MULTI-SCALE FACTORS INFLUENCING DETECTION, SITE OCCUPANCY AND RESOURCE USE BY FORAGING BATS IN THE OZARK HIGHLANDS OF MISSOURI

Sybill K. Amelon

Dr. Frank R. Thompson, III, Dissertation Supervisor

ABSTRACT

Conservation of bat populations requires understanding the associations between bats and their use of resources. We used maximum likelihood to estimate probability of site occupancy using acoustic data for ten species of bats. We evaluated *a priori* hypotheses for both probability of detection and site occupancy using AIC. Time, temperature, moisture, vegetative clutter, and date influenced detection probability. Response to spatial scale varied by species. Habitat, patch, and landscape characteristics influenced site occupancy and varied among species. We evaluated use of resource utilization functions (RUFs) to assess habitat and landscape factors affecting foraging resource use by red bats, *Lasiurus borealis*. Highest foraging use was associated with open deciduous forest on ridges and upland drainages in areas close to non-forest edge and relatively high road density. Resource selection was variable among individuals, geographic location and stage of lactation. Management strategies that provide a range of composition and structural diversity will favor foraging use by *L. borealis*.