habitat selection by Indiana bats (*Myotis sodalis*); in particular, we know little about the variables that influence the use of torpor in free ranging bats. In a laboratory environment reproductive female bats use different thermoregulatory behaviors and patterns than non-reproductive females and males. Reproductive females use torpor less frequently because it slows neonate development and milk production, influencing growth and survival rates. Our objectives were to define normal roosting body and torpor temperatures for free-ranging Indiana bats, and to identify independent variables that influence torpor. In the summer 2011, we used a Telonics TR5 receiver to locate 22 roosts and a Lotek SRX-DL datalogger to record body temperature for 11 tagged bats (6 pregnant, 2 lactating, 1 non-reproductive male, and 2 juvenile males) carrying temperature sensitive Holohil transmitters. We found differences in body temperature due to reproductive class, roost type, and roosting group size, and we found differences in frequency of night visits to roost between pregnant and lactating bats. This data will lead to a better understanding of body temperature and the factors that influence the use of torpor by Indiana bats in the summer. Ultimately, data on temperature requirements of Indiana bats in the southern Appalachians may help with identification and management of suitable natural or artificial roosting habitat.

PROBABILITY OF ACOUSTIC DETECTION OF THE INDIANA BAT (*MYOTIS SODALIS*) NEAR A KNOWN MATERNITY COLONY

Zachary D.E. Kaiser*, Joy M. O'Keefe. *Indiana State University, Terre Haute, IN 47809*

Traditionally, capture techniques have provided biologists with information about the presence or probable absence of bat species within particular habitats. Evolving ultrasonic bat detector technologies now provide viable alternatives. Bat detectors sample larger areas and record higher species richness with less effort than capture techniques alone. However, bat detectors record over a limited area, which is dependent upon the orientation and sensitivity of the detector's microphone, the strength and frequency of the emitted call, and environmental conditions occupied by the bat. To test the recording range of bat detectors, I will sample 40 randomly selected points near a known maternity colony of the federally endangered Indiana bat (*Myotis sodalis*). One Anabat SD2 and one Wildlife Acoustics SM2Bat+ recorder will be paired to record at each sampling point. Species identification will be conducted both quantitatively and qualitatively by analyzing passes that contain ≥ 5 search-phase calls. Microhabitat and macrohabitat data will be collected at each sampling point. Utilizing program PRESENCE 4.1, occupancy and heterogeneity models will be created to assess presence/absence relative to probability of detection, as well as habitat covariates. The results will provide insight as to the detection range of popular bat detector technologies, which is essential information for the proper management of the Indiana bat.

CURRENT STATUS OF WHITE-NOSE SYNDROME RESEARCH AT ILLINOIS BAT HIBERNACULA

J.F. Merritt[1], J.A. Kath[2], E.J. Heske[1], A.N. Miller[1], A.C. Yannarell[3], N. Mateus-Pinilla[1], V.P. Hustad[4], H.M. Lin[3], R.D. McClanahan[5], and S.J. Taylor[1]. [1]*Illinois Natural History Survey, University of Illinois, 1816 South Oak St., Champaign, IL 61820 (sjtaylor@illinois.edu).* [2]*Illinois Department of Natural Resources, One Natural Resources Way, Springfield, IL 62702.* [3]*Dept. of Natural Resources and Environmental Science, University of Illinois, 1102 South Goodwin Ave., Urbana, IL 61801.* [4]*Dept. of Plant Biology, University of Illinois, 505 South Goodwin Ave., Urbana, IL 61801.* [5]*US Forest Service, Shawnee National Forest - Hidden Springs RD, 602 North First St., Vienna, IL 62995*

In anticipation of the invasion of *Geomyces destructans* we are monitoring bat hibernacula in Illinois. We use molecular and culture-based approaches to evaluate dead and live-caught bats and cave and mine substrates for the presence of *G. destructans*, and describe the microbial and fungal communities of sampled animals and caves. Beginning in winter 2012, we will visit about 7-8 hibernacula per year for 3 years, and will also conduct limited sampling of active bats during the summer. We are collecting swab and wing-punch samples from asymptomatic and symptomatic bats; soil, air, and various other substrate samples from hibernacula; and temperature, humidity, and light data to characterize cave environments. These data will inform our understanding of the occurrence and distribution of *G. destructans* in hibernacula on the leading edge of the spread of white-nose syndrome, and the fungal and microbial ecosystems in which it becomes established. Depending on the timing and extent of the invasion into Illinois, we may be able to provide new insights into how interactions between *G. destructans* and other components of fungal microbial communities on bats and in caves influence the establishment of *G. destructans*.

INVESTIGATION OF SURROUNDING HABITAT OF ROOSTS USED BY *DERMANURA WATSONI* AND *VAMPYRESSA NYMPHAEA* IN COSTA RICA

Julia Nawrocki* and Timothy Carter. *Ball State University, Muncie, IN 47306*

Twenty-two bat species demonstrate the distinct behavior of modifying leaves to create tents in which to roost. Knowledge of this behavior and preferences of tent-making species is poorly understood, yet crucial to the protection and understanding of species. The objective of this study is to examine the habitat surrounding the tent roosts of Big Yellow-eared bat (*Vampyressa nymphaea*) in *Potalia turbinata* plants and of Thomas' Fruit-eating bat (*Dermanura watsoni*) in *Asterogyne* plants and to uncover any preferences these species might have. *Asterogyne* and *Potalia* plants with and without bat tents were located within Tirimbina Biological Reserve, Heredia, Costa Rica. Habitat measurements were taken on each plant and the surrounding vegetation. *V. nymphaea* showed the most selective preference for the height of the plant and the distance to the closest tree ($p=0.004$). *D. watsoni* displayed a discriminating partiality towards height of the plant and canopy cover ($p=0.013$). Because bats have a highly sensitive and selective attitude towards their habitat, these results may have direct implication on conservation efforts in the tropics.

WING DAMAGE PATTERNS OF NORTH AMERICAN BATS: INDICATORS OF WHITE-NOSE SYNDROME SURVIVAL?

Lisa E. Powers*, Joyce E. Hofmann, Jean Mengelkoch and B. Magnus Francis. *Program in Ecology, Evolution and Conservation Biology (LEP); Prairie Research Institute, Illinois Natural History Survey (JEH, JM); Department of Entomology, University or Illinois at Urbana-Champaign (BMF)*

Wing damage has been documented in bats with WNS and could become a useful detection method for use in post-hibernation seasons, but because there are no historical records of wing damage prior to the emergence of WNS, it is unknown what types of damage are specific to WNS. To address this knowledge gap, we inspected the wings of hundreds of bat carcasses collected in Illinois from 2005 to 2010, and modeled the frequencies of different types of wing damage using age, sex, year, season, region as predictors in *Eptesicus fuscus.* Region and season were included in our top model for wing damage index (WDI); while region, season and year were included in our top models for wing discoloration. None of our predictors improved models for wing holes or membrane loss. We found that about one-fourth of all *E. fuscus* surveyed from this WNS-negative state had moderate or severe wing damage. We urge field researchers to limit the number of bats euthanized for WNS testing until the relationship between WNS and wing damage is better understood.

ROOST MOVEMENTS OF THE EASTERN SMALL-FOOTED BAT (*MYOTIS LEIBII*) IN THE SOUTHERN APPALACHIAN MOUNTAINS

Tara J. Thomson* and Joy M. O'Keefe. *Department of Biology, Indiana State University, Terre Haute, IN 47809.*

Little is known about the ecology of the eastern small-footed bat (*Myotis leibii*), a rare species currently being petitioned for federal listing. Our objective was to examine movements between roosts in *M. leibii.* We hypothesized that bats would travel short distances and switch roosts frequently. From 1 July to 7 October 2011, we attached 0.30- 0.36 g transmitters (5.8-7.7% of body weight) to 10 males and 5 females ($\geq$ 4.5 g) captured from expansion joints of 2 bridges in the southern Appalachian Mountains. On average, males (n = 8) moved further from the capture site to the first roost site (2.6 ± 1.2 km) and between subsequent roosts (0.64 ± 0.17 km) than females (0.25 ± 0.05 km; 0.20 km; n = 2). Males also showed higher fidelity to roost sites (mean of 5.3 ± 1.3 consecutive days in a roost) than females (mean of 2 ± 1 days). Movements between roosts were greater, and switching rates were lower than values reported for this species in the central Appalachians. These individuals showed fidelity to specific rock outcrops, suggesting these outcrops will be important to local and regional management plans for this species. Future work may include collecting more detailed movement data with PIT tags and molecular analysis to assess the relatedness of bats in this population.

INDIANA BAT USE OF ARTIFICIAL ROOSTS NEAR INDIANAPOLIS INTERNATIONAL AIRPORT: PAST AND PRESENT

Joey A. Weber, Brianne L. Walters, and Joy M. O'Keefe. *Department of Biology, Indiana State University, Terre Haute, IN 47809*

Land near the Indianapolis International Airport (south of Plainfield, Indiana) has been designated for the conservation of the federally endangered Indiana bat (*Myotis sodalis*). In the project area primary roosts have included dead cottonwood (*Populus deltoids*) trees and a dead shagbark hickory (*Carya ovata*). From 1992-1994, 3204 artificial roosts were erected to provide additional roosts for bats and to test the effectiveness of artificial roost designs. Of the 9 types of artificial roosts installed, 4 types were used by all species of bats (single bat boxes, triple bat boxes, shake garlands, and Missouri-style bat boxes). Indiana bats mainly used birdhouse-style single and triple boxes. Indiana bats were first detected using artificial roosts at the airport in 1995, and in 2003 a maternity colony was recorded using boxes. From 2004-2011, 11 bat boxes were documented to have been used by Indiana bats near the airport. Bat boxes served as both primary (used by most of the colony for some of the maternity season or multiple seasons) and alternate (used by multiple or few bats for a short period) roosts. Most of the original boxes were installed in shaded locations and many have fallen to the ground. In 2012, we installed 3 rocket-style boxes and 2 standard multi-chambered bat boxes in sunny locations in hopes that they will provide better artificial roosting habitat for the Indiana bat. We also reinstalled 1 birdhouse-style box that was used in 2010 and 2011. We plan to erect several other bat boxes in ideal locations this year.

THE DISCOVERY OF A BREEDING POPULATION OF THE EASTERN SMALL-FOOTED MYOTIS (*MYOTIS LEIBII*) IN ILLINOIS

Michael Whitby*, Timothy Carter, Rod McClanahan, Scott Bergeson, and Stephanie Rutan, *Dept. of Biology, Ball State University, Muncie, IN 47303 (MW, TC, SB, SR); Shawnee National Forest-Hidden Springs RD, Vienna, IL (RM)*

The only record of Eastern small-footed bats in Illinois was from a 2005 discovery of 2 individuals under a rock at the Fink Sandstone barrens of Shawnee National Forest. The Illinois Department of Natural Resources lists M. leibii as a species of possible occurrence but it is not considered a resident species. In 2011, the Fish and Wildlife Service found "substantial information indicating that listing a species may be warranted" and requested information on the species in order to complete the review. In response to this request the Shawnee National Forest initiated a survey of likely areas of *M. leibii* occurrence. A survey of likely roosting habitat for the rock dwelling species was conducted in July and August 2011. 26 individuals, including post lactating females and juveniles, were discovered by surveying rock outcroppings around the original site of discovery. While, the extent of *M. leibii* occurrence in Illinois is still poorly understood, this survey indicates that a resident breeding population occurs within the southern tip of the state.

***Indicates Student Presenter**