Bats in Alaska: Citizen Science and Field Research Give New Insights about their Distribution, Ecology, and Overwintering Behavior

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Why study bats?

• Resource managers need to determine the appropriate actions and levels of effort necessary to fulfill their public trust responsibilities for this species

• Planning and environmental assessment processes for public lands should include bat habitat and range information when considering effects of land-management practices
Why study bats?

• Through increased awareness of the value of bats in the wild, we can slowly begin to understand and conserve bats in Alaska.

• Important that we continue to learn more about bats and bat ecology in Alaska so we can conserve resources critical to their survival and prevent population declines.
Conservation Concerns

• The U.S. Fish and Wildlife Service listed the entire genus *Myotis* as a conservation concern in 2003

• White Nose Syndrome is decimating bat populations in eastern North America

• High mortality rates caused by crashes with wind turbines
White Nose Syndrome
Bat Species in Alaska

Little brown bat
(Myotis lucifugus)

Silver-haired bat
(Lasionycteris noctivagans)

Yuma myotis
(Myotis yumanensis)

Long-legged bat
(Macrophyllum macrophyllum)

Hoary bat
(Lasiurus cinereus)

Keen's myotis
(Myotis keenii)

California myotis
(Myotis californicus)
Little brown bat (*Myotis lucifugus*)

- Most common and widespread bat species in Alaska
- Weight: 5–9 g
- Length: 3–4 ½ in
- Wingspan: 8–9 in
- Flying speeds: up to 22 mph, average of 12 mph
Little brown bat (*Myotis lucifugus*)

- **Habitats**
  - Southeast: Temperate rainforests
  - Interior: Spruce/birch forests
  - Western region: Treeless, shrub-dominated communities

- Distribution limited by geographic barriers, roost availability, climate, length of night, and prey availability
Research Needs

• Little is known about the ecology of bats in Alaska
  – Distribution and abundance during summer months poorly understood
  – Few summer maternity roosts documented
  – Even less known about where bats go in winter
Research Needs

• Knowing where bats are on the landscape, where they hibernate, and whether or not they migrate are critical information gaps.

• Because bats occur in low densities in Alaska, documenting their summer distribution, roosting habitat, migration habits, and winter hibernacula is a challenging task.
Alaska Citizen Science Program

• Partnership between members of the public and professional scientists
• Provides opportunities for private citizens to assist wildlife biologists in collecting important data and be part of ongoing research projects and conservation planning
• With help of local residents we are able to expand our efforts and do more with our resources
Alaska Citizen Science Program

- Alaska is a huge state with few scientists and limited funds available to study the many different species of wildlife that live here.
- The Citizen Science Program allows individuals, families, community organizations, and school groups — anyone interested in learning more about our local wildlife — a chance to get involved.
Alaska Bat Monitoring Program (ABMP)

• Developed in 2004, a citizen science-based approach for collecting baseline information on the locations of bats, roosts, and hibernacula to

• Aims to encourage general public and natural resource professionals across Alaska to report any and all encounters with bats.

• Used as the basis for more intensive, directed research efforts
Alaska Bat Monitoring Program (ABMP)

• Enlist volunteer participation by:
  – Extensive public outreach efforts
  – “Inreach” to academics, agency researchers, and other natural resource professionals
  – Mass-media elements to publicize the project
  – Live presentations for the general public, civic organizations, and school groups
  – The website www.akbats.net provides “self-service” alternative for those we are unable to reach in person
Alaska Bat Monitoring Program (ABMP)

• Volunteer data
  • Observations wherever bats encountered
  • Record number of bats observed
  • Whether bats flying or roosting
  • Substrate type (if roosting)
  • Date and time, elevation, latitude and longitude, and physical directions to the observation site.
• Photographs to validate observations are requested but remain optional
Ongoing Research

• Bat detectors convert the high-frequency calls that bats make to a lower-frequency sound within the range of human hearing
• Allow us to “eavesdrop” on bats while they forage
Summer Roosts

- We know of only a handful of summer roosts, most in buildings.
- Track summer roosts through fall to determine if bats leave or remain in place over winter.
Winter Roosts

- Either migrate to warmer climates or hibernate
- Drop body temperature and metabolic rate to conserve energy when no food is available
- Hibernacula must stay cold, but remain above freezing
- Caves and abandoned mines popular in East and Midwest
- Don't know where most western bats spend the winter
Results of Citizen Science, 2004-2012

• Yielded data with geographic scope and temporal sweep that would be extraordinarily expensive to acquire using more traditional field methods for such exploratory research.

• This project and these data are intended to inform and guide more rigorous research efforts utilizing these gold-standard methods in the future
Bat Reports

• Received reports of bats from 252 unique locations
  – Southcentral (n=191)
  – Central (n=34)
  – Western Alaska (n=27)

• Overall, bats reported throughout state south of Brooks Range
  – Northernmost observation in Kotzebue
  – Westernmost in White Mountain and St. Michael
  – Southernmost from Semidi Island group
Bat Reports

• Clustered along road corridors and near population centers
• Also received reports from remote villages off of road system
• Received 48 reports of maternity roosts
  – All were associated with human structures
Bat Reports

• Reports of bats in 25 unique locations during the winter period from October to April
  – All associated with buildings unless observed flying outdoors
  – No hibernacula in natural substrates

• Implications
  – Bats in most northerly areas are likely non-migratory and overwinter in human structures
  – Winter observations in Southcentral Alaska suggest both migratory and non-migratory behavior
Local Environmental Observer Network