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Roosts of Rafinesque's Big-Eared Bats and Southeastern Myotis in East Texas

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Abstract - Because diurnal roosts can be important in determining bat occupancy and abundance in forested habitats, we identified characteristics of cavity trees that influence roost selection by *Corynorhinus rafinesquii* (Rafinesque's Big-eared Bats) and *Myotis austroriparius* (Southeastern Myotis) in east Texas. We identified used and non-used cavity trees with a combination of transect searches, radiotelemetry, and historical records at 7 study areas. Both bat species selected similar cavity trees for summer diurnal roosts, showing an affinity for tupelo trees (*Nyssa* spp.), with 55% of diurnal roosts in *Nyssa aquatica* (Water Tupelo) and 33% in *N. sylvatica* (Blackgum). Of 17 tree and habitat variables we measured at used and unused cavity trees, those related to cavity size and availability (cavity height and diameter, tree diameter, density of large trees in the area) were the most important predictors of use. Characteristics of the surrounding stand at both local and landscape scales were less important. Rafinesque's Big-eared Bats and Southeastern Myotis appeared to use the largest cavity trees present and we speculate that the availability of suitable trees with large cavities may limit abundance in this region.

Introduction

Suitable diurnal roosts are vital for the success and persistence of all bat species. Diurnal roosts provide protection from predators and ambient environmental conditions, and aid in reducing energetic costs associated with parturition and thermoregulation (Barclay and Kurta 2007). Within forested systems, bats utilize a variety of structures for diurnal roosts, including tree foliage, exfoliating bark, cracks or crevices in the tree, and internal cavities (Brigham 2007). Due to the importance of diurnal roosts and the relative ease of studying bats in their roosts, roost selection has been extensively studied for some species; however, much of the research been focused on certain species (e.g., *Myotis sodalis* [Indiana Bat]) or certain regions (e.g., the Pacific Northwest) (Brigham 2007). Because roost characteristics are often very species-specific, local information on individual species' needs is needed to formulate effective plans for conservation.

Corynorhinus rafinesquii Lesson (Rafinesque's Big-eared Bat) and *Myotis austroriparius* Rhoads (Southeastern Myotis) are closely associated with bottomland hardwood forests and forested swamps throughout their ranges in the southeastern

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