Bat Activity in Natural Canopy Gaps

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INTRODUCTION

Species of insectivorous bats have undergone a dramatic shift in population size following the spread of White Nose Syndrome. Bat species that were once abundant in Connecticut have faced population declines of up to 90%.

Effective monitoring techniques are critical to support remaining populations. The morphological characteristics of bats largely determine the types of habitat they forage in. We are interested in how the structural differences in forest canopy influence bat activity.

Conservation Research Purpose: To inform the monitoring efforts of insectivorous bats in interior forests

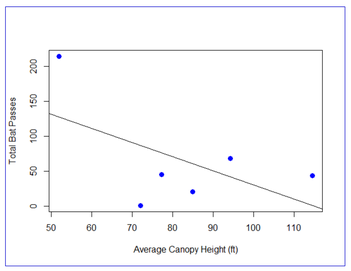
Bat species in Connecticut:

- Little Brown Bat (*Myotis lucifugus*) → Most common, state endangered
- Big Brown Bat (*Eptesicus fuscus*) → Most common, least concern
- Northern Long-eared Bat (*Myotis septentrionalis*) → state endangered, federally threatened
- Tricolored Bat (*Pipistrellus subflavus*)
- Silver-haired Bat (*Lasionycteris noctivagans*) → of special concern
- Hoary Bat (*Lasiurus cinereus*) → of special concern
- Red Bat (*Lasiurus borealis*) → of special concern
- Indiana Bat (*Myotis sodalis*) → federally endangered

RESULTS

Forestry Measurements

Finding 1: We found no significant relationship between bat activity and any of the forest canopy characteristics we measured.



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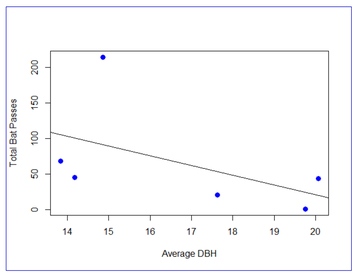

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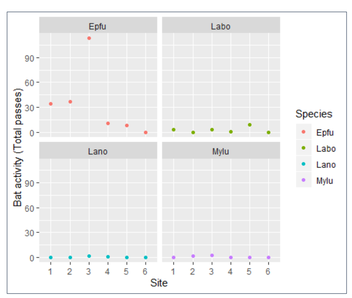

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Fig. 1.a. Average canopy height and total bat passes
Fig. 1.b. Average DBH and total bat passes
Fig. 1.c. Total bat passes per site separated by species

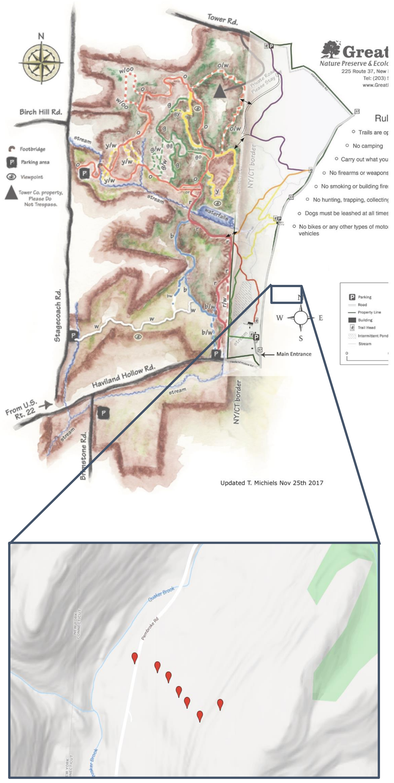

Figure 2. Locations of natural canopy gaps on the Great Hollow Nature Preserve

Methods

Site selection:

We located gaps in forest canopy suitable for bat foraging in Great Hollow Nature Preserve.

- Canopy gaps were selected between 80-100 meters of each other, starting at 100m from road (Figure 2).

Acoustic monitoring:

- Bat activity was monitored using Pettersson D500X acoustic detectors.
- Monitors were active for 3 consecutive nights at each site.

Forestry measurements:

- For all trees on the border of selected canopy gaps, we recorded:
  - Tree species
  - Tree height
  - DBH
  - Average age of stand

MATERIALS AND METHODS

Materials

- Clinometer used to measure canopy height
- DBH tape used to measure size of tree
- Pettersson D500X Monitor
- SonoBat v.4.3.0
- Increment borer for age measurements

Fig. 4. Top left: Canopy gaps are selected and characteristics of the surrounding trees are recorded
Bottom left: SonoBat is used to analyze the bat calls and identify species
Right: Core samples are taken to determine the age of the tree

RESULTS CONT.

Finding 2:

Aside from forest measurements, an unintended finding arose:

As the distance from the road increased, so did the number of recorded bat calls.

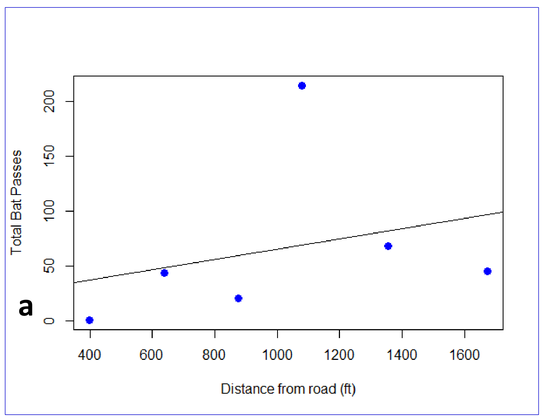

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Fig. 3. Distance from road (ft.) and total bat passes

CONCLUSION

There was no significant relationship between our forest canopy data and bat activity. However there was a connection between bat activity and the distance each site was from the road, with bat activity increasing as the sites moved further away from the road.

Our inferences about how canopy structure affects bat activity were hindered by a small sample size. Although currently there isn't substantial evidence to support this, data collection within Great Hollow will contribute to a greater project regarding bat's activity in regenerating forests.

REFERENCES

https://portal.ct.gov/DEEP/Wildlife/Learn-About-Wildlife/Bats-in-Connecticut
https://portal.ct.gov/DEEP/Wildlife/Fact-Sheets/Bats

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