

ABSTRACT

Thesis: Examining the Suitability of the Little Brown Bat (*Myotis lucifugus*) as a Surrogate for the Endangered Indiana Bat (*M. sodalis*).

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The use of common species as surrogates for those that are threatened or endangered is best conducted using species that are biologically related. If the two species are fairly dissimilar then conclusions based on data collected from surrogates may be misleading. The abundant little brown bat (*Myotis lucifugus*) has been suggested as a suitable surrogate for the endangered Indiana bat (*Myotis sodalis*) due to their close morphological similarities. In order to examine the suitability of little brown bats as surrogates in ecological based research and management, research was conducted on the roosting ecology, foraging home ranges, foraging habitat selection, and diets of both species. While research is available on Indiana bats in these subjects, there is a paucity of information on little brown bat roosting ecology and foraging ecologies. Therefore, data were collected concerning these ecological factors to determine the similarity between the species. There was enough research on little brown bat and Indiana bat diets available to compile data and compare them without conducting additional research. Roosting

ecology and foraging ecology data were collected during the summers of 2003, 2007, and 2009-2011 from 2 study areas in the Shawnee National Forest, IL, and 2 study areas in south-central Indiana. Bats of both species were tracked during the day to record maternity roost characteristics and again at night to record foraging locations. A total of 67 Indiana bats and 31 little brown bats were tracked during our study. Our results show that while the species are similar in some ecological characteristics (roosting habitat, roost tree species) they are also different in several other characteristics (roost type, home range, and habitat selection). Therefore, little brown bats may be suitable surrogates for some research and management projects and unsuitable for others, depending on the objectives of the project. However, holistically little brown bats are unsuitable surrogates for Indiana bat summer habitat management.