SEASONAL CHANGES OF FOOD HABITS OF *LYNX RUFUS* IN THE MOUNT HAMILTON RANGE, CENTRAL CALIFORNIA

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RESEARCH GOALS

Cañada de los Osos Ecological Reserve is a beautiful place with rolling hills, oak woodlands, shady valleys, natural springs and seasonal streams. The land has been set aside and managed for the purpose of maintaining a natural space, of which the flora and fauna can thrive mostly uninhibited by human interference. Bobcats, scientifically known as *Lynx rufus,* are one of the many native species that can be found roaming the open spaces of Cañada de los Osos. Many researchers describe bobcats as being mostly nocturnal (Larivière and Walton 1997), elusive and shy of humans (Nussbaum and Maser 1975). Although this may be true in more urban settings, bobcats are often seen during the day at Cañada de los Osos Ecological Reserve hunting in the grasslands and traveling along the dirt roads. The main goal of this research was to study the seasonal food habits of bobcats in an un-fragmented landscape in central California. The second goal of this research was to identify individual bobcats with wildlife game cameras and to gain a better understanding of the number of bobcats that may be using the resources on the reserve.

METHODS

Food Habit Study - The study period took place from December 2013 to December 2014, during which scats were collected bi-monthly, on 24 km (15 miles) of dirt roads located throughout Cañada de los Osos Ecological Reserve. After washing and drying, all samples were thoroughly examined using a dissecting microscope with a light source. Contents were then separated into different categories for ease of identification. Bones, feathers, insect parts and plant material were all separated and placed into smaller individual zip-top bags and then placed into the bag with the rest of sample. All bones were identified down to species level with the use of various guides (Gilbert 1980, Elbroch 2006, Reid 2006) and also compared to samples in the museum collection at San Jose State University.

Game Camera Study - Thirteen infrared digital game cameras (Moultrie Panoramic 150 and Game SPY 165) were placed in locations on dirt roads and at drinkers. Cameras were maintained in the same location the entire year, unless they were not producing any bobcat photos after a period of four weeks. Unproductive cameras were moved to another location in order to increase capture success (Heilbrun et al. 2006, Foster and Harmsen 2012). Individual bobcats can be identified by the pattern of their spots and the pictures from game cameras were used in this identification process.

RESULTS

Food Habit Study - Between December 14, 2013 and December 23, 2014, a total of 439 scat samples were collected. Some samples (n = 48) were not analyzed as data because they were suspected of being from the incorrect species or because the sample was made un-usable at some point during the washing process. Samples from December 2013 (n = 53) were omitted from the data analysis in order to capture seasonal changes over a 12 month time period. All

prey species identified in the remaining 338 scat samples were used to analyze bobcat seasonal food habits at Cañada de los Osos Ecological Reserve. The number of scats collected varied per season, with most scats collected in the winter (n = 102) and the least number in the spring (n = 74). The most abundant prey species found in bobcat scats were *Neotoma fuscipes* (dusky footed woodrat), *Thomomys bottae* (Botta's pocket gopher), *Microtus californicus* (California vole), and *Peromyscus californicus* (California mouse). Other mammal species identified were *Peromyscus maniculatus* (deer mouse), *Peromyscus truei* (Piñon mouse), *Reithrodontomys megalotis* (western harvest mouse), *Chaetodipus californicus* (California pocket mouse), *Sciurus niger* (eastern fox squirrel), *Sciurus griseus* (western gray squirrel), *Otospermophilus beecheyi* (California ground squirrel), *Sylvilagus bachmani* (brush rabbit), *Mephitis mephitis* (striped skunk), *Sus scrofa* (wild boar), and *Odocoileus hemionus* (black-tailed deer).

Game Camera Study - One hundred and thirty seven photos of bobcats were taken from 13 different locations throughout the reserve between December 2013 and 2014. The exact number of days that cameras were active is unknown. Of the 137 bobcat photos, 66.5% (n = 91) were used to identify individuals. The remaining 33.5% (46 photos) were labeled "noncapture" and did not contain sufficient information or were of too poor quality to be used in the analysis. Careful analysis of the 91 quality photos produced an estimate of 11 individual bobcats. Of the 13 different camera locations, 8 produced quality photos that contributed to individual identification.

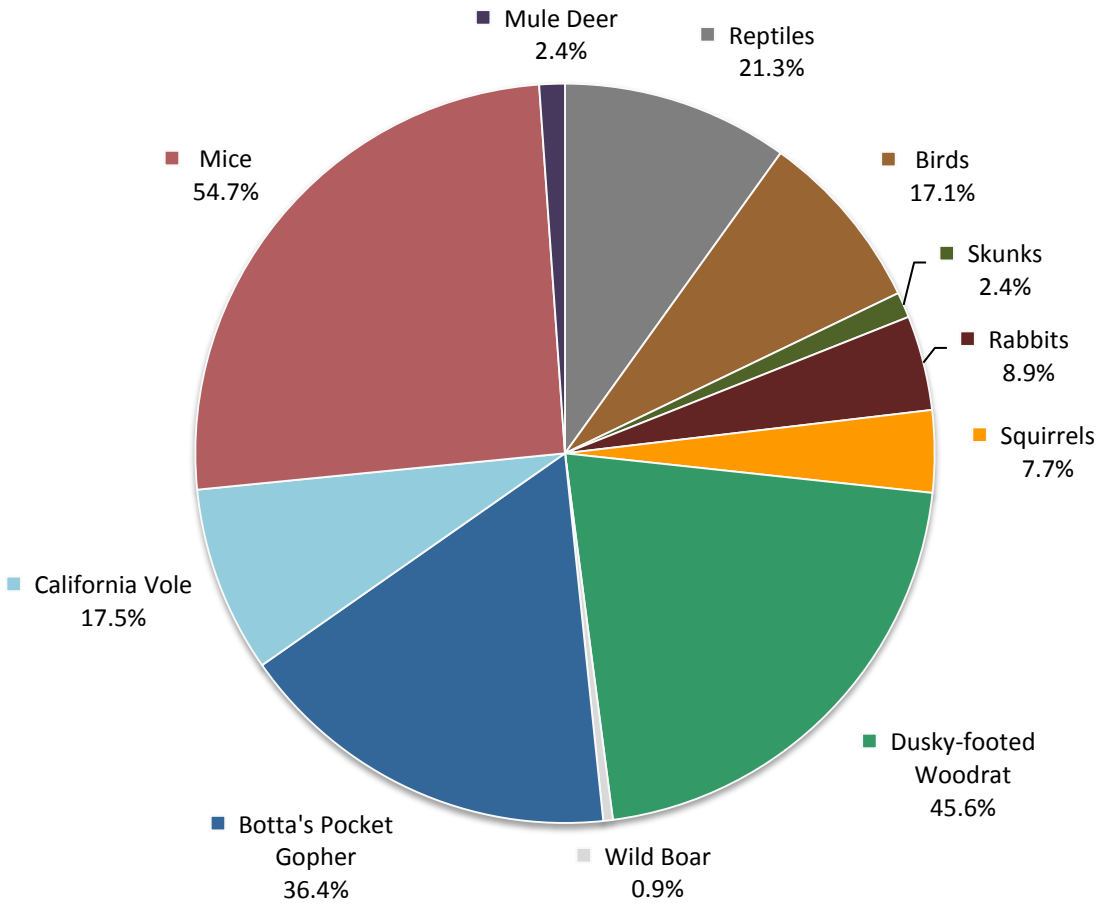
DISCUSSION

Analysis of scats from Cañada de los Osos Ecological Reserve confirmed that there was a seasonal variation in the prey items eaten by bobcats in 2014. This study revealed that lagomorphs such as *Sylvilagus sp*. (brush rabbit and cottontail) were not found in the bobcat's diet at Cañada de los Osos Ecological Reserve with the same frequency that they are in other places. Instead a large number of *N. fuscipes* (dusky footed woodrat) were consumed in the fall season and *T. bottae* (Botta's pocket gopher) were consumed in the winter. Mice, birds, lizards, snakes, rabbits, deer, boar, skunks, squirrels and Jerusalem crickets were all part of the bobcat's diet during different seasons when they may have been more available or easier to catch. Extended research such as small mammal trapping with concurrent vegetation surveys are needed to reveal a more broad scope of the effects that drought are having on the flora and fauna at the Reserve. Also, projects involving GPS or VHF transmitting collars and DNA analysis are needed to give managers more information about the population dynamics of bobcats in the Mount Hamilton Range.

The results of the camera study revealed that at least 11 bobcats were viewed in photos taken on the Reserve during the study period between December 2013 and December 2014. Other predators such as Puma concolor (mountain lion), Canis latrans (coyote), Urocyon cinereoargenteus (gray fox), and Aquila chrysaetos (golden eagle) were also captured on game cameras. Some helpful information about the biodiversity at CDLOER has been learned through this research, but a more intensive study with game cameras could provide useful data on wildlife populations in the Reserve.

With the ever changing landscapes and growing cities of central California, places like Cañada de los Osos Ecological Reserve should be protected because they provide a place for learning and research, but they also provide precious habitat and corridors of connectivity needed for the preservation of biodiversity.

Percentage of all prey found in total number of scats (n = 338) at Cañada de los Osos Ecological Reserve from January to December 2014



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