11th Annual Meeting of the

Tennessee Bat Working Group

University of Tennessee
Knoxville, Tennessee
November 18, 2015

Agenda

9:00 Welcome/Opening Remarks

9:15 Cory Holliday: **The State of WNS and Cave Bats in Tennessee**

9:35 Amanda Janicki: **Endangered gray bat (*Myotis grisescens*) population stable despite White-Nose Syndrome**

9:55 Thomas Lilley: **White-nose syndrome survivors have pre-WNS hibernation patterns despite *Pseudogymnoascus destructans* infection**

10:15 Riley Bernard: **The dietary breadth of bats captured in the Southeastern U.S.**

10:35 **Break**: *Refreshments provided by the Tennessee Valley Authority*

11:00 Leanne Burns: **Winter Activity Patterns of Bats of the Big South Fork National River and Recreation Area**

11:20 Jonathon Brooks: **Bat Use of Forest Openings in Relation to Landscape Characteristics and Prey Abundance**

11:40 Bill Stiver: **Status and management of WNS affected bats in Great Smoky Mountains National Park**

12:00 **Lunch**

1:00 Steve Samoray: **Foraging range of tri-colored (*Perimyotis subflavus*) and little brown (*Myotis lucifugus*) bats during a 2015 study at Arnold Air Force Base, TN**

1:20 Daniel Istvanko: **Sex-specific foraging habits of the Evening bat (*Nycticeius humeralis*) in the Ozark Region of North-Central Arkansas**

1:40 Theresa Wetzel: **Spring migration movements of Indiana bats (*Myotis sodalis*) from two Tennessee caves.**

2:00 **Break**: *Refreshments provided by the Department of Ecology and Evolutionary Biology*

2:30 Dustin Thames: **Indiana Bat Foraging Range Selection in Wilson County, Tennessee**

2:50 Emma Willcox: **Prescribed Fire and Overstory Thinning Increase Bat Activity in Tennessee Hardwood Forest**

3:10 Veronica Brown: **Rapid Range Expansion of the Brazilian Free-Tailed Bat in North Carolina, Tennessee, and Virginia 2008-2015**

3:30 Cory Holliday: **Canada WNS decontamination guidance: A DVD presentation**

3:40 Veronica Brown: **A update on the bat outreach box**

3:50 **Closing Remarks**

4:00 **Break**

4:15 **Business Meeting**

Abstracts
Presentations

The State of WNS and Cave Bats in Tennessee

Cory Holliday
The Nature Conservancy of Tennessee

After five years of white-nose syndrome in TN, statewide bat population data and disease statistics for Tennessee's caves and cave hibernating bats will be presented. This presentation will highlight pre WNS bat statistics, current bat population trends, and persisting questions about Tennessee's cave hibernating bats.

Endangered gray bat (*Myotis grisescens*) population stable despite White-Nose Syndrome

Amanda Janicki
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White-Nose Syndrome (WNS) is an epizootic disease in hibernating bats caused by the fungus *Pseudogymnoascus destructans*. While this disease has devastated populations of six bats species in eastern North America, gray bats (*Myotis grisescens*) do not appear to suffer similar mortality. We examined *M. grisescens* population census data from 1969-2015 at six priority one hibernacula to determine regional population trends before and after the arrival of *P. destructans*. Our results show that the *M. grisescens* population was stable prior to the arrival of *P. destructans* and appears stable three years after the discovery of *P. destructans*. We compared the prevalence and *P. destructans* load of *M. grisescens* and four other bat species (*M. lucifugus, M. septentrionalis, M. sodalis*, and *Perimyotis subflavus*) at 18 sites to illustrate each species' exposure to disease and infection intensity. Infection prevalence differed among species; 88% of the sampled *M. grisescens* had no detectable *P. destructans* while the prevalence of positive qPCR swabs in the other four species ranged from 24% to 60%. Differences in fungal loads were apparent in the substantially higher loads found in three species (*M. lucifugus, M. septentrionalis,* and *P. subflavus*). While *M. grisescens* had the lowest fungal loads among species examined, there was no difference between the fungal loads of *M. grisescens* and *M. sodalis*. Documenting differences in the way *P. destructans* affects bat species and ultimately leads to mortality is central to understanding long-term disease dynamics. Even though the regional *M. grisescens* population appears stable in the short-term, it is unclear what impact *P. destructans* will have on range-wide *M. grisescens* population in the long-term.

White-nose syndrome survivors have pre-WNS hibernation patterns despite *Pseudogymnoascus destructans* infection

Thomas Lilley[1], Joseph Johnson[1], Lasse Ruokolainen[2], Elisabeth Rogers[1], Cali Wilson[1], Spencer Schell[1], Kenneth Field[1], and DeeAnn Reeder[1]
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White-nose syndrome (WNS) has devastated bat populations in North America, with millions of bats dead. WNS is associated with physiological changes in hibernating bats, leading to increased arousals from hibernation and premature consumption of fat reserves. However, there is evidence of surviving populations of little brown myotis (*Myotis lucifugus*) close to where the fungus was first detected nearly ten years ago. We examined the hibernation patterns of a surviving population and compared them to patterns in populations before WNS and at the peak of mortality. Despite infection with *P. destructans*, the survivor population displayed less frequent arousals from torpor and lower torpid body temperatures than bats that died from WNS during the peak mortality phase of the syndrome. The hibernation patterns of the remnant population resembled pre-WNS patterns with some modifications. Bats may be adapting their thermoregulatory behavior and microhabitat selection to avoid WNS-associated mortality.

The dietary breadth of bats captured in the Southeastern U.S.

Riley Bernard
Department of Forestry, Wildlife and Fisheries, University of Tennessee, Knoxville

We used NextGen sequencing of fecal DNA to investigate the food habits of bats in middle and eastern Tennessee from 2012 to 2014. Our objectives were to 1) identify the composition of prey consumed by bats during winter; 2) determine if there are differences in composition of prey consumed between bat species; and 3) determine if bats found PCR positive for Pseudogymnoascus destructans (Pd), consume different prey items when compared to PCR negative bats captured during the same intervals. During this preliminary study, we analyzed fecal pellets from 117 individuals representing nine of the ten species known to hibernate in the region, as well as 43 individuals representing 10 species captured during summer. On average, bats consumed 11 different species of prey or OTUs (Operational Taxonomic Units; range from 1 to 33 OTUs). Males (n = 88) consumed an average of 11.48 OTUs, whereas females (n = 29) consumed 9.55 OTUs. Using epidermal swab results from a previous study, 36 of the 117 bats examined for dietary analysis were found PCR positive for Pd, the causative agent of White-nose Syndrome. On average, individuals found Pd positive consumed less OTUs than Pd negative individuals (Pd+ = 9.72 OTUs; Pd- = 12.02 OTUs). We also found a weak correlation between the number of OTUs consumed versus the load of Pd of an individual. More specifically, male bats with a higher load of Pd were more likely to consume more OTUs than males with very low loads of Pd.

Winter Activity Patterns of Bats of the Big South Fork National River and Recreation Area

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As winter is an energetically expensive time for temperate bats, a better understanding of their winter activity can provide insight to inform conservation strategies in the face of white-nose syndrome and climate change. We investigated winter bat activity in Big South Fork River and Recreation Area in Tennessee and Kentucky by continuously monitoring bat presence and activity with AnabatII detectors from October 2014 to April 2015. We sampled 10 sites in a variety of habitats: 3 recently burned (<2 years) forests, 3 unburned forests, 3 fields adjacent to ponds, and an over-wintering rock shelter. At each site we measured structural characteristics and temperature. Echolocation files were separated into high (≥36 kHz) and low (≤35 kHz) phonic groups with AnalookW software, and identified to species when possible using qualitative identification. Identified species included Eptesicus fuscus, Lasiurus borealis, L. cinereus, Perimyotis subflavus and Myotis spp. Bat activity was observed during 408 of 1507 total detector nights, with 21072 bat passes recorded; only 3759 of which were recorded from November through March. The number of detections per month was positively related to average monthly temperature, with a marked decrease in activity during February, the coldest month. While all detectors documented bat activity throughout the winter, activity was greatest at sites close to ponds, with significantly less activity recorded in the forested sites. Greater activity near water suggests that bats were primarily arousing to drink during the winter months, as gleaning insects—an important cold-temperature foraging strategy—is likely easier in forested areas.

Bat Use of Forest Openings in Relation to Landscape Characteristics and Prey Abundance

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Numerous studies have shown that bats frequent forest openings, although little is known about how bats select these openings. Understanding how bats select openings and where to forage within them is important for making forest management decisions. In this study, we asked (1) do bats select openings based on prey availability or opening size and (2) do bats select where they forage within openings based on prey availability or the presence of forest edge? We placed Anabat SD2 detectors and lighted Malaise traps at the interior and edge of 20 forest openings ranging in size from 0.2 ha to 18.5 ha in the Nantahala National Forest, NC between June and August 2014. Species activity was determined using AnalookW and Kaleidoscope Pro. Captured insects were identified to Order and counted. The effect of opening characteristics and insect abundance on bat activity was tested using a mixed general linear model with fixed (size, location, size x location, total insect abundance) and random (opening within size) effects. There

was a significant effect of distance from edge (P=0.07) and total insect abundance (P=0.07) on hoary bat (*Lasiurus cinereus*) activity with higher activity in opening interiors and openings with higher insect abundance. The effect of size, distance from edge, and insect abundance was not significant for all other species and overall activity. These results suggest that most bat species opportunistically exploit forest openings, although hoary bats are more likely to forage in opening interiors and where insects are more abundant.

Status and management of WNS affected bats in Great Smoky Mountains National Park.

Bill H. Stiver
Great Smoky Mountains National Park

Great Smoky Mountains National Park (GRSM) has been working cooperatively with other parks and federal, local and state agencies across the country to protect bats and manage cave habitats. In an effort to prevent the unintentional spread of White Nose Syndrome (WNS) by people, the park closed all of its 16 caves and two mine complexes to public entry in 2009. However, WNS was detected in 2010 and the disease manifested during winter 2012 and 2013 with infected bats exhibiting unusual behavior including flying erratically during the day and diving down toward people. The park is home to 12 species of bats including the federally endangered Indiana bat and White Oak Blowhole Cave (WOBH) is one of only 11 caves across the country designated as critical winter habitat for the species. Population monitoring during the winter has indicated significant declines in Indiana bats, tricolored bats, little brown bats and northern long-eared bats. In an effort to maximize protection of the Indiana bat and increase the odds of the local population surviving WNS, park managers have temporarily closed the area immediately around four caves in the White Oak Sink, including WOBH cave. Minimizing human disturbance during critical life stages, both inside and outside of the cave, will afford the best chance for the species to survive.

Foraging range of tri-colored (*Perimyotis subflavus*) and little brown (*Myotis lucifugus*) bats during a 2015 study at Arnold Air Force Base, TN.

Steve Samoray,
Copperhead Environmental Consulting, Paint Lick, USA

Three hundred eleven bats were captured during a 2015 survey at Arnold Air Force Base, TN. Two hundred sixty-nine were captured during standard mist-netting surveys and 42 during a one-night, large scale netting effort at the Bethpage Bridge near Estill Springs, TN. Bat captures included 96 evening bats (*Nycticeius humeralis*), 94 red bats (*Lasiurus borealis*), 59 gray bats (*Myotis grisescens*), 29 little brown bats (*Myotis lucifugus*), 28 big brown bats (*Eptesicus fuscus*) and 4 tri-colored bats (*Perimyotis subflavus*). Of the 4 tri-colored bats captured, 3 were fitted with radio transmitters, tracked to diurnal roosts, and followed during foraging bouts. Of the 29 little brown bats captured, 15 were fitted with radio transmitters, tracked to diurnal roosts, and

followed during foraging bouts. Nine roost trees were found for the three radio-tagged tri-colored bats and 3 roosts were found for 13 of the 15 radio-tagged little brown bats. Foraging data were collected for 7 nights and showed that the tri-colored bats traveled relatively quickly from roost trees to open water and were most often found feeding over or near the edge of larger water bodies. Similarly, the majority of foraging points collected from radio-tagged little brown bats were also over open water or along the shorelines. Individual tri-colored bats returned to their own distinct foraging areas each night while some little brown bats showed movement between foraging areas. Once established in a foraging area for the night, individual little brown bats tended to stay in those areas with very little, if any overlap found among the individual foraging areas of this species.

Sex-specific foraging habits of the Evening bat (*Nycticeius humeralis*) in the Ozark Region of North-Central Arkansas

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Although many studies address the roosting ecology of forest-dwelling bats, little is known about the foraging habits for abundant, forest-dependent species. There is even less knowledge pertaining to behavioral differences between male and female bats. During summers 2013 and 2014, I thus monitored the sex-specific foraging habits of the evening bat (14 males & 10 females) in the Ozark National Forest, Sylamore Ranger District of north-central Arkansas. I used fixed kernel (FK) with least squares cross validation and minimum convex polygon (MCP) methods to estimate the space-use patterns of male and female evening bats during their nightly foraging bouts. Evening bats, primarily males, used multiple core foraging areas. Females exhibited larger FK foraging ranges (852 ± 198 ha) than males (332 ± 85 ha), likely reflecting differences in energetic requirements or habitat availability (i.e., female roosts). MCP estimates were not different between sexes but varied among years. Similarly, FK foraging range estimates were significantly larger in 2014 (739 ± 163 ha) than 2013 (323 ± 106 ha) possibly due to differences in annual precipitation and resource availability. Results suggest that differences in foraging habits between males and females do exist. Further research is needed to produce better informed habitat management decisions.

Spring migration movements of Indiana bats (*Myotis sodalis*) from two Tennessee caves.

Piper Roby, **Theresa Wetzel**, and Mark Gumbert,
Copperhead Environmental Consulting, Inc., Paint Lick, USA

Migration pathways have long been determined for Indiana bats through straight line connections between banding sites and re-capture sites. Although still important, this method excludes essential data including some physiological and ecological forces that may be driving migration. Actively tracking a migrating bat can provide this crucial information on an individual that are

lacking from other techniques. We tracked Indiana bats from their hibernacula as the migrated in the spring. Our primary objective was to document connections to maternity sites, both new and previously identified. In addition, we collected data about the bats' flight routes, roost stops, and layover areas. A total of 65 female Indiana bats were radio-tagged in April 2015: 30 from Hubbard's Cave and 35 from Rose Cave. Two bats were actively tracked upon release. One individual was tracked for 15 days, only two of which were active travel migration days. Due to weather and plane issues, neither was tracked for the entirety of the migration route. During the project, we heard from 43% of the radio-tagged individuals. Twenty-four of the 65 bats were located in previously known maternity colonies in Tennessee, Alabama, and Mississippi. This was the first year that bats were radio-tagged from Hubbard's cave resulting in new cave connections to Alabama and Tennessee.

Indiana Bat Foraging Range Selection in Wilson County, Tennessee.

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In April 2013, the first Indiana bat (*Myotis sodalis)* maternity colonies in Wilson County, Tennessee were discovered on private property. There exists a considerable amount of literature on Indiana bat roosting ecology; however, few studies have examined the foraging habitat selection of female Indiana bats throughout the maternity season. The objective of our research is to determine the foraging habitat preferences of Indiana bats in Wilson County and compare the size of the foraging range at various points during the maternity season. To test our hypothesis that Indiana bats are selecting foraging ranges with a higher percent of forest than available, we used telemetry equipment to obtain foraging locations of two Indiana bats. Land cover composition of fixed kernel foraging ranges were calculated for each bat and compared with the land cover composition of the available foraging area within a 5 km radius of the maternity tree. Preliminary results support our hypothesis and highlight the importance of large forest tracts in agricultural landscapes for the species. Future research will focus on increasing our sample size to allow a statistical analysis of foraging range selection within the available foraging area and habitat selection within the foraging range. Ultimately, incorporating foraging ecology into our conservation strategies will improve our ability to protect the newly discovered maternity colonies of Indiana bats in Wilson County.

Prescribed fire and overstory thinning increase bat activity in Tennessee hardwood forest

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We examined bat response to prescribed fire and overstory thinning in Tennessee hardwood forests. We used acoustic recording of bat echolocation calls to assess bat activity in hardwood forest stands subject to 4 prescribed fire and overstory thinning treatments (spring and fall prescribed fire with woodland residual basal area (low overstory thinning; SpW or FaW) or

savanna residual basal area (high overstory thinning; SpS or FaS), as well as untreated controls. We classified recorded echolocation call sequences to species using automated identification software. To minimize errors in species classification of recorded calls, we combined similar species in groups based on call characteristics. We found total bat activity ($P \leq 0.001$), as well as activity of LANY (eastern red bat [*Lasiurus borealis*] and evening bat [*Nycticeius humeralis*]; $P = 0.001$), EPLA (big brown bat [*Eptesicus fuscus*] and silver-haired bat [*Lasionycteris noctivagans*]; $P \leq 0.001$), PESU (tricolored bat [*Perimyotis subflavus*]; $P = 0.001$), and LACI (hoary bat [*Lasiurus cinereus*]; $P = 0.005$) was greater in SpS and FaS stands. Activity of these bat species was inversely related to live overstory basal area, being lower in Control, SpW and FaW stands where basal area was higher ($P \leq 0.001$). Our results suggest these basal area reductions reduce structural clutter leading to improved foraging and commuting conditions for bats, particularly larger bodied species with low call frequencies that are adapted to more successfully fly and forage in open conditions. In areas where conservation of these bat species is a priority, prescribed fire and overstory thinning may provide useful tools for their management.

Rapid range expansion of the Brazilian Free-Tailed bat in North Carolina, Tennessee, and Virginia 2008-2015

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Brazilian free-tailed bats (*Tadarida brasiliensis*) are one of the most abundant and widely distributed mammal species in the Western Hemisphere, with wide-ranging habitat and roost preferences. Here we document recent accounts of these bats found year-round in multiple locations throughout North Carolina, East Tennessee, and Virginia. Until recently, this species has only been reported as occasional vagrants in the region. The reports presented here come from local wildlife management professionals, wildlife rehabilitation experts, various community members, and from bats submitted for rabies testing. The presence of these bats in buildings and bat houses in rapidly increasing numbers indicates that these bats moved into this area as recently as 2008, and are now establishing year-round colonies. We expect the expansion of these bats will be highly visible and have implications for public health, ecosystem services, and bat conservation since they are moving into White-nose syndrome positive areas. The reports presented here also emphasize the importance of community outreach and collaborations between researchers, wildlife management professionals, and rehabilitation experts.

POSTERS

Bat activity at an urban pond.

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Despite higher human activity, bats may use urban ponds as a source of water and emergent insects. Our hypothesis was that bat activity would be affected by time of night and temperature, with lower activity found in the middle of the night and at lower temperatures. We monitored bat activity via acoustic analysis in relation to time of night, temperature, and time of season. In addition, we used SonoBat and visual verification of bat calls to analyze bat activity by species at this pond. We recorded 5 species of bats April 7-17, 2015. The overall bat activity (n=1720 total bat passes over 11 nights) was not related to maximum or minimum temperature per night, but was related to the time of night. Given the amount of activity at this small urban pond, this aquatic resource may be very important for bats, especially when they are migrating to their summer roosts.

The correlation of bat activity with insect abundance and habitat at the Reelfoot Lake Environmental Field Station site near Buck Basin of Reelfoot Lake.

Ian Nevills, Kevin Pitz, Jack Grubaugh, and Nancy Buschhaus
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Emergent insects can be a significant food source for bats near an aquatic ecosystem, but habitat can affect the ability of bats to capture those insects. We hypothesized that bat activity would be correlated with insect abundance and habitat type at our study site near Reelfoot Lake in northwest Tennessee. We determined bat activity via acoustic analysis by recording bats with Wildlife Acoustics SM2BAT+ bat detectors, and identifying bats with SonoBat 3.1 and visual verification. We sampled insect abundance with black light traps and identified insects to family. We compared an open lawn area to an area with a mowed corridor in a young woodlot next to Reelfoot Lake. Bat activity was correlated with habitat.

The relationship of salamander size structure and bat activity in the Kimball Creek watershed in western Colorado.

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4 *High Lonesome Ranch, DeBeque, Colorado (HW)*.

Bat foraging activity has previously been shown to be related to the emergence of aquatic invertebrates. The emergence of insects can be affected by the size variance of salamanders that inhabit a watershed. We hypothesized that areas in the Kimball Creek Watershed at the High Lonesome Ranch on the western slope of the Colorado Rocky Mountains that have high variance in salamander size structure would have higher levels of bat activity due to a greater abundance of emergent insects. We used a SM2BAT+ bat detector to record bat calls and SonoBat 3.1 to analyze bat activity and bat species richness. We collected emerging aquatic invertebrates by placing emergence traps along the longest axis of Kimball Creek. We captured tiger salamanders with seines and analyzed their size by using ImageJ. Salamander size structure was related to bat activity of the 15 species of bats recorded in this watershed.

The relationship of salamander size structure and bat activity in the Land Between the Lakes watershed in western Kentucky.

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2 *Valdosta State University, Valdosta, Georgia*
3 *Murray State University, Murray, Kentucky*

Size variation in aquatic predators can influence the availability of emergent insects that are consumed by bats. For example, in ponds with both large and small salamanders, the smallest salamanders themselves may become prey of the larger salamanders, decreasing predation pressure on aquatic insect larvae that, in turn, emerge in greater quantities and are available for bat predators. We hypothesized that salamander size structure in ponds in the Land Between the Lakes National Recreation Area in western Kentucky would be related to bat activity. To quantify bat activity and species richness, we recorded bats with a Wildlife Acoustics SM2BAT+ detector and used SonoBat 3.1 with visual verification to assign species identification. We captured salamanders with dip nets and analyzed their size by using ImageJ. We collected emerging aquatic invertebrates by placing emergence traps on each sampled pond. We found a significant relationship between bat activity and size variation among salamanders.

Are bats and sport climbing compatible? A pilot study

Susan Loeb[1] and Patrick Jodice[2]
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2 *U.S Geological Survey, South Carolina Cooperative Fish and Wildlife Research Unit, Clemson University, Clemson, SC, USA*

Sport climbing is a rapidly growing sport in the US and elsewhere. Although several species of bats commonly roost in cliff faces, the potential for impacts of climbers on bats has received very little study. We initiated a pilot study on the potential impacts of sport climbing on bats in Obed Wild and Scenic River in eastern Tennessee during June-August 2015. Our objectives were to 1) examine small-footed bat (*Myotis leibii*) roost use to determine if they avoided climbed cliffs, and 2) determine if overall bat foraging and commuting activity varied between climbed and unclimbed areas. We used radio-telemetry to track small-footed bats to day roosts and Anabat SD2 detectors to compare bat activity between climbed and unclimbed areas along climbed cliff faces, and between climbed and unclimbed cliffs. Four adult males were tracked to 9 day roosts. Three roosts were in large boulders on the shore of the river, 1 roost was in a barn, and 5 roosts were in cliff faces (3 on climbed and 2 on unclimbed faces). Foraging/commuting activity was high along climbed cliffs and did not differ between climbed and unclimbed areas. However, bat activity was significantly higher along climbed cliffs than unclimbed cliffs. Lower activity along unclimbed cliffs may have been related to lower cliff heights and more clutter along cliff faces. High bat activity along cliff faces suggests that additional study of bat activity in relation to climbing throughout the annual cycle will aid in the development of climbing management plans.

Survey & management of buildings used as summer roosts by bats in Great Smoky Mountains National Park

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2 *National Park Service*

Great Smoky Mountains National Park (GRSM) is the most heavily visited national park in the country, and the summer months attract tourists with opportunities for wildlife viewing and exploration of historic structures. During this time, visitors and employees regularly report bats and bat sign in historic and non-historic buildings. In light of catastrophic bat population declines due to White-nose Syndrome (WNS), it is essential that management of these buildings balance the need for public safety and preservation of cultural resources with conservation of threatened bats. As a taxon with small litter sizes and low recruitment, the persistence of bats on the landscape is dependent upon individual survival and reproduction, and therefore the availability and quality of summer roosts, including buildings, where post-natal development and preparation for hibernation can take place. The goals of our study are to assess which buildings in GRSM are being used by bats as summer roosts; determine why structures are selected for roosting; and develop recommendations for the management of structures when bats are present. To date we have surveyed over 150 buildings. For buildings used as roosts, as evidenced from observation of bats or presence of guano, and paired, randomly selected, unused buildings, we evaluated a variety of microhabitat features and structural attributes. We collected guano from used buildings

for DNA analysis to identify bat species when not observed. We will present preliminary findings regarding use and selection of buildings in GRSM by bats as summer roosts and initial management recommendations.

Summer roosting ecology of Tricolored Bats in the Great Smoky Mountains National Park

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1 *Department of Forestry, Wildlife, and Fisheries, University of Tennessee, USA*
2 *National Park Service*

Due to the threat of White-nose syndrome in the Great Smoky Mountains National Park, we are studying relative abundance of tricolored bats (*Perimyotis subflavus*) pre and post outbreak, as well as roost site selection to better inform management strategies and aid species recovery. Little is known about this species and it is being considered for federal listing due to the disease. To determine whether the relative abundance of Tricolored bats within the park has changed since the arrival of WNS, we are surveying bats at 20 locations for 40 net-nights, and will be comparing our data with results from a study conducted at the same sites in 2001-2003, prior to the outbreak. To investigate roost site selection, we are using radio telemetry to locate day roosts selected by individual bats. Selected roosts will then be compared to randomly selected trees to determine if there is a significant preference for tree species and habitat within a 0.1-ha plot. From May 13, 2015 to July 1, 2015, seven roost trees have been located; three white oak (*Quercus alba*), two red oak (*Q. rubra*), one chestnut oak (*Q. prinus*) and one red maple (*Acer rubrum*). Preliminary results from this season will be presented.