

REPORT ON VISITOR IMPACT UPON WILDLIFE POPULATIONS AT CEDAR BREAKS NATIONAL  
MONUMENT, JUNE 1983 - OCTOBER 1983.

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Data were collected by live-trapping animals, time-area counts, and observations in four locations: campground, campground control, alpine pond trail, and alpine pond trail control (the controls were undisturbed areas similar to the target areas).

A statistical method was chosen that tested the hypothesis that there was a 1:1 ration between the number of captures of small mammals obtained in the campground (or alpine trail area) and that recorded in the control area.

A Chi-Square value was computed using the formula:

$$\chi^2 = \sum \frac{((O-E) - 0.50)^2}{E}$$

where

O = observed ratio between the captures of the two areas

E = expected ratio between the captures of the two areas

(1:1)

This Chi-Square value ( $\chi^2$ ) was then compared to a critical value of  $\chi^2$  which was 3.841 (P = 0.05 level) in all cases in this study.

Table 1 lists those species trapped or tallied in large enough numbers to do meaningful statistics; all other species that will be discussed were evaluated primarily through observation and/or animal 'sign'.

There was a significant difference in the number of golden-mantled squirrels

TABLE 1. SUMMARY OF CHI-SQUARE VALUES AT CEDAR BREAKS NATIONAL MONUMENT  
CAMPGROUND AND ALPINE POND TRAIL AREA.

| SPECIES                                               | $\chi^2$ |
|-------------------------------------------------------|----------|
| CAMPGROUND                                            |          |
| Golden-mantled Squirrel ( <u>Citellus lateralis</u> ) | 4.25*    |
| Colorado Chipmunk ( <u>Eutamias quadrivittatus</u> )  | 4.25*    |
| Masked Shrew ( <u>Sorex cinereus</u> )                | 2.50     |
| Red Squirrel ( <u>Tamiasciurus hudsonicus</u> )       | 0.29     |
| ALPINE POND TRAIL                                     |          |
| Red Squirrel ( <u>Tamiasciurus hudsonicus</u> )       | 3.33     |
| Colorado Chipmunk ( <u>Eutamias quadrivittatus</u> )  | 3.33     |

\* Significant at the  $P = 0.05$  confidence level

(Citellus lateralis) found in the campground as compared with the campground control area. Four times as many animals were found in the campground. These animals prefer areas with open overstory and feed on plants such as penstemon and gooseberry. Although these food plants and others occurred in the campground control area, there was a more dense canopy cover and a thicker understory, which could account for some of the results. The foods of golden-mantle squirrels consist mainly of seeds, nuts, and fruits, but insects and flesh are frequent minor items of the diet. They will eat meat left in traps, eggs, and carrion; it is probable that they would scavenge on food remains left in the camp. These animals were observed eating scraps at camp sites, and so it is likely that camp refuse accounts for their abundance in this area.

There was also a significant difference in the number of Colorado chipmunks (Eutamias quadrivittatus) found in the campground as compared with the control.

Four times as many chipmunks were found out of the campground and in the control. This was surprising as these animals are very adaptable and if anything, they would be expected to occur in greater numbers around the campsites. This species diet consists of insects, seeds, and fruits; it is likely that the chipmunks squirrels are weaker competitors than the ground squirrels. Colorado chipmunks also occurred in greater numbers in the alpine trail control area, which had a denser understory similar to the campground control area. Thus the understory, coupled with competitive interaction with golden-mantled squirrels, influence the numbers and occurrence of Colorado chipmunks in the monument.

There was no significant difference in the number of red squirrels (Tamiasciurus hudsonicus) found in the campground, alpine pond trail, and in the control areas. This species feeds on the seeds and fruits of fir and spruce trees. The largest concentrations were located in middle-age to old growth stands(spruce) with dense canopy cover and little understory.

Masked shrews (Sorex cinereus) were captured only in the campground. This shrew inhabits moist locations, which by no means was limited to the campground this summer. These animals feed primarily upon insects, other invertebrates, and small mice; it is likely they would scavenge on campground food remains (meat, fat, etc.).

Deer mice (Peromyscus maniculatus) were trapped only in the wet meadow area. Deer mice are quite adaptable and have been documented to increase with an increase in human use of forested areas. They have a generalized diet (insects, seeds, fruit, and roots) and will utilize food debris. It was surprising that deer mice were not trapped in the campground.

Neither the long-tailed vole (Microtus longicaudus) nor the mountain vole (Microtus montanus) were trapped. These mice are partial to open areas including meadows and clearings in the woods. Voles are almost entirely vegetarian and sub-

sist on foliage, roots, twigs, bark, and seeds. As such, it is not surprising that there is evidence that voles decline with an increase trampling of vegetation.

Rats (Neotoma cinerea) and (Rattus norvegicus) will exploit garbage if enough ground cover is present. These species adjust to local availability of material that can serve as shelter. The removal of small sticks and branches in the campground (for firewood) reduces the amount of nest building material available to woodrats, in particular.

Equal numbers of yellow-bellied marmots (Marmota flaviventris) were observed in the rocky area alongside the north end of alpine pond trail, meadow near Chessman's parking, alongside the road, aswell as the undisturbed meadows far from U-143. The marmot diet includes woody as well as herbaceous plants. Their tolerance of visitors and the type of habitat they dwell in (rocky areas near grassy meadows) and food availability are the major influence on distribution in the monument.

Skunk, fox, coyote, and bobcat utilize the areas east of U-143. These were the woods and clearings adjoining the national forest. One reason for this is that the majority of visitor use in the monument is concentrated west of the highway near viewpoints, trails, etc. Although these species are primarily nocturnal and/or crepuscular, they tend to avoid human activity. It should be noted that west of the highway there is a marked lack of suitable habitat for these animals. The main area west of the road that would provide sufficient food and cover was the dense thickets surrounding Alpine Pond. Moderate use by mule deer, fox and weasle was noted here.

Skunks, foxes, and coyotes have a varied diet: insects, small mammals and birds, amphibians and fruits. Carnivorous bobcats and weasles take rabbits, squirrels,

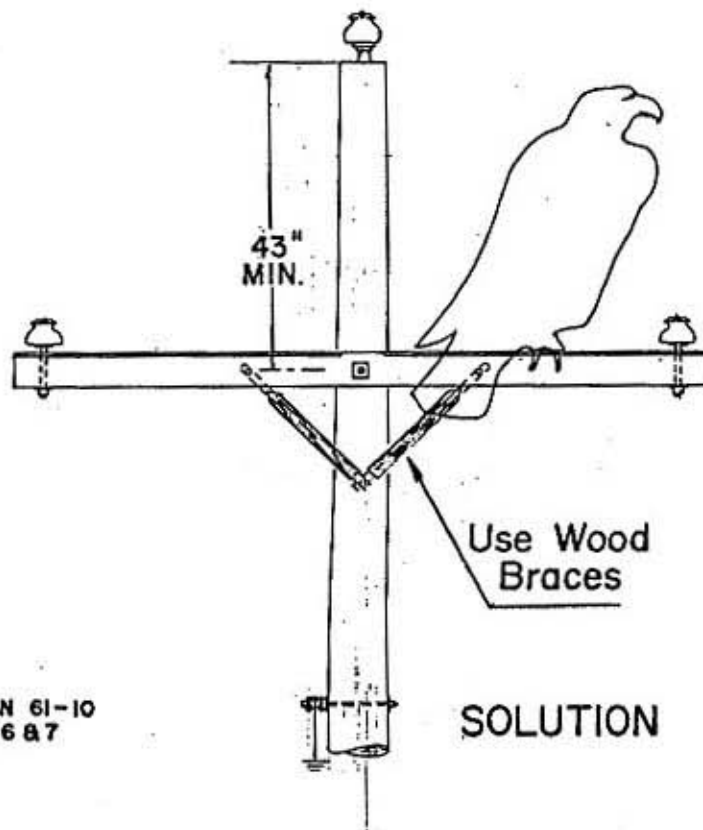
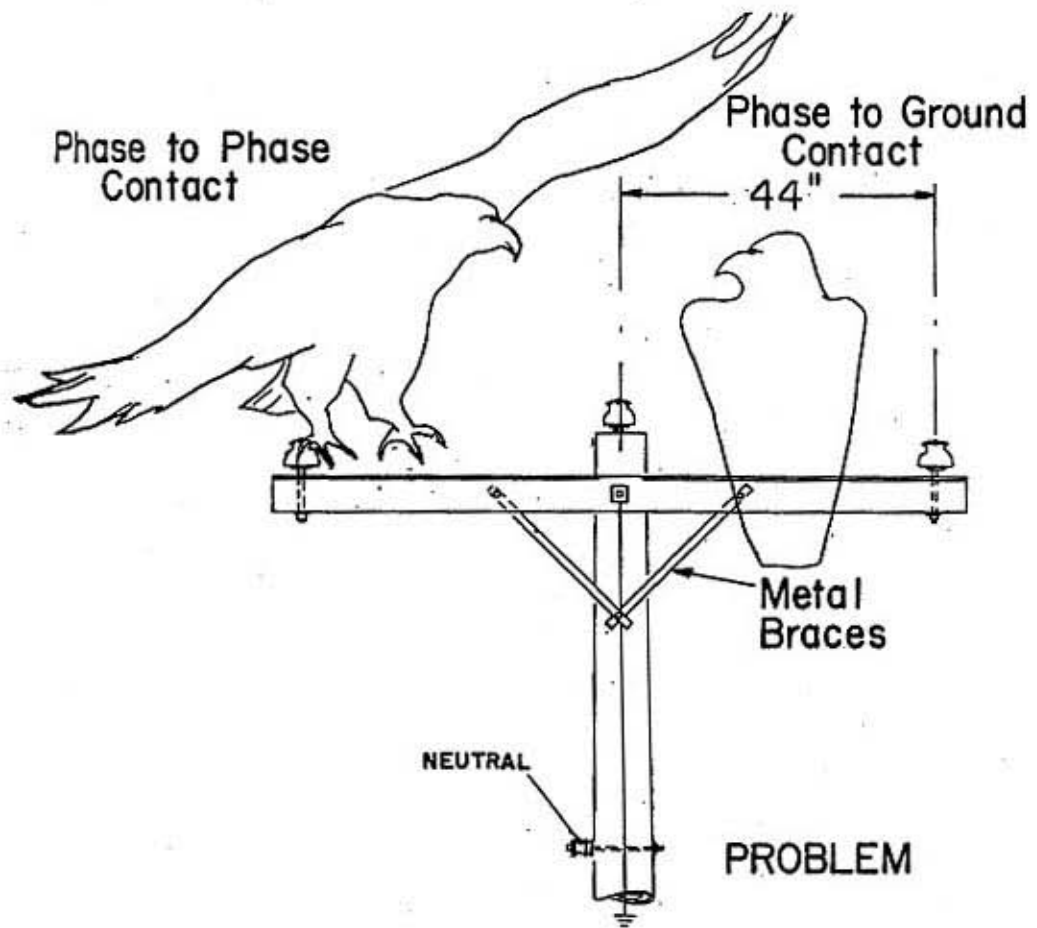
and other small birds and mammals as prey. Mule deer browse on trees and shrubs, and also consume grasses and other herbaceous plants. Deer sign and observation were recorded primarily from meadows and forested areas.

#### Power Lines

The power line poles within the monument are the type that can electrocute raptor species (see pp. 6 & 7). On the existing construction, a pole top extension needs to be added to the pole such that the top conductor phase is approximately 43 inches (instead of the current 24 inches) above the pole top when used with an 8 foot crossarm. Although no evidence of electrocution was detected this summer, I recommend that the lines be checked during fall and spring migration (September through October, April through May). This would be the approximate time of greatest risk to the raptors crossing the monument. At least 10 of the raptors that occur in Cedar Breaks are large enough to be endangered by the power lines.

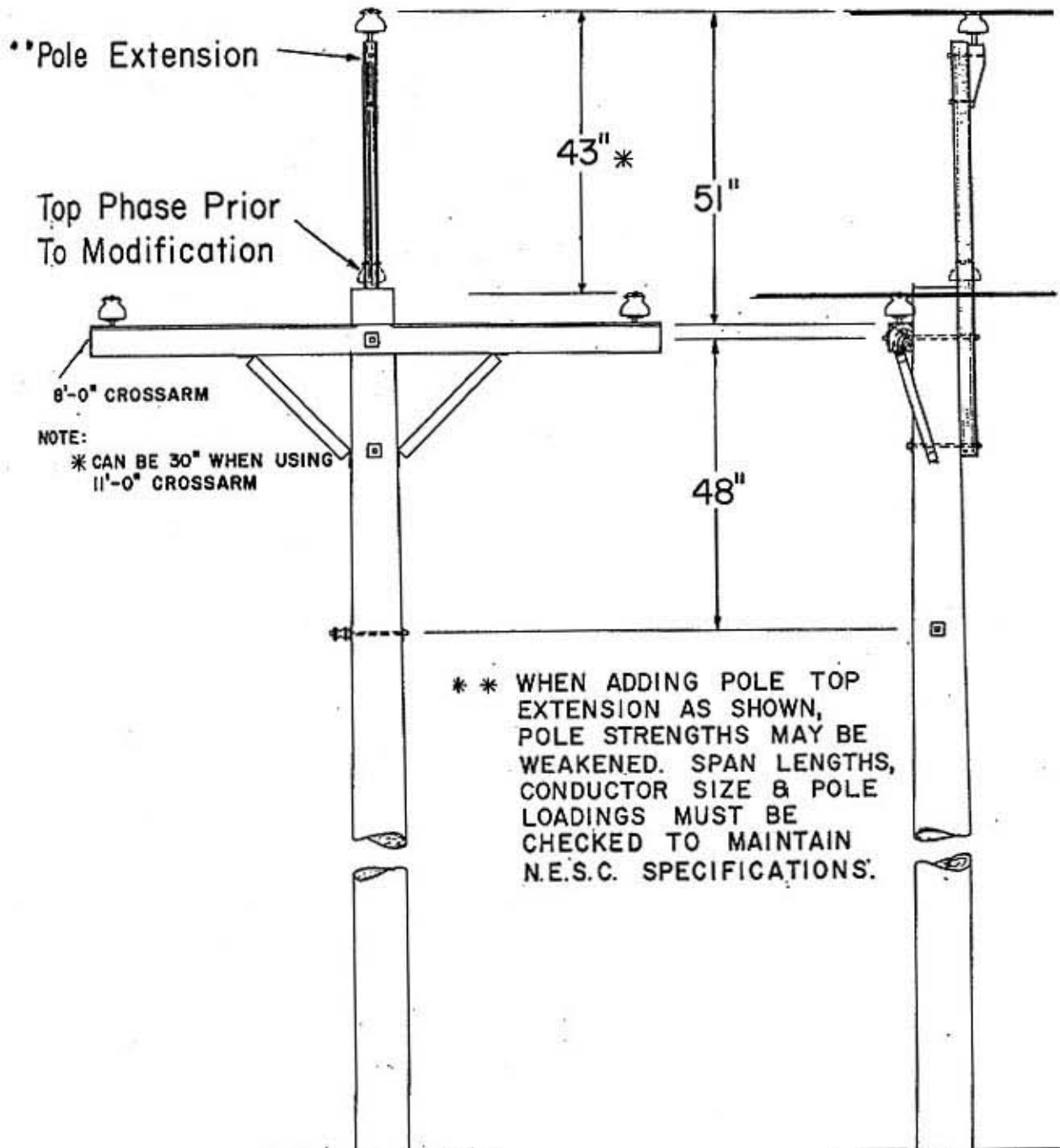
#### Conclusion

The primary influence on wildlife populations resulting from visitor use centers on small mammals. The main impacts result from modification of vegetation and leaving food remains. Because of the small size of the monument, my long-range concern would be to monitor the trampling of vegetation off heavy-use trails and those areas surrounding the campground. Certain rodent populations might decline due to lack of ground cover and nesting materials. Some species in particular might be unable to tolerate higher levels of human activity.



REFERENCE:  
REA BULLETIN 61-10  
FIGURES 6 & 7

# POLE-TOP EXTENSION TO ELEVATE CENTER PHASE ABOVE PLANE OF TWO OUTER CONDUCTORS



## REFERENCE:

IDAHO POWER COMPANY  
APPROVED BY: MORLAN W. NELSON  
BIRDS-OF-PREY CONSULTANT

EXHIBIT No. 5

ADDENDUM TO REPORT ON VISITOR IMPACT UPON WILDLIFE POPULATIONS AT CEDAR BREAKS  
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POPULATION DATA

| Species                        | Census   | Location       |
|--------------------------------|----------|----------------|
| Red squirrel                   | 12.6/ha  | Campground     |
| Red squirrel                   | 9.41/ha  | Camp control   |
| Red squirrel                   | -        | Alpine trail   |
| Red squirrel                   | 3.57/ha  | Alpine control |
| Colorado chipmunk              | 3.14/ha  | Campground     |
| Colorado chipmunk              | 14.29/ha | Camp control   |
| Colorado chipmunk              | 5.95/ha  | Alpine trail   |
| Colorado chipmunk              | 1.19/ha  | Alpine control |
| Golden-mantled ground squirrel | 12.56/ha | Campground     |
| Deer mouse                     | 1.76/ha  | Wet meadow     |
| Masked shrew                   | 1.19/ha  | Campground     |

SPECIES LIST

Animals captured or observed:

Masked shrew\*

Golden-mantled ground squirrel

Red squirrel

Colorado chipmunk

Deer mouse

Long-tailed weasle

Yellow-bellied marmot

Mule deer

\*On the Dixie Natl. Forest species list, not on the Cedar Breaks Mon. List

Animals Identified by scats, tracks, and/or sign:

Rabbit (species unknown)

Porcupine

Skunk (striped or spotted)

Bobcat

Fox (red or gray)

Coyote

Although other species on the Cedar Breaks species list were not seen, the literature indicates that this area is within their range. A more extensive inventory might detect their presence and the presence of additional species not on the list. One exception appears to be the pika. If they are present, they have shown up in the rocky Alpine trail area, where trapping and time area counts centered. It is doubtful that they are present in the monument.

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