

SMALL ANIMALS - BOGAN & RAMOTNIK.

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BASELINE SURVEYS FOR MAMMALS AT
JEWEL CAVE NATIONAL MONUMENT
SOUTH DAKOTA

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Annual Report

Entered.

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Biological Survey of Jewel Cave National Monument (JECA), South Dakota

Itinerary--We departed Fort Collins on 25 July 1993 with an initial fieldcrew of four; we were joined by a fifth person on 30 July. We camped in a pine forest above the Monument Headquarters and used the Pole Barn as our laboratory. Park facilities and cooperation from Superintendent Cannon and staff were excellent. We returned to Fort Collins late on 5 August. Although we had previously visited the Monument in connection with surveys of bats in Jewel Cave (see Worthington and Bogan 1993), our visit in July and August of 1993 was our first occasion to conduct surveys for other small mammals. Jewel Cave National Monument lies entirely within the Black Hills, a limestone plateau of rolling highlands. The vegetation of JECA is dominated by Ponderosa pine-covered slopes with scattered rocky outcroppings, and canyon bottoms containing grassy meadows of varying size. Mesic grassy areas, often fed by springs, extend along drainages on slopes.

Methods--We surveyed for small mammals throughout the Monument and tried to sample a variety of representative habitats. Much of our work was conducted in and near Hell and Lithograph canyons, two major drainages in the Monument. Habitats we censused included pine-forested ridgetops, rocky slopes, and mesic canyon bottoms and springs. Study sites were located near Headquarters, the Historic Entrance, the extreme eastern and southeastern edge of JECA, and at localities along Highway 16. Voucher specimens of mammals were retained from each locality; specimens are housed in the Biological Survey Collection, Albuquerque. We recorded our observations of medium-to-large sized mammals, and kept records of all sightings of amphibians and reptiles. Bats were sampled using mist nets set over ponds, stock tanks, and other bodies of water and by a harp trap set at the Historic Entrance to Jewel Cave.

Results--The most common species, listed in decreasing order of abundance, were Red-backed Vole, Deer Mouse, and Least Chipmunk. These three species accounted for 82% of total captures. Red-backed Voles were abundant on dry pine-covered slopes in association with low-lying shrubs; chipmunks were common and were usually associated with downed logs. The prevalence of this habitat at JECA probably accounts for the large numbers of voles and chipmunks taken. Other species associated with pine forest habitat were Red Squirrel and Bushy-tailed Woodrat. We frequently heard Red Squirrels calling and saw their middens, or caches of pine cones. Bushy-tailed Woodrats were associated with rocky outcroppings on slopes. We captured several along rocky ledges and vertical crevices in Hell Canyon.

Species associated with moist, grassy canyon bottoms were the Masked Shrew, Meadow Vole, and Long-tailed Vole. Shrews were trapped near and under logs and low-lying shrubs. Meadow and Long-tailed voles seemed to exhibit considerable habitat overlap although Meadow Voles were more common in the wetter habitats. Meadow Voles were captured near Choke Cherry and Prairie Dog springs. Prairie Voles, more tolerant of xeric conditions, were captured in the large grassy meadow south of the Historic Entrance in Hell Canyon. Northern Pocket Gophers were taken in open grassy areas at the bottom of Hell and Lithograph canyons.

On the Monument we netted over "open water" at only one spot, the sewage lagoons. Bat activity here was moderate; we captured 13 bats, mostly Silver-haired and Little Brown bats. One individual Long-legged Myotis and one

Fringed Myotis also were taken. Of the three sites on U. S. Forest Service land we netted, Water Draw Spring was the most productive. Here we captured 25 bats of eight species, including the four species mentioned above as well as the Northern Myotis, Big Brown Bat, Western Small-footed Myotis, and Hoary Bat. Over a stock tank at Lithograph Spring, we caught a Little Brown Bat, a Northern Myotis, and a Big Brown Bat. Bat activity may have been low due to the influence of the full moon. A third site on FS land was located immediately south of JECA near the confluence of Hell and Lithograph canyons, and was more productive: we caught and released nine Silver-haired Bats, a Northern Myotis and a Fringed Myotis. For more information on surveys for bats in the southern Black Hills, see Mattson and Bogan (1993).

In addition to captures of small mammals, we observed or found sign of the following medium-to-large sized mammals: Porcupine and scat (Lithograph Canyon), Bobcat (USFS land, S of NPS boundary) and tracks (bottom of Hell Canyon); Coyote (heard throughout JECA) and scat (bottom of Hell Canyon).

We also recorded all observations of amphibians and reptiles from JECA or nearby: Chorus Frog (Black Hills NF, ca. 0.2 mi S JECA boundary; specimen collected from a small pool, others heard in nearby pools); Great Plains Toad (JECA Sewage Lagoons and Housing area and one observed on trail to Sewage Lagoons); Western Smooth Green Snake (JECA, bottom of Hell Canyon, along wall of cave); Prairie Rattlesnake [Black Hills NF, 5.6 mi (by road) S Hwy 16 along FS 277]. Vouchers for these species were retained.

Bibliography--

Worthington, D. J. and M. A. Bogan. 1993 Report on Cave Entrance Modification and Potential Impact on Bat Populations at Jewel Cave National Monument, South Dakota, with Appendix on Winter Census, 1992. Unpublished Report to Jewel Cave National Monument, 18 February 1993, 10 pp.

Mattson, T. A. and M. A. Bogan. 1993. Survey of Bats and Bat Roosts in the Southern Black Hills in 1993. Unpublished Report to Jewel Cave National Monument, December 1993, 15 pp.

1993 Capture Summary for
Jewel Cave National Monument (JECA)

MAMMALS

South Dakota: Custer Co., Badluck Cave, 3 mi N, 13 mi W Custer 22 July 1993

1 *Plecotus townsendii*

South Dakota: Custer Co., JECA, Hell Canyon nr.
Historic Entrance

25 July 1993

✓ 14 *Eutamias minimus* ✓
✓ 17 *Peromyscus maniculatus* ✓
✓ 2 *Neotoma cinerea* ✓
✓ 2 *Clethrionomys gapperi* ✓
✓ 1 *Microtus longicaudus* ✓
36 (5) spp

South Dakota: Custer Co., JECA, Lithograph Canyon nr.
Visitor Center

26 July 1993

✓ 4 *Eutamias minimus* ✓
✓ 5 *Peromyscus maniculatus* ✓
✓ 1 *Neotoma cinerea* ✓
✓ 7 *Clethrionomys gapperi* ✓
17 ∅

South Dakota: Custer Co., JECA, 0.5 mi NNE Visitor Center

26 July 1993

✓ 1 *Eutamias minimus* ✓
✓ 2 *Peromyscus maniculatus* ✓
✓ 6 *Clethrionomys gapperi* ✓
9

South Dakota: Custer Co., JECA, 0.7 mi NNE Visitor Center 27 July, 4 Aug 1993

✓ 1 *Sylvilagus nuttallii* ✓
✓ 2 *Eutamias minimus* ✓
✓ 1 *Tamiasciurus hudsonicus* ✓
✓ 8 *Peromyscus maniculatus* ✓
✓ 2 *Neotoma cinerea* ✓
✓ 8 *Clethrionomys gapperi* ✓
✓ 1 *Microtus longicaudus* ✓
23 1 x 2 702 spp

South Dakota: Custer Co., JECA, Hell Canyon at jct with
Lithograph Canyon

28 July 1993

✓ 1 *Sorex cinereus* ✓
✓ 5 *Peromyscus maniculatus* ✓
✓ 7 *Clethrionomys gapperi* ✓
✓ 1 *Microtus ochrogaster* ✓
14 x 2 9 spp

South Dakota: Custer Co., JECA, Lithograph Canyon at jct with
Hell Canyon

28-29 July 1993

✓1 Thomomys talpoides ✓
✓3 Eutamias minimus ✓
✓1 Microtus pennsylvanicus ✓
✓3 Clethrionomys gapperi ✓
8

South Dakota: Custer Co., Roby Springs, 4 mi N, 22 mi W Custer
5400 ft

29 July 1993

✓2 Lasiurus cinereus ✓
✓1 Myotis ~~septentrionalis~~ ✓
3 *Keenii*

South Dakota: Custer Co., JECA, 0.7 mi ESE Visitor Center

29 July 1993

✓3 Eutamias minimus ✓
✓9 Peromyscus maniculatus ✓
✓2 Neotoma cinerea ✓
✓5 Clethrionomys gapperi ✓
✓1 Microtus ochrogaster ✓
20

South Dakota: Custer Co., JECA, 0.4 mi NNE Visitor Center

29,31 July 1993
2-4 Aug 1993

✓3 Eutamias minimus ✓
✓2 Peromyscus maniculatus ✓
5

South Dakota: Custer Co., JECA, Sewage Lagoons

30 July 1993

✓1 Eutamias minimus ✓
✓4 Peromyscus maniculatus ✓
✓2 Clethrionomys gapperi ✓
✓1 Microtus longicaudus ✓
8

South Dakota: Custer Co., JECA, Hell Canyon at Hwy 16

30 July 1993

✓1 Eutamias minimus ✓
✓2 Peromyscus maniculatus ✓
✓3 Clethrionomys gapperi ✓
✓1 Microtus ochrogaster ✓
7

South Dakota: Custer Co., JECA, 0.7 mi NW Visitor Center

30 July 1993

✓15 Eutamias minimus ✓
✓11 Peromyscus maniculatus ✓
✓1 Neotoma cinerea ✓
✓7 Clethrionomys gapperi ✓
34

South Dakota: Custer Co., JECA, 0.9 mi SW Visitor Center

4 Aug 1993

~~1~~ Eutamias minimus ✓
~~9~~ Peromyscus maniculatus ✓
~~5~~ Clethrionomys gapperi ✓
15

1993 Capture Summary for
Jewel Cave National Monument (JECA)

AMPHIBIANS & REPTILES

South Dakota: Custer Co., JECA, Housing Area

28 July 1993

✓ 1 Bufo cognatus

South Dakota: Custer Co., JECA, Sewage Lagoons

30 July 1993

✓ 1 Bufo cognatus

South Dakota: Custer Co., JECA, Hell Canyon, 0.6 mi W
Visitor Center

4 Aug 1993

✓ 1 Opheodrys vernalis

South Dakota: Custer Co., JECA, Lithograph Canyon,
0.3 mi ESE Visitor Center

31 July 1993

✓1 Sorex cinereus ✓
✓4 Peromyscus maniculatus ✓
✓7 Clethrionomys gapperi ✓
✓3 Microtus pennsylvanicus ✓
15

South Dakota: Custer Co., JECA, 0.5 mi E Visitor Center

31 July 1993

✓6 Clethrionomys gapperi ✓

South Dakota: Custer Co., JECA, 0.6 mi ENE Visitor Center

31 July 1993

✓2 Sorex cinereus ✓
✓1 Eutamias minimus ✓
✓1 Peromyscus maniculatus ✓
✓3 Clethrionomys gapperi ✓
✓1 Microtus longicaudus ✓
8

South Dakota: Custer Co., Elk Mountains, 2.5 mi S
~~Wildcat Peak, 4700 ft~~

1 Aug 1993

1 Lasiurus borealis

South Dakota: Custer Co., JECA, Lithograph Canyon,
0.1 mi S Visitor Center

1 Aug 1993

✓2 Sorex cinereus ✓
✓1 Eutamias minimus ✓
✓2 Peromyscus maniculatus ✓
✓1 Microtus longicaudus ✓
✓5 Clethrionomys gapperi ✓
11

South Dakota: Custer Co., JECA, Lithograph Canyon,
0.2 mi SW Visitor Center

1 Aug 1993

✓1 Sorex cinereus ✓
✓3 Peromyscus maniculatus ✓
✓6 Clethrionomys gapperi ✓
10

South Dakota: Custer Co., JECA, 0.8 mi W Visitor Center

2 Aug 1993

✓2 Peromyscus maniculatus ✓
✓1 Neotoma cinerea ✓
✓2 Microtus longicaudus ✓
✓2 Clethrionomys gapperi ✓
7

South Dakota: Custer Co., JECA, 0.9 mi SE Visitor Center

2 Aug 1993

4 Microtus longicaudus ✓
8 Clethrionomys gapperi ✓
12

South Dakota: Custer Co., JECA, Chokecherry Spring,
0.6 mi S Visitor Center

2 Aug 1993

1 Microtus pennsylvanicus ✓
3 Clethrionomys gapperi ✓
1 Erethizon dorsatum ✓
5

South Dakota: Custer Co., JECA, Prairie Dog Spring
0.8 mi WSW Visitor Center

2-3 Aug 1993

1 Sylvilagus nuttallii ✓
1 Tamiasciurus hudsonicus ✓
3 Peromyscus maniculatus ✓
1 Microtus pennsylvanicus ✓
3 Clethrionomys gapperi ✓
9

South Dakota: Custer Co., JECA, Hell Canyon,
0.6 mi W Visitor Center

3 Aug 1993

1 Tamiasciurus hudsonicus ✓
3 Peromyscus maniculatus ✓
1 Neotoma cinerea ✓
14 Clethrionomys gapperi ✓
4 Microtus longicaudus ✓
4 Microtus ochrogaster ✓
27

South Dakota: Custer Co., JECA, 0.5 mi W Visitor Center

3 Aug 1993

2 Peromyscus maniculatus ✓
1 Neotoma cinerea ✓
2 Clethrionomys gapperi ✓
5

South Dakota: Custer Co., JECA, Hell Canyon, 0.7 mi SW Visitor
Center

3-4 Aug 1993

1 Thomomys talpoides ✓
1 Eutamias minimus ✓
1 Clethrionomys gapperi ✓
1 Microtus longicaudus ✓
1 Microtus ochrogaster ✓
1 Microtus pennsylvanicus ✓
6

Preliminary List of the Mammals of Jewel Cave National Monument

This list includes all mammals thought to occur on the park and the adjacent Black Hills. Species captured by the NBS are noted by year of capture. Pertinent references are in the Bibliography.

INSECTIVORA

Sorex cinereus lesueurii

CHIROPTERA

- ✓ *Myotis ciliolabrum* [93]
- ✓ *M. evotis* *
- ✓ *M. lucifugus* [93]
- ✓ *M. volans* [93]
- ✓ *M. septentrionalis* [93]
- ✓ *M. thysanodes kahlapensis* [93]
- ✓ *Lasiurus noctivagans* [93]
- ✓ *Lasiurus borealis* [93, off park]
- ✓ *L. cinereus* [93]
- ✓ *Eptesicus fuscus* [93]
- ✓ *Plecotus townsendii* [93]
- ✓ *Corynorhinus*

LAGOMORPHA

- ✓ *Sylvilagus audubonii* [93]
- ✓ *S. floridanus*
- ✓ *S. nuttallii*
- ✓ *Lepus townsendii*

RODENTIA

- ✓ *Tamias minimus* [93]
- ✓ *Marmota flaviventris*
- ✓ *Spermophilus tridecemlineatus*
- ✓ *Cynomys ludovicianus*
- ✓ *Sciurus niger* *
- ✓ *Tamiasciurus hudsonicus* [93]
- ✓ *Glaucomys sabrinus*
- ✓ *Thomomys talpoides* [93]
- ✓ *Perognathus fasciatus*
- ✓ *P. hispidus*
- ✓ *Dipodomys ordii*
- ✓ *Castor canadensis*
- ✓ *Reithrodontomys megalotis*
- ✓ *Peromyscus leucopus*
- ✓ *P. maniculatus* [93]
- ✓ *Neotoma cinerea* [93]
- ✓ *Clethrionomys gapperi* [93]
- ✓ *Microtus longicaudus* [93]
- ✓ *M. ochrogaster* [93]
- ✓ *M. pennsylvanicus* [93]
- ✓ *Ondatra zibethicus*
- ✓ *Rattus norvegicus*
- ✓ *Mus musculus*
- ✓ *Zapus hudsonius*
- ✓ *Erethizon dorsatum* [93]

CARNIVORA

Canis latrans [observ.]
C. lupus +
Vulpes vulpes
V. velox *
Urocyon cinereoargenteus *
Ursus americanus
U. arctos +
Procyon lotor
Mustela erminea
M. frenata
M. nigripes +
M. vison
Taxidea taxus
Spilogale putorius *
Mephitis mephitis
Felis concolor
Lynx canadensis ?
L. rufus [observ.]

ARTIODACTYLA

Cervus elaphus [+ , reintroduced]
Odocoileus hemionus
O. virginianus
Antilocapra americana
Bison bison [+ , reintroduced]
Oreamnos americanus [introduced]
Ovis canadensis [+ , reintroduced]

* = Species not surely known from Black Hills; *Myotis evotis* may occur in the northern Black Hills but additional captures (and specimens) are needed to verify this.

+ = Species or subspecies extirpated from Black Hills

BIBLIOGRAPHY:

Turner, R. W. 1974. Mammals of the Black Hills of South Dakota and Wyoming. University of Kansas, Museum of Natural History, Misc. Publ. 60, 178 pp.