Habitat Ecology, Species Presence, and Public Perception of Three Declining Bat Species in Southeastern Missouri

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Introduction

Bats Benefit Humans
- Bats provide many ecosystem services for humans such as pollination and insect control.
- In an agricultural study in Illinois, bats helped reduce pest larvae densities and mycotoxin in corn. This effort is estimated to save $1 billion U.S. dollars of insect-related control for corn crops (Maine and Boyles 2015).

Bats are Threatened
- Bat populations are threatened by habitat loss, habitat fragmentation, and disease. For many species in decline, not much is known about their habitat needs.
- The greatest threat bats face in North America is white-nose syndrome (WNS). Since its introduction in 2006, WNS has caused over 6 million bat mortalities. WNS is a deadly fungal disease that causes bats to awake frequently during hibernation. WNS has been documented in Missouri since 2012.

Our Three Target Species in Missouri are Impacted by WNS
- Northern long-eared bat (Myotis septentrionalis) was the first species to be federally listed as threatened due to WNS. During a survey of 183 caves in Missouri in 2014-2015, 2,281 bats were found. When the same caves were surveyed in 2015-2017, only 2 individuals were found (Colatskie 2017).
- The little brown bat (Myotis lucifugus) has declined 86.7% in Missouri (Colatskie 2017).
- Populations of Missouri’s tricolored bat (Perimyotis subflavus) have declined by 53.8% (Colatskie 2017).

Methods

Objective 1

- Mist net surveys will occur in the counties of Shannon, Carter, and Reynolds within Missouri Department of Conservation (MDC) Conservation Areas.
- Females and any juveniles of the target species will be radio-tagged and tracked to their diurnal maternity roosts.
- A variety of forest characteristics will be measured at the roost trees, to identify the forest characteristics important to our target species. This effort will contribute to better forestry practices that support remaining populations.

Objective 2

- We will measure the effectiveness of an acoustic lure by evaluating capture rates and acoustic activity.
- We will document the presence of the target species across the three counties by using acoustic detectors.
- For our acoustic analysis, we will manually vet every recording and only consider analyzing files with >2 calls. We will only ID files to species if the echolocation is in the ‘search phase.’

Objective 3

- We will distribute a human dimensions survey to Missouri residents living around the study area. Our survey will assess perceptions of bat natural history, WNS, and MDC land use and enjoyment.

Preliminary Results

- We captured 149 bats over 23 nights through mist netting.

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References