# HEART MOUNTAIN VERTEBRATE SURVEY
# 10 August - 13 August 1999

*Gary P. Beauvais, Heritage Zoologist*
*Wyoming Natural Diversity Database / University of Wyoming*

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## Background / Introduction

At the request of Dr. J. Freilich (Science Director, Wyoming Field Office of The Nature Conservancy), I surveyed the Bischoff property / Heart Mountain Ranch for rare vertebrates from 10 August 1999 to 13 August 1999. My primary goal was to investigate the small mammal assemblage on the property. In addition to accomplishing this goal, I documented several other wildlife occurrences of conservation interest.

## Methods

Small mammals were surveyed using standard Sherman live-traps and pitfall traps. Four trap lines, each consisting of 50 Sherman traps set at 5m intervals, were run each night for a total sampling effort of 600 trap-nights (uncorrected for accidentally tripped traps). Traps were set between 17:00 and 19:00, and checked the following morning between 06:00 and 09:00. Trap lines were moved to different locations each night in order to sample a wide range of habitats (Table 1).

Twelve pitfall traps were also set for each of 2 nights, for a total sampling effort of 24 pitfall-nights. Eight pitfalls remained in the same location for both nights; 4 were moved to different locations each night in order to sample a wide range of habitats (Table 2).

Foot searches, aided by 10X (binocular) and 25X (spotting scope) optics, were conducted in 7 areas: (1) southern rim of Eaglenest Basin; (2) Eaglenest Creek both above and below the siphon near base camp; (3) sagebrush-dominated alluvial fan east of Heart Mountain and west of the canal; (4) timbered slopes north and east of the summit of Heart Mountain; (5) seeps and springs north of the summit of Heart Mountain (6) the middle section of Buck Creek, near the base of Heart Mountain; (7) the lower reach of Iron Creek. All observations of species of conservation concern were recorded.

## Results

### *Small mammal trapping*

Three trap lines (D, K, and L) and 15 pitfalls (1-11, 13-16) failed to capture any small mammals. A total of 34 individuals of 5 species were captured in the remainder of the traps (Table 3).

***Other observations of species of conservation concern***
On 10 August, B. Ferguson's (ranch manager) sons displayed a live, larval tiger salamander (A*mbystoma tigrinum*) they had collected from a stock pond immediately east of the ranch house. They stated that there were "many more" in the pond.

A group of 5-7 long-billed curlews (*Numenius americanus*) was seen each day on the canal bank southeast of the ranch house or in the sagebrush flat to the west. It is likely that the same group of birds was observed each day. On 11 August I approached the group closely and identified at least 2 adults and 2 immature individuals based on relative bill length; based on this information, the group is probably a mated pair with this year's brood. Three photos were taken of individual birds.

Some of the benches above the upper forks of Eaglenest Cr. appear to be suitable habitat for mountain plovers (*Charadrius montanus*); none were observed, however, on a foot search of the area on 12 August.

Two immature golden eagles (*Aquila chrysaetos*) were observed soaring over Eaglenest Basin on 10 and 11 August; one mature golden eagle was observed on lower Iron Creek on 12 August.

One adult male northern harrier (*Circus cyaneus*) flew over base camp on 11 August.

Several piles of scat and one day-bed of a bear (*Ursus* spp.) were observed north of Heart Mountain. Sign was located in closed-canopy conifer forest with heavy under- and mid-story of soft-mast bearing shrubs. Individual was likely an American black bear (*Ursus americanus*).

Many piles of sage grouse (*Centrocercus urophasianus*) scat were observed in the sage flat between Heart Mountain and the canal. Although most of the sign appeared >30 days old, 3-6 piles appeared more recent.

Very old (>20 years?) beaver activity (cut stumps and branches) was noted along Eaglenest Creek at the base camp location.

A single bat, likely a little brown bat (*Myotis lucifugus*), was observed over base camp on 11 August.

Miscellaneous observations of species not noted in the report of the surveys performed 24 May - 26 May 1999: mule deer (*Odocoileus hemionus*); white-tailed deer (*Odocoileus virginianus*; antler shed); pronghorn (*Antilocapra americana)*; elk (*Cervus elaphus*); white-tailed jackrabbit (*Lepus townsendii)*; chipmunks (presumed to be *Tamias minimus* or *T. umbrinus*); coyote (*Canis latrans*); red squirrel (*Tamiasciurus hudsonicus*); prairie rattlesnake (*Crotalus viridis*);

**Discussion**
The occurrence of the strongly forest-adapted red squirrel and southern red-backed vole on Heart Mountain itself is of note. The largest contiguous patch of forest on the mountain is only 258ha in size. If all forest patches within 2000m of the main patch are included, there is only 350ha of forest, heavily fragmented by sagebrush and grassland, on Heart Mountain (Figure 1). Because

it is unlikely that this area is large enough to sustain an isolated population of either species for very long, Heart Mountain must receive occasional immigrants of both species from adjacent forests. The shortest distance between contiguous forest on Heart Mountain and the "mainland" forest on the Absaroka Mountains is 9.2 km (Figure 1). This span is dominated by dry sagebrush and grassland vegetation, which should be an effective dispersal barrier to forest-adapted small mammals. However, the drainage network in this landscape supports occasional small patches of trees (typically *Populus* spp., with infrequent conifers) and mesic shrubs (typically *Salix* spp.) (Figure 1). The occurrence of boreal mammals on Heart Mountain suggests that infrequent dispersal occurs along these drainage channels, with small tree patches serving as stepping stones.

Currently, the Idaho pocket gopher is known to occur in central Idaho through southern and western Montana, and in southwestern Wyoming and adjacent portions of Utah. The capture of an Idaho pocket gopher on Heart Mountain would represent a significant range extension. The specimen captured on 12 August has been tentatively identified as an Idaho pocket gopher, and has been sent for independent confirmation.

Two areas of the property appear suitable for large bat roosts and/ or hibernacula: the summit of Heart Mountain, and the eroded sandstone outcrops along Iron Creek. Bat surveys should be performed in these areas. Large roosts in these areas would be of substantial conservation value, and would likely support a large proportion of the bat community in the northeastern Bighorn Basin.

The failure to capture any *Microtus* spp. was somewhat surprising. The ranges of 4 species (*M. montanus, M. longicaudus, M. ochrogaster,* and *M. pennsylvanicus*) overlap in this area, and trap lines D, E, H, I, K, and L sampled suitable *Microtus* spp. habitat. Furthermore, the Wyoming Natural Diversity Database has 3 records of *M. montanus* from the immediate vicinity of the ranch. It is possible that more trapping effort, especially if concentrated in wet and grassy areas (e.g., hay meadows) would reveal the presence of 1 or more of these species on the property.

As noted in the report from 24-26 May, there was a conspicuous absence of burrowing sciurids (i.e., *Spermophilus* spp., *Cynomys* spp.). Both ground squirrels and prairie dogs are typically easily observed during vehicle and foot travel, but none were noted during this survey. Burrowing sciurids are important faunal components in shrub-dominated systems; burrows provide cover and breeding sites for other species of conservation concern like burrowing owls (*Athene cunicularia*), and the sciurids themselves form a large prey base for species like ferruginous hawks (*Buteo regalis*). It may be appropriate to perform more intensive searches for these species, possibly including aerial surveys for prairie dog towns and interviews with nearby landowners, to more accurately determine the status of these taxa on the property. Management actions like intensive grazing and prescribed burning could be used to expand existing ranch populations and extend adjacent populations onto the ranch; such actions could also increase habitat quality for mountain plovers. However, habitat manipulations targeted to one group of species can detrimentally affect others. In particular, the effects of intense grazing and fire on sage grouse would need to be addressed.

Also as noted in the report from 24-26 May, open water and well-developed riparian areas are very limited on the ranch. Increasing such habitats would likely draw several waterbirds to the property as well as increase amphibian populations. It is important to note that even in late summer the upper forks of Iron Creek, Buck Creek, and Eaglenest Creek have some surface flow and small amounts of wetland habitat in the form of sedge meadows. This water is undoubtedly supplied by Heart Mountain itself, which is likely a very good (if local) catchment feature. However, most of the late-summer surface water disappears into the alluvium at the base of the mountain, and the lower reaches of ranch streams are mostly dry. It may be possible to increase year-round flow by constructing a series of storage ponds on upper stream reaches. There is a well-developed literature on pond and wetland construction to enhance wildlife populations, and several Federal programs are dedicated to funding such actions.

**Tables**

Table 1. Locations of Sherman trap lines, August 1999, Heart Mountain, Wyoming.

| Night | Trapline | Habitat description / Location |
|---|---|---|
| 10 Aug | A | Dry, sage draw / T55N R101W S33 (mid 1/9) |
| | B | Rocky, sage ridge / T55N R101W S32 (NE 1/9) |
| | C | Sage flat / T54N R101W S4 (mid 1/9) |
| | D | Sage flat near hay meadow / T54N R101W S15 (W-central 1/9) |
| 11 Aug | E | Open-canopy conifer forest with sage / T54N R102W S11 (SE 1/9) |
| | F | Closed-canopy conifer forest / T54N R102W S11 (S-central 1/9) |
| | G | Closed-canopy conifer forest / T54N R102W S11 (S-central 1/9) |
| | H | Open-canopy conifer forest with sage / T54N R102W S11(SW1/9) |
| 12 Aug | I | Sedge, grass marsh / T54N R101W S7 (NW 1/9) |
| | J | Dry, sandy channel, some sedge / T54N R101W S21 (mid 1/9) |
| | K | Sedge, willow seep / T54N R101W S16 (SE1/9) |
| | L | Sedge, grass, cattail marsh / T55N R101W S33 (SW1/9) |

Table 2. Locations of pitfall traps, August 1999, Heart Mountain, Wyoming.

| Night | Pitfall # | Habitat description / Location |
|---|---|---|
| 11 Aug - 12 Aug | 1, 2 | Dry, sage draw / T55N R101W S33 (mid 1/9) |
| | 3, 4 | Sage flat / T54N R101W S4 (mid 1/9) |
| | 5, 6 | Dry stream channel / T54N R101W S7 (NE 1/9) |
| | 7, 8 | Shrubby stream margin / T55N R101W S33 (S-central 1/9) |
| 11 Aug | 9 | Open-canopy conifer forest with sage / T54N R102W S11 (SE 1/9) |
| | 10 | Closed-canopy conifer forest / T54N R102W S11 (S-central 1/9) |
| | 11 | Closed-canopy conifer forest / T54N R102W S11 (S-central 1/9) |
| | 12 | Open-canopy conifer forest with sage / T54N R102W S11(SW1/9) |
| 12 Aug | 13, 14 | Sedge, grass marsh / T54N R101W S7 (NW 1/9) |
| | 15, 16 | Dry, sandy channel, some sedge / T54N R101W S21 (mid1/9) |

Table 3. Small mammal captures, August 1999, Heart Mountain, Wyoming.

| Trapline | Species | No. of individuals |
|---|---|---|
| A | Deer mouse (*Peromyscus maniculatus*) | 4 adult, 1 immature |
| B | Deer mouse (*Peromyscus maniculatus*) | 3 adult, 2 immature |
| | Bushy-tailed woodrat (*Neotoma cinerea*) | 1 immature |
| C | Deer mouse (*Peromyscus maniculatus*) | 1 adult, 1 immature |
| E | Deer mouse (*Peromyscus maniculatus*) | 4 adult |
| F | Deer mouse (*Peromyscus maniculatus*) | 1 adult, 2 immature |
| | S. red-backed vole (*Clethrionomys gapperi*) | 1 adult |
| G | Deer mouse (*Peromyscus maniculatus*) | 1 immature |
| H | Deer mouse (*Peromyscus maniculatus*) | 3 adult |
| | Idaho pocket gopher (*Thomomys idahoensis*) | 1* |
| I | Deer mouse (*Peromyscus maniculatus*) | 2 adult |
| J | Deer mouse (*Peromyscus maniculatus*) | 5 adult |

| Pitfall # | Species | No. individuals |
|---|---|---|
| 12 | Masked shrew (*Sorex cinereus*) | 1 adult** |

* identification tentative; independent confirmation pending

** positive identification difficult due to extremely old specimen with very worn teeth

Figure 1. Northeastern portion of the Bighorn Basin in north-central Wyoming. Shaded areas are forested, as defined by USGS 1:24,000 scale topographic maps.