Statewide efforts to monitor year-round bat activity in Montana, utilizing a collaborative network of agencies and volunteers

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NRMG Photo

Fringed Myotis (Kristi DuBois Photo).

Introduction

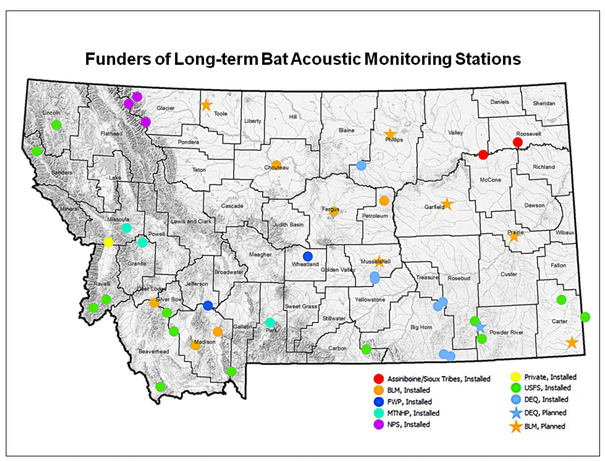
Information on the distribution of Montana's bat species has increased in recent years, but our knowledge about seasonal activity patterns, migration pathways, and roost sites remains very limited. Montana is experiencing increasing energy production (especially wind, coal, and gas), residential development, and continued habitat conversion from native or semi-natural habitats into row crops. The potential arrival of *Geomyces destructans* (White Nose Syndrome, or WNS) has placed an urgency on better understanding our bat populations, so we can develop mitigation strategies to help limit the impacts on bats. This study was initiated in 2011 as part of a competitive State Wildlife Grant.

Information Needs/Objectives

- Centralization of winter and summer roost site data.
- Overwintering locations and temperature and relative humidity of roosting areas.
- Baseline activity levels within and outside of hibernacula.
- Timing, routes, and other correlates of migration.
- Focal studies at wind energy facilities.
- Year-round spatial use of landscapes.
- Year-round status information (occupancy rates, sizes of roost aggregations, activity levels).

Methods

- Formed a Bats and Caves Working Group with state and federal agencies, tribes, cavers, and interested volunteers.
- Prioritized caves and mines for bat surveys and data logger deployment.
- Deployed a statewide system of SM2 acoustic monitoring stations.
- Deployed Hobo U23-002 data loggers in caves known or suspected to be used by bats, to characterize cave environments.
- Developed a "Bat Roost" category in the Montana Natural Heritage Program (MNHP) database.
- Developed a statewide network of volunteers and cooperating agencies to increase our effort and effectiveness.
- Analyzing bat calls using Sonobat 3.



Bat acoustic monitoring stations have been installed by state and federal agencies, tribes, and a private conservation ranch in landscapes with open water and good bat roosting habitat.

Abstract

Montana's bat populations face a wide array of conservation issues, including loss of roosting sites, pesticide impacts to prey species, hazards at sites where they forage and drink, wind farms and other energy development, and the potential arrival of *Geomyces destructans*. These conservation issues and the low reproductive output of bats highlight the need to gather baseline information that can be used to mitigate impacts to populations. A collaborative effort was initiated in 2011 to document roost habitat characteristics and year-round spatial and temporal activity patterns of Montana's bats. Collaborators include federal and state agencies, tribes, school groups, and members of the Montana caving community. Collaborators have deployed data loggers at roost sites, established a large array of passive ultrasonic detector stations, and contributed valuable information on bat presence/absence in caves. Advantages of these collaborative efforts include efficient data collection coverage across a very large state, increased understanding of bat conservation issues among land managers, establishment of good working relationships among collaborators, and hands-on educational opportunities for kids.

BCC student Mandy Derber rappelling into Whitaker Sink (BCC Photo).

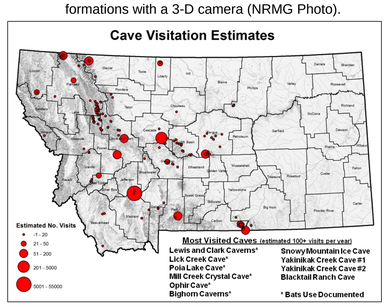
Challenges for Montana

- Montana is the 4th largest state in the United States. How do we cover such a vast area with limited resources?
- Many Montana caves require vertical entry and specialized training and equipment.
- Many caves have limited or difficult access, especially in winter.

Michael McEachern documents cave formations with a 3-D camera (NRMG Photo).

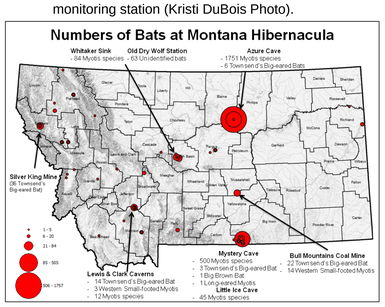
Acoustic stations may help us document hoary bat migration events (Kristi DuBois Photo).

Volunteer Bob Bastasz checking an acoustic monitoring station (Kristi DuBois Photo).



Human use of caves from cave registers provides important planning information.

BCC student Abe Malley collecting soil samples for WNS testing (BCC Photo).



Bat numbers documented in Montana bat hibernacula, from past and current counts.

Northern Rocky Mountain Grotto (NRMG)

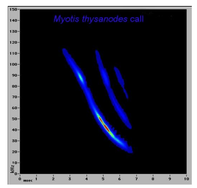
- Helps install and maintain the acoustic monitoring network.
- Installs data loggers and cave registers.
- Reports observations of bats.
- Documents other cave biota and resources.
- Conducts surveys and prepare cave maps.

Bigfork High School Cave Club (BCC)

- A student science and caving group founded by Hans Bodenhamer, science educator.
- Explores, maps, and studies caves throughout Montana.
- Trained in GIS mapping, cave biota studies, and cave safety.
- Cooperates with Glacier NP and other agencies.
- Received 2009 President's Environmental Youth Award.
- Featured speakers at 2010 ESRI International Users & 2013 Montana Chapter of the Wildlife Society Conferences.

Results

- In the first half of the three-year grant, 17 volunteers from NRMG & BCC have logged 513 hours of work, valued at over $10,500.
- Deployed 30 data loggers in caves as of February 2013.
- Deployed > 40 bat acoustic monitoring stations.
- Documented 8 new cave roost sites.
- MNHP developing database of bat roosts.
- Bat acoustic data is being analyzed by MNHP.



Discussion and Conclusions

Benefits from working with cavers extends well beyond the monetary value of their contribution.

- Developed productive relationships that will help us work together to conserve bats and caves in Montana.
- Greatly extended our knowledge about Montana bats.
- Engaging Bigfork High School students in important conservation efforts, impacting them in ways that will last throughout their lives.
- This project is considered a model for getting ground work done and using a cooperative approach to studying bats.
- Cavers and caving groups are critical to baseline assessment, monitoring, and conservation of our bats and caves!

Web Resources of Interest

Northern Rocky Mountain Grotto: http://www.nrmg.org
National Speleological Society: http://www.caves.org
Bigfork High School Cave Club: http://bigforkhighschoolcaveclub.weebly.com
MPG Ranch: http://www.mpgranch.com

Myotis sp. (Kristi DuBois Photo).

Cooperators