Correlational Analysis of Mammals and Residential Land Use: Amherst, MA

Ella Gutkowski
Sustainable Community Development
University of Massachusetts at Amherst

Introduction:

- This project uses data from a 2018 UMass Amherst wildlife management course that assessed how mammal diversity relates to surrounding land use
- Camera traps = device that records movement
  - Often used to track animal behavior
- This project aims to answer the driving question of:
  - Does human activity in residential land use areas influence the occurrence of the most tracked species?

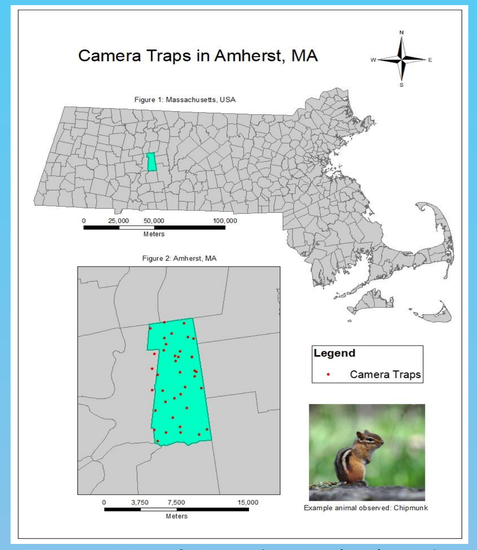

Figure 1: Map of Massachusetts (top), study area of Amherst, MA featuring camera trap locations (bottom left)

Methods:

1. Placed 500 meter buffer around each camera trap (Fig. 2)
2. Clipped all residential land use areas to 500 meter buffer (Fig. 3)
3. Calculated the area (in square meters) of the clipped land use parcels in the buffer (Fig. 4)

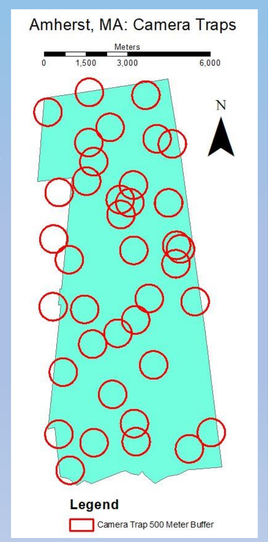

Figure 2: Buffer

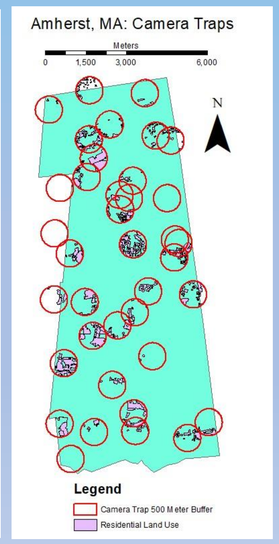

Figure 3: Clip

camera_traps_2017.Res_area_m
0
126649
3680.37
0
57743
9665.41
37033.6
74218.9
185823
64082.6
64243.6
135558
0
39941.9
144835
129273
89582
368922
412173
193283
80004.8
57307.6
42459.7
171853
0
365541
106532
336732
26639.6
182026
149172
172534
297758
68728.7
6398.43
93408.6
260218
84561.8
171629

Figure 4: Chart

Results and Discussion:

- **5 out of the 22 species with recorded data (frequency of species during data collection period) had a moderate correlation to being found within residential land use area in the 500 meter camera trap buffer**
  - The 5 species included: chipmunks, gray foxes (Fig. 5), flying squirrels, mice, and an unknown species found in MA
    - The average correlation = 0.35
  - Highest identified species correlation was the Gray Fox at 0.357 (Fig. 6)
  - The data collection timeline was not specified in the metadata file, but that is where the frequency of species derives from

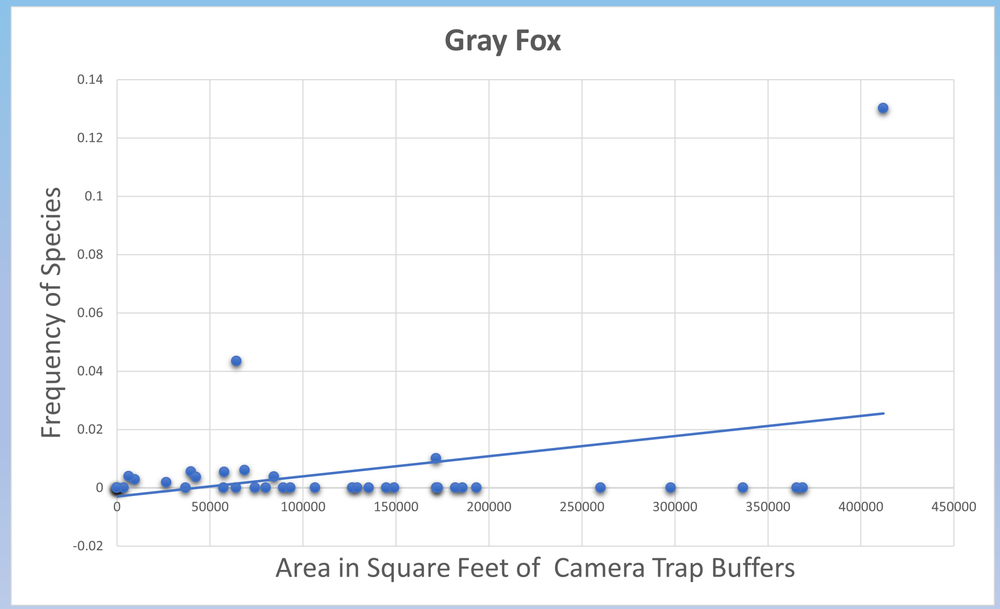

Figure 6: Example of 1 out the 5 species with moderate correlation

Conclusion:

- **The moderate correlation between 5 out of the 22 species indicates that human activity in residential land uses did not influence the occurrence of these mammals**
- This project would be made better with specified timeline of the data or the area buffer size differing for each species

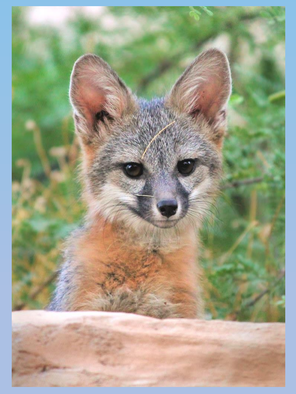

Figure 5: Gray Fox

References:

Grayson, R. (2018). *Gray Fox Kit* [Photograph]. Flickr. Springs Preserve, Las Vegas. https://www.flickr.com/photos/132295270@N07/42767047802