

Bat Ecology



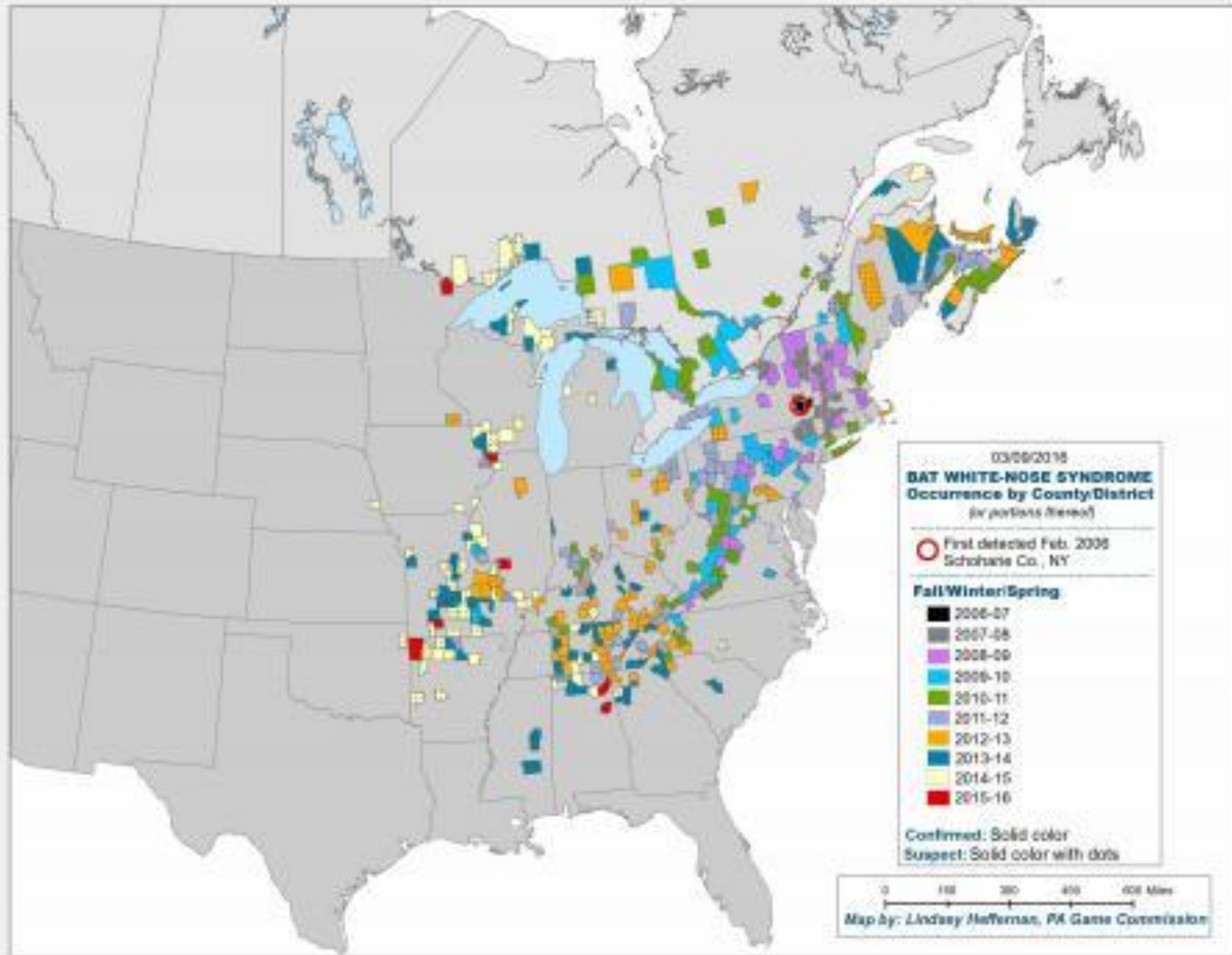
NERCOFE - 2016

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

White Nose Syndrome

3-9-16



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

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.

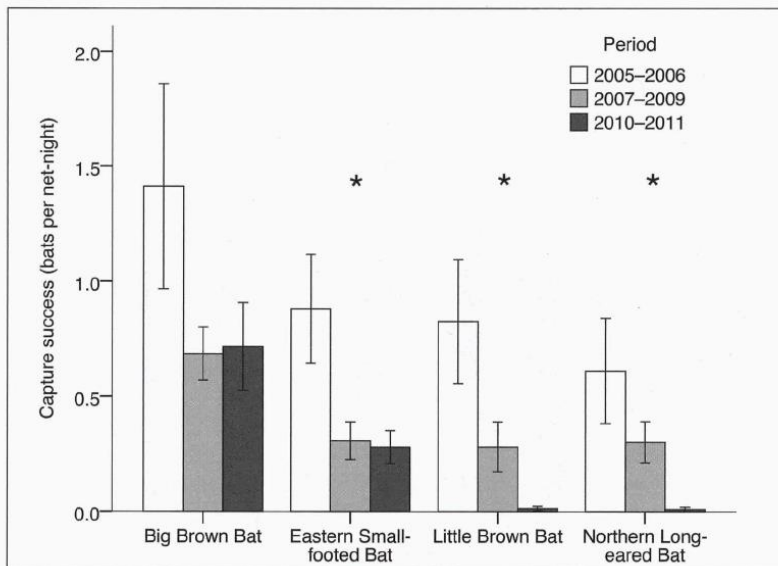


Figure 1. Mean (\pm SE) capture success in 4 species of bats during the progression of white-nose syndrome in New Hampshire. Asterisks indicate species with significant effects ($P < 0.001$) across all periods of the disease.

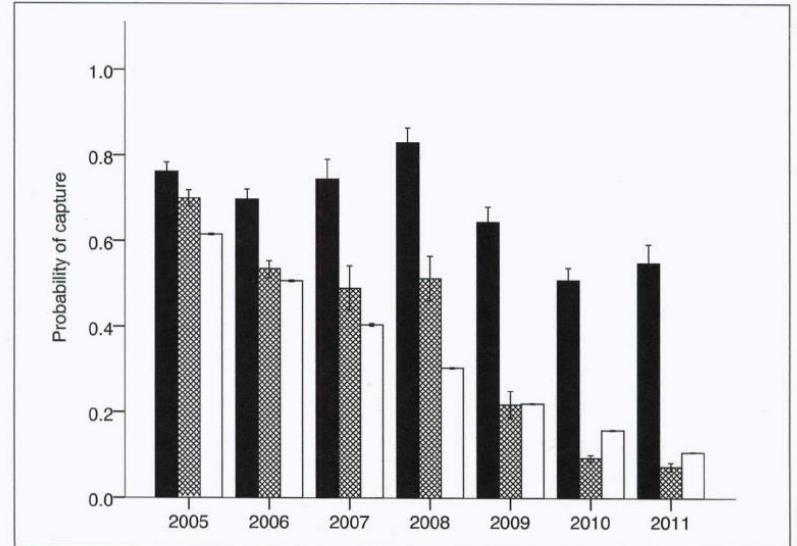
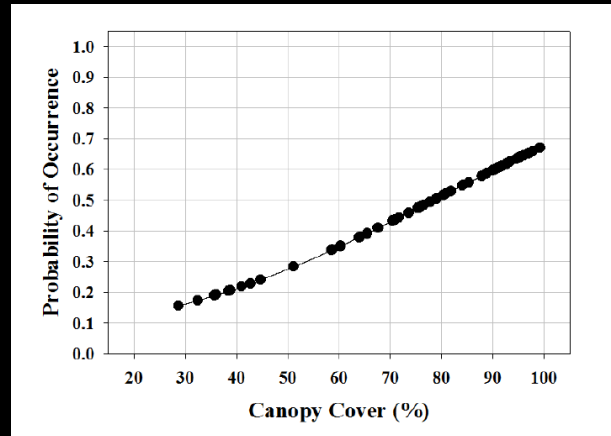


Figure 2. Declines in the predicted probability of capturing Big Brown Bats (black bars), Little Brown Bats (crosshatched bars), and Northern Long-eared Bats (white bars) during the progression of white-nose syndrome in New Hampshire. Data represent results of logistic regression models. Error bars show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

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. 2015. Effects of hierarchical roost removal on northern long-eared bat (*Myotis septentrionalis*) maternity colonies. *PLOS ONE*, DOI:10.1371/journal.pone.0116356