

A+ Great Job!

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Eating Habits of Wintering Raptors in the Boulder County Area

Abstract:

This study was conducted in order to gather information on current prey use and availability of wintering raptures in the Boulder County area. In the summer of 1994, due to an outbreak of bubonic plague, there was a decline in one of the raptures major food source, the prairie dog (Miller, 1995). A concern was raised whether or not there was enough food to support this rapture population, and of what they were eating as an alternative food source. *ok!*

Introduction:

Boulder County has a wide variety of raptures nesting in the area. The raptures that were present during the study included the golden eagle, (Aquila chrysaetos), bald eagle, (Haliaeetus leucocephalus alascanus), great horned owl, (Bubo virginianus), the prairie falcon (Falco mexicanus), and the red tailed hawk, (Buteo jamaicensis). Other species known to the area are the barn owl, (Tyto alba), burrowing owl, (Athene cunicularia), american kestrel, (Falco sparverius), and the screech owl, (Oyus asio) and may have also contributed to our

data. The golden eagle shows a wide variety in food habits with preference mainly towards rabbits and rodents (Snow 9). The bald eagle eats fish and birds for it's food source and also prefers rabbit. The great horned owl and the red tailed hawk both prefer similar small rodents such as voles (Short 341).

Many of these raptures were spotted during our study. We sighted the great horned owl, the golden eagle, and the bald eagle all at the Coot Lake area. We also sighted the red tailed hawk in the Coal Creek area. Although we observed the raptures in these areas, residents of the area have said they had not seen raptures to the extent as in past years (Lyman, 1995). [!] [!]

The sources of food available for the raptures during this study were the prairie vole, (Microtus orcharagaster), the meadow vole, (Microtus pennsylvanicus), the deer mouse, (Peromyscus maniculatus), the rabbit (Sylvilagus), and the prairie dog, (Cynomys ludovicianus). ^{Source?}

The prairie vole lives in varied grassland areas while the meadow vole prefers taller grass land areas that are moist (Short 344). Prairie dogs live in prairie areas that contain short grasses.

Raptures control agricultural pests, and serve as indicator species. ^{? Explain.} People also simply enjoy the aesthetic value of observing raptures in flight (Blumstien 10). It is important to establish a record of rapture eating habits to ensure a healthy population, and to preserve the eco-system as a whole. ^{Send!} Despite the decline in prairie dogs, the raptures should be supported by the other prey sources.

Study Area:

Our study area consisted of three diverse habitats which provide homes for a variety of prey for the raptures. The first site was Boulder Valley Ranch. This area is located west of the Boulder reservoir (see figure 1@2). It is an open grass land with residential developments to the northwest and south. There are several large cottonwood trees, (Populus sargentii), which we found pellets under. There is a line of twelve abandoned telephone poles about a mile long that is spread out in a northwest direction. These poles serve as convenient perch sites for the raptures. We found most of their food remains under these. The short grassland area provided homes for the many prairie dogs that had lived in the area. About sixty percent were wiped out by the bubonic plague (Lyman, 1995). *was this a study?*

Our second site was the Coot Lake area, located north of the Boulder reservoir (see figure 3@4). There is agricultural land to the east and to the west, a wetland area to the southwest, a open field, the Boulder Reservoir canal and canal road that cuts threw the middle of the area. There are several large cottonwood trees that serve as excellent perch sites. The prairie dog population that lived in the open field was hit hard by the bubonic plague and completely wiped out. *Cite source?*

The last site area, Coal Creek, is located east of Doody Draw and highway 128 (see figure 5@6). This riparian area along the creek has many large cottonwood trees where raptures perch. While in the area, we saw no existing or sign of previous prairie dog population.

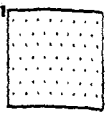
Methods and Techniques:

In order to determine what these wintering raptures were eating, we collected approximately thirty pellets and other eating remains. ^(at each?) We collected the remains between October and December of 1994. The remains were found under perch sites where they consumed their prey. After locating and picking up the remains, with rubber gloves, we placed them in labeled plastic bags (see figure 7@8). We then plotted our locations on a map of Boulder county ~~(see figure 10)?~~ Each pellet was picked apart with tweezers and separated into identifiable and non-identifiable. The identifiable included bones while the non-identifiable included hair and fur. We wore masks while doing this to keep from inhaling hair. yuck!

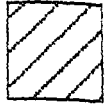
The next step was to identify the remains. By looking at the dental formula of each of the skulls found under a microscope we determined the type of rodent. The teeth of each of the skulls had certain lakes. By looking at these lakes we could narrow down to the type of species of each rodent. The prairie vole had a 5-4-4 dental lake formula and the meadow vole had a 5-5-5 dental formula. Other characteristics such as the size of the skull, number of teeth, and the presence of grooved incisors were also examined and helped in the identification. These characteristics helped us identify the prairie dogs, rabbits, and the deer mice.

Results:

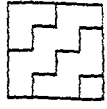
The following graphs demonstrate the types of prey found at each location and at what tree or pole with in each site. Graph number five is the total amount of prey found from all three sites. We estimate that this information came from thirty pellets and from six of the most dominant species of raptures surveyed at the time. We also estimate that about seventy percent of the pellets found were vomited during the time of our study. The other thirty percent were old pellets and may be the reason why so many prairie dogs were found at the Boulder Valley Ranch area even though this population was nearly wiped out by the plague.



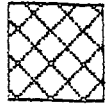
RABBIT



PRAIRIE DOG



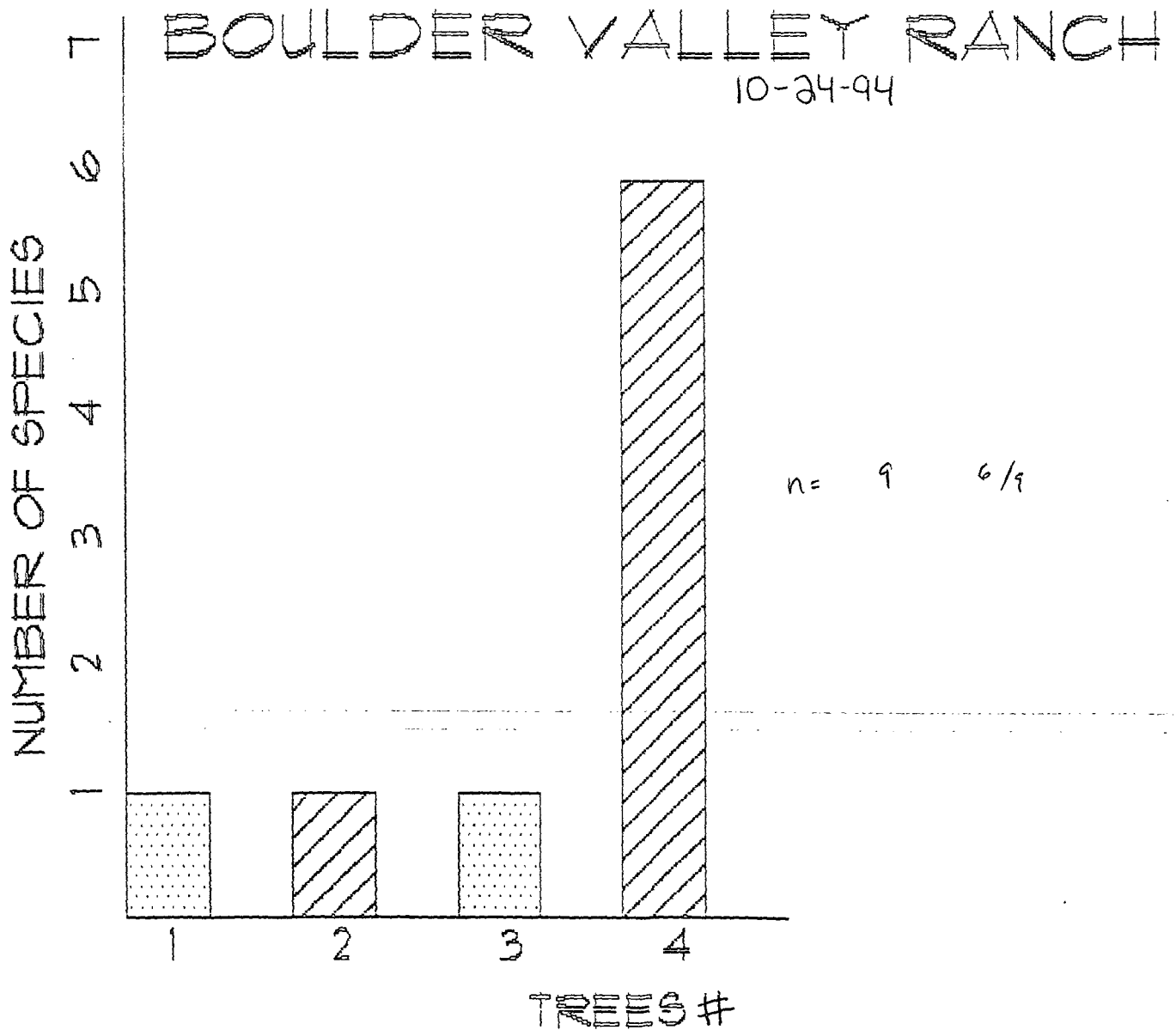
PRAIRIE VOLE

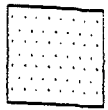


MEADOW VOLE



DEER MOUSE

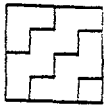




RABBIT



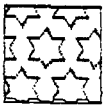
PRARIE DOG



PRARIE VOLE



MEADOW VOLE

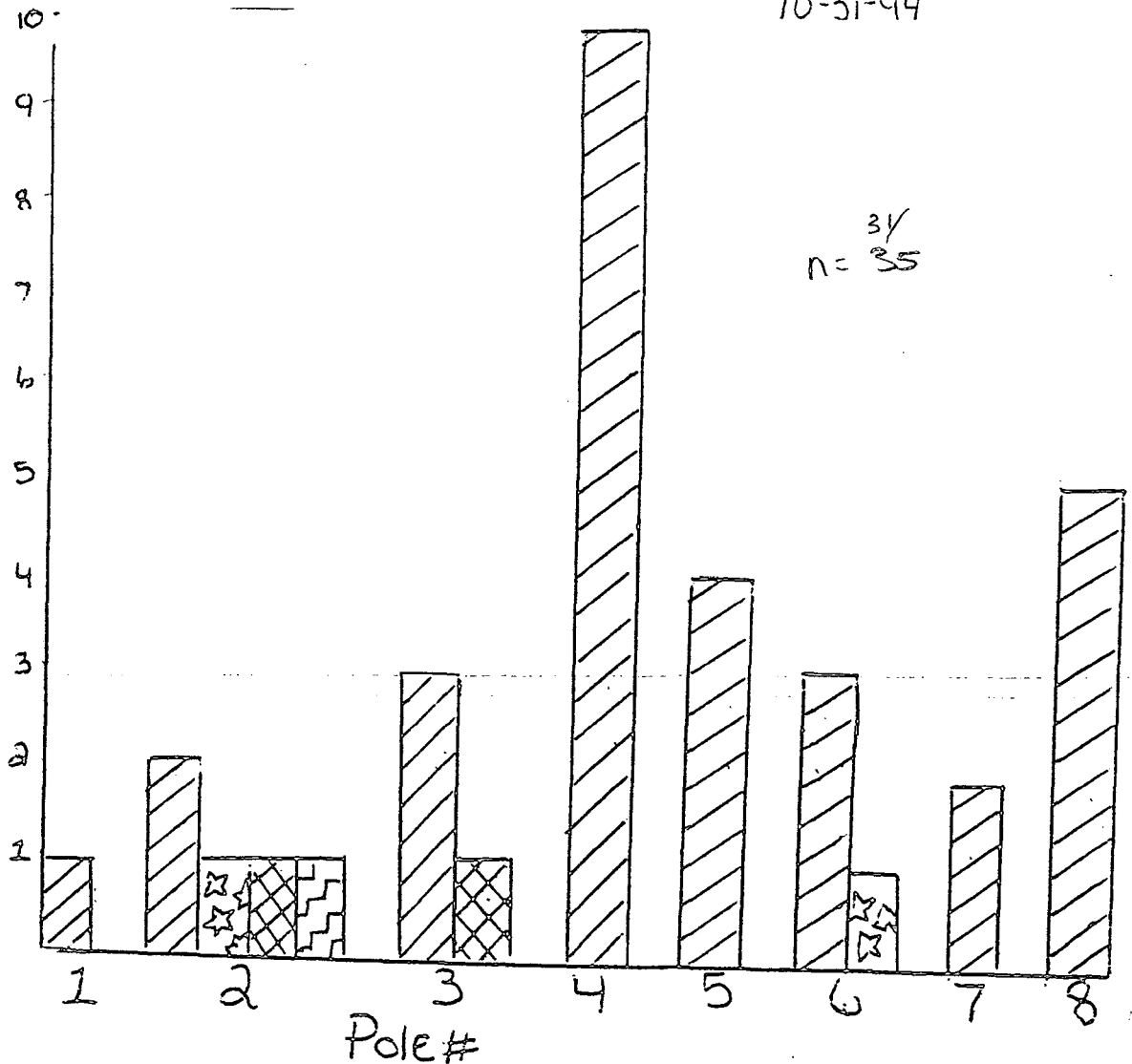


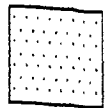
DEER MOUSE

BOULDER VALLEY RANCH

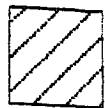
10-31-94

NUMBER OF SPECIES

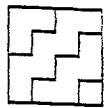




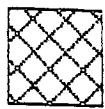
RABBIT



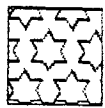
PRAIRIE DOG



PRAIRIE VOLE



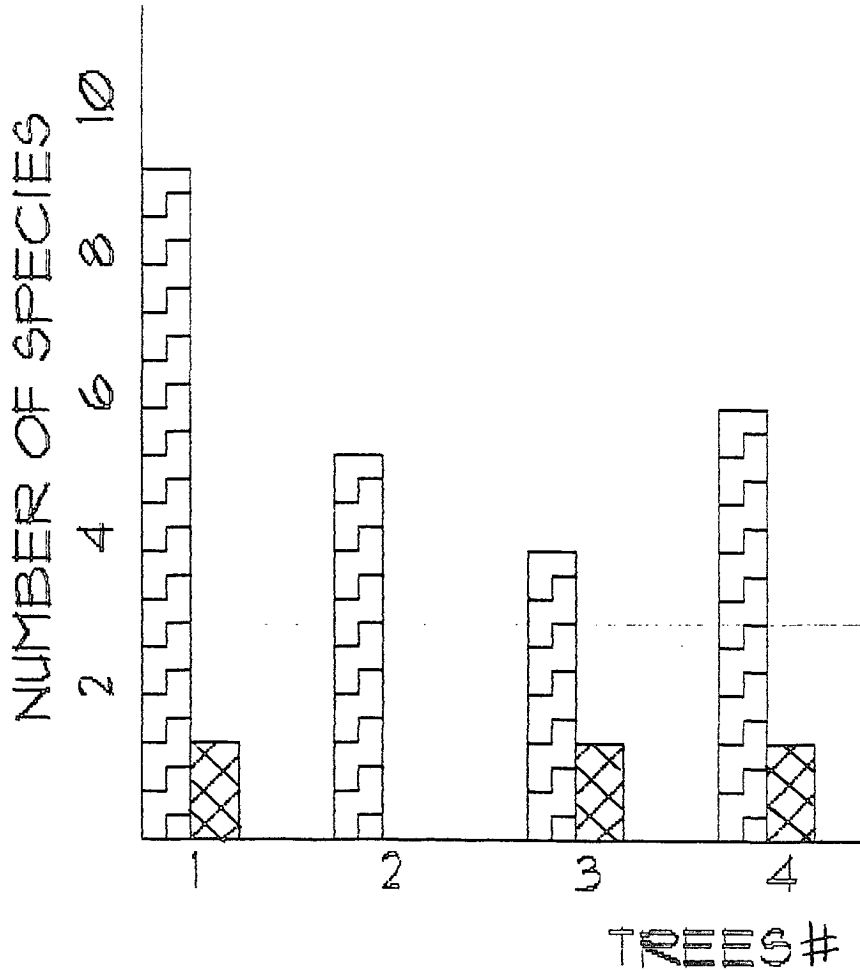
MEADOW VOLE

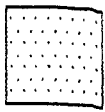


DEER MOUSE

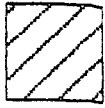
COAL CREEK

12-20-94

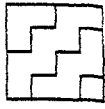




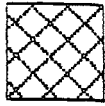
RABBIT



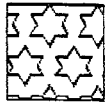
PRAIRIE DOG



PRAIRIE VOLE



MEADOW VOLE

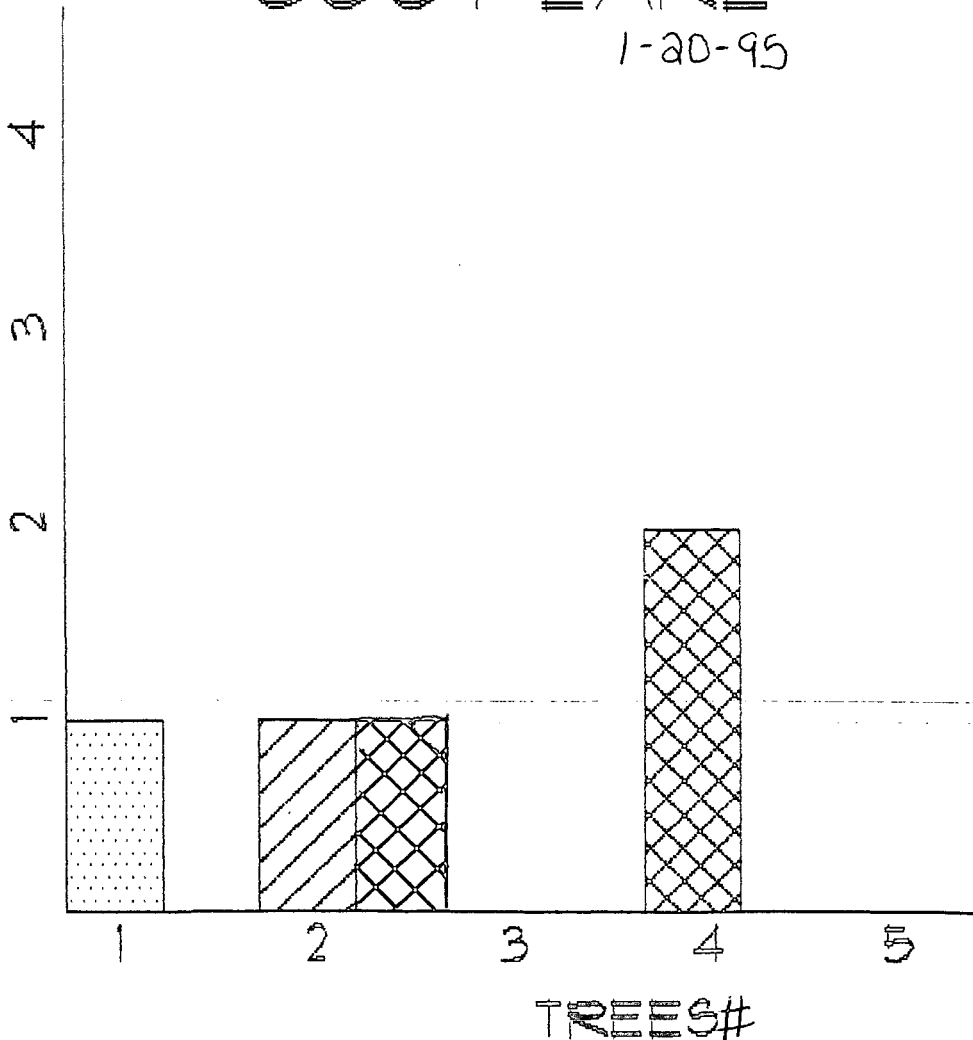


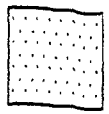
DEER MOUSE

COOT LAKE

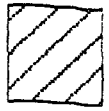
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NUMBER OF SPECIES

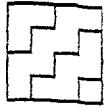




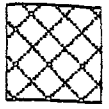
RABBIT



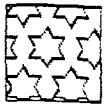
PRAIRIE DOG



PRAIRIE VOLE



MEADOW VOLE



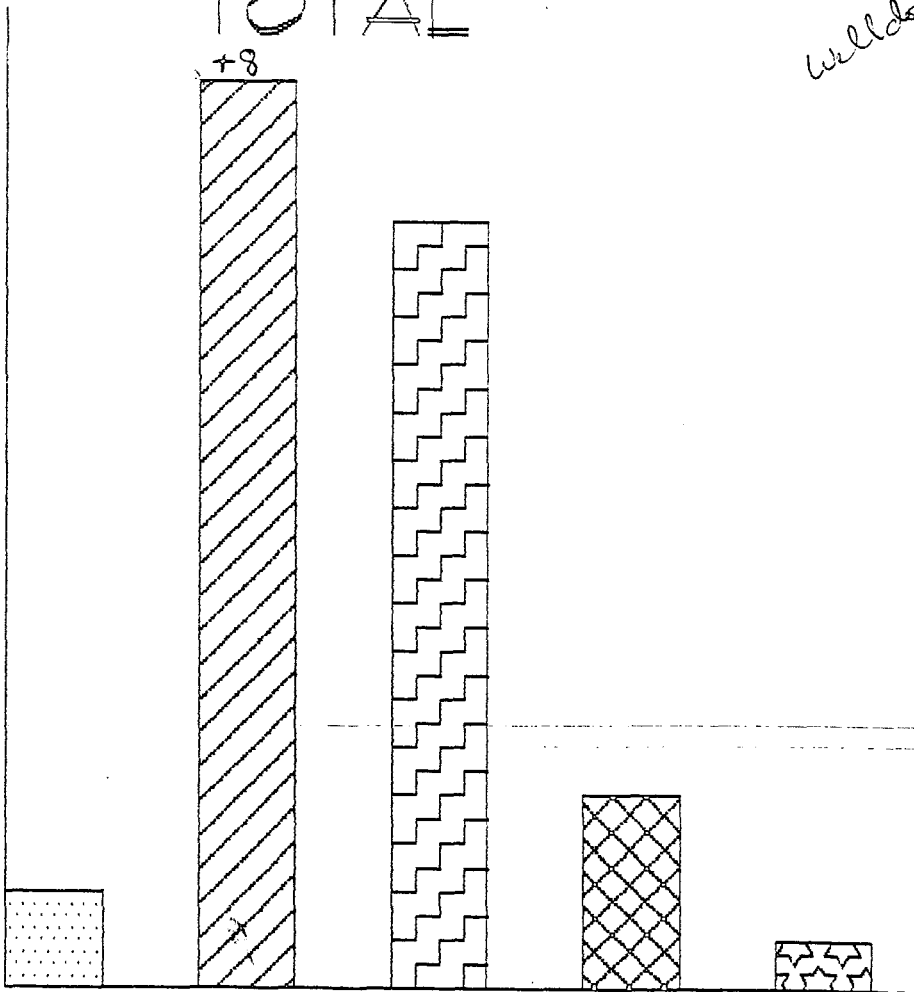
DEER MOUSE

NUMBER OF SPECIES

5 10 15 20 25 30

TOTAL

+8



Will done graphics!

Discussion:

Our results to this study indicated that the raptures were eating a variety food sources dependent upon the availability of food within each habitat. Despite the decline in their major food source they have found alternate sources which seem to be supporting the population. Only a small decline in sighting of these raptures has occurred. *we can assume or infer From data ...*

The habitat where each of the surveys were done played an important role on what types of prey were being consumed. The prairie vole was predominant in the Coal Creek area which consisted of a riparian zone. The meadow vole was predominate in the Coot Lake area a mixed grassland area. Keeping a diverse habitat for a variety of prey is important to the rapture population. These other habitats and prey are helping support the rapture population while there is a decline in prairie dogs. It;s important that we do everything that we can to protect these habitats. As long as there is diversity to fall back on, this natural cycle of bubonic plague should have no great effect ^{on} the rapture population. Long term effects of a decline like this may be different. These alternate food sources may only be able to support the raptures for a limited time. Further studies should be conducted to determine this. *good!*

One management concern that we have is the relocating of the existing prairie dog towns into large areas (Gershman 1995). If there is a large population concentrated in one area, diseases, such as the bubonic plague, could wipe out a whole population of the prairie dogs at once. This would leave the raptures to

depend solely on alternate sources which may not sustain raptures for too long. Problems as this should be considered when making drastic changes in the prairie dog population.

The raptures being at the top of the food chain are good indicators ^{of} at how the eco-system is doing as a whole. Thru diversity and careful management we can help sustain a solid population of raptures and a healthier environment for all.

The uniqueness of each habitat allowed you to make some specific inferences about the relationships involved... That made your study more reliable due to the inclusion of scientific control. Good job.

Excellent!

The next study might include a population census of food sources (Rabbit, PD, Voles + mice) at each study site.

Acknowledgments:

We would like thank Clint Miller, wildlife biologist for the City of Boulder Open Space, for his time and effort in helping us carry out this project. Brain Richards, ranger for the City of Boulder, for giving us a tour of the Coal Creek area. Mr. Huck, science teacher at Niwot High School, for his guidance and support. We would also like to thank the following individuals: Susan Ross for her guidance, Dick Lyman for his information, Chris Barker for his support and to the rest of the City of Boulder Open Space Department for the use of their facilities.

BOULDER VALLEY RANCH

Labeled and
Figures and
a Condensed
map would be
helpful.

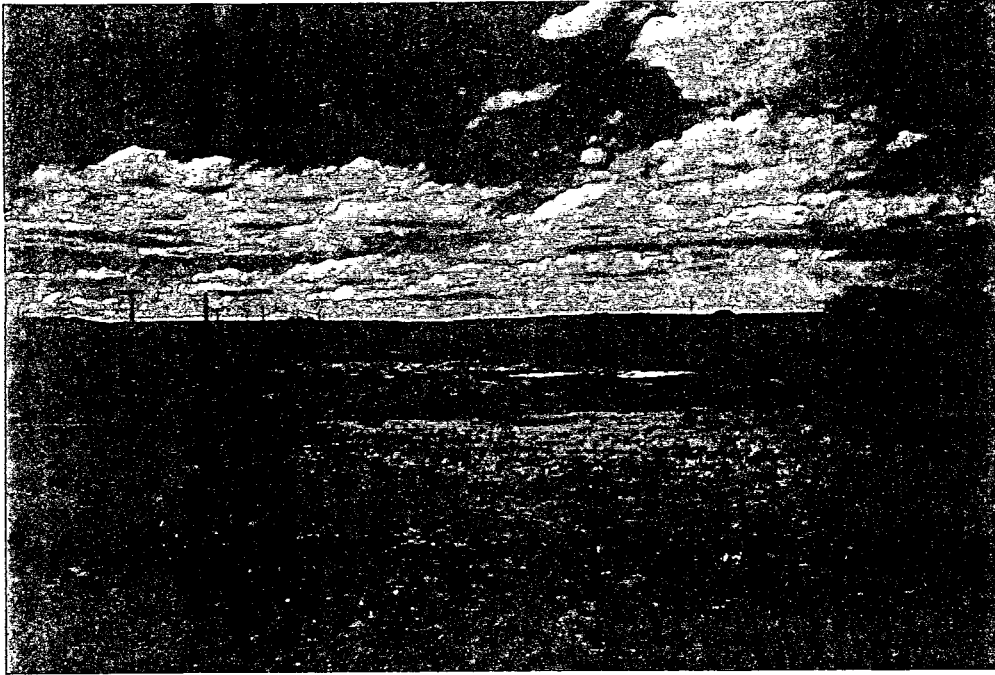


Figure 1

well
done!

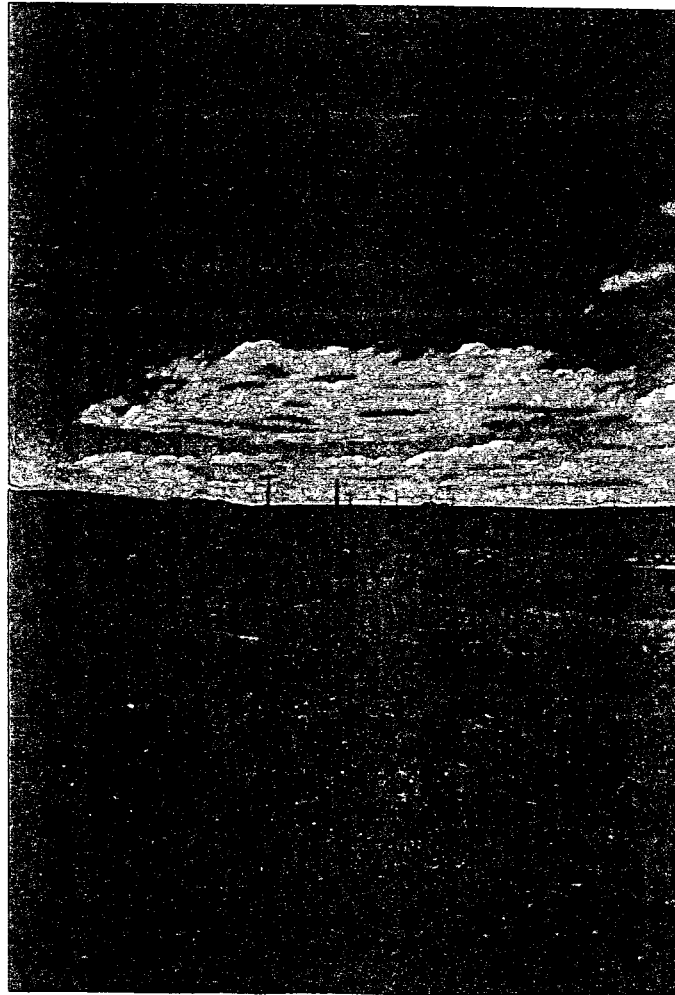


Figure 2

COOT LAKE



Figure 3



Figure 4

COAL CREEK

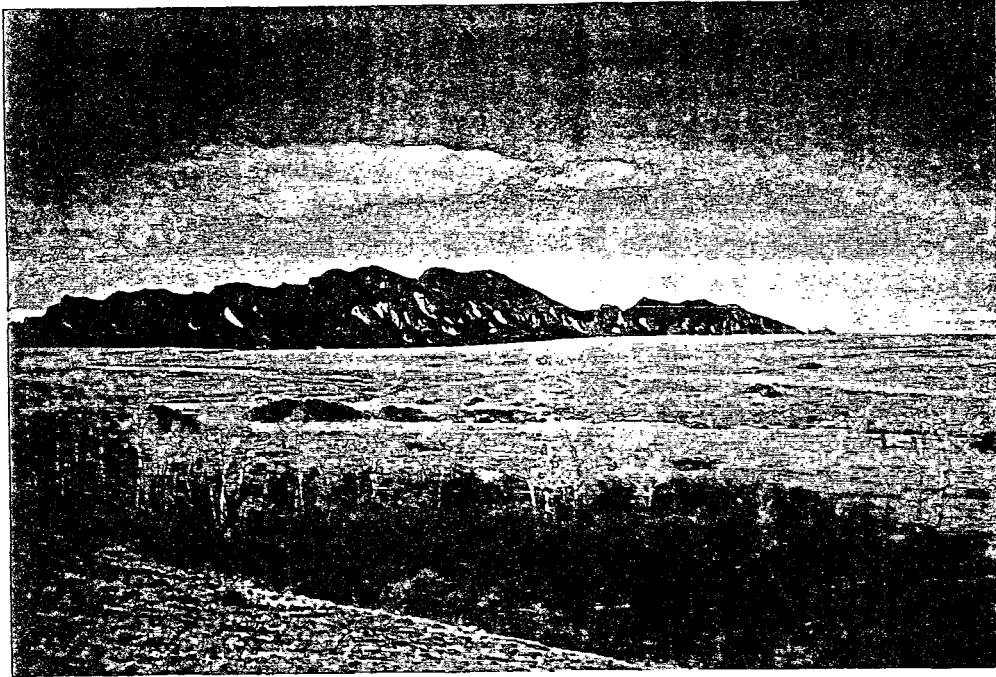


Figure 5

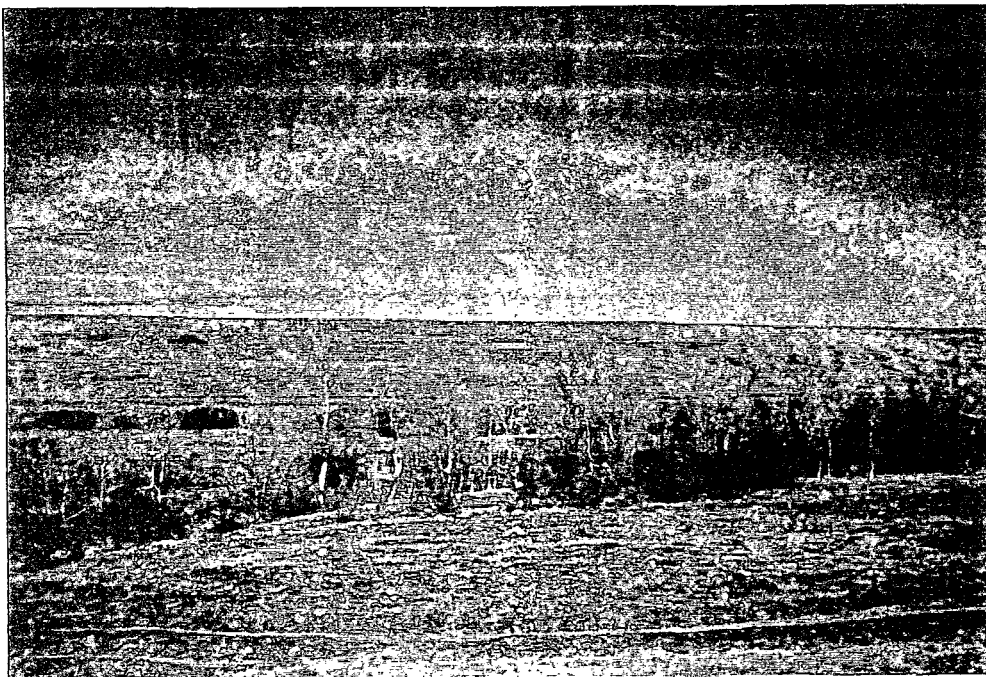


Figure 6

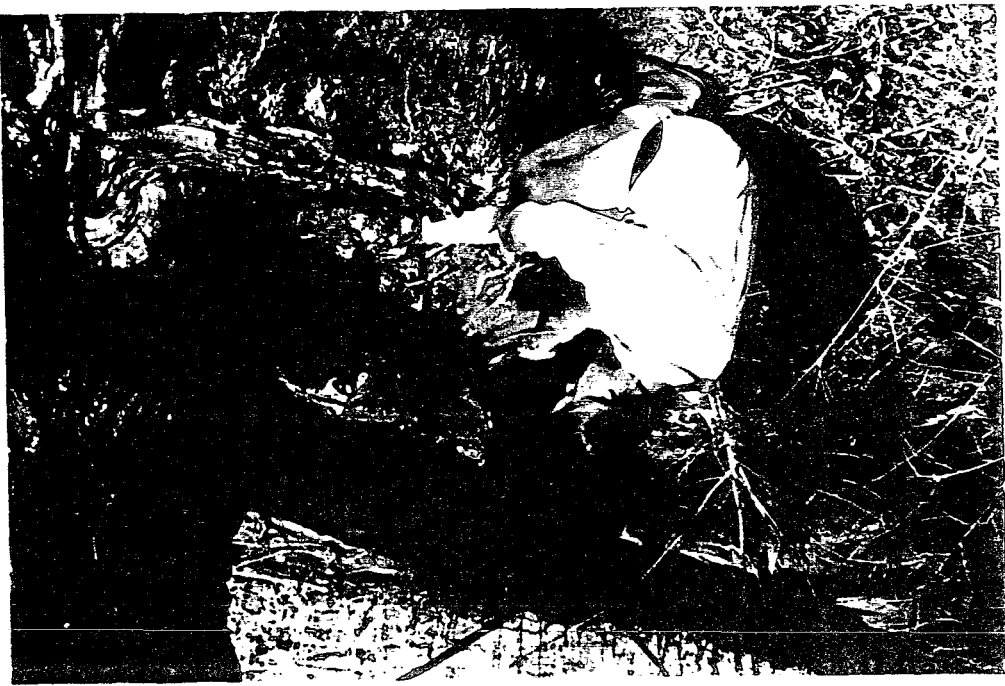
Figure 9



Figure 8



Figure 7



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