Game Camera Analysis of Activity Patterns of Mammals in Fargo City Parks, North Dakota, and at the Minnesota State University Moorhead Regional Science Center near Glyndon, Minnesota

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Abstract

The use of game cameras or "camera traps" is becoming more common to document many wild animals that would otherwise be difficult to physically capture or track, such as large carnivores. For our study, Reconyx Game Cameras (HC600 Hyperfire) were set up and arranged in various areas of the Minnesota State University Moorhead Regional Science Center (RSC) and at several city parks in the Fargo Park District for a period of a few weeks during the summer and/or early fall of 2018 and 2019. Cameras were locked onto trees in likely habitats. Wooden shims that had been soaked in commercial urine, usually from coyotes (*Canis latrans*), were stuck in the ground in front of each camera to attract animals, especially carnivore species. In this study, we compared species composition in urban areas versus rural areas. Species in the urban parks included red fox (*Vulpes vulpes*) and raccoons (*Procyon lotor*). A gray squirrel (*Sciurus carolinensis*) and mouse (*Peromyscus sp*.) were recorded in the rural areas. White-tailed deer (Odocoileus virginianus) were one of the most common species recorded in both habitats, and we will compare their activity patterns in more detail regarding seasonal and temporal activity patterns and moon phase.

Introduction

Game cameras are commonly associated with hunting activities. They, however, have also been increasingly used in research because of the numerous advantages they provide over more traditional means of data collection. Due to their low maintenance, they allow researchers to gather data without being present and disturbing the wildlife (Larrucea and Brussard 2019). This is a great advantage, because this allows data to be collected without affecting the behavior of the subjects, which in and of itself is vital information. Data can be gathered without the need to stress the animals by physically handling them. Cameras can also remain in place and operate for a long time, allowing for more familiarization with local wildlife and more natural behavior to occur (Larrucea and Brussard 2019).

Poster Objective

Our project will focus specifically on deer, because most photos captures were of white-tailed deer (*Odocoileus virginianus*), and we have more data on them than any other species we documented. Deer are primarily active at dawn and dusk (Webb et al. 2010, Cornicelli *et al*. 1996), and we wanted to see if the deer that our cameras had captured were active at times that supported this. We also wanted to see if there was any correlation between deer activity and moon phases, because interactions between does have been found to be higher during a full moon (Kjær *et al*. 2008).

Methods

Game cameras were set up in several spots around the Minnesota State University Moorhead Regional Science Center (Fig. 2), in areas that showed signs of wildlife activity. These were attached to trees using special locks (Fig. 1), and stakes coated with coyote (*Canis latrans)* urine were positioned in front of several of the cameras. These cameras take several pictures at once, so multiple photos of the same animal within a certain time frame was considered one capture or instance. We also utilized photos from 2017 and 2018 camera projects, located at Trefoil Park and Rose Creek Golf Course in Fargo, ND.

Figure 1. Reconyx Game Camera (HC600 Hyperfire) with security housing, titanium lock, wooden stake, and coyote urine.

Figure 2. Map showing all locations where game cameras were placed.at the Regional Science Center.

Results

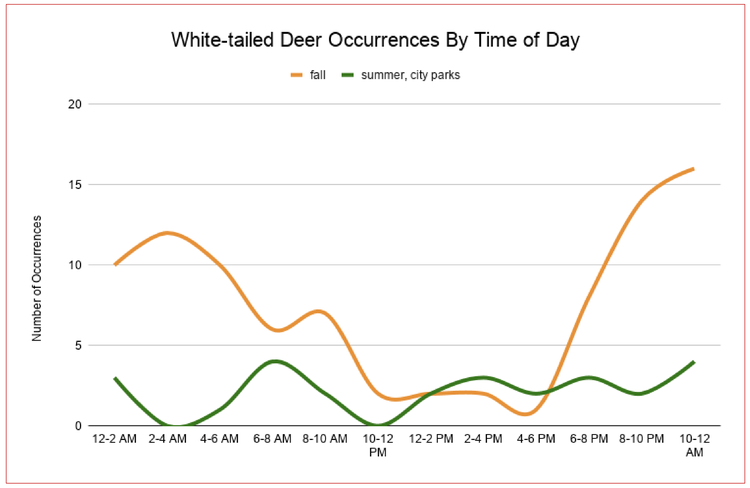

Figure 3. White-tailed deer activity according to time of day within 2-hour periods. A group of deer or a single deer photographed within 5 minutes of each other were counted as a single observation. Data includes all buck, doe, and fawn occurrences from all cameras.

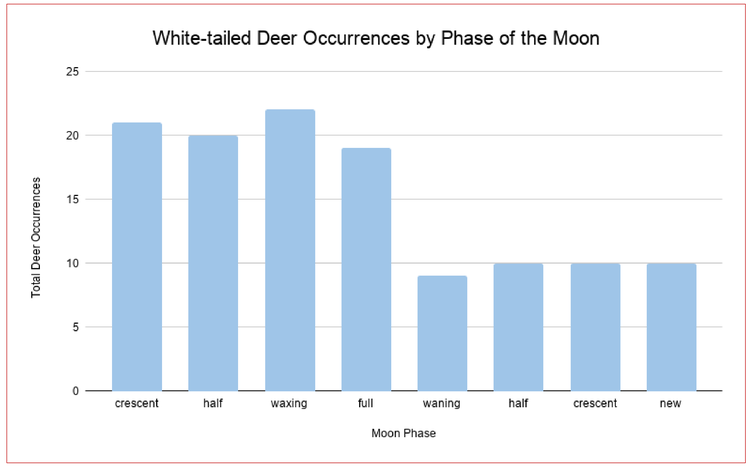

Figure 4. White-tailed deer activity during lunar phases. A group of deer or a single deer photographed within 5 minutes of each other were counted as a single observation. Data includes all buck, doe, and fawn occurrences from all cameras.

Occurrences of Observed Species

Despite our focus being on whitetail deer, our camera captured photos of multiple different species. Species names and the number of occurrences are listed below (Fig. 5):

- White-tailed deer (*Odocoileus virginianus*) - 124
- Raccoons (*Procyon lotor*) - 3
- Red fox (*Vulpes vulpes*) - 1
- Eastern gray squirrel (*Sciurus carolinensis*) - 7
- Domesticated dog (*Canis familiaris*) - 4
- Domesticated cat (*Felis catus*) – 1
- Mouse (*Peromyscus sp*.) - 3
- Humans (*Homo sapiens*) - 10

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Results (continued)

Figure 5. Sample pictures from game cameras.

Results/Discussion/Conclusions

- Deer activity in the fall had a peak running from late evening to the early morning hours with less activity during the daylight hours (Fig. 3)
- Deer activity in the summer was more constant throughout the 24-hr day, with no definite peaks like we saw in the fall activity (Fig. 3)
- Moon phase appeared to have no direct influence on deer activity; however, deer activity did not seem to be hindered by a full moon (Fig. 4)

Going Forward

- We hope to :
  - Continue studies into next year with cameras placed into differing habitats.
  - Use more cameras at each location
  - Consider where humans are likely to interfere

References

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