Human Influence on Wildlife Activity at Fitzgerald Lake

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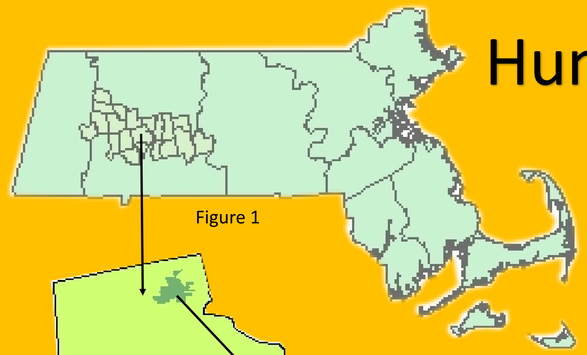
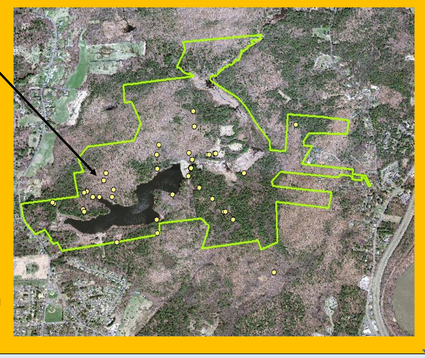


Figure 1



Fitzgerald Lake Conservation Area

Introduction

Fitzgerald Lake Conservation Area (FLCA) is an 852-acre conservation restricted area located in the northeastern part of Northampton, Massachusetts adjacent to Route 5 and Route 9 (Figure 1). The land is maintained by the Broad Brook Coalition of Northampton and provides recreational activities for patrons such as fishing, hiking, canoeing, and hunting. The management of the FLCA property is important regarding the overarching goal of sustaining biodiversity and wildlife habitat in the Pioneer Valley. Large predators such as Coyote (Image 1) and Black Bear (Image 2) indicate strong ecological integrity. FLCA is the largest conservation area in Northampton with the central area containing a low hazard dam and 40 acre lake

The goal of my research was to perform a wildlife survey and data analysis regarding wildlife activity on FLCA property. In my data collection I used trail cameras to target terrestrial mammals. I hypothesized that human activities would deter wildlife activity in the conservation area. My analysis used the vegetation cover type, mean distance to the lake, mean distance to the nearest building, and mean distance to the nearest human caught on trail camera to analyze human influence on wildlife activity. Understanding wildlife composition and movement, potential human influence, and habitat characteristics may help future management decision of the FLCA property

Image 2: Black Bear caught on camera at FLCA

Acknowledgements:
Office of Geographic Information (MassGIS), Commonwealth of Massachusetts, MassIT

Methods

Camera placement:

- I located species indicators such as chew or claw marks, scat, den sites, or habitat requirements.
- I placed camera on a tree 1 to 1.5 meters from the ground at approximately 90° angle.
- Carnivore lure was applied at distance 2 to 5 meters from camera.
- Cameras were checked between 21 and 28 days.

Map Creation:

- MassGIS Ortho and basemap tiles were downloaded and clipped for FLCA study area.
- My compiled data was imported into ArcGIS, XY coordinates were displayed and converted to shapefile.
- I downloaded shapefiles for buildings and wetlands; and clipped wetlands within FLCA. Buildings outside of FLCA were left for analysis and context (Figure 3).
- I created shapefiles displaying the lake and streams (Figure 2) and trails.
- After adding all the elements and selecting Human observed sites (Figure 4) I used the Generate Near Table Analysis to determine distance between Camera points (stations) and nearest buildings, distance to lake, and distance to nearest human caught on trail camera. I joined these to the attribute table.
- I created graphs showing vegetation type and distance analysis to nearest water source, building, and human observed station for the top five photographed species (excluding humans and domestic dogs)(Figures 6-9).

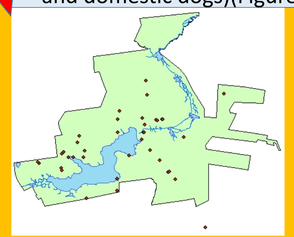


Figure 2: Lake and Streams

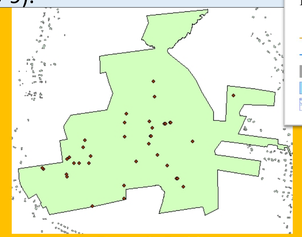


Figure 3: Buildings

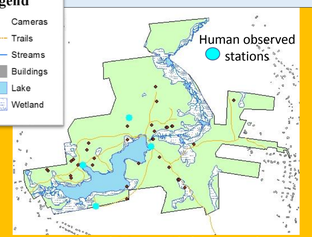


Figure 4: Final Map with human observance

Discussion

All species were located relatively close to stations where humans were recorded. This indicates that the types of human activity in the conservation area (i.e. recreational hiking, bicycling, boating, etc.) do not appear to be deterrents to wildlife activity. Coyotes had the highest mean distance to buildings and human observed stations. This is characteristic of coyotes wariness of human and human scents; however, calculating distance to hiking trails found that the station the coyotes were captured at was relatively close to a nearby trail. Deer generally stay away from people, but when people are not in the direct area deer are often found in human used areas. Raccoon are scavenger species often located near buildings. They have ritualistic habits that involve dipping their hands in water. Having observed them mostly in wetland vegetation with the lowest mean distance to both the lake and buildings is fairly expected. Gray Squirrel and Eastern Chipmunks are easily habitualized to human presence and were expected to be found in the same vicinity of humans.

The most surprising results were the species not observed. Opossum, fox, beaver, and cottontail were not observed. Opossum are critically linked to buildings and dwellings. Most stations were probably too far from any buildings for opossum to occur. Fox may not occur because of competition from coyote and bobcat; however it may also be due to lack of primary prey of hare and eastern cottontail. Beaver are present at FLCA (personal visual documentation) so I expected them to be documented by trail camera; however, they were not. This was probably due to inefficient camera placement for beaver documentation.

Image 1: Coyote caught on camera at FLCA

Results

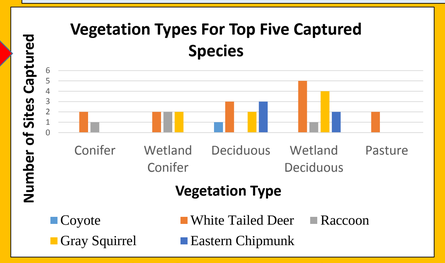


Figure 6: Vegetation Analysis

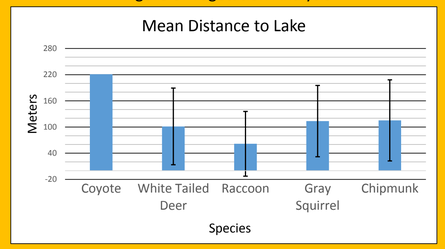


Figure 7: Mean Distance to lake

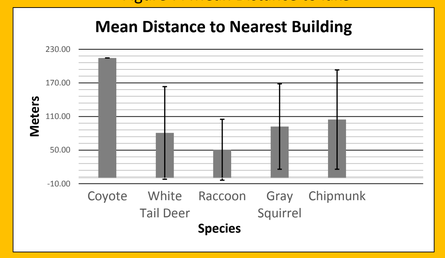


Figure 8: Mean Distance to Nearest Building

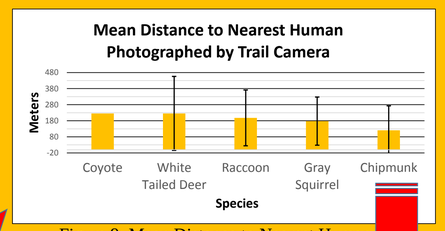


Figure 9: Mean Distance to Nearest Human Caught on Trail Camera

All Species	Photo Events and Relative Abundance
Black Bear *Ursus americanus*	3 (0.43)
Bobcat *Lynx Rufus*	2 (0.29)
Coyote *Canis latrans*	5 (0.71)
White-Tailed Deer *Odocoileus virginianus*	43 (6.14)
Porcupine *Erethizon dorsatum*	2 (0.29)
Raccoon *Procyon lotor*	14 (2.0)
Gray Squirrel *Sciurus carolinensis*	40 (5.71)
Eastern Chipmunk *Tamias striatus*	11 (1.57)
Deer Mouse *Peromyscus maniculatus*	1 (0.14)
Unknown Large Mammal	2 (0.29)
Unknown Medium Mammal	1 (0.14)
Human *Homo sapien*	17 (2.43)
Dog, Domestic *Canis lupus familiaris*	5 (0.71)
American Robin *Turdus migratorius*	1(0.14)
Crow *Corvus brachyrhynchos*	1(0.14)
Unknown Aves	3 (0.43)

Figure 5: Species Photo Rates

Results continued..

- 9 target species, 2 bird species, 2 domestic species, and 3 unknown classifications were observed (Figure 6).
- White tailed deer and gray squirrel show no preference for vegetation type. Coyote and Eastern chipmunk prefer deciduous forest. Raccoon show preference to wetland vegetation (Figure 6).
- Raccoon have the lowest mean distance to the lake. This correlates with the wetland vegetation preference. Coyote had the largest mean distance to the lake. All other mean distances show no obvious correlations between species observance and distance to the lake (Figure 7).
- Coyote have the highest mean distance to nearest building. Raccoon had the lowest mean distance to nearest building (Figure 8). All other mean distances show no obvious correlations between species observance and distance to buildings (Figure 8).
- Coyote and White Tailed Deer have the highest mean distance to humans caught on trail cameras (Figure 9).