

CATHANCE RIVER PRESERVE MAMMAL STUDY 2019

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PURPOSE

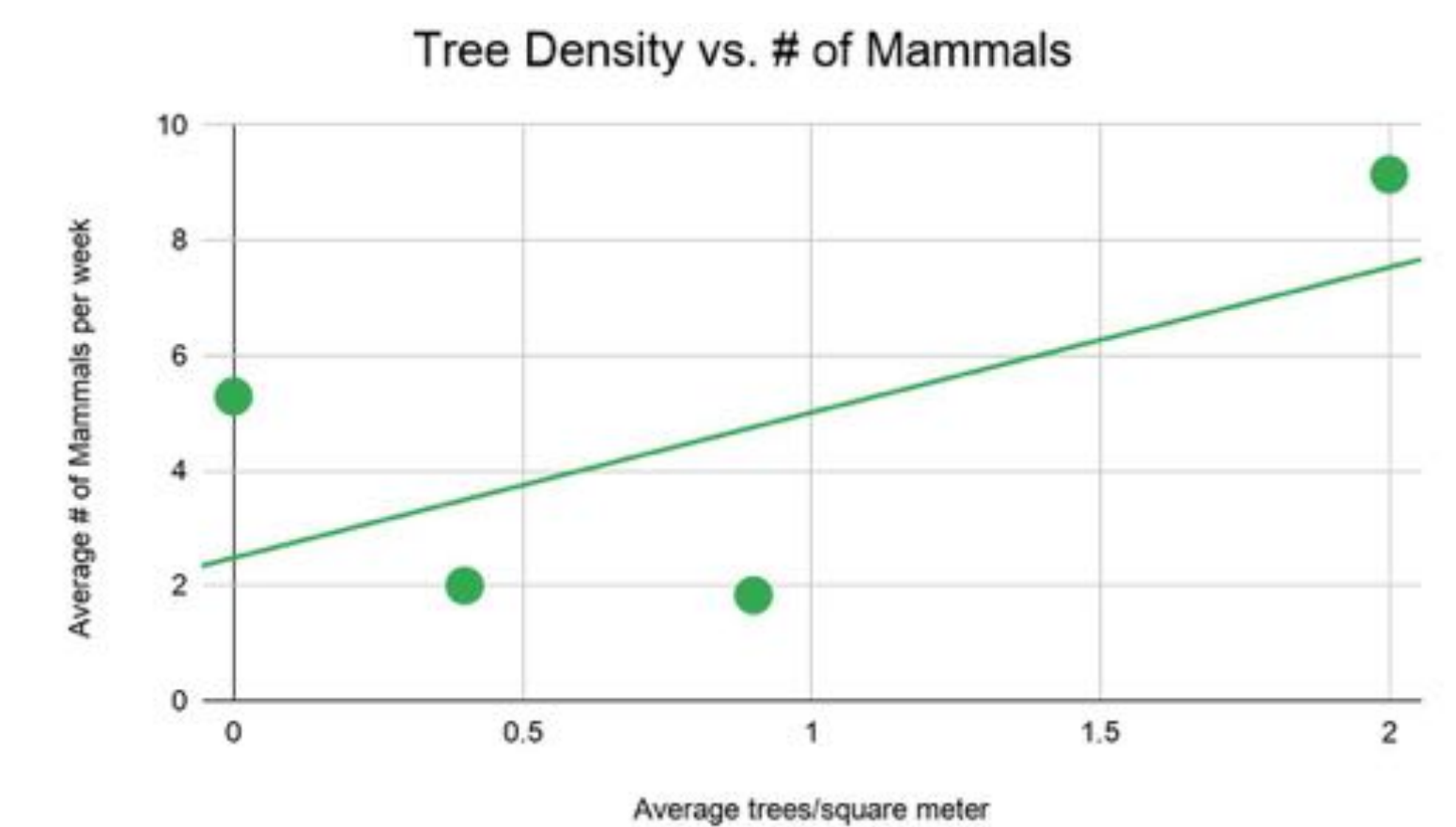
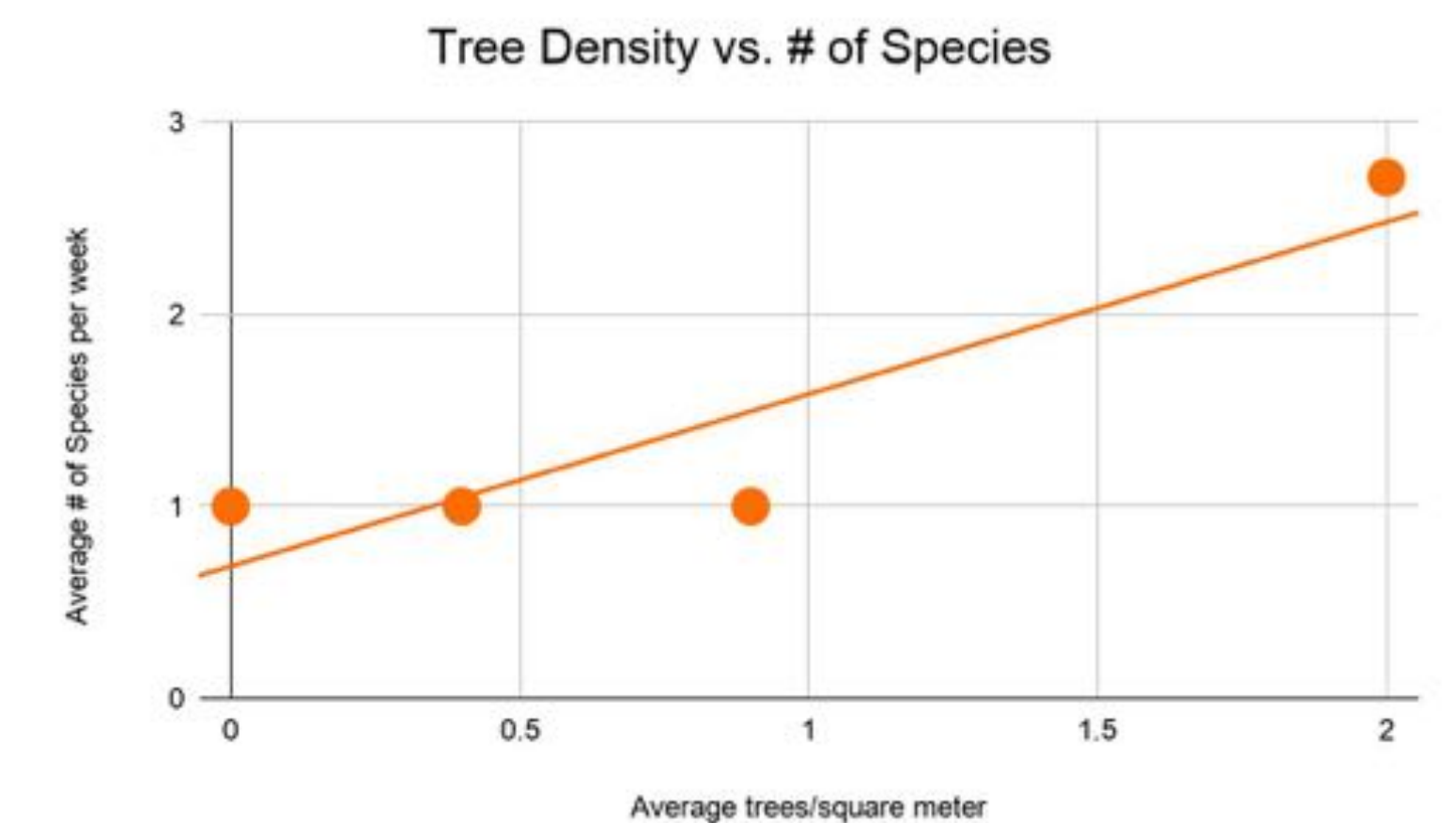
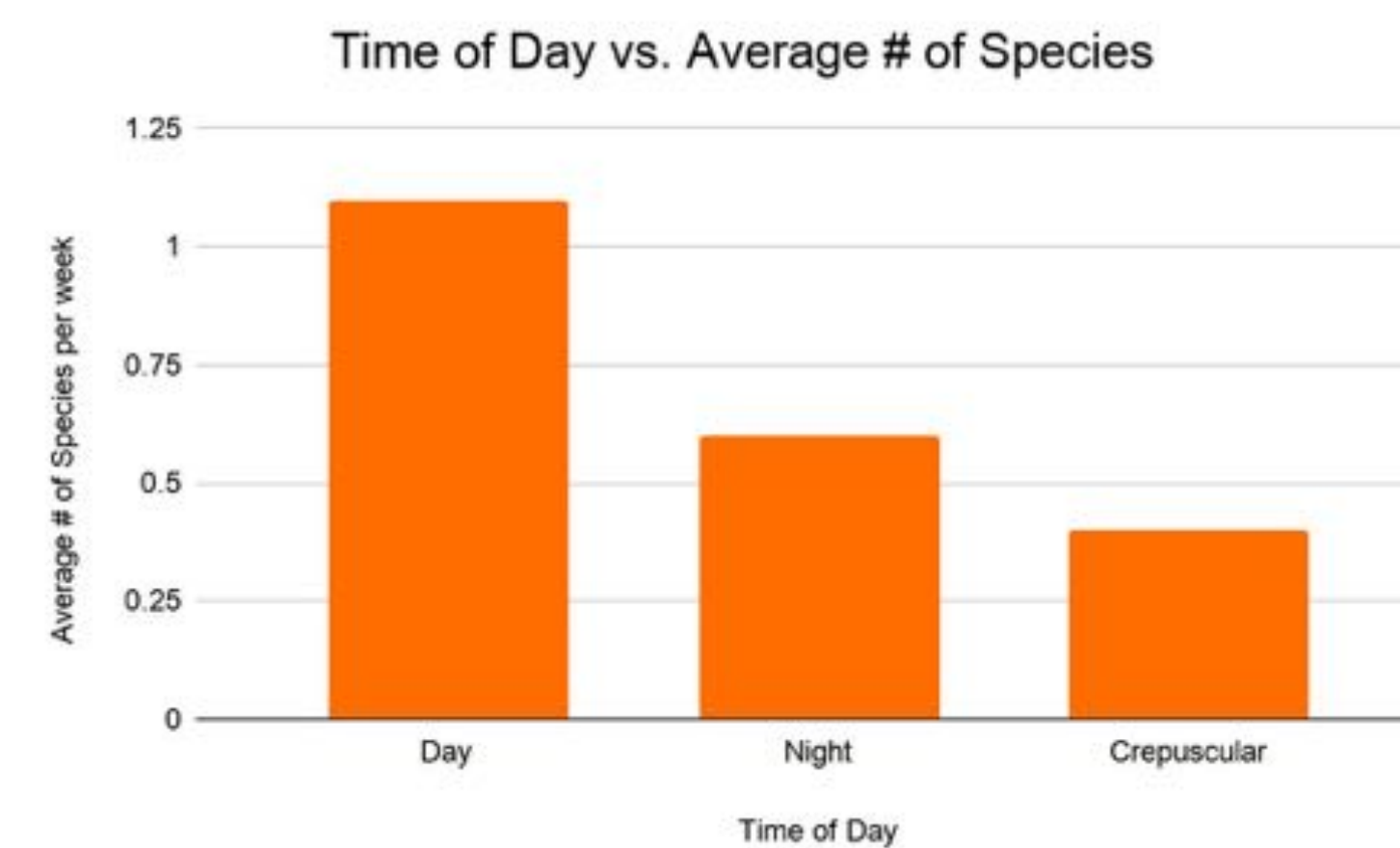
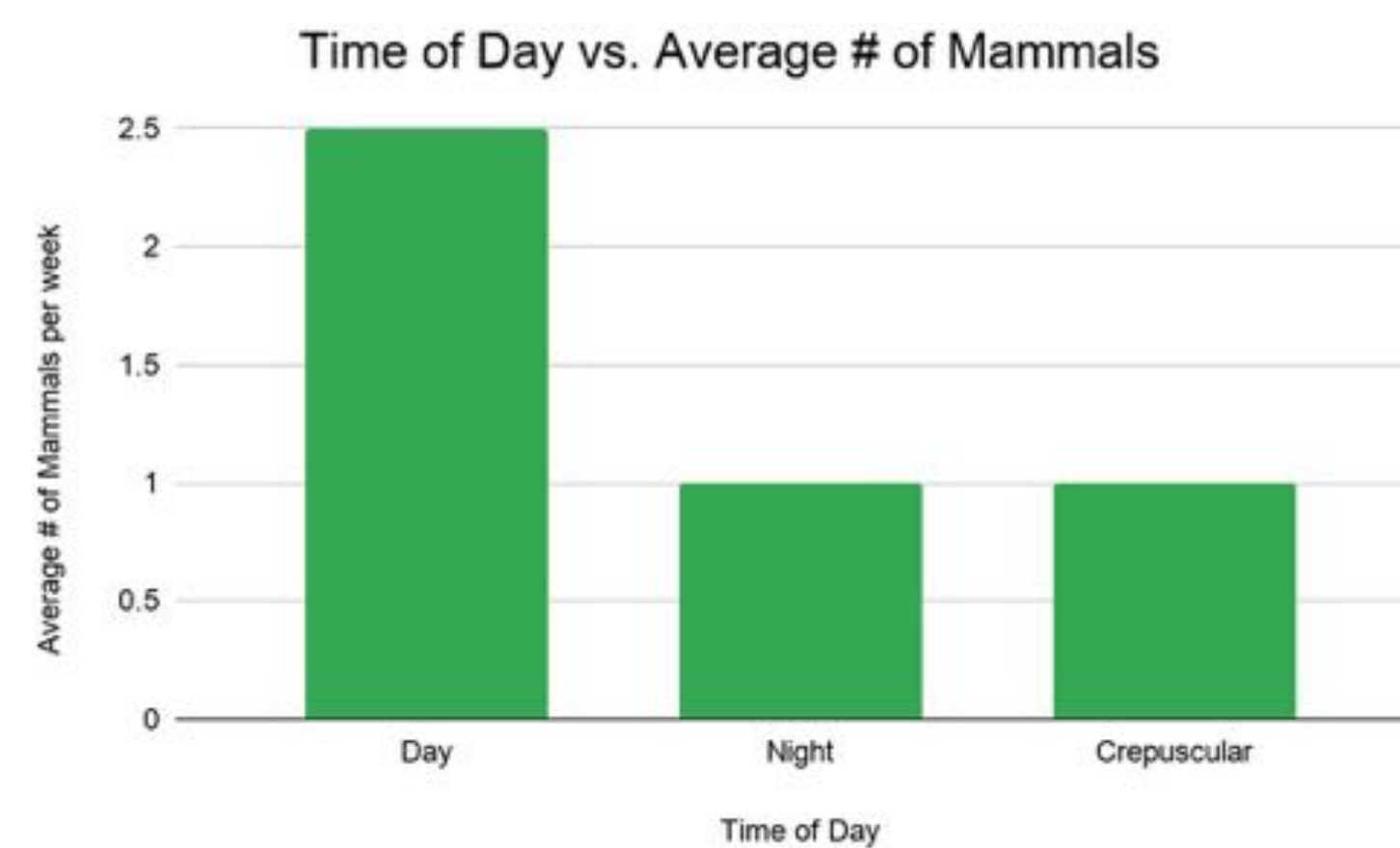
How does tree density (trees/m²) and time of day (day vs. night vs. dawn/dusk) affect the variety of mammal species and number of mammals identified?

BACKGROUND

- Mammals: vertebrate animals characterized by the possession of hair/fur, mammary glands, three middle ear bones, and (usually) the birth of live young
- White-tailed deer (*Odocoileus virginianus*): They are most active during the day and prefer hardwood forests, brushlands, and pasturelands.
- The raccoon (*Procyon lotor*): Nocturnal mammals commonly found in coniferous and deciduous forests
- The fisher (*Pekania pennanti*): A slim-bodied mammal which finds cover in underbrush. They tend to be active during the daytime in the winter and nocturnal during the summer
- Crepuscular: A time of day resembling twilight, or the time between astronomical dawn and sunrise, or between astronomical dusk and sunset

HYPOTHESIS

If cameras are set up in 4 areas, varying in tree density, to take pictures of moving mammals, then the number of mammals and variety of species identified will be greatest at night and dawn/twilight, and the least during the day, and the greatest in areas with the highest tree density and the least in areas with the lowest tree density.



Above: A white-tailed deer walks to the Cathance river



Above: An eastern coyote walks through the Stump Forest location

PROCEDURE:

1. Create a data table to record the number of animals spotted per species, time of day, daylight hours, and location.
2. Identify 4 locations (specified right) within the Cathance Preserve to set up wildlife cameras. Each "area" will consist of a 10-by-10 meter square, with a wildlife camera centered on the inside edge of one side. The tree density (trees/m²) of each area should vary.
3. Calculate the tree density of each area: at least 4 sample plots with areas of approximately 2 by 2 meters; count the number of trees within the sample area. Two sample plots should be "openings" (i.e. clearings with little to no trees), while the other two should be located in denser forests. Average the number of trees per sample, and use this to calculate the average number of trees per square meter.
4. In these locations, set up cameras with empty SD cards to take photos, and record the location of each camera setup with a GPS device.
5. Retrieve the camera's SD card, and install empty SD cards in the camera.
6. Put retrieved SD cards into the SD card reader.
7. Identify and record the animals and time of day in the location. Repeat for each SD card.
8. Repeat steps 4-6 each week.
9. On 10/3/2019, add skunk lure to each location. The lure may affect lab results, however, it could attract mammals out of the range of the camera.

LOCATIONS

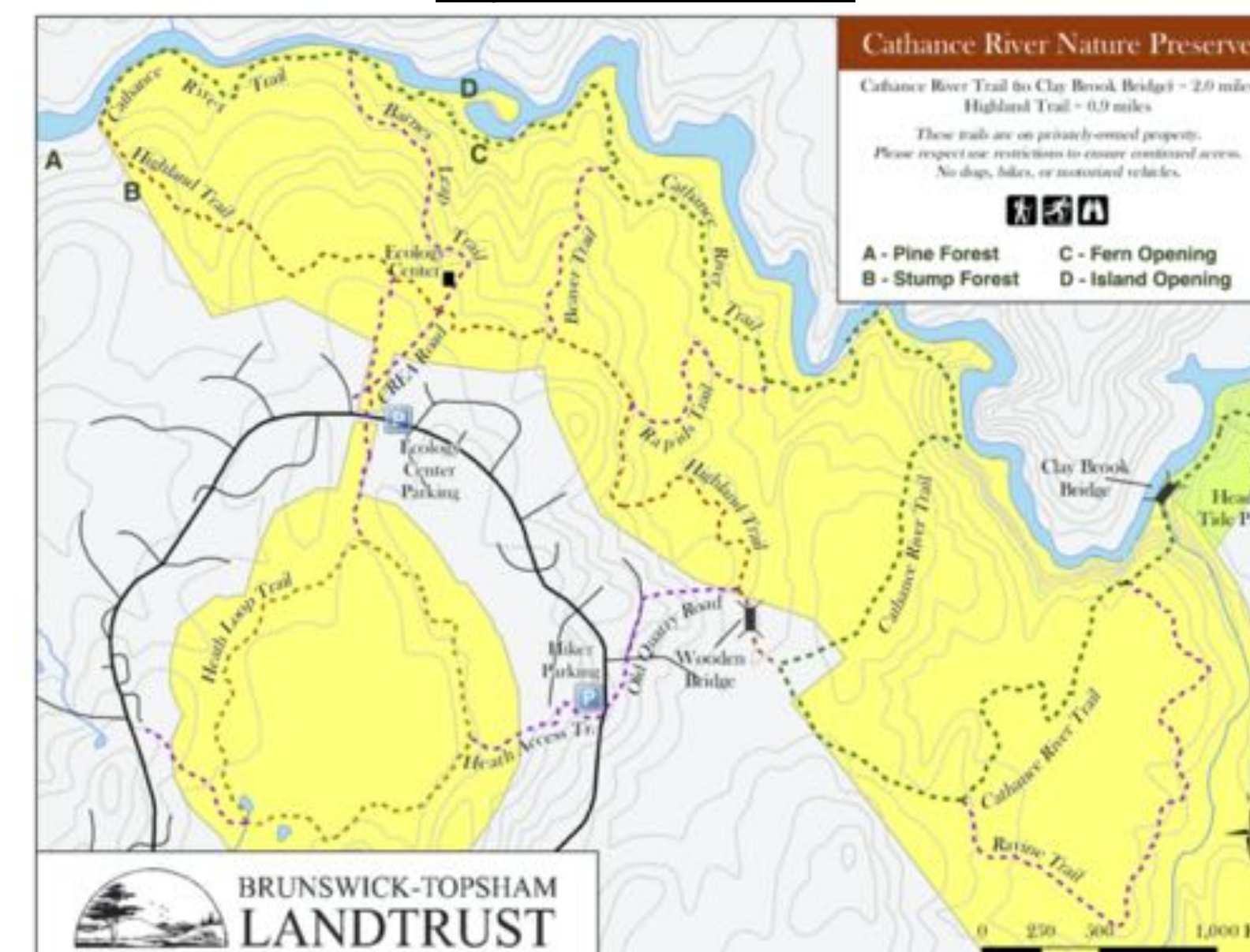
Pine forest: 43.957733, -69.956116. In forest off of the northwest corner of Barnes' Leap loop.

Stump forest: 43.957001, -69.953875. Near unmarked trail west of Barnes' leap loop.

Fern Opening: 43.957944, -69.949634. Opposite side of Island Opening. Walk east on the trail; opening atop a forested hill.

Island Opening: 43.958774, -69.949495. Island off Cathance River Trail.

Map of Camera Locations



Summary Data Table

Location	Trees/sq. meter	Mammals seen	Avg. mammals per week	Avg. species per week
Island opening	0	Whitetail deer, Human	5.286	1
Fern opening	0.4	Whitetail deer, Unknown species	2	1
Pine forest	0.9	Whitetail deer, Red squirrel,	1.833	1
Stump forest	2	Raccoon, Whitetail deer, Porcupine, Fisher, Red squirrel, Human, Chipmunk, Eastern coyote	9.143	2.714

CONCLUSIONS

- As hypothesized, the most mammals and the greatest variety of mammal species were found in areas of high tree density
- Contrary to the hypothesis, the most mammals and greatest variety were found during the day
- The greatest number of mammals and mammal species were found in the Stump Forest location.
- Potential sources of error include: possible double-counting due to the proximity of photos, as well as faulty batteries and uncertainties over which times to consider "crepuscular"
- To improve future experiments, researchers should increase sample sizes, test batteries for power before use, and examine plant life in mammal ecosystems

Special Thanks: Kelly Waddle (Stantec), Caroline Elliot (CREA), and Mr. G. Evans (Mt. Ararat High School).