Monitoring Wildlife Activity Patterns In Great Hollow Nature Preserve

NRCA Student: Lucas Shanahan[1]
Community Partner: Kristen Beattie[2]
[1]Brookfield High School; [2]UCONN NRE Department

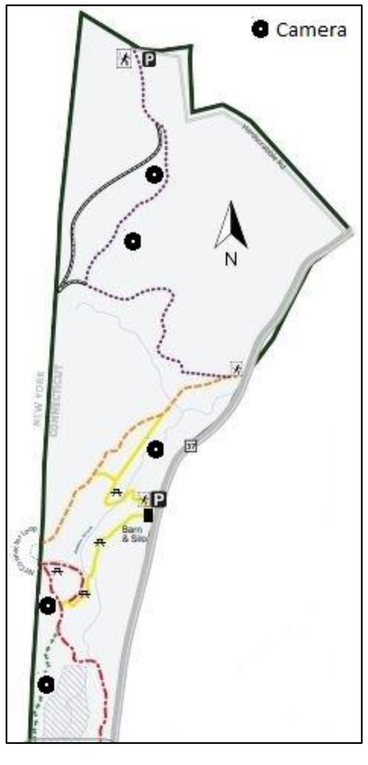
Introduction

Great Hollow Nature Preserve amasses 1,000 acres, and is located in New Fairfield, CT. Officially founded in 2015, Great Hollow is in the infancy stage of research to determine the diversity of wildlife species that inhabit the preserve. Understanding the overall species activity patterns and other various factors can help inform management decisions at the preserve, and help direct where research efforts need to go.

The research conducted at Great Hollow Nature Preserve will address the lack of species surveillance and information. This will hopefully fulfill our objective of quantifying and solidifying a species data bank.

Purpose

This project seeks to identify the wildlife of Great Hollow, to understand species diversity, species temporal patterns, and other various factors(Species growth, species relations, etc.). Our hope is that we can help inform future research and preservation of wildlife in the area. This will have a significant outcome on the wildlife management and facilitation decisions for Great Hollow Nature preserve.



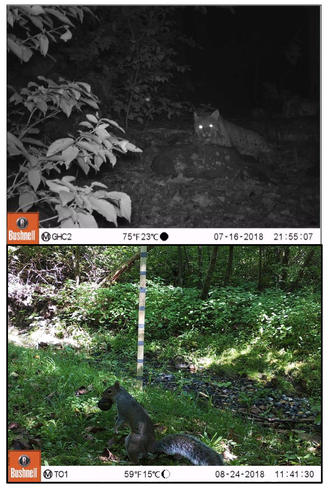
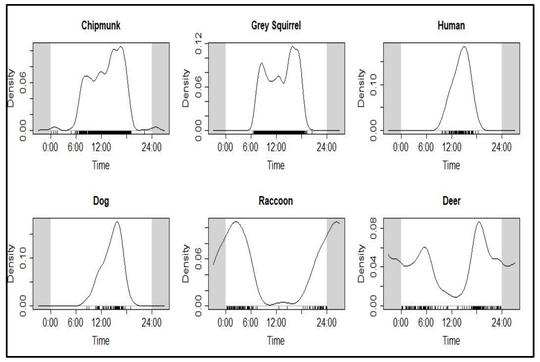


Figure 1 (left): The current parameters of Great Hollow Nature Preserve, and locations of each trail camera and camera placement.
Figure 2 (right): Predator and prey species caught on trail cameras.

Table 1. Species total detections from June to December 2018

Species	Detections
Avian Spp.	30
Bobcat (*Lynx rufus*)	9
Chipmunk (*Marmotini*)	347
Coyote (*Canis latrans*)	14
Deer (*Cervidae*)	142
Fisher (*Pekania pennati*)	2
Grey fox (*Urocyon*)	9
Grey squirrel (*Sciurus carolinensis*)	828
Human (*Homo sapiens*)	83
Opossum (*Didelphimorphia*)	20
Raccoon (*Procyon lotor*)	98
Red fox (*Vulpes vulpes*)	4
Red squirrel (*Scriurus vulgaris*)	1
Stripped Skunk (*Mephitis mephitis*)	4
Small mammal (*Peromyscus*)	29



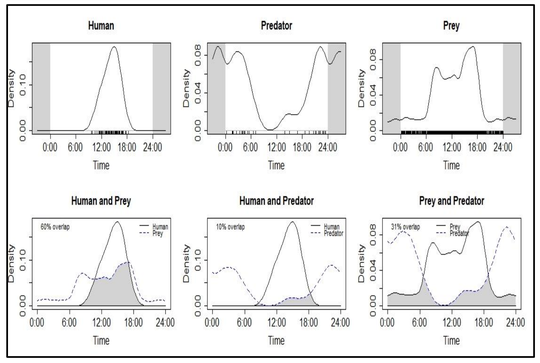


Figure 3 (top): Species activity patterns across 24 hour time scale
Figure 4 (bottom): Species group activity patterns and overlap between groups across a 24 hour time scale.

Method and Materials

Camera Setup

- 5 Bushnell Trophy trail cameras were installed on trees in Great Hollow Nature preserve in New Fairfield, CT (Figure 1) and operated from July to December, 2018
- Each camera was motion triggered, and programmed to capture 3 pictures within 10 seconds delay of each triggering motion
- Cameras were placed within the parameters of Great Hollow Nature Preserve and each location was chosen to monitor varying landscapes and habitats

Photo Identification

- The photos from each camera were downloaded to a hard drive, then was transferred to Colorado Parks and Wildlife Photo Warehouse software for photo identification
- Individual species detections were assessed at a 30 minute time interval
- Photo data was compared between individual species and between groups of prey, predator, and human

Activity Curves

- Using activity plots across a 24 hour time scale, we assess temporal patterns of individual species with greater than 50 detections and groups of species (prey, predators, human)

Results

From the 17,500+ trail photos obtained at Great Hollow Nature Preserve, 19 total species were documented (Table 1).

Species Composition

- High rates of prey detections were observed on the trail cameras, with grey squirrel having the highest number of detections
- The detection rates of predator species, such as bobcats and coyotes, were low compared to the detections of prey species

Activity Patterns

- The overlap between prey and predator species density together increased at ~7:00am and ~8:00pm and their overall chance of encounters (Figure 4)
- Predators' density in the daytime hours heavily decreases and preys' density heavily increases during daytime hours at Great Hollow Nature Preserve (Figures 3 and 4)

Conclusion

Overall, Great Hollow Nature Preserve has an important wildlife diversity that uses the preserve as habitat. A dynamic mix of relatively common species (squirrels, chipmunks, and raccoons) and relatively uncommon species(bobcats and herons) were observed inside the parameters. Based on these findings, we suggest that management decisions and conservation policy should facilitate the protection of these wildlife species in the area.

Additionally, Great Hollow Nature Preserve has a good variety of species including multiple prey and predator. The density of predator and prey species allow for uniform growth of critically important species like bobcats and herons that have environmental effects on surrounding ecosystems. Great Hollow Nature Preserve's landscape habitats vary by species, and this finding gives a solid foundation along with an abundance of prey that allows for consistent/good food web dynamics.

Acknowledgements

I would like to thank all of Great Hollow Nature Preserve for allowing us to conduct research on their preserve , and the scholarship to participate in CAP. I would like to thank Kristen Beattie, Dr. Rittenhouse, and the Dept. of Natural Resources & the Environment for the supervision and aid in the research. I would like to thank my 10th grade science teacher Stephanie Vivas for the introduction to NRCA. Lastly, I would gratefully thank Abby Beissinger and the Natural Resources Conservation Academy for giving myself the opportunity to conduct research and enhance my skills in GIS, Data Collection, and other 21st Century Skills. These people were able to contribute to the finalization and execution of this project.