

Bat Ecology



Maine Wetland Scientists

Why monitor/study bats?

- Long lived (MYLU 35+yrs)
- High site fidelity
- Important in insect control and agricultural pests
- Bio-indicators
- Important species worldwide for pollination and seed dispersal

Little brown



Northern long-eared



Tri-colored



Eastern small-footed



Big brown



Silver haired



Red



Hoary



History of Northern Long-eared bat (NLEB) Status

- “Myotis keenii is a northern species” (Barbour & Davis 1969)
- “It is a common bat in Indiana and Illinois, but scarce in Kentucky and West Virginia” (Barbour & Davis 1969)
- Until mid – late 1990’s the NLEB was on the Natural Heritage’s “rare species” list in almost every state in which it was found.



Reasons for Early Status

- Not found in large numbers in caves and almost no summer surveys were completed.
- Early Indiana bat summer surveys focused on open riparian corridors, which are not where most NLEB's forage and travel.
- Netting in upland habitats, especially over ponds and water-filled road-ruts in Kentucky during 1991 – 1996 changed the way surveys were conducted.



Life History

- Roost habitat generalist
- Highly maneuverable (lowest wing loading ratio in northeast)
- Active below forest canopy (gleaners)
- Asynchronous birth within colonies (June to mid-July, nursing period up to 34 days)



Habitat Characteristics

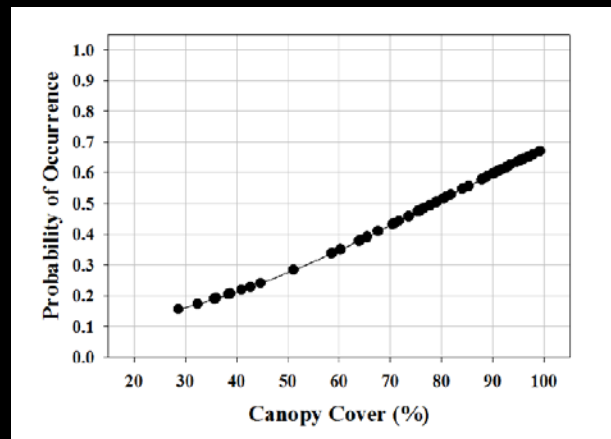
- Winter habitat (New York: Oct. 1 - May. 1)
 - Caves, mines, railroad tunnels
 - Other man-made structures?
 - Up to approx. 170 miles from summer roosts
- Summer habitat (Apr. 1 – Sep. 30)
 - Maternity colonies May 15 – Aug. 15
 - Some use of man-made
 - Trees >3" DBH, live/snags, exfoliating bark, cracks etc.
 - NLEB home ranges occur within 3 miles (mi.) of capture/acoustic record, or within 1.5 mi. of a suitable roost tree.
- Fall swarming (Aug. 1 – Oct. 30)
 - Forested habitat within 5 mi. of hibernaculum

Habitat Use/Distribution in Maine

- Extensive working forests
 - Variety of tree species/roost characteristics used across range
- Extensive coastal habitats
 - Coastal refugia? (Maine, New Hampshire, Long Island)
- Limited hibernacula data
 - Species uses hibernacula with variable temperatures
- Widespread presumed presence prior to WNS

Recent Literature

Ford, W.M., M.A. Menzel, J.L. Rodrigue, J.M. Menzel, and J.B. Johnson. 2005. Relating bat species presence to simple habitat measures in a central Appalachian forest. *Biological Conservation* 126:528–539.



Silvis, A. W.M. Ford, E.R. Britzke, N.R. Beane, and J.B. Johnson. 2012. Forest succession and maternity roost selection by *Myotis septentrionalis* in a mesophytic hardwood forest. *International Journal of Forestry* doi: 10.1155/2012/148106.8 p

Recent Literature

Moosman, P.J. Jr., J.P. Veilleux, G.W. Pelton, and H.H. Thomas. 2013. Changes in capture rates in a community of bats in New Hampshire during the progression of white-nose syndrome. *Northeastern Naturalist* 20(4):552–558.

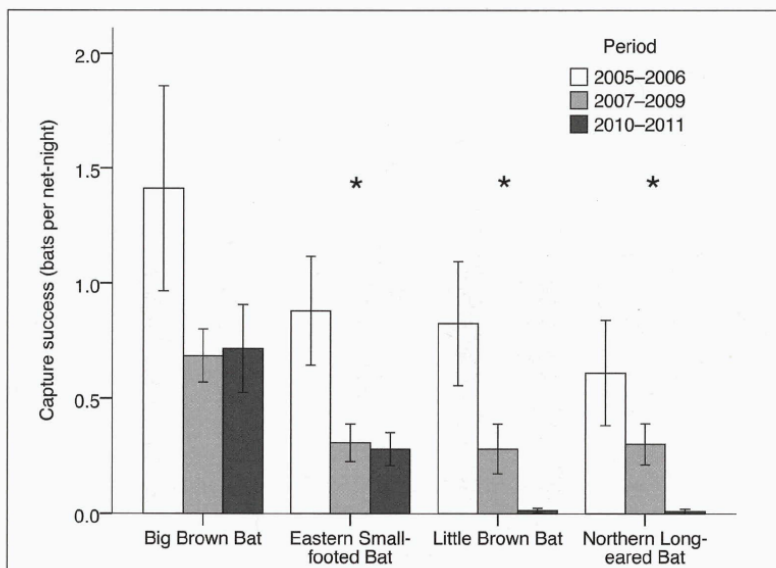


Figure 1. Mean (\pm SE) capture success in 4 species of bats during the progression of white-nose syndrome in New Hampshire. Asterisks indicate species with significant effects ($P < 0.001$) across all periods of the disease.

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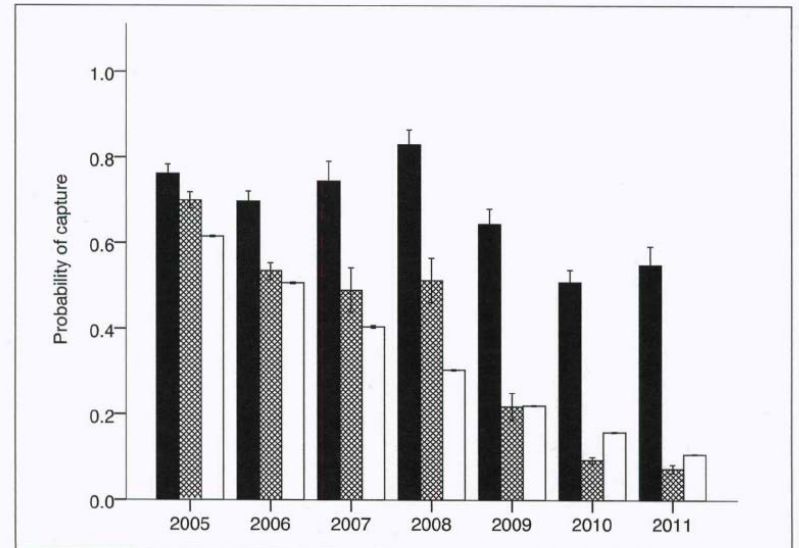


Figure 2. Declines in the predicted probability of capturing Big Brown Bats (black bars), Little Brown Bats (crosshatched bars), and Northern Long-eared Bats (white bars) during the progression of white-nose syndrome in New Hampshire. Data represent results of logistic regression models. Error bars show standard error of the mean.

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NLEB Listing Status

- Proposed Rule–October 2, 2013 in Federal Register
 - Comment period closed January 2, 2014
 - Proposed as Endangered
 - Critical habitat–not determinable
- Threats:
- WNS is primary threat
 - Compounding threats may include:
 - *Impacts to hibernacula
 - *Mortality from wind projects
 - *Forest conversion/loss