Summer Bat Activity on South Bass Island in 2024

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Introduction

There have been no attempted bat or other mammal biodiversity assessments on the Bass Islands. The Islands are not only important for biodiversity of species but provide necessary habitat for migratory species. Bats face a host of conservation threats and determining baseline data of spatio-temporal variation in summer bat activity on South Bass Island will provide information on the ecology of the native bats as well as their potential response to future threats.

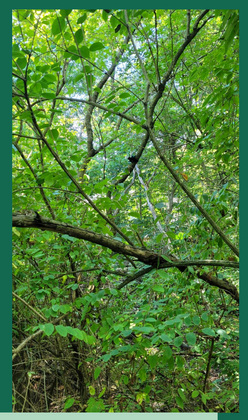

Figure 1: AudioMoth detector on building railing and tree.

Methods

- Recorded bat echolocation calls with AudioMoth at 13 locations covering different habitat types from June – July
- Recorded continuously for 2-3 nights, 30 minutes before sunset and 30 minutes after sunrise
- Automatically classified the echolocations with Kaleidoscope Pro
- Selected only classified calls which had at least 4 detected pulses and a classification matching ratio of 0.8 or greater

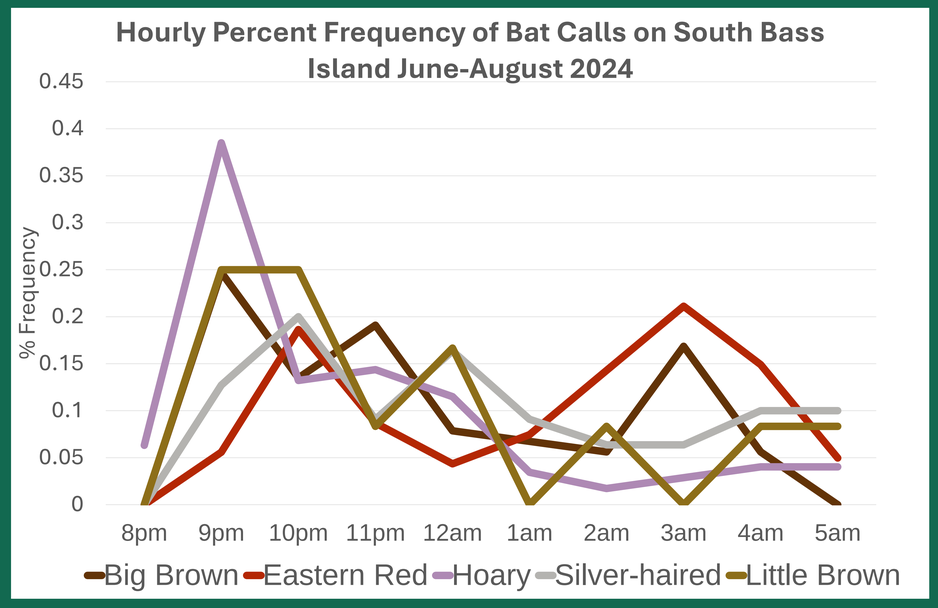

Figure 2: Graph representing the variation in what time of time different species calls were recorded.

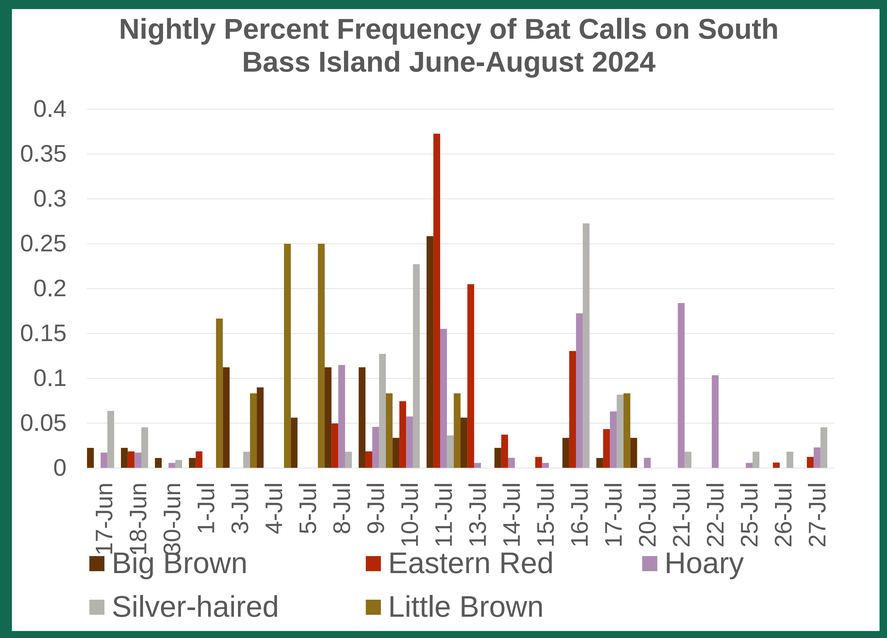

Figure 3: Graph representing the variation in what nights over the months different species calls were recorded.

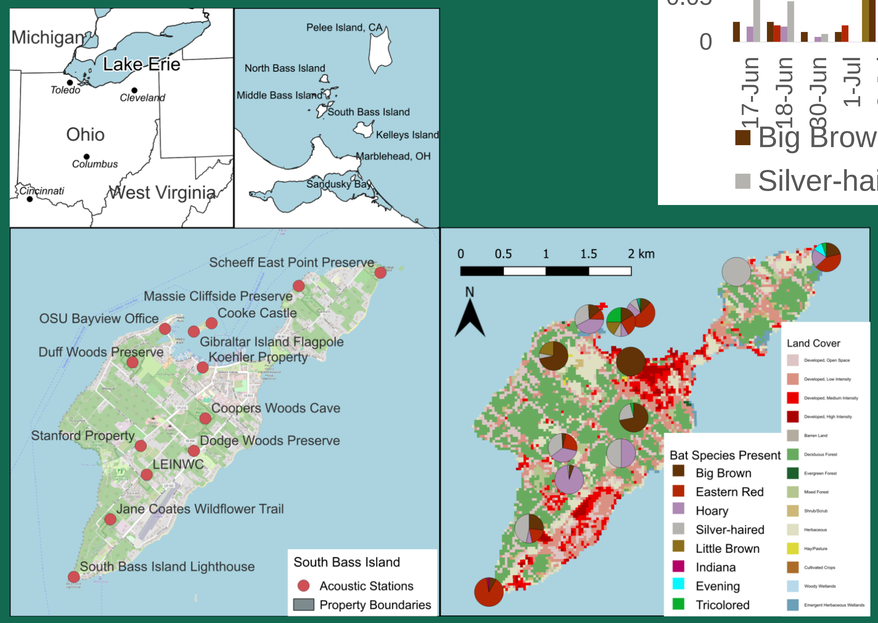

Figure 4: Maps showing the location of South Bass Island (upper map), the AudioMoth detector points in relation to property boundaries (lower left) , and land cover types in relation to species present in different habitats (lower right).

Results

Over 22 nights of recording, there was a total of 559 usable calls from 8 species that matched the parameters. These 8 species were Big Brown, Eastern Red, Hoary, Silver-Haired, Little Brown, Indiana, Evening, and Tri-Colored. Most of the calls were from 4 species, which included Big Brown, Eastern Red, Hoary, and Silver-Haired. Call frequency varied between species depending on the hour, night, and habitat.

Discussion

There is spatio-temporal variation in between the species of summer bats, which can show niche partitioning of habitat, prey, and timing of activities between the local species. Bats play an essential role in the ecosystem and understanding how they use their environment now and in the future is necessary for protecting bat populations. This research not only provides baseline data for the understudied bats in this area, but also can assist in understanding the impact climate change and habitat loss have on bats at a national level.

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References

Beilke, Elizabeth A., Rachel V. Blakey, and Joy M. O'Keefe. "Bats partition activity in space and time in a large, heterogeneous landscape." *Ecology and Evolution* 11.11 (2021): 6513-6526.

Dodd, Luke E., et al. "Forest structure affects trophic linkages: how silvicultural disturbance impacts bats and their insect prey." *Forest Ecology and Management* 267 (2012): 262-270.

Ohio Bat Conservation Plan. 2018. Ohio Bat Action Team, Columbus, OH.

Russo-Petrick, Kelly, and Karen V. Root. "Factors impacting bat activity and species richness in protected parks in the oak openings region of Northwest Ohio." *Environmental Management* 72.5 (2023): 1086-1098.

Stankavich, Sarah. "Statewide Mobile Bat Acoustic Survey." (2020)