

Bat Monitoring by Echolocation for Upper Mississippi National Wildlife and Fish Refuge, US Fish & Wildlife Service

Abstract

Determine if local bats used U.S. Fish & Wildlife Service (USFWS) bat houses set at boat landings and determine what bat species frequented the area June through October. An Echo Meter Touch 2 Pro was used to record acoustic sessions at boat landings. Sessions began 30 minutes before and concluded an hour after sunset. Seven bat species were recorded during sessions from five locations along the Mississippi River. Bats were documented, as they left bat houses, by quantity of calls and time of day. Findings showed one of five bat houses was in use during sessions, seven bat species occupy the area including the federally endangered Northern Long-Eared bat recorded in two locations, indicating their presence.

Introduction

Bats are the only mammals in the world with the natural capability of flight. They are the world's most under-researched mammal, yet are found on every continent except Antarctica. Bats occupy an important niche in many ecosystems around the world with the majority of them feeding on fruit, insects, and other small animals. In the United States, bats have noticeably decreased in population due to deforestation and the lethal fungal disease known as White Nose Syndrome (WNS). WNS is very contagious among these mammals; interaction with other bats, can cause it to spread. Through improved technology and observation methods, studies focused on bats have increased. Bats are incredibly underestimated in many habitats, mainly due to their complex behaviors and hard-to-reach roosts.

Methods

- Equipment: Echo Meter Touch 2 Pro and Echo Meter App
- record bat calls between half hour before and hour after sunset
- Record temperature, windspeed and cloud cover
- Document when and what species' call was made



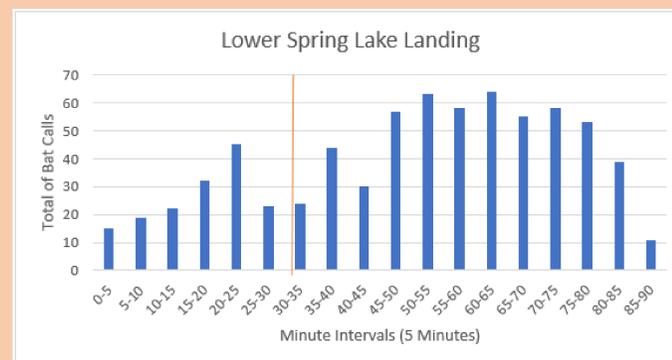
Minnesota City Boat Club, yellow dot indicates bat house location



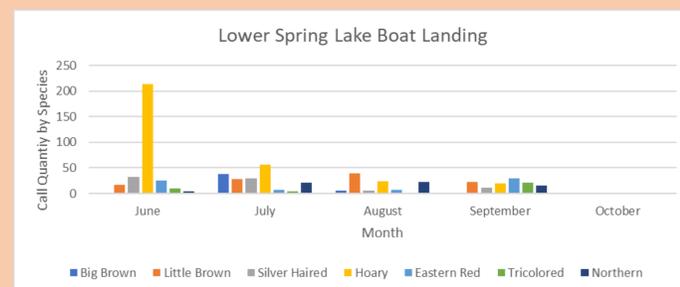
Weaver bat house has wooden slits inside to provide shelter



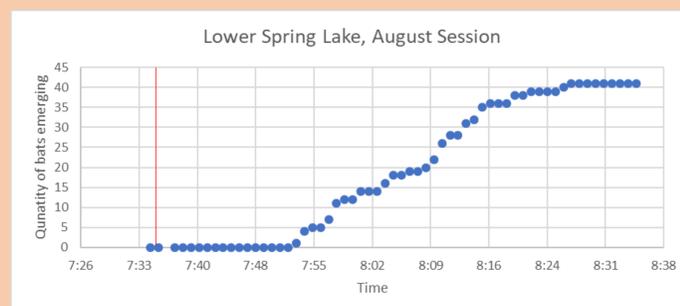
Northern Long-Eared bat call received between 40-126 kHz.



Cumulative Bat Calls over 5-minute Time Intervals. Graph consists of all accumulated Lower Spring Lake Landing calls received at the time interval. Orange line indicates sunset time.



Lower Spring Lake Landing; Bat Call each Month by Species, June to October 2018



Lower Spring Lake August session of bat emergence quantified over time. Start time was 7:05PM and End time was 8:35PM. Red line indicates sunset time



Hoary Bat (*Lasiurus cinereus*)



Tricolored Bat (*Perimyotis subflavus*)



Northern Long-Eared Bat (*Myotis septentrionalis*)
Federally Endangered

Objective:

Using echolocation monitoring techniques to collect information on relative abundance of local bats on the Upper Mississippi National Wildlife & Fish Refuge-Winona District, USFWS. This was done during summer and fall 2018 with five bat houses located on five boat landings: Lower Spring Lake, McNally, MN City Boat Club, Verchota and Weaver.

Discussion

Main success of this project was discovering Lower Spring Lake Boat Landing as the only location with any bats using the bat house. There was also documented evidence of Northern Long-Eared bats found at two of the locations. This is important information since this species is marked as federally endangered and is under Special Concern in the state of Minnesota.

No bats were found coming out of bat houses from McNally, Minnesota City, Verchota and Weaver locations. Although no bats were seen, it cannot be determined that there were no bats using the bat house at the time. It is crucial to know that there may have been some bats inside, but did not emerge until well after nightfall, so confidence in estimates of abundance cannot be completely assured. It can be hypothesized, that there were indeed bats inside the bat houses, but didn't come out during monitoring sessions. It is impossible to know if they were inside without looking inside the bat house, however looking inside would disturb them. This is not advised, therefore, inconclusive if any bats used it. It may also be hypothesized that the bat house is used, just not on days during monitoring sessions. Another and final hypothesis, is the bat houses being only 2 years old, are too new for the bats to know they are there.

Conclusion

Documentation like this is important to see what species live in the area and are using resources provided by USFWS. Results found there were bats at all locations, with one bat house in use and documentation of a federally endangered species. It is uncertain to know what kinds of species use the bat houses without disturbing them, so it is inconclusive to know what kinds of bats roost inside. New questions can be brought forward with continued research in this area and further projects done to provide for bats since they are vital to this areas' ecosystem.

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