

## Public Abstract

First Name:Sarah

Middle Name:A

Last Name:Pennington

Adviser's First Name:Matthew

Adviser's Last Name:Gompper

Co-Adviser's First Name:Sybill

Co-Adviser's Last Name:Amelon

Graduation Term:SP 2013

Department:Fisheries & Wildlife

Degree:MS

Title:USING OCCUPANCY ESTIMATES TO ASSESS HABITAT USE AND INTERSPECIFIC INTERACTIONS OF THE INDIANA BAT (MYOTIS SODALIS) AND LITTLE BROWN BAT (M. LUCIFUGUS) IN NORTHEAST MISSOURI

The Indiana bat has been endangered since 1967 and is the focus of a controversial debate among stakeholders on both public and private lands. Much of this debate is due to a lack of understanding the summer habitat needs of the species. In addition, even less is known about interactions with other bats and if this could be playing a role in the decline of this species. Our objectives were to estimate the probability of site occupancy for the Indiana bat and the little brown bat in three locations in northeastern Missouri from which we could model their summer habitat suitability. We then used our occupancy modeling estimates to determine whether the knowledge of the little brown bat's landscape occupancy patterns improved the fit of Indiana bat occupancy models and vice versa.

For the Indiana bat, the quantity of bottomland hardwood forest in the landscape was the single most significant factor in determining Indiana bat occupancy. Because bottomland hardwood habitat is scarce throughout the range of the Indiana bat, this would help explain the species' struggle to rebound. For the little brown bat, we found conservation area combined with distance to water and canopy cover created the top model determining little brown bat occupancy.

We then combined this information on Indiana and little brown bats to determine whether the little brown bat occupancy improved the probability of Indiana bat occupancy (and vice versa), for which we found it did not. Our findings help managers consider the summer needs of the endangered Indiana bat. We suggest managers ensure adequate bottomland hardwood habitat is available to sustain summer populations of Indiana bats. We also suggest that resource partitioning may exist between Indiana and little brown bats and that managers should use caution in using the little brown bat as a surrogate species when assessing the needs of the Indiana bat.