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Title: Large Game Distribution Camera Study at Los Alamos National Laboratory

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Large Game Distribution Camera Study at Los Alamos National Laboratory

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Abstract

The unique habitats at the Laboratory support a diverse community of wildlife. The habitat types that include Pinon Juniper, Ponderosa Pine, and Mixed-conifer forests each provide different resources important for a variety of species. Wildlife monitoring for large game animals can be challenging because they avoid interactions with humans, and prefer undeveloped areas. This study was conducted to analyze the distribution of predators and other game animals seasonally across the Laboratory. The data gathered will be used to make recommendations regarding wildlife management for conservation and protection. Utilizing game cameras to remotely monitor wildlife was determined to be the most effective, noninvasive method to gather the necessary data. As camera technology has advanced, game cameras have become adequate for documenting individuals, and are commonly used in wildlife studies on predation, abundance, occupancy, diversity, and endangered species detection. Twenty cameras were placed across the LANL landscape using a modified systematic sampling design. They were deployed in February 2018 and retrieved in January 2019, thus each camera sampled for one full year. All images were reviewed and the species, number, age, and sex of all animals in the photo were recorded. Here we present data for the most abundant species encountered: deer, elk, coyote, bear, bobcat, mountain lion, and fox respectively. The data were summarized by species and season. Future work will include occupancy modelling for each species. This will allow the development of heat maps showing species distributions across the Laboratory.

Introduction

- Los Alamos National Laboratory is approximately 40 square miles with a variety of berries, grasses and other food resources for animals. Seasons and weather influence the vegetative components that serve as food and protection for wildlife.
- Species of interest for this study that occur on Laboratory property include: Rocky Mountain Elk, Black Bear, Mule Deer, Mountain Lion, Gray Fox, Bobcat and Coyote.
- One of the most efficient ways for biologists to monitor wildlife is by using game cameras because they capture remarkable photos of animals in a minimally invasive way.
- The objectives of this study were to analyze pictures taken from different locations across the Laboratory and determine the most abundance species encountered at each location and during each season.

Materials and Methods

Laboratory biologists deployed 20 Reconyx HyperFire wildlife monitoring cameras following a stratified random design across the Laboratory. Biologists mounted cameras on trees at a standard height and aspect for all locations (Figure 1). Each camera was secured in a lock box and with a cable lock. An identification card was left on all cameras (Figure 3). The cameras were checked regularly and removed after one year. Images were analyzed (Figure 2) for target species and data were maintained in Excel. While analyzing images I determined the species present, age class, total number of animals, gender, and whether or not young were present. Data were compiled by camera number and summary tables were created.

Figure 1. Example of a secured camera.

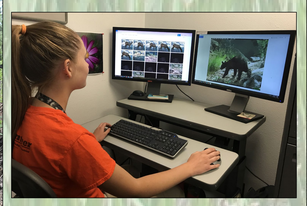

Figure 2. Analyzing images.

Figure 3. Camera setup.

Results

Seasonal Comparisons

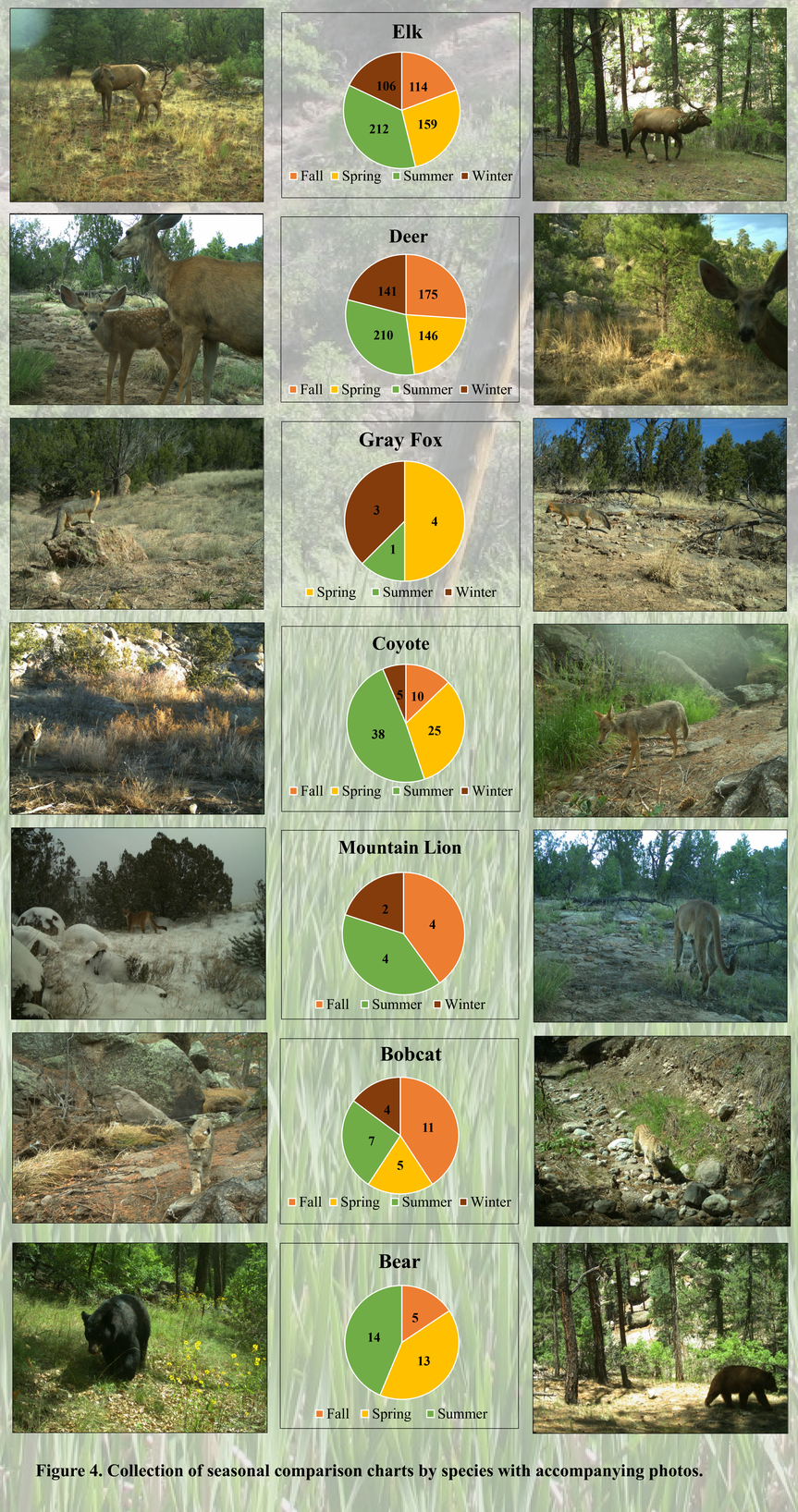

Figure 4. Collection of seasonal comparison charts by species with accompanying photos.

Results continued

Location Comparisons

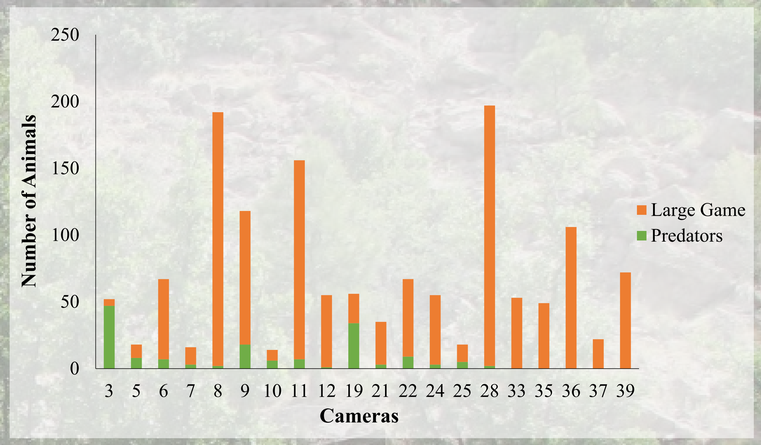

Figure 5. Distribution of large game and predators by camera location.

Results showed that wildlife is found year round on LANL property, with seasonal variation of occurrences between species (Figure 4). Elk and deer are found consistently throughout each season. Bears were not detected in the winter but had a high detection rate in the summer (n=14). Bobcats were also detected in each season but were most commonly found in the fall (n=11), while they had a low detection rate in the winter (n=4). Coyotes were detected in each season but were most commonly found in the summer (n=38) and similar to the bobcat, they were detected the least in the winter (n=5). Gray foxes were not detected in the winter and were most commonly found in the spring (n=4). Mountain lions were not detected in the spring but there were an equal number of detections in fall and summer (n=4).

Conclusions

The abundance of a species during each season can be attributed to the availability of resources at the camera location. Elk and deer are foragers that rely on certain food sources. Depending on the season, their diet consists of grasses, forbs, tree bark, and twigs. Predators, like mountain lions and bobcats, move across the landscape to maximize cover for stalking prey. This often requires them to move lower in elevation during the colder months where important habitat components are common. Bears are hibernators, and prepare year round for the winter months when their omnivorous resources are scare. Coyotes and gray foxes are omnivores that depend on vegetation and meat. The coyote was least detected in the fall and winter due to the lack of vegetation. Although the gray fox is active year round we did not get a detection in the fall, this can be explained by high activity of mountain lions, bobcats, and coyotes which are their direct predators. There was an indirect relationship between predator and prey animals in which large game had low detections where predator occurrences were high (Figure 5).

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