

SPECIES OF CONCERN

Bat populations have been greatly affected by a number of ecological stressors including human disturbance, loss of habitat, and contamination by deadly toxins. A more recent threat, the fungus that causes the deadly disease known as white-nose syndrome (WNS), has killed more than six million bats in eastern North America since 2006.

BRI researchers are focusing on two bat species that are greatly affected by WNS: Indiana and northern long-eared bats.



The Indiana bat (left) has a limited range, hibernating in only a few caves, which leaves them extremely vulnerable to ecological threats. These bats were first listed as endangered in 1967 and they have been on the Endangered Species List ever since.

Northern long-eared bat populations are succumbing

to WNS at an alarming rate. These bats recently received protection as a threatened species under the Endangered Species Act.

BRI Findings from the Field

A core component of BRI's mission is to assess emerging threats to wildlife and ecosystems. Our surveys are a critical tool in helping to identify and monitor threats to at-risk species such as the Indiana and northern long-eared bats.

Through our research, we have contributed to the knowledge of population distributions, roost ecology, and how populations are responding to WNS.

BRI researchers use tracking technologies to help discover ways in which to help at-risk species such as the northern long-eared bat (here pictured with a transmitter attached).



BRI's MAMMAL PROGRAM

Following BRI's initial mercury studies on mink and river otters in 2000, the Institute's mammal program quickly expanded to incorporate studies of many other species. BRI's biologists have many years of experience conducting endangered species surveys. Our mammal staff includes federally permitted biologists and Qualified Indiana Bat Surveyors.

Research Capabilities

Methods we use to study mammal species throughout the United States include:

- Acoustics
- Telemetry
- Contaminant analysis
- Hibernacula surveys
- Live capture

Species We Study

- Beaver
- Harbor seal
- Mink
- Muskrat
- River otter
- Shrews, mice, voles, and rats
- Bats (partial list)
 - Eastern small-footed
 - Indiana bat
 - Little brown bat
 - Neotropical bats
 - Northern long-eared



MAMMAL PROGRAM DIRECTOR

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BIODIVERSITY RESEARCH INSTITUTE
innovative wildlife science

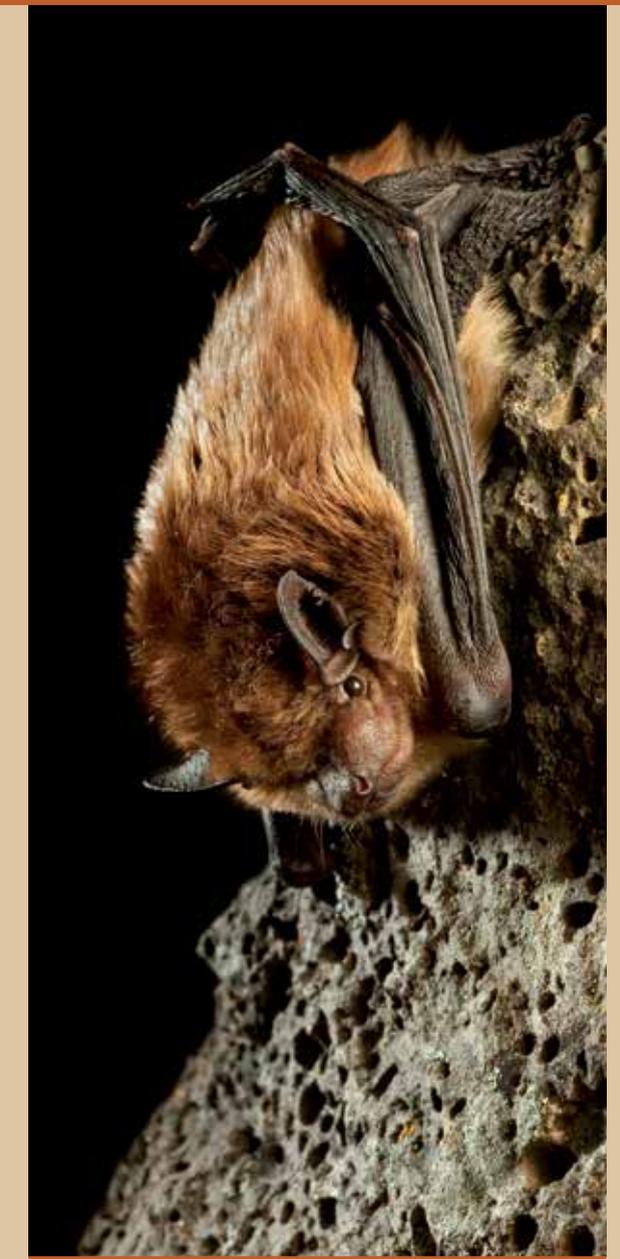
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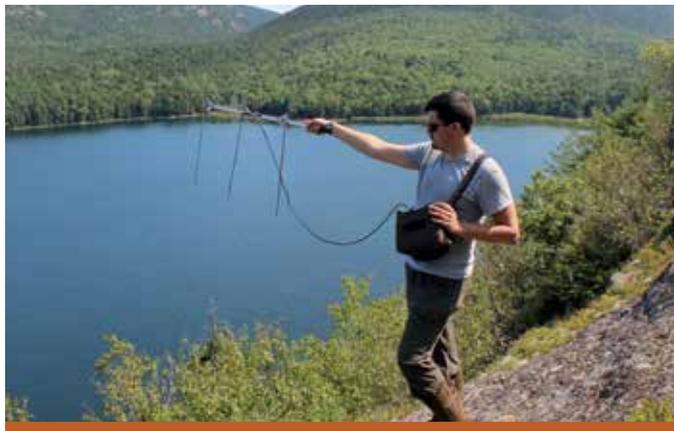
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BIODIVERSITY RESEARCH INSTITUTE MAMMAL PROGRAM





TRACKING

Tracking individual animals provides remarkable information valuable in a wide spectrum of research, management, conservation, and legislative decisions.

Animals fitted with traditional radio transmitters and nanotags are typically tracked by plane, vehicle, boat, automated tracking tower, or on foot. Using these methods, biologists can investigate different aspects of the life cycles of many different species.

Below is a selection of representative mammal tracking projects:

- Home range study of northern long-eared and eastern small-footed bats at Great Bay National Wildlife Refuge
- Determining home range of little brown bats on a contaminated river in Virginia, home range movements of otter, mink, beaver, and muskrat on a fluctuating reservoir in western Maine
- Tracking Indiana bats to day roosts and performing exit counts for pipeline and utility corridor surveys throughout the eastern U.S.
- Tracking eastern small-footed, northern long-eared, and little brown bats to rock roosts at Acadia National Park

Marking bats (like the little brown bat shown here) with unique wing bands is one of the most long-standing methods of studying bats. Traditional bands help us identify the banding origin of bats that are recovered or recaptured elsewhere.



SURVEYING



Habitat loss and fragmentation cause a variety of ecological impacts that trigger different responses in mammal species. Conducting surveys allows us to monitor populations and examine species response to habitat alterations. Depending on the objective of the study, we use a variety of methods to survey and inventory a species. These inventories are important to understand how the mammals we study utilize the landscapes we share with them.

Below is a selection of representative mammal survey and monitoring research projects:

- Bat survey of Parker River and Great Bay National Wildlife Refuges
- Bat acoustical surveys and analysis for pipeline utility corridor and development throughout the eastern U.S.
- Cave surveys for endangered species and those affected by white-nose syndrome, throughout the northeastern U.S.
- Ecoregion survey to determine rare bat and small mammal species in Maine
- Characterizing bird and bat migration in the Thousand Islands region of New York (with U.S. Fish and Wildlife Service)



CONTAMINANT STUDIES

BRI's extensive experience in contaminant investigations throughout the United States has provided information about toxins in the ecosystem for the past 20 years. BRI has the capability to analyze samples in its Wildlife Mercury Research Lab. Below is a selection of some representative mammal contaminants research projects:

- Evaluating spatial and temporal patterns of mercury exposure in northeast U.S. bat populations
- Evaluating spatial and temporal patterns of mercury exposure in northeast U.S. mink and otter populations
- Developing mercury lowest adverse effect levels (LOAEL) for U.S. bat populations
- Penobscot River mercury study: mercury assessment in bats, seals, and otters along the Penobscot River and comparison regions in Maine
- Assessing bat, furbearer, and small mammal mercury profiles for Natural Resource Damage Assessments (NRDA) with USFWS, EPA, and various state agencies

ABOUT BRI

Biodiversity Research Institute (BRI), headquartered in Portland, Maine, is a nonprofit ecological research group whose mission is to assess emerging threats to wildlife and ecosystems through collaborative research, and to use scientific findings to advance environmental awareness and inform decision makers.

BRI supports 10 research programs within three research centers including the **Center for Ecology and Conservation Research**, the **Center for Mercury Studies**, and the **Center for Loon Conservation**.

Within the Center for Ecology and Conservation Research, BRI manages the following programs:

Taxonomic

- Mammal Program
- Marine Bird Program
- Raptor Program
- Songbird Program
- Waterfowl Program

Ecosystems

- Arctic Program
- Tropical Program
- Wetlands Program

Environmental Issues

- Wildlife Health Program
- Wildlife and Renewable Energy Program



BRI has been conducting scientific inquiries for private sector and government clients nationwide and globally since 1998. Using both traditional and innovative approaches, our researchers collect, analyze, and interpret scientific results on how ecological stressors impact living systems.

By incorporating regional data and developing strategies for collecting additional data, BRI has effectively modeled such stressors on species and community distributions, phenology, adaptive strategies and population viability across tropical, temperate, and arctic biomes.

For more information on our capabilities and services, visit: www.briloon.org/services