

**A GUIDE TO THE MAMMALS OF
GREAT BASIN NATIONAL PARK**

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Introduction

The Great Basin is a vast region of more than 500,000 square kilometers that includes much of the land area between the Rocky Mountains and the Sierra Nevada. It forms a closed interior drainage basin containing isolated mountain ranges that are separated by intervening valleys. The complex geography of this region has resulted in great physical and biological diversity (Grayson 1993). Great Basin National Park is the only national park located entirely within the Great Basin. The park includes much of the southern portion of the Snake Range (Fig. 1). It encompasses one of the most dramatic elevational gradients in the region, from portions of the Snake Valley on the eastern boundary at about 5,800 feet (1,770 m) to the summit of Wheeler Peak, which at 13,063 feet (3,980 m) is the highest point in the central Great Basin. The extremes of temperature and moisture across this gradient have resulted in a wide variety of habitats, ranging from low-elevation desert shrub communities to wet forests and alpine tundra. These diverse habitats support a wide variety of animal life, including a rich assortment of mammal species.

The earliest reference to mammals of the Park region is from the Simpson military expedition of 1859 which encountered elk and bighorn sheep in what is now the northern portion of the Park (Simpson 1876). Between 1929 and 1939, the first comprehensive surveys of mammals from the region were undertaken by the Museum of Vertebrate Zoology, University of California. These surveys focused mainly on areas in the Lehman and Baker creek drainages (Hall 1941). Work by zoologists over subsequent decades produced additional information on mammals from the Park, mostly in the form of unpublished museum specimen records. Between 2000 and 2003, the authors and colleagues conducted surveys throughout much of the Park region and

produced a comprehensive report on Park mammals (Rickart and Robson 2005) which served as the foundation for this guide.

There are 67 species of mammals either known from the Park region or suspected to occur here. This mammal fauna is very diverse, including species of bats, shrews, rabbits, carnivores, ungulates, and many kinds of rodents. It includes some of the most spectacular large ungulates and carnivores and also some of the smallest mammals in North America. Although most of these species are broadly distributed, a few are found only in the Great Basin region. Many regional mammals are quite common, others are seen only occasionally, and a few are considered to be rare and ecologically sensitive.

How to use this guide

This work is intended as an identification guide and general information source on the mammals of the Park region. It includes an identification key, checklist, and accounts that summarize identifying characteristics, regional distribution, and information on basic ecology for each of the 67 regional species. Because one information source is never sufficient, we suggest that this guide be used in conjunction with more general field guides to North American mammals (for example, Kays and Wilson 2002, Murie and Elbroch 2005, Elbroch 2006, Reid 2006).

Mammals offer many challenges to those who seek to understand them. Unlike birds, most mammals are active mainly at night, and are generally less easily observed. Despite such difficulties, mammals can offer the careful observer rich rewards. A few species are easily seen, including large ungulates and squirrels that are active during the day. Many nocturnal species can be seen near dusk. Many others can be identified

by their sign (tracks or scat), or from their skeletal remains. Bats often can be identified by their echolocation calls by using ultrasonic bat detectors. Observational records are a particularly important source of information on local patterns of occurrence and abundance of mammals, and are of great value to Park resource managers. Any sightings of unusual species should be reported to Park personnel.

Acknowledgments

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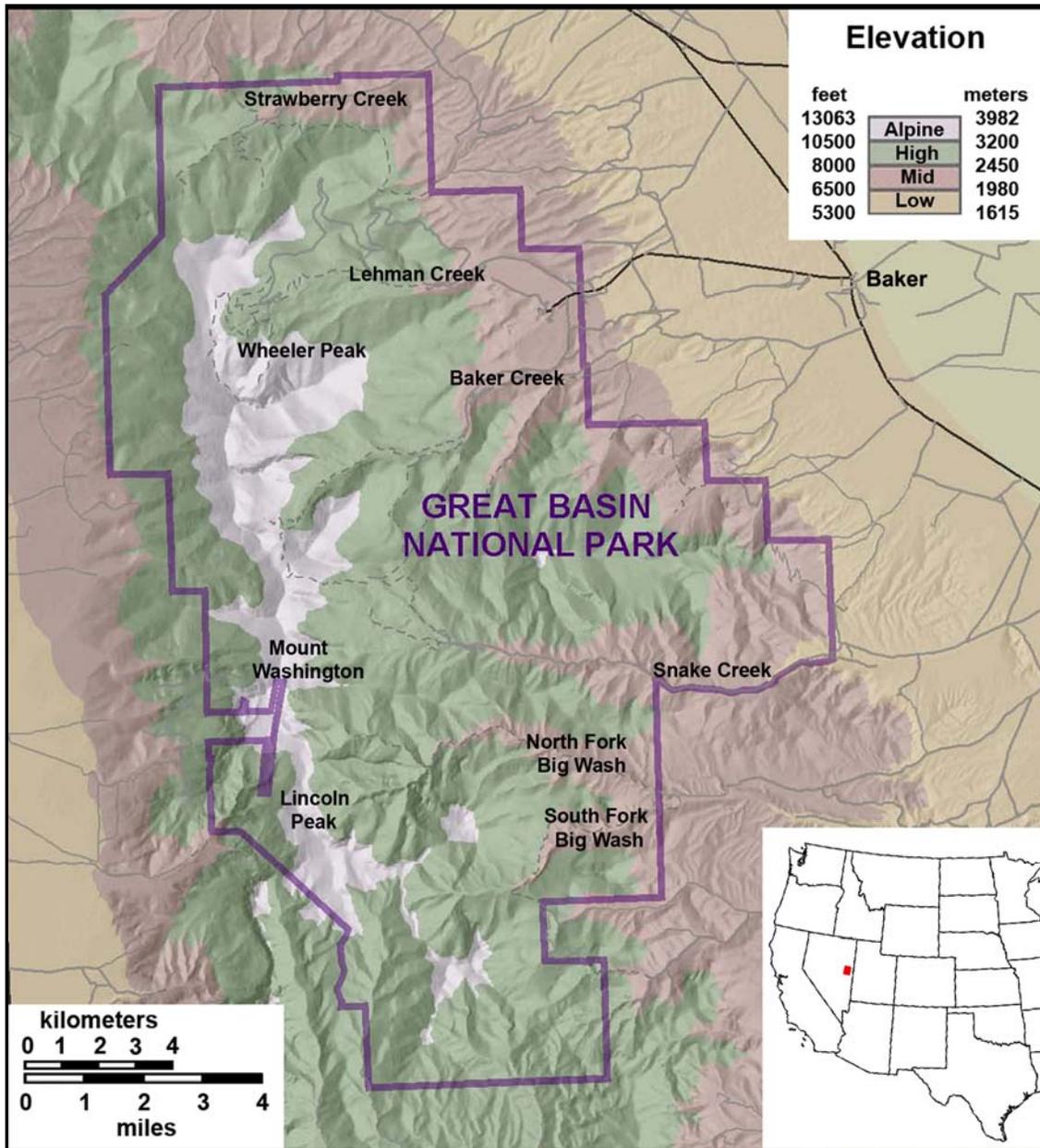


Figure 1. Relief map of Great Basin National Park.

Checklist

Order Lagomorpha – rabbits, hares and pikas

Family Leporidae – rabbits and hares

- Brachylagus idahoensis* – Pygmy Rabbit
- Lepus californicus* – Black-tailed Jackrabbit
- Sylvilagus audubonii* – Desert Cottontail
- Sylvilagus nuttallii* – Mountain Cottontail

Order Soricomorpha – shrews and moles

Family Soricidae -- shrews

- Sorex merriami* – Merriam's Shrew
- Sorex palustris* – American Water Shrew
- Sorex tenellus* – Inyo Shrew
- Sorex vagrans* – Vagrant Shrew

Order Chiroptera – bats

Family Molossidae – free-tailed bats

- Nyctinomops macrotis* – Big Free-tailed Bat
- Tadarida brasiliensis* – Mexican Free-tailed Bat

Family Vespertilionidae – evening bats

- Antrozous pallidus* – Pallid Bat
- Corynorhinus townsendii* – Townsend's Big-eared Bat
- Eptesicus fuscus* – Big Brown Bat
- Euderma maculatum* – Spotted Bat

- Lasionycteris noctivagans* – Silver-haired Bat
- Lasiurus cinereus* – Hoary Bat
- Myotis californicus* – California Myotis
- Myotis ciliolabrum* – Western Small-footed Myotis
- Myotis evotis* – Long-eared Myotis
- Myotis volans* – Long-legged Myotis
- Parastrellus hesperus* – Western Pipistrelle

Order Carnivora -- carnivores

Family Canidae -- dogs and relatives

- Canis latrans* – Coyote
- Urocyon cinereoargenteus* – Gray Fox
- Vulpes macrotis* – Kit Fox
- Vulpes vulpes* – Red Fox

Family Procyonidae -- raccoons and relatives

- Bassariscus astutus* – Ringtail
- Procyon lotor* – Raccoon

Family Mustelidae – weasels and relatives

- Mustela erminea* – Ermine
- Mustela frenata* – Long-tailed Weasel
- Taxidea taxus* – American Badger

Family Mephitidae – skunks

- Mephitis mephitis* – Striped Skunk
- Spilogale gracilis* – Western Spotted Skunk

Family Felidae – cats

- Lynx rufus* – Bobcat
- Puma concolor* – Cougar

Order Rodentia – rodents

Family Sciuridae – squirrels

- Tamias dorsalis* – Cliff Chipmunk
- Tamias minimus* – Least Chipmunk
- Tamias umbrinus* – Uinta Chipmunk
- Ammospermophilus leucurus* – Antelope Ground Squirrel
- Spermophilus lateralis* – Golden-mantled Ground Squirrel
- Spermophilus mollis* – Piute Ground Squirrel
- Spermophilus variegatus* – Rock Squirrel
- Marmota flaviventris* – Yellow-bellied Marmot

Family Heteromyidae – kangaroo rats and pocket mice

- Dipodomys microps* – Chisel-toothed Kangaroo Rat
- Dipodomys ordii* – Ord's Kangaroo Rat
- Microdipodops megacephalus* – Dark Kangaroo Mouse
- Chaetodipus formosus* – Long-tailed Pocket Mouse
- Perognathus longimembris* – Little Pocket Mouse
- Perognathus parvus* – Great Basin Pocket Mouse

Family Geomyidae – pocket gophers

- Thomomys bottae* – Botta's Pocket Gopher

Family Castoridae – beavers

- Castor canadensis* – American Beaver

Family Cricetidae – New World rats and mice

- Reithrodontomys megalotis* – Western Harvest Mouse
- Peromyscus crinitus* – Canyon Mouse
- Peromyscus maniculatus* – Deer Mouse
- Peromyscus truei* – Piñon Mouse
- Onychomys leucogaster* – Northern Grasshopper Mouse
- Neotoma cinerea* – Bushy-tailed Woodrat
- Neotoma lepida* – Desert Woodrat
- Microtus longicaudus* – Long-tailed Vole
- Microtus montanus* – Montane Vole
- Lemmyscus curtatus* – Sagebrush Vole
- Ondatra zibethicus* – Muskrat

Family Muridae – Old World rats and mice

- Mus musculus* – House Mouse

Family Erethizontidae – New World porcupines

- Erethizon dorsatum* – North American Porcupine

Order Artiodactyla – even-toed ungulates

Family Cervidae -- deer

- Cervus elaphus* – Wapiti
- Odocoileus hemionus* – Mule Deer

Family Antilocapridae -- pronghorns

- Antilocapra americana* – Pronghorn

Family Bovidae – cattle, sheep, antelope, goats

- Ovis canadensis* – Bighorn Sheep

Key to mammals

- 1A. Tooth rows with diastemae (long toothless spaces); 0-4 upper incisor teeth..... 2
- 1B. Tooth rows continuous; 6 upper incisors..... 7
- 2A. One or two pairs of upper incisors; one pair of lower incisors; feet with claws.... 3
- 2B. No upper incisors; feet with hooves. Order ARTIODACTYLA..... 64
- 3A. Two pairs of continuously growing upper incisors (second pair small and peg-like, located behind the large first pair); hind limbs larger than forelimbs. Order LAGOMORPHA..... 4
- 3B. One pair of continuously growing upper incisors. Order RODENTIA.....36
- 4A. Hind foot more than 105 mm; ear more than 90 mm; top of tail black
Lepus californicus (Black-tailed jackrabbit), pg. 19
- 4B. Hind foot less than 105 mm; ear less than 80 mm; top of tail not black 5
- 5A. Hind foot less than 75 mm; ear less than 50 mm; underside of tail not white
Brachylagus idahoensis (Pygmy rabbit), pg. 18
- 5B. Hind foot more than 75 mm; ear more than 50 mm; underside of tail white..... 6
- 6A. Ear more than 65 mm, sparsely haired on inner surface
Sylvilagus audubonii (Desert cottontail), pg. 20
- 6B. Ear less than 65 mm, heavily haired on inner surface
Sylvilagus nuttallii (Mountain cottontail), pg. 21
- 7A. Snout long and flexible, extending beyond the mouth; eyes and external ears very small; first upper and lower incisors large, canines small. Order SORICIMORPHA..... 8
- 7B. Snout not long, eyes and ears prominent, incisors small, canines prominent..... 11
- 8A. Hind foot more than 17 mm, fringed with stiff hairs; total length more than 125 mm; body and tail strongly bicolored (dark above, pale below)
Sorex palustris (Water shrew), pg. 23
- 8B. Hind foot less than 17 mm; total length less than 120 mm 9

9A. Third unicuspid (third tooth behind the first upper incisor) not smaller than the fourth; no medial tine on the first upper incisor <i>Sorex merriami</i> (Merriam's shrew), pg. 22	
9B. Third unicuspid tooth smaller than the fourth; medial tine present on the first Incisor.....	10
10A. Skull flattened; medial tine on first upper incisor positioned low on the tooth within the pigmented zone; hind foot 9-13 mm; weight 4 g or less <i>Sorex tenellus</i> (Inyo shrew), pg. 24	
10B. Skull not flattened; medial tine on first incisor positioned above (outside) the pigmented zone; hind foot 12-14 mm; weight 4 g or more <i>Sorex vagrans</i> (Vagrant shrew), pg. 25	
11A. Forelimbs elongated and modified into wings. Order CHIROPTERA.....	12
11B. Limbs not modified for flight. Order CARNIVORA	24
12A. Tail conspicuous, extending beyond the tail membrane.....	13
12B. Tail contained entirely within the tail membrane.....	14
13A. Forearm 36-46 mm; ears not joined at base, anterior margin of the ear with six to eight thickened bumps <i>Tadarida brasiliensis</i> (Mexican free-tailed bat), pg. 27	
13B. Forearm 58-63 mm; ears large and joined basally on top of the head <i>Nyctinomops macrotis</i> (Big free-tailed bat), pg. 26	
14A. Ear more than 30 mm.....	15
14B. Ear less than 30 mm.....	17
15A. Color black with 3 white spots above, grayish-white below; ears pink <i>Euderma maculatum</i> (Spotted bat), pg. 31	
15B. Color brownish; ears dark.....	16
16A. Color pale, yellowish-brown; forearm 48 mm or more <i>Antrozous pallidus</i> (Pallid bat), pg. 28	
16B. Color light to medium brown; forearm less than 48 mm <i>Corynorhinus townsendii</i> (Townsend's big-eared bat), pg. 29	
17A. Color uniformly brown.....	18

17B. Color not uniformly brown (light gray, black or brownish-gray tipped with white).....	22
18A. Forearm more than 35 mm.....	19
18B. Forearm less than 35 mm.....	21
19A. One upper premolar on each side; forearm 40 mm or more, ear 13 mm or more <i>Eptesicus fuscus</i> (Big-brown bat), pg. 30	
19B. Three upper premolars on each side; forearm 42 mm or less.....	20
20A. Ear less than 15 mm; underside of wing furred to elbow <i>Myotis volans</i> (Long-legged myotis), pg. 37	
20B. Ear more than 17 mm; underside of wing not furred to elbow <i>Myotis evotis</i> (Big-eared myotis), pg. 36	
21A. Ear black; skull flattened, without an abrupt forehead; pelage with a glossy sheen <i>Myotis ciliolabrum</i> (Western small-footed myotis), pg. 35	
21B. Ear brownish; skull rounded, with an abrupt forehead; pelage not glossy <i>Myotis californicus</i> (California myotis), pg. 34	
22A. Forearm less than 35 mm; color pale gray or yellowish-gray; face and ears blackish <i>Parastrellus hesperus</i> (Western pipistrelle), pg. 38	
22B. Forearm more than 36 mm.....	23
23A. Color black with scattered silvery-white hairs on back, upper surface of the tail, membrane furred near the body <i>Lasionycteris noctivagans</i> (Silver-haired bat), pg. 32	
23B. Color brownish-gray tipped with white; entire tail membrane heavily furred <i>Lasiurus cinereus</i> (Hoary bat), pg. 33	
24A. Hind foot with four toes.....	25
24B. Hind foot with five toes.....	30
25A. Muzzle long and narrow; claws not retractile; 42 teeth.....	26
25B. Muzzle short, head rounded, claws retractile; 28-30 teeth.....	29

- 26A. Adult weight more than 7 kg; color reddish-brown
Canis latrans (Coyote), pg. 39
- 26B. Adult weight 7 kg or less..... 27
- 27A. Back of ear red; tail with a dark dorsal stripe from base to tip
Urocyon cinereoargenteus (Gray fox), pg. 40
- 27B. Back of ear grayish brown or black..... 28
- 28A. Back of ear black; tip of tail white; total length 900 mm or more
Vulpes vulpes (Red fox), pg. 42
- 28B. Back of ear grayish-brown; tip of tail dark brown or black; total length
800 mm or less
Vulpes macrotis (Kit fox), pg. 41
- 29A. Tail more than 50 percent of body length
Puma concolor (Cougar), pg. 51
- 29B. Tail less than 50 percent of total length
Lynx rufus (Bobcat), pg. 50
- 30A. Tail with rings; 40 teeth, including two pairs of upper molars..... 31
- 30B. Tail without rings; fewer than 40 teeth, and only one pair of upper molars..... 32
- 31A. Black rings on tail complete all around; black facial mask surrounding eyes
Procyon lotor (Raccoon), pg. 44
- 31B. Black rings on tail incomplete (on underside); no black facial mask
Bassariscus astutus (Ringtail), pg. 43
- 32A. Body brown above and pale yellow below, winter color entirely white except
for black tail tip..... 33
- 32B. Body black and white, or black and white on head with a grayish body..... 34
- 33A. Tail shorter than 90 mm and less than 40 percent of body length
Mustela erminea (Ermine), pg. 45
- 33B. Tail longer than 100 mm and more than 40 percent of body length
Mustela frenata (Long-tailed weasel), pg. 46
- 34A. Color black and white on head, body silvery gray; tail less than 25 percent
of body length
Taxidea taxus (American badger), pg. 47

34B. Color black and white; tail more than 30 percent of body length.....	35
35A. Back with several lines of broken white stripes or white spots; total length less than 500 mm <i>Spilogale gracilis</i> (Western spotted skunk), pg. 49	
35B. Back with two continuous white stripes; total length more than 500 mm <i>Mephitis mephitis</i> (Stripped skunk), pg. 48	
36A. Body and tail with quills <i>Erethizon dorsatum</i> (Porcupine), pg. 80	
36B. Body and tail without quills.....	37
37A. Hair on middle part of tail longer than diameter of fleshy part of tail; more than three pairs of cheek teeth.....	38
37B. Hair on middle part of tail shorter than tail diameter (except for <i>Neotoma cinerea</i>); three pairs of cheek teeth	45
38A. Hind foot more than 70 mm; color dark grayish above yellowish below <i>Marmota flaviventris</i> (Yellow-bellied marmot), pg. 59	
38B. Hind foot less than 65 mm.....	39
39A. Hind foot more than 50; tail bushy, more than 170 mm <i>Spermophilus variegatus</i> (Rock squirrel), pg. 58	
39B. Hind foot less than 50.....	40
40A. Color uniform pale gray without stripes <i>Spermophilus mollis</i> (Piute ground squirrel), pg. 57	
40B. Color gray, reddish-brown or grayish-brown, upper parts with pale and/or dark Stripes.....	41
41A. Stripes confined to body (not extending onto face).....	42
41B. Stripes extending onto face.....	43
42A. Color pale reddish-brown or grayish-brown above, white below; two lateral white stripes extending from shoulder to hip; underside of tail white <i>Ammospermophilus leucurus</i> (White-tailed antelope squirrel), pg. 55	
42B. Color grayish-brown on body; head, neck and shoulders reddish or buffy; two white lateral stripes bordered by black stripes extending from shoulder to hip;	

underside of tail not white
Spermophilus lateralis (Golden-mantled ground squirrel), pg. 56

- 43A. Color grayish above, body stripes indistinct
Tamias dorsalis (Cliff chipmunk), pg. 52
- 43B. Well-defined alternating white (4) and dark (3 or 5) stripes on body..... 44
- 44A. Five dark stripes, including lower-most (lateral) pair which are well defined;
hind foot 30 mm or less
Tamias minimus (Least chipmunk), pg. 53
- 44B. Three well-defined dark stripes (lateral dark stripes faint or absent); hind foot
more than 30 mm
Tamias umbrinus (Uinta chipmunk), pg. 54
- 45A. External, fur-lined cheek pouches opening on either side of mouth..... 46
- 45B. No external cheek pouches..... 52
- 46A. Tail less than 50 percent of body length; color uniformly brown; incisors large;
forefeet and fore claws large
Thomomys bottae (Botta's pocket gopher), pg. 66
- 46B. Tail more than 75 percent of body length..... 47
- 47A. Soles of hind feet densely haired..... 48
- 47B. Soles of hind feet mostly naked..... 50
- 48A. Tail without a terminal tuft of long hairs; hind foot less than 30 mm
Microdipodops megacephalus (Dark kangaroo mouse), pg. 62
- 48B. Tail with a terminal tuft of long hairs; hind foot more than 30 mm..... 49
- 49A. Lower incisors with rounded anterior surfaces, wearing to sharp points
Dipodomys ordii (Ord's kangaroo rat), pg. 61
- 49B. Lower incisors with flat anterior surfaces, wearing to straight, chisel-like tips
Dipodomys microps (Chisel-toothed kangaroo rat), pg. 60
- 50A. Hind foot less than 20 mm
Perognathus longimembris (Little pocket mouse), pg. 64
- 50B. Hind foot more than 20 mm..... 51
- 51A. Side of body with a dark yellowish lateral line; tip of tail not conspicuously

crested

Perognathus parvus (Great Basin pocket mouse), pg. 65

51B. Side of body without a yellowish lateral line; end of tail with a crest and terminal tuft of longer hairs

Chaetodipus formosus (Long-tailed pocket mouse), pg. 63

52A. Tail flattened dorsoventrally

Castor canadensis (American Beaver), pg. 67

52B. Tail not dorsoventrally flattened..... 53

53A. Tail more than 50 percent of body length..... 54

53B. Tail less than 50 percent of body length..... 61

54A. Tail laterally flattened; hind foot more than 50 mm

Ondatra zibethicus (Muskrat), pg. 78

54B. Tail not laterally flattened; hind foot less than 50 mm..... 55

55A. Hind foot more than 25 mm..... 56

55B. Hind foot less than 25 mm..... 57

56A. Tail with long hairs (more than 20 mm); hind foot more than 35 mm

Neotoma cinerea (Bushy-tailed woodrat), pg. 73

56B. Tail without long hairs; hind foot less than 35 mm

Neotoma lepida (Desert woodrat), pg. 74

57A. Tail very sparsely haired, scale rings visible

Mus musculus (House mouse), pg. 79

57B. Tail well haired, scale rings not visible..... 58

58A. Upper incisors grooved on front surface

Reithrodontomys megalotis (Western harvest mouse), pg. 68

58B. Upper incisors smooth on front surface..... 59

59A. Ear longer than hind foot; tail strongly bicolored with narrow upper stripe

Peromyscus truei (Piñon mouse), pg. 71

59B. Ear shorter than hind foot..... 60

- 60A. Tail nearly equal in length to body, not strongly bicolored
Peromyscus crinitus (Canyon mouse), pg. 69
- 60B. Tail shorter than body, strongly bicolored
Peromyscus maniculatus (Deer mouse), pg. 70
- 61A. Color light brown above, white below; ears and eyes large
Onychomys leucogaster (Northern grasshopper mouse), pg. 72
- 61B. Color gray or grayish-brown above, gray below; ears and eyes small..... 62
- 62A. Color gray; tail light gray and short, about the same length as the hind foot
Lemmyscus curtatus (Sagebrush vole), pg. 77
- 62B. Color grayish brown to dark brown; tail longer than hind foot and dark on top... 63
- 63A. Tail about 1/3 total length and strongly bicolored (dark above, pale below)
Microtus longicaudus (Long-tailed vole), pg. 75
- 63B. Tail less than 1/3 total length, not strongly bicolored
Microtus montanus (Montane vole), pg. 76
- 64A. Males with antlers (seasonally), females without antlers..... 65
- 64B. Horns present in both sexes..... 66
- 65A. Antler beam directed backwards, brow (first) tine prominent and directed forward; tail buffy; head and neck dark brown, body paler
Cervus elaphus (Wapiti or Elk), pg. 81
- 65B. Antlers directed outward and upward, beam forked, brow tine small; tail white with a black tip; head and neck not uniformly dark
Odocoileus hemionus (Mule deer), pg. 82
- 66A. Horns forked; underside of neck with two white bars
Antilocapra americana (Pronghorn), pg. 83
- 66B. Horns not forked, in adult males massive and curled into a spiral; no white bars on neck
Ovis canadensis (Bighorn sheep), pg. 84

Pygmy rabbit (*Brachylagus idahoensis*)



Taxonomy:

Family Leporidae. Placed in the genus *Sylvilagus* by some authors. No subspecies are recognized.

Description:

The smallest North American rabbit, this species is distinguishable from cottontails (*Sylvilagus*) by its smaller size, relatively short ears, and tail which lacks a white underside.

Total length: 230-305 mm; Tail: 15-30 mm; Hind foot: 65-72 mm; Ear: 36-48; Weight: 370-460g.

Distribution:

North America: Restricted to the intermountain west, including the Great Basin and southern Columbia Plateau. An isolated population occurs in southeastern Washington.

Park region: There are specimen records from Spring Valley west of the Park, and a sight record from near the eastern Park boundary. May occur elsewhere in sagebrush habitat.

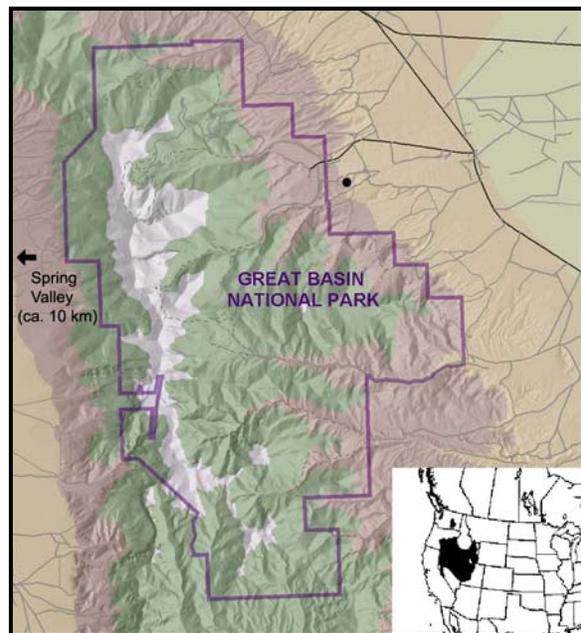
Ecology and diet:

The Pygmy rabbit is a habitat specialist, essentially restricted to areas dominated by mature sagebrush (*Artemisia tridentata*). They construct burrows and are principally nocturnal. Sagebrush constitutes most of their year-round diet, but a variety of green vegetation is consumed when available. Historically, their geographic range has diminished along with loss of sagebrush habitat.

Life History:

The breeding period occurs in late winter through spring. Litters averaging 6 young are born after a gestation period of about a month, and females may produce up to 3 litters per year. Young do not breed during the year of their birth, but become sexually mature the following season.

References: Hall 1946; Flinders 1999.



Black-tailed jackrabbit (*Lepus californicus*)



Taxonomy:

Family Leporidae. Also called California jackrabbit. Seventeen subspecies are recognized; the regional subspecies is *Lepus californicus deserticola*.

Description:

Readily distinguished from other rabbits by its large size and elongate ears and limbs.

Total length: 515-550 mm; Tail: 76-90 mm; Hind foot: 120-130 mm; Ear: 109-125 mm; Weight: 1.3-3.3kg.

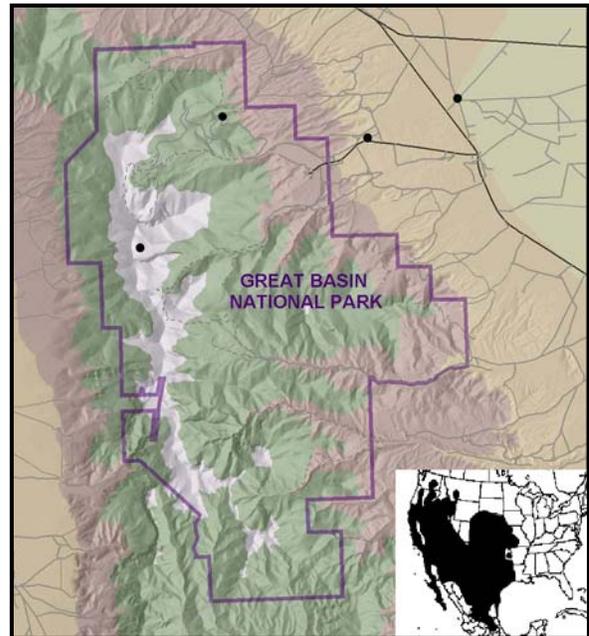
Distribution:

North America: The arid regions of western North America, from the Great Plains to the Pacific coast, and from the northern Great Basin and adjacent Columbia Plateau south to central Mexico including the Baja peninsula.

Park region: Although there are few specimen records, jackrabbits are common throughout the Park region, particularly at low elevations.

Ecology and diet:

This species is most abundant in open desert shrub habitat or in piñon-juniper woodland. However, it may occur in virtually any habitat in the Park region, and has been seen at elevations above timber line. Although mainly nocturnal, by day they are seen resting in the shade of shrubs and other vegetation. Diet includes grass, forbs, and leaves of shrubs. Physiological adaptations for heat tolerance and water conservation enable them to cope with the extremes of desert climate.



Life History:

Most births occur from late winter through early summer. Gestation is approximately 45 days. Litter size ranges from 1 to 6 young and females have multiple litters. Males reach sexual maturity in about 7 months, and females breed in the spring of their second year.

References: Best 1996; North & Marsh 1999; Rickart & Robson 2005.

Desert cottontail (*Sylvilagus audubonii*)



Taxonomy:

Family Leporidae. Also called Audubon's cottontail. Eleven subspecies are recognized, the regional one being *Sylvilagus audubonii arizonae*.

Description:

Similar to the mountain cottontail (*S. nuttallii*), but distinguished by its longer and more sparsely-haired ear.

Total length: 341-382 mm; Tail: 35-67 mm; Hind foot: 80-92 mm; Ear: 69-79 mm; Weight: 755g-1.25kg.

Distribution:

North America: Occurs from North Dakota and eastern Montana south to central Mexico, and from central Nevada and California south through the Baja peninsula.

Park region: The only records of this species are from low-elevation sites in the Snake Valley northeast of the Park. However, it may occur uncommonly elsewhere in the region.

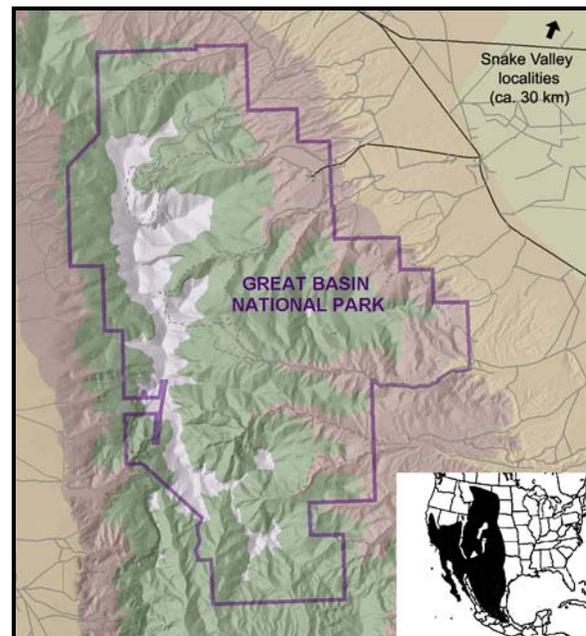
Ecology and diet:

The desert cottontail is more common in areas south of the Park region. Compared to its relative the mountain cottontail, it is more adapted to extreme heat and aridity of low elevation deserts, but it can be found in a wide variety of habitats including piñon-juniper woodland. It often occurs in low elevation riparian habitat. As with other rabbits, the diet includes a wide variety of green vegetation.

Life History:

This species may breed year-round, but most often from mid-winter through summer. Gestation lasts about 1 month, and young may mature as young as 3 months of age. Litter size averages 2 to 4 young, and females may have multiple litters per season.

References: Hall 1946; Chapman & Willner 1978; Chapman 1999a.



Mountain cottontail (*Sylvilagus nuttallii*)



Taxonomy:

Family Leporidae. Also called Nuttall's cottontail. Three subspecies are recognized; the regional form is *Sylvilagus nuttallii grangeri*.

Description:

Similar to the desert cottontail, but distinguished by its shorter ear with more densely furred inner surface.

Total length: 320-385 mm; Tail: 20-60 mm; Hind foot: 87-98 mm; Ear: 54-63 mm; Weight: 641-885 g.

Distribution:

North America: From southern Alberta and Saskatchewan south through the western Great Plains and Rocky Mountains to northern New Mexico and Arizona, and west through the intermountain region to the Cascade and Sierra Nevada Mountains.

Park region: Occurs throughout the Park region, from low elevations in the Snake Valley to above 10,000 feet (3,050 m).

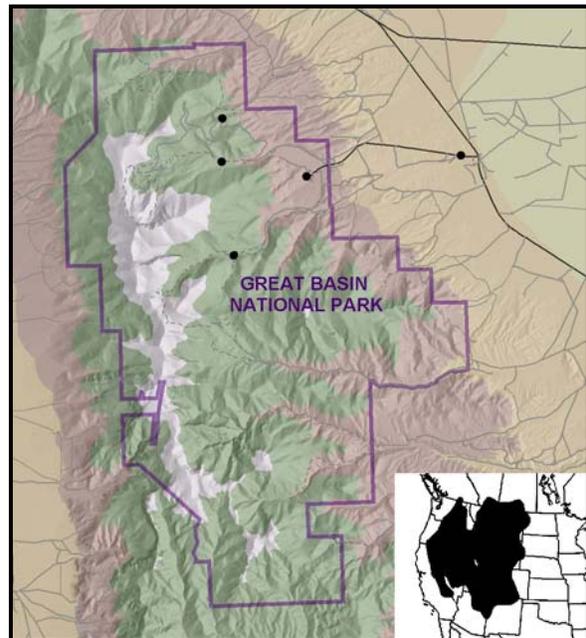
Ecology and diet:

The mountain cottontail occurs in a wide range of habitats from desert shrub to montane forest, often in rocky situations. It is generally nocturnal, although often seen during daylight, particularly near dawn or dusk. Diet includes grass, sagebrush, juniper, and other green vegetation.

Life History:

Reproduction occurs from late winter to summer. Gestation lasts approximately 1 month, and litter size ranges from 4 to 8. A female may produce as many as 5 litters per year. Sexual maturity may be achieved as early as 3 months of age.

References: Hall 1946; Chapman 1975, 1999b.



Merriam's shrew (*Sorex merriami*)



Taxonomy:

Family Soricidae. Two subspecies are recognized; animals from the Park region probably represent *Sorex merriami leucogenys*.

Description:

Color grayish-brown above and very pale below. The tail is strongly bicolored, gray-brown above and white below.

Total length: 88-107 mm; Tail: 33-42 mm; Hind foot: 11-13 mm; Weight: 4-7g.

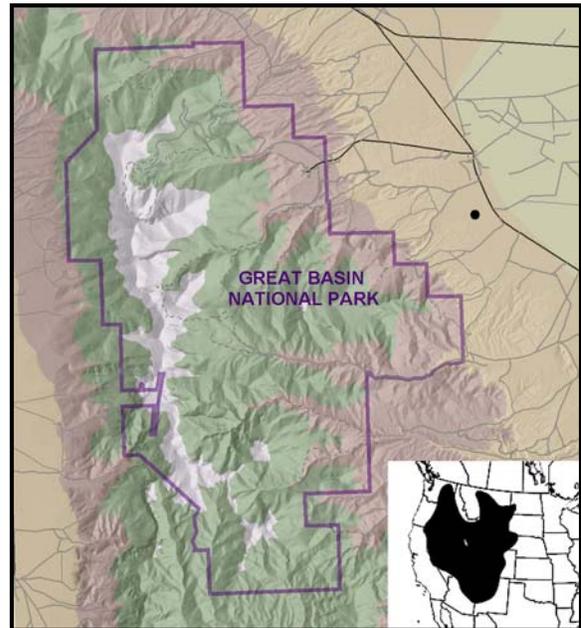
Distribution:

North America: Occurs from the Columbia Plateau region south through the Great Basin and eastward through the Colorado Plateau, central Rocky Mountains, and into the westernmost Great Plains.

Park region: There is a single record of this species from near Baker east of the Park. It may occur at lower elevations throughout the region.

Ecology and diet:

Compared to other western shrews, this widespread but seemingly uncommon species generally occurs in relatively dry habitats. It is most frequently found in areas dominated by sagebrush, but also occurs in grassland, piñon-juniper woodland, and montane forest. As with most shrews, diet includes a wide variety of arthropods



Life History:

Pregnancies have been noted from March to July, with litter size ranging from 5 to 7.

References: Hall 1981; Armstrong 1999.

Water shrew (*Sorex palustris*)



Taxonomy:

Family Soricidae. Also called American water shrew or northern water shrew. There are 10 subspecies including *Sorex palustris navigator* from the Park region.

Description:

Largest shrew in the region. Color is blackish gray above, silvery below. Tail is strongly bicolored, black above and silver below. Hind foot is large and fringed with stiff hairs.

Total length: 130-170 mm; Tail: 57-89 mm;
Hind foot: 18-21 mm; Weight: 8-18 g.

Distribution:

North America: Southern Alaska south and east through the western mountains to south-central California, southern Utah, and northern New Mexico, and eastward from central Canada through the northern Great Lakes region to eastern Canada and the northeastern US.

Park region: The few regional records span a broad elevation range from 7,500 to 11,100 feet (2,285-3,385 m).

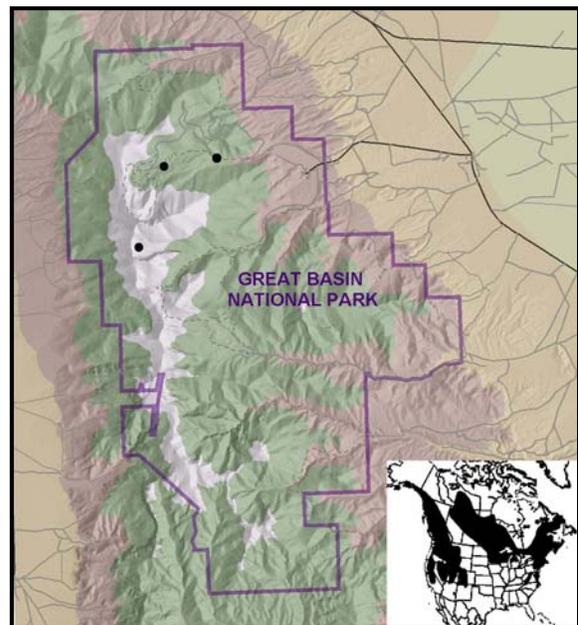
Ecology and diet:

Water shrews are restricted to riparian habitat, usually along permanently flowing streams at mid to high elevations. Although mainly nocturnal, they are occasionally seen along streams during the day. Their diet consists mostly of immature and adult aquatic insects, but includes other invertebrates, small aquatic vertebrates, and occasional fungi and plant matter.

Life History:

Births occur in the spring and summer. Gestation lasts about 3 weeks and a female may produce two or three litters of 3 to 10 young. Overwintering populations consist of young animals born the previous season. Most individuals reach sexual maturity during the late winter or early spring.

References: Hall 1946; Beneski & Stinson 1987



Inyo shrew (*Sorex tenellus*)



Taxonomy:

Family Soricidae. Also called Great Basin dwarf shrew. Closely related to the Rocky Mountain dwarf shrew (*Sorex nanus*). No subspecies are recognized.

Description:

The smallest shrew in the Park region. Brownish-gray above, slightly paler below. Median tine present in the pigmented zone of the first incisor.

Total length: 85-103 mm; Tail: 36-48 mm; Hind foot: 9-13 mm; Weight: 3.4-4.1 g.

Distribution:

North America: Eastern California, (principally the western slope of the Sierra Nevada), western, southern, and eastern Nevada. There are isolated records from northern California (Lassen Volcanic National Park) and eastern Nevada (Great Basin National Park).

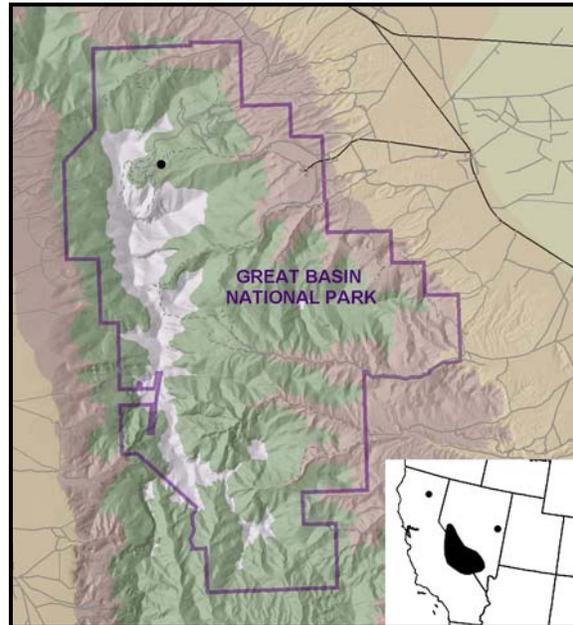
Park region: The single Park record of the Inyo Shrew is from Lehman Creek at 9,900 feet (3,250 m) elevation.

Ecology and diet:

There are few records of this uncommon shrew which is very difficult to see or capture because of its small size. The single specimen from the Park was captured in a pitfall trap set in rocky, streamside habitat in spruce-fir forest. Elsewhere, Inyo shrews occur in rocky habitat ranging from piñon-juniper woodland to alpine tundra, and are often associated with talus fields. Nothing is known of the behavior or food habits of this species.

Life History: No information.

References: Hoffmann & Owen 1980; Hoffmann 1999a; Rickart et al. 2004; Shohfi et al. 2006.



Vagrant shrew (*Sorex vagrans*)



Taxonomy:

Family Soricidae. Also called wandering shrew. Formerly grouped with the closely related montane shrew (*Sorex monticolus*). Four subspecies are recognized including *Sorex vagrans vagrans* from the Park region.

Description:

Brownish-gray above, slightly paler below. A small pigmented median tine is present on the first incisor.

Total length: 90-115 mm; Tail: 33-48 mm;
Hind foot: 12-14 mm; Weight: 4-8 g.

Distribution:

North America: Southern British Columbia south to central California, and from the Pacific coast eastward to western Montana, Idaho, and western Utah.

Park region: Common throughout the Park, occurring over a broad elevation range from below 6,500 to over 11,000 feet (1,980-3,352 m).

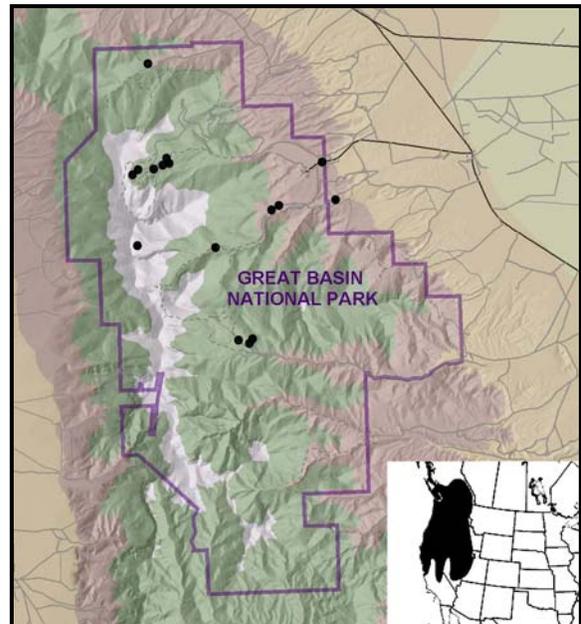
Ecology and diet:

Vagrant shrews are most abundant in moist habitat, such as wet montane forest, wet meadows, marshes, and along stream margins. Their food consists of insects and other invertebrates, and they forage during both night and day. They are sometimes seen during the day, particularly in moist forest and meadows. Vagrant shrews also use echolocation for orientation.

Life History:

Up to three litters of 1 to 9 young may be produced each year during the warmer months. Development is rapid, and young are weaned after 3-4 weeks. Over wintering populations consist of young animals that enter reproductive condition in the spring. Maximum longevity is 16 months.

References: Hall 1946; Findley 1999; Rickart & Robson 2005



Big free-tailed bat (*Nyctinomops macrotis*)



Taxonomy:

Family Molossidae. Formerly known as *Tadarida macrotis* and *Tadarida molossa*. No subspecies are recognized.

Description:

Distinguished from the common Mexican free-tailed bat (*Tadarida brasiliensis*) by its larger size and ears that are joined across the forehead.

Total length: 120-160 mm; Tail: 40-57 mm; Hind foot: 7-11 mm; Ear: 25-32 mm; Forearm: 58-64 mm; Weight: 22-30 g.

Distribution:

North America: Occurs from the southwestern US south into Mexico and Central America.

Park region: The big free-tailed bat reaches its northwestern distributional limit in the southern Great Basin. Although there are no records of this species from the immediate Park region, a specimen from a site ca. 50 km to the east in Millard County, Utah suggests that it may occasionally occur in the Park.

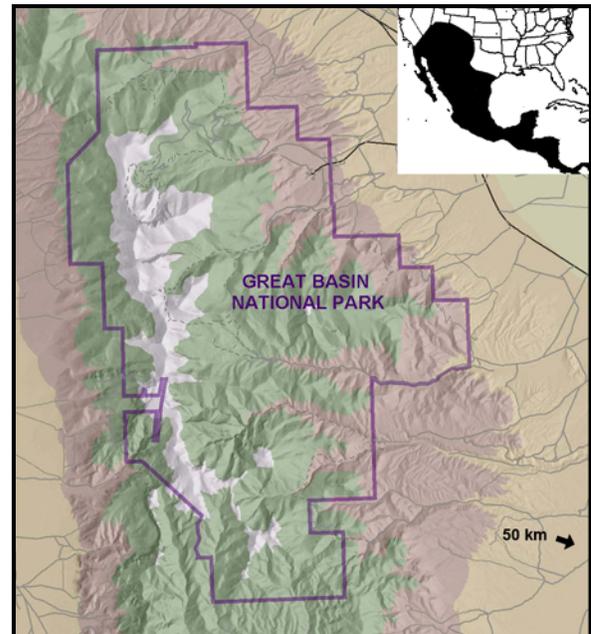
Ecology and diet:

Big free-tailed bats roost in a variety of locations, including buildings, caves, and tree hollows. They feed on moths and other flying insects that are captured in flight. They use low-frequency echolocation calls audible to humans.

Life History:

Females congregate in maternity colonies where they give birth to single young in late spring or early summer. Juveniles are weaned by late summer.

References: Hall 1981; Milner et al. 1990; Parish & Jones 1999.



Mexican free-tailed bat (*Tadarida brasiliensis*)



Taxonomy:

Family Molossidae. Also called Brazilian free-tailed bat or Guano bat. Nine subspecies are recognized. The regional subspecies is *Tadarida brasiliensis mexicana*.

Description:

Distinguished from other regional bats by its distinctive “free-tail” which extends beyond the tail membrane.

Distinguished from the uncommon Big free-tailed bat (*Nyctinomops macrotis*) by its smaller size and ears that are not joined across the forehead.

Total length: 85-109 mm; Tail: 31-41 mm; Hind foot: 8-12mm; Ear: 14-20 mm; Forearm: 36-46 mm; Weight: 10-15 g.

Distribution:

North America: Southern US, from California to Kansas, eastward along the Gulf and lower Atlantic coasts, and south throughout Mexico into Central America.

Park region: Reported from few sites in the Park region. However, nearby Rose Guano Cave is a major roost site supporting an estimated 75,000 individuals of this species. It probably occurs throughout much of the Park.

Ecology and diet:

Free-tailed bats undergo seasonal migrations, moving north during spring and summer to form large colonies. During winter, they form hibernation colonies. The major roosts are in natural caves where colonies can number in the millions. They also roost in mines and buildings. Their diet consists mainly of moths and other flying insects that they catch while foraging in open habitat, often at high altitudes.

Life History:

Females bear single offspring in late spring - early summer. Females and dependent young form large maternity colonies. Young are weaned in about 6 weeks. Life span may exceed 10 years.

References: Wilkins 1989; Ports & Bradley 1996; McCracken 1999; Rickart & Robson 2005.



Pallid bat (*Antrozous pallidus*)



Taxonomy:

Family Vespertilionidae. Six subspecies are recognized, including *Antrozous pallidus pallidus* from the Park region

Description:

Distinguished from other species by its yellowish-brown color, and relatively large ears, eyes, and forearm.

Total length: 92-135 mm; Tail: 35-53 mm; Hind foot: 11-14 mm; Ear: 30-34 mm; Forearm: 48-60 mm; Weight: 13-22 g.

Distribution:

North America: Southern British Columbia south through most of the western US into central Mexico including Baja California.

Park region: There are few records of this species from the Park region, which represent its northern distribution limit in the central Great Basin.

Ecology and diet:

Pallid bats occur in a variety of habitats over a broad elevation range, but are most abundant in low elevation deserts. They are colonial, using many different types of roost sites. In contrast to other regional species, pallid bats often forage on the ground where they consume a variety of ground-dwelling insects, non-flying arthropods such as scorpions, and occasionally small vertebrates. They detect prey by listening for passive sound as well as with echolocation.

Life History:

As in other bats of the family Vespertilionidae, mating takes place in fall or early winter, females store sperm, and fertilization occurs in the spring. Females form maternity colonies and can reproduce as yearlings, producing a single offspring litter. Older females have twins. Young are weaned between 6 and 8 weeks of age. Maximum longevity is about 14 years.

References: Ports & Bradley 1996; Hermanson 1999; Hermanson & O'Shea 1983.



Townsend's big-eared bat (*Corynorhinus townsendii*)



Taxonomy:

Family Vespertilionidae. Formerly placed in the genus *Plecotus*. Also called western big-eared bat or western lump-nosed bat. Five subspecies are recognized, including *Corynorhinus townsendii pallescens* which occurs in the Park region.

Description:

Distinguished from other regional bat species by its very large ears, brown coloration, and a pair of large glandular lumps on the nose.

Total length: 89-106 mm; Tail: 35-54 mm; Hind foot: 10-12.5 mm; Ear: 30-41 mm; Forearm: 39-47 mm; Weight: 9-12 g.

Distribution:

North America: Southern British Columbia south through most of the western US and into central Mexico.

Park region: This species has been recorded at sites throughout the Park region, where it is undoubtedly common given the large number of mines and caves.

Ecology and diet:

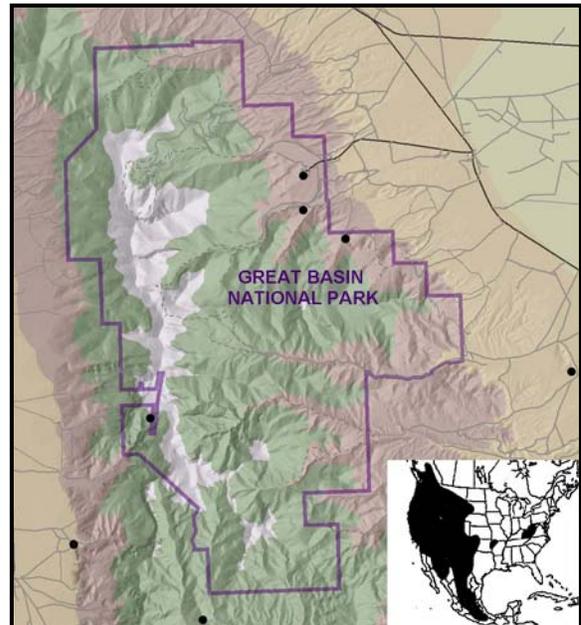
Big-eared bats occur in a wide variety of habitats across a broad elevational range. They utilize many different roosting sites but are particularly dependant on caves and mines. They usually emerge from day roosts relatively late after sunset. They generally forage near vegetation, feeding mainly on moths but taking other flying insects as well.

These bats hibernate in caves or mines, often in groups of more than 100 individuals.

Life History:

Females form large maternity colonies of up to several hundred individuals. Single young are in early summer after a gestation of 56 to 100 days. Young are weaned in about 4-5 weeks. The maximum recorded life span is 16 years.

References: Hall 1946; Kunz 1999b; Kunz & Martin 1982; Ports & Bradley 1996



Big brown bat (*Eptesicus fuscus*)



Taxonomy:

Family Vespertilionidae. Eleven subspecies are recognized. The regional race is *Eptesicus fuscus pallidus*.

Description:

Likely to be confused only with *Myotis volans*, but distinguished by its larger size, and single upper premolar tooth.

Total length: 105-119 mm; Tail: 39-51 mm; Hind foot: 9-12 mm; Ear: 13-17 mm; Forearm: 40-54 mm; Weight: 14-19 g.

Distribution:

North America: Southern Canada, south through the entire continental US and most of Mexico.

Park region: This species is widespread in eastern Nevada. There are scattered from the Park region where it is probably fairly common.

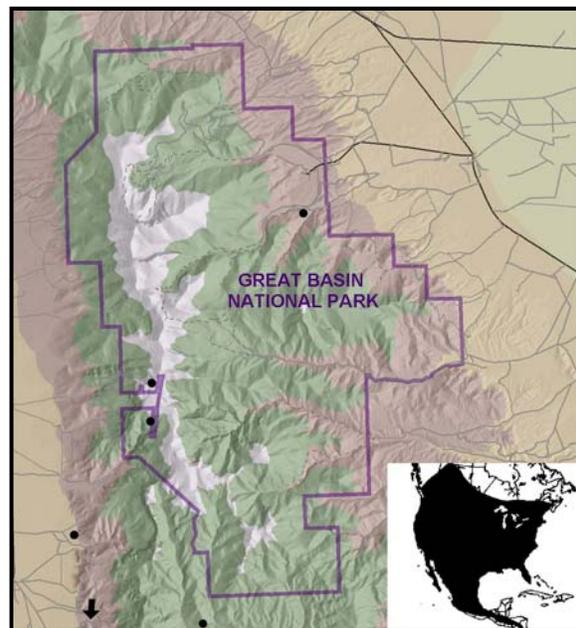
Ecology and diet:

The big brown bat utilizes many different types of roosts including hollow trees, caves, and mines, and is one of the most common species found roosting in buildings. They forage in a wide range of habitats and feed on a variety of flying insects but prefer beetles.

Life History:

Females mate in the fall and store sperm during winter hibernation. They ovulate and are fertilized in the spring, and births of single young occur 2 months later between May and July. Females congregate in maternity colonies. Young are weaned at about 1 month. Recorded life span is 19 years.

References: Kurta 1999; Kurta & Baker 1990; Ports & Bradley 1996; Rickart and Robson 2005.



Spotted bat (*Euderma maculatum*)



Taxonomy:

Family Vespertilionidae. Also called pinto bat. No subspecies are recognized.

Description:

Easily distinguished from other bat species by the black and white color pattern and large pink ears.

Total length: 107-125 mm; Tail: 47-55 mm; Forearm: 48-54 mm; Hind foot: 11-12 mm; Ear: 37-47 mm; Weight: 15-22 g.

Distribution:

North America: Widespread in western North America, from southwestern Canada south through the intermountain region and into north-central Mexico.

Park region: The only Park records for this species are sighting in the Gray Cliffs area in the Baker Creek drainage.

Ecology and diet:

Spotted bats forage on flying insects, feeding most often on moths. They occur over a broad elevational range in habitats ranging from desert shrub to coniferous forest. They frequently roost in crevices and are often found in areas with cliffs and rocky outcrops. Although they are known to hibernate, in the southern portions of their range they may be active in mid-winter.



Life History:

Births of single young occur in early summer. Length of gestation is not known.

References: Black & Cosgriff 1999; Rickart & Robson 2005.

Silver-haired bat (*Lasionycteris noctivagans*)



Taxonomy:

Family Vespertilionidae. Also called silvery-haired bat. No subspecies are recognized.

Description:

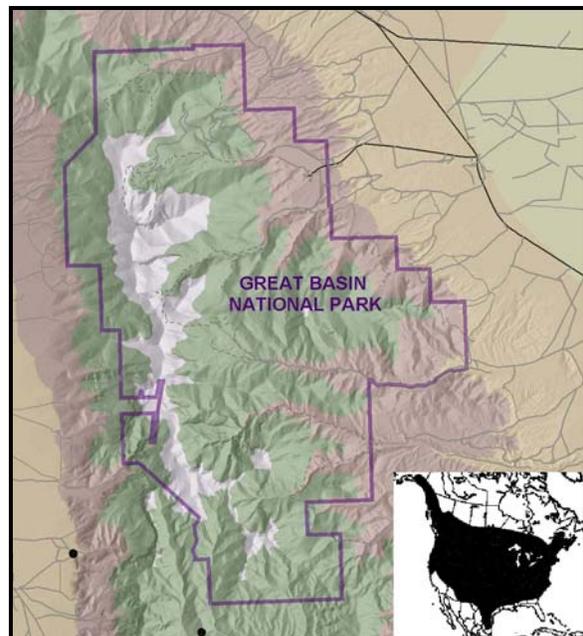
Distinguishable from other bats by its blackish pelage with a “frosting” of silvery-white hairs on the back

Total length: 90-117 mm; Tail: 31-50 mm; Hind foot: 8-10 mm; Ear: 11-14 mm; Forearm: 37-47 mm; Weight: 9-12 g.

Distribution:

North America: From SE Alaska south, through southern Canada, nearly all of the lower US (except the extreme SW and Gulf coast), and into northern Mexico.

Park region: Recorded at sites along the western slope of the south Snake Range. Probably an uncommon but regular seasonal visitor to the region.



Ecology and diet:

This distinctive bat is a widespread migrant, most often found in forested regions. Silver-haired bats roost singly or in small groups preferring hollow trees, old woodpecker holes, and under loose bark. They occasionally roost in buildings and caves. They are active early in the evening, foraging over vegetation and water for moths and other small insects.

Life History:

The sexes are geographically segregated during the summer, with males found mainly in the West. Mating occurs during the fall migration period. Females apparently store sperm over the winter. Following a 50-60 day gestation, females give birth to twins in early summer. Young are weaned in 3-4 weeks. Adults may live for 12 years.

References: Kunz 1982, 1999a; Ports & Bradley 1996.

Hoary bat (*Lasiurus cinereus*)



Taxonomy:

Family Vespertilionidae. Three subspecies are recognized, but only one, *Lasiurus cinereus cinereus*, occurs in North America.

Description:

Distinguished from all other regional bats by its large size, and mixed brown, gray and yellow fur that is "frosted" with white.

Total length: 134-140 mm; Tail: 50-63 mm; Hind foot: 6-14 mm; Ear: 18 mm; Forearm: 46-55 mm; Weight: 20-35g.

Distribution:

North America: Occurs through most of eastern Canada, southern Alberta and British Columbia, south through the contiguous US to southern Mexico.

Park region: Although there are few verified records, this migratory species is found throughout Nevada and is probably a regular seasonal visitor to the Park region.

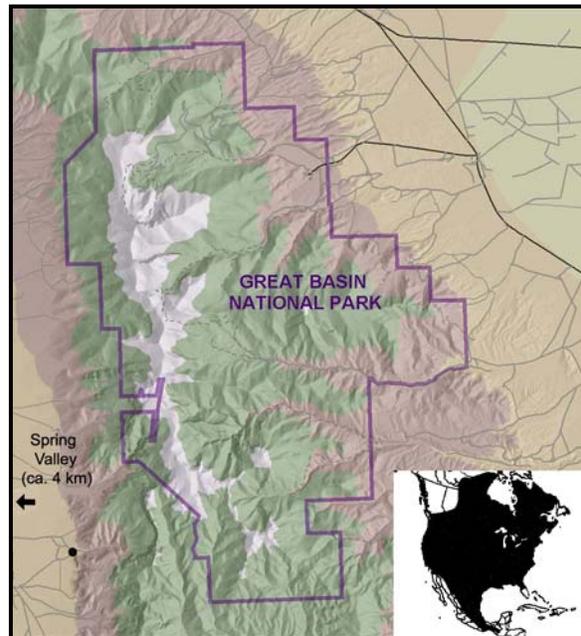
Ecology and diet:

This is one of the most widespread bats in North America. It occurs across a broad range of latitude and elevation and therefore may be found in a wide variety of habitats. They are solitary and principally roost in the foliage of trees. The diet includes a wide variety of insects, but most commonly moths.

Life History:

Mating occurs during the course of fall migration, and implantation is delayed until spring. Most births occurs from May to July. As with all members of the genus *Lasiurus* and in contrast to most bats, litter size is large, ranging from 1 to 4 young. Young develop rapidly and are capable of flight in less than 4 weeks.

References: Ports & Bradley 1996; Shump & Shump 1982; Rickart & Robson 2005.



California myotis (*Myotis californicus*)



Taxonomy:

Family Vespertilionidae. Also called California bat. Four subspecies are recognized including *Myotis californicus stephensi* from the Park region.

Description:

Distinguished from most other bats by its small size. Differentiated from *Myotis ciliolabrum* by its rounded skull which has a distinct “forehead”, and pelage which is dull rather than glossy.

Total length: 70-94 mm; Tail: 35-42 mm; Hind foot: 5.5-7 mm; Ear: 12-14 mm; Forearm: 30-35 mm; Weight: 3.3-5.4 g.

Distribution:

North America: Occurs from western Canada south through the intermountain and Pacific coastal regions to southern Mexico.

Park region: Most Nevada records for this species are from the western and southern portion of the state. Although there are few records from within the Park, the species probably is widespread, particularly at lower elevations.

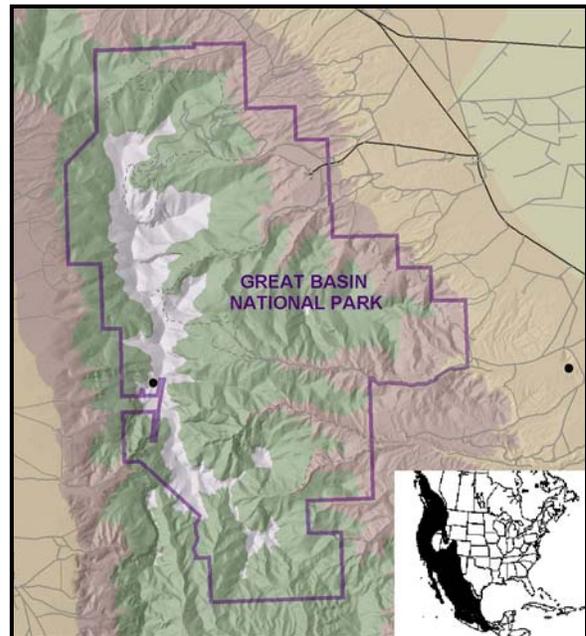
Ecology and diet:

The California myotis principally occurs in low elevation desert habitat, and is one of the most arid-adapted bats in North America. This species utilizes a wide variety of sites as both day roosts and hibernacula, including caves, abandoned mines, and buildings. It forages for flying insects early in the evening, often close to the ground or over water.

Life History:

Mating occurs in the fall, and females store sperm during winter hibernation. Fertilization and pregnancy occur in the spring. Single young are born mid-summer, often in small nursery colonies. Young are independent at around 1 month of age, and may live 15 years.

References: Bogan 1999a; Hall 1946, 1981; Rickart & Robson 2005; Simpson 1993.



Western small-footed myotis (*Myotis ciliolabrum*)



Taxonomy:

Family Vespertilionidae. Also called small-footed bat. Closely related to the eastern small-footed myotis (*M. leibii*) with which it was once grouped under the name *Myotis subulatus*. Two subspecies are recognized, including *Myotis ciliolabrum melanorhinus* which occurs in the Park region.

Description:

Distinguished from most other regional bats by its small size. Most easily confused with the California myotis from which it can be distinguished by its black ears, relatively flattened skull, and glossy pelage.

Total length: 76-90 mm; Tail: 32-45 mm; Hind foot: 7-9 mm; Ear: 12-16 mm; Forearm: 30-34 mm; Weight: 2.8-7.1 g.

Distribution:

North America: Found throughout much of the west from the high plains to California and from the Canadian Rockies south to the northern Mexico.

Park region: This bat is common and widespread in Nevada. There are many records from the Park region, principally at lower elevations.

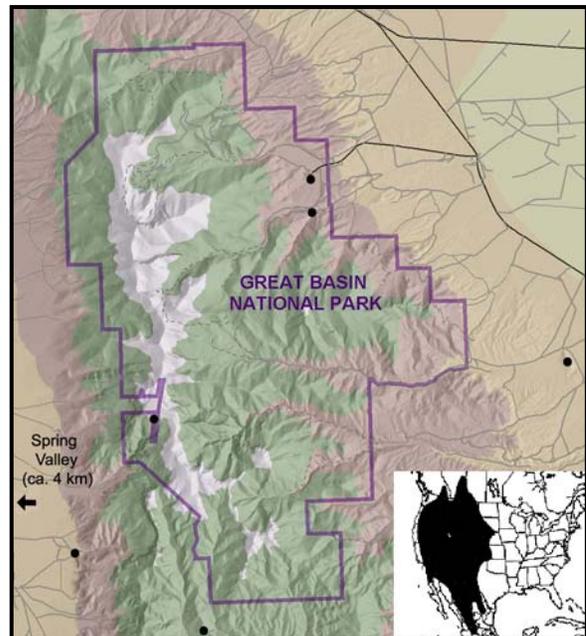
Ecology and diet:

One of the most common bats of the West, the small-footed myotis mainly occurs in forests but can also be found in desert habitats. They roost singly or in small groups, preferring rock crevices, caves, mines, tree hollows and buildings. They feed on a wide variety of flying insects, often foraging over rocky substrate.

Life History:

As with other myotis, this species mates in the fall, with pregnancy and birth occurring in spring and summer. The single young are weaned at about one month of age. Record life span is 12 years.

References: Bogan 1999b; Holloway & Barclay 2001; Ports & Bradley 1996.



Long-eared myotis (*Myotis evotis*)



Taxonomy:

Family Vespertilionidae. Also called long-eared bat and little big-eared bat. Six subspecies are recognized including *Myotis evotis evotis* which occurs in the Park region.

Description:

Distinguished from other regional bats by its large ears and brown color.

Total length: 81-100 mm; Tail: 35-49 mm; Hind foot: 7-10 mm; Ear: 18-22 mm; Forearm: 36-41 mm; Weight: 5-8 g.

Distribution:

North America: Western US from the Rocky Mountains to the Pacific, and adjacent areas in southwestern Canada.

Park region: There are scattered records for this species throughout the Park region, spanning a broad range of elevations and habitats. They are most likely to be found in mid to high elevation forests.

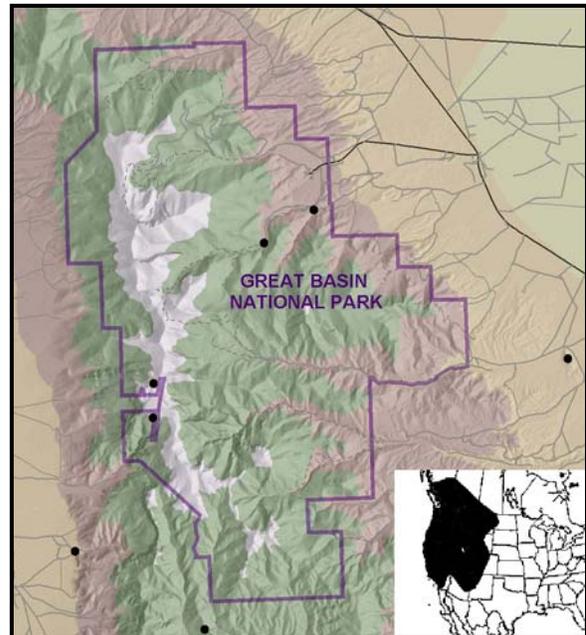
Ecology and diet:

The long-eared myotis is one of the more common bats found in the western United States, occurring throughout Nevada. It is principally associated with coniferous forest, but may also occur in arid plant communities at lower elevations. These bats roost singly or in small groups in tree hollows, rock outcrops, caves, abandoned mines and buildings. They forage over water and dense vegetation, and are thought to “glean” insects from vegetation rather than foraging strictly on flying prey. Their diet includes a high percentage of beetles, but they also consume moths and other insects.

Life History:

Mating occurs in the fall, females store sperm during the winter, and ovulation and fertilization occurs in spring. Females may form small maternity colonies. Births of single young occur in late spring or early summer, and offspring are independent by mid-summer. Bats of this species have lived as long as 22 years.

References: Bogan 1999c; Manning & Jones 1989; Ports & Bradley 1996.



Long-legged myotis (*Myotis volans*)



Taxonomy:

Family Vespertilionidae. Also called long-legged bat or hairy-winged myotis. Four subspecies are recognized, including *Myotis volans interior* from the Park region.

Description:

This species is readily distinguished from other regional bats by its large size, ears that are short and rounded, and relatively dense fur on the underside of the wing membrane which extends to the elbow and knees.

Total length: 76-106 mm; Tail: 29-49 mm; Hind foot: 7-10 mm; Ear: 10-14mm; Forearm: 35-42 mm; Weight: 5-10 g.

Distribution:

North America: Occurs in much of the West, from the high plains to the Pacific coast, and from southwestern Canada south to central Mexico.

Park region: Among bats occurring in the Park region, the long-legged myotis has the broadest documented distribution, occurring from low elevation sites in the Snake and Spring valleys to high elevations throughout the Park.

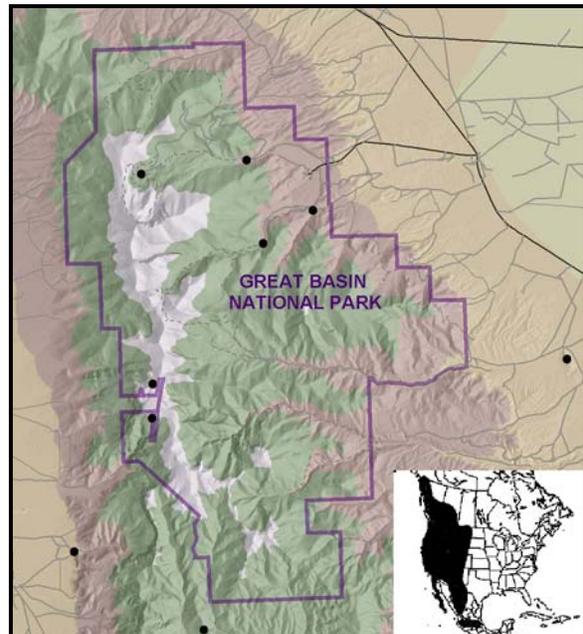
Ecology and diet:

Myotis volans is found in mountainous areas of the West, where it occurs over a very broad elevation range. It is most often associated with coniferous forest habitats. These bats use a wide variety of day roosts, including tree hollows, cliff crevices, caves, mines, and buildings. Hibernacula include caves and mines. They forage opportunistically on moths and other flying insects, often over water and riparian vegetation.

Life History:

Long legged myotis mates in late summer. Females store sperm during hibernation, with ovulation and fertilization delayed till the following spring. Young are born in the spring or summer. Maximum recorded life span is 21 years.

References: Czaplewski 1999; Ports & Bradley 1996; Rickart & Robson 2005.



Western pipistrelle (*Parastrellus hesperus*)



Taxonomy: Family Vespertilionidae. Also known as canyon bat. Formerly placed in the genus *Pipistrellus*. Two subspecies are recognized including *Parastrellus hesperus hesperus* which occurs in the Park region

Description:

This is the smallest bat in the Park region. It is distinguishable from small myotis bats by its pale fur, black ears and wing membranes, and back facial mask.

Total length: 60-86 mm; Tail: 25-36 mm; Hind foot: 5-8 mm; Ear: 10-12 mm; Forearm: 26-33 mm; Weight: 2-6 g.

Distribution:

North America: Occurs from southeastern Washington south through the entire southwestern US and south into central México including the Baja peninsula.

Park region: A single record from a site in Spring Valley is the northern-most record for this species in eastern Nevada. However, it probably occurs occasionally throughout the Park region.

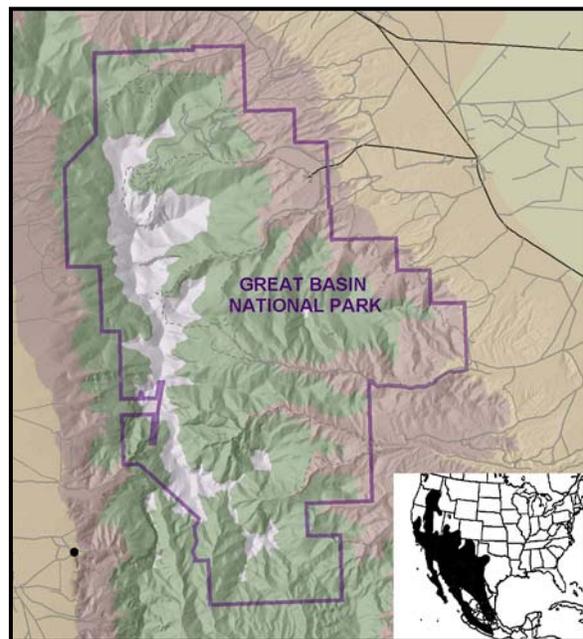
Ecology and diet:

The western pipistrelle is the smallest bat in North America. It typically occurs at low elevations, and is more common in desert habitat to the south of the Park region. This species roosts in rock outcrops, caves, mines, and buildings, and generally forages for small insects in areas near water. It is one of the most commonly seen species. It flies earlier in the evening than most other bats, and occasionally is active during mid-day in heavily shaded canyons.

Life History:

Females give birth to twins in early summer after a gestation of 40 days. Young grow very rapidly and are capable of flight at 1 month.

References: Hall 1946; Ports & Bradley 1996; Sidner 1999.



Coyote (*Canis latrans*)



Taxonomy:

Family Canidae. Nineteen subspecies are recognized, including *Canis latrans lestes* which occurs in the Park region.

Description:

Distinguished from foxes by its larger dog-like form, and reddish-brown color. The 3 species of fox that occur in the Park region are all smaller and have relatively shorter legs and longer tails.

Total length: 1-1.3 m; Tail: 300-394 mm; Hind foot: 177-220 mm; Weight: 7-20 kg.

Distribution:

North America: Alaska and western Canada south through the US and Mexico. In recent decades, the range has expanded eastward to include eastern Canada and the eastern seaboard states.

Park region: Common throughout the Park region at all elevations.

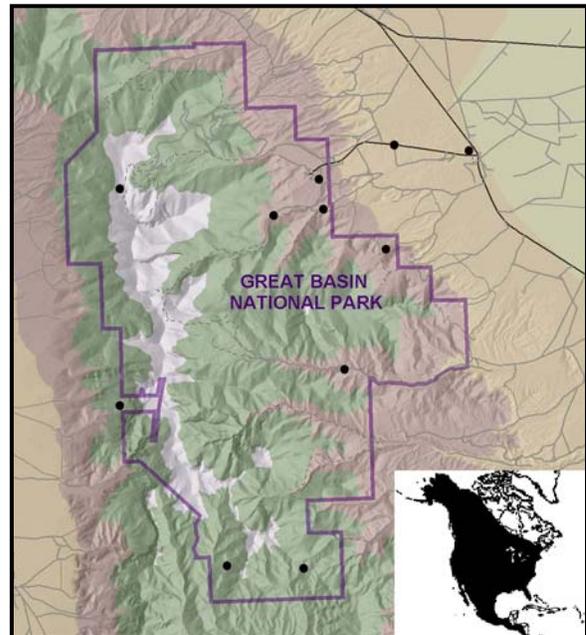
Ecology and diet:

Coyotes are highly adaptable, occurring in nearly all terrestrial habitats. They are generalist predators, hunting any available prey ranging from mice to large mammals, but also consuming insects, carrion, and a wide variety of plant matter. Social structure is variable, probably as a function of available resources, but most often involves small packs consisting of a mated pair and their dependent young of various ages. Packs are highly territorial, actively defending resources against other groups. Social communication involves a wide variety of vocalizations as well as scent marking. They are often heard yelping during the evening, and may be seen foraging during the day.

Life History:

Coyotes have a monogamous mating system. Pairs generally produce a single litter averaging 6 pups annually. Mating occurs in mid-winter. Pups are born in underground dens following a gestation of 58 to 65 days, weaned at 5 to 7 weeks, and are sexual mature at 9-10 months. Maximum longevity in the wild is 10 years.

References: Zeveloff 1988; Bekoff 1999.



Gray fox (*Urocyon cinereoargenteus*)



Taxonomy:

Family Canidae. Fifteen subspecies are recognized in North America including *Urocyon cinereoargenteus scotti*, the regional subspecies.

Description:

Distinguished from other regional canids by its gray and red body color, red on back of ears, and dark stripe on the top of the tail.

Total length: 800-1,130 mm; Tail: 275-443 mm; Hind foot: 100-150 mm; Weight: 3-7 kg.

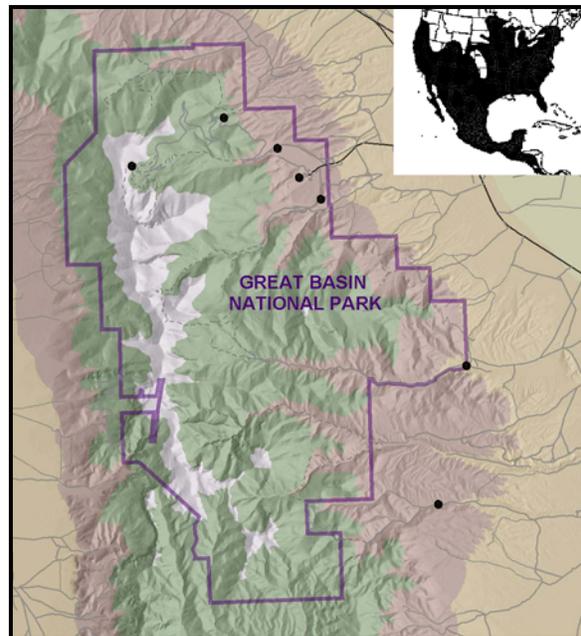
Distribution:

North America: Occurs throughout most of the US, Mexico, and Latin America except for portions of the northwestern and midwestern US.

Park region: Common below 8,000 ft (2,500 m) elevation.

Ecology and diet:

Gray foxes are mainly nocturnal, and only occasionally seen during daytime. They den in borrows, rock outcrops, abandoned buildings, or clumps of brush. A single male-single female and their offspring comprise a typical social unit. They eat a variety of plants, fruit, and small mammals. Unlike most canids, they are agile tree climbers.



Life History:

Mating occurs from early January through March. Females bear 1-7 pups following a gestation period of 59 days. Only one litter is produced annually. Age at sexual maturity is about 10 months, and maximum lifespan is 6-10 years.

References: Zeveloff 1988; Fritzell 1999.

Kit fox (*Vulpes macrotis*)



Taxonomy:

Family Canidae. Formerly grouped with the Swift Fox (*Vulpes velox*) which occurs in mid-western plains region. Eight subspecies are recognized, including *Vulpes macrotis nevadensis* from the Park region.

Description:

Distinguished from other canids by its small size, pale color, and long tail with a black tip.

Total length: 600-800 mm; Tail: 225-300 mm; Hind foot: 111-132 mm; Weight: 1.4-3.0 kg.

Distribution:

North America: The intermountain region from southeastern Oregon south through the Great Basin and Colorado Plateau, southern California, southern Arizona, New Mexico, western Oklahoma and Texas, north-central Mexico and the Baja peninsula.

Park region: Widespread, mainly at elevations below 8,000 ft (2,500 m).

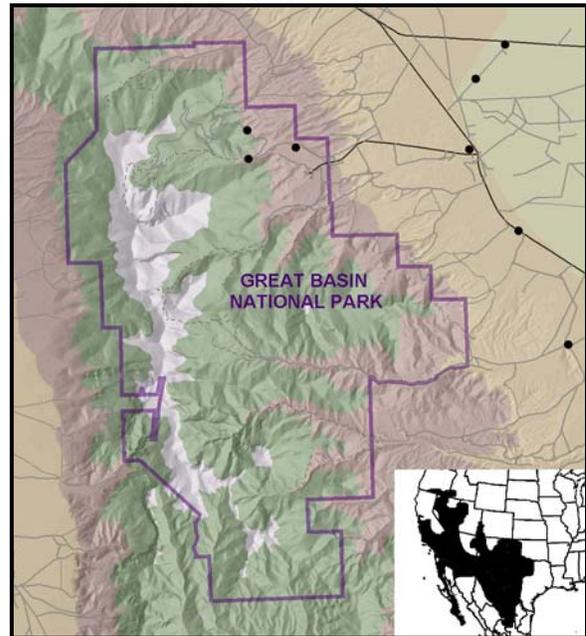
Ecology and diet:

Kit foxes are most common in sagebrush, shadscale, and greasewood communities primarily at lower elevations where they dig underground dens in sandy soil. Their diet varies seasonally, typically including small mammals, birds, reptiles, amphibians, fish, and insects, but also fruits and other plant matter.

Life History:

Mating occurs during the winter. Following a gestation period of 49-55 days, litters of 3 to 6 pups are born in late winter or early spring. Pups emerge from the den when about one month old, and are independent by late summer or early autumn. Kit foxes are sexually mature at about 2 years of age. Maximum longevity is more than 15 years.

References: McGrew 1979; Zeveloff 1988



Red fox (*Vulpes vulpes*)



Taxonomy:

Family Canidae. North American populations of red fox have been treated as a separate species, *Vulpes fulva*. Twelve subspecies are recognized in North America, including *Vulpes vulpes necator* from the Park region.

Description:

Color variable, but most often bright red. Lower legs and back of ears are black. Tail is tipped with white

Total length: 900-1,250 mm; Tail: 350-400 mm; Hind foot: 145-17 mm; Weight: 3-7 kg.

Distribution:

North America: The most widely distributed wild carnivore in the world. In North America occurs throughout Alaska, Canada, and most of the lower US except for parts of the arid west.

Park region: Reported from near Garrison Utah, ca. 2 km west of the Park. Unconfirmed sightings between 5,275 and 6,800 feet (1,605-2,070 m) elevation. Widely transplanted, its range is expanding in this region.

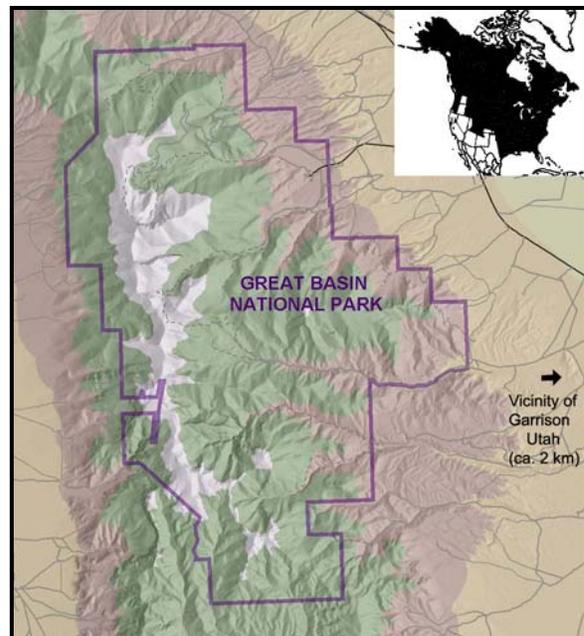
Ecology and diet:

Red foxes are found in a wide range of habitats including forest, tundra, prairie, and farmland. They are primarily carnivorous, eating rodents, rabbits, and other small vertebrates, as well as insects, fruit, and carrion. They often store excess food in caches.

Life History:

Mating occurs in late winter (January through March). Females bear a single litter of about 4 pups in April or May each year. Gestation length is 59 days. Age at sexual maturity is about 10 months, and maximum lifespan is about 8-10 years.

References: Zeveloff 1988; Larivière and Pasitschniak-Arts 1996



Ringtail (*Bassariscus astutus*)



Taxonomy:

Family Procyonidae. Also called cacomistle or ring-tailed cat. Fourteen subspecies are recognized. The regional subspecies is *Bassariscus astutus nevadensis*.

Description:

Differentiated from the raccoon by its long tail (about as long as the body) and lack of a black facial mask. Clearly distinguished from other regional species.

Total length: 616-811 mm; Tail: 310-438 mm; Hind foot: 57-78 mm; Ear: 44-50 mm; Weight: 0.8-1.1 kg.

Distribution:

North America: From southern Oregon, eastern Nevada, northern Utah and Colorado south through the southern plains, southern Rocky mountains, and California into southern Mexico including the Baja peninsula.

Park region: Occurs principally in the southern and eastern portions of the Great Basin. Records are mainly from low to mid elevations.

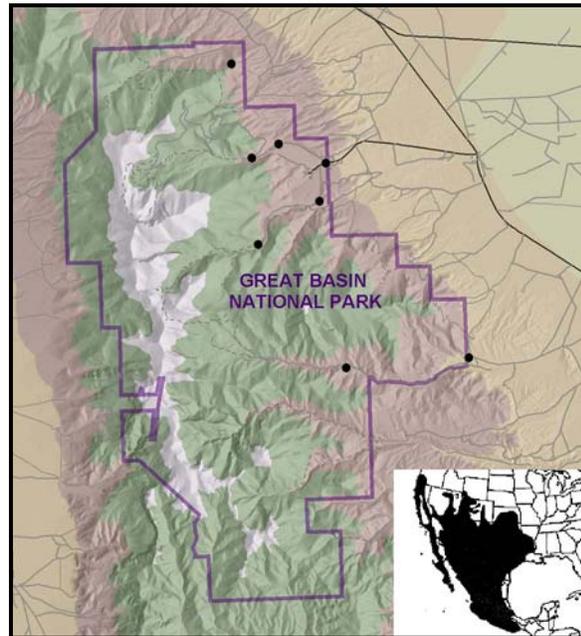
Ecology and diet:

Ringtails prefer rocky areas such as canyon edges, rock outcrops, and talus, in piñon-juniper woodland and desert riparian habitat. They are excellent climbers and strictly nocturnal. They have omnivorous food habits, eating a variety of invertebrates and small vertebrates, as well as fruit and other plant matter.

Life History:

Ringtails mate in early spring, and litters of 1-4 young are born after a gestation of about 7 weeks. Young are weaned at about 3 months of age. Both sexes mature during their second year. Life span in captivity averages 12-14 years.

References: Hall 1981; Pogleyan-Neuwall & Toweill 1988; Rickart & Robson 2005; Zeveloff 1988.



Northern raccoon (*Procyon lotor*)



Taxonomy:

Family Procyonidae. There are 23 subspecies in North America. The nearest native populations represent the subspecies *Procyon lotor pallidus*, but animals in the Park region may be represent introductions from more distant areas.

Description:

Distinguished from the related ringtail by its distinctive facial mask and shorter tail.

Total length: 603-950 mm; Tail: 192-405 mm; Hind foot: 83-138 mm; Ear: 44-50 mm; Weight: 1.8-10.4 kg.

Distribution:

North America: Southern Canada south through most of the continental US (excluding parts of the intermountain west), and south to Central America.

Park region: There are no historical records from the region. Recent reports from low elevations east of the Park.

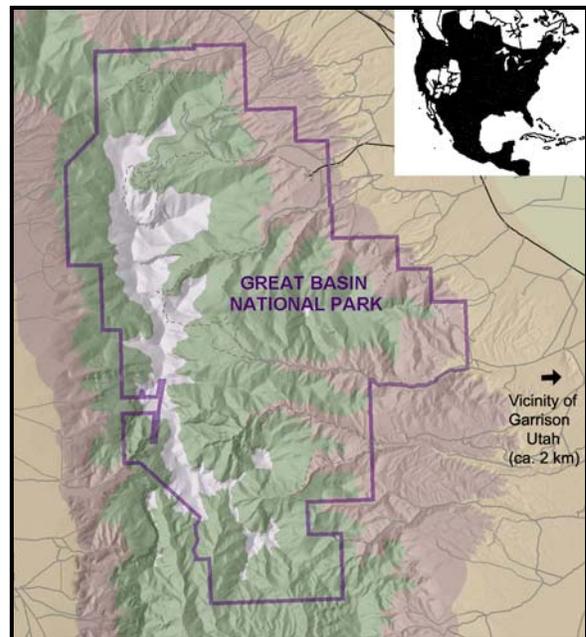
Ecology and diet:

Historically, raccoons appear to have been absent or at least very rare in the interior Great Basin but they are rapidly expanding into the region. Raccoons are often closely associated with human-modified habitats, but they are highly adaptable omnivores with broad ecological tolerances. Their primary habitat requirement is access to permanent water. They can cross intervening desert to reach isolated mountain ranges and it is likely that they soon will be common throughout the Park region.

Life History:

Mating occurs in the spring. Litters of 3 to 7 young are born after a gestation of 2 months. Cubs are weaned at around 10 weeks, but often remain with the mother through the winter. Raccoons can breed as yearlings. Adult life span in the wild is 5 years on average, but can exceed 16 years.

References: Lotze & Anderson 1979; Hall 1981; Zeveloff 1988.



Ermine (*Mustela erminea*)



Taxonomy:

Family Mustelidae. Also called short-tailed weasel or stoat. Nineteen North American subspecies including *Mustela erminea murices* from the Park region.

Description:

Long, slender body and neck with short legs, a small head, and rounded ears. Relatively short, fluffy tail with a black tip. Summer fur is

brown above and white below, turning pure white during the winter. Distinguished from *Mustela frenata* by its smaller size and shorter tail.

Total length: 190-343 mm; Tail: 42-90 mm; Weight: 25-116 g.

Distribution:

North America: Alaska and Canada, including many Arctic islands, northeastern and northwestern US and south through the intermountain west.

Park region: Common at high elevations above 8,500 feet (2,590 m).

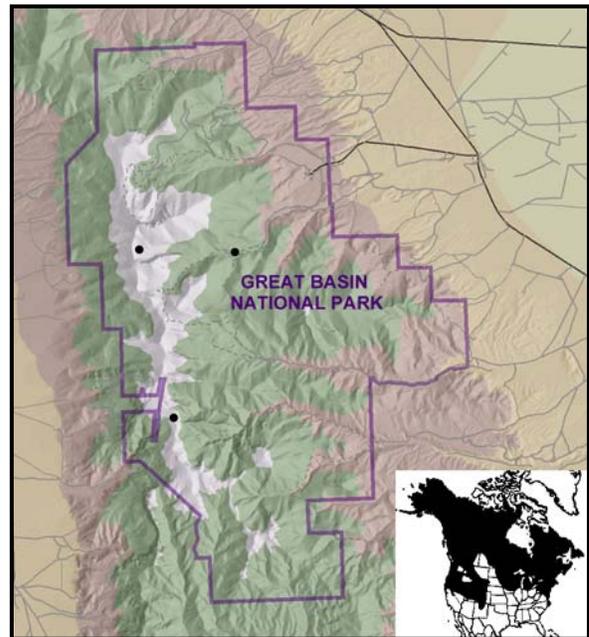
Ecology and diet:

Carnivore generalists, ermines prey on a wide variety of small vertebrates. Although they are primarily nocturnal they are also active during daylight. Dens are made in hollow logs, rock piles, or burrows where they nest and cache food. They are good swimmers and can also climb trees to forage in bird nests.

Life History:

Mating occurs in mid-summer when several ova are fertilized but cease to develop until the following March. Following implantation, females bear a single litter of about 4-9 offspring in April or May after a gestation period of about 27 days. Age at sexual maturity is about 3-4 months for females. Maximum lifespan is 6-7 years.

References: King 1983; Zeveloff 1988



Long-tailed weasel (*Mustela frenata*)



Taxonomy: Family Mustelidae. Also called the bridled weasel. Forty-two subspecies are recognized, including *Mustela frenata navadensis* which occurs in the Park region.

Description: Long, thin neck and body, short legs, small head and rounded

ears. Color brown above, underside of neck and belly creamy white. Bushy, black-tipped tail. Distinguished from the ermine by its larger size and relatively longer tail.

Total length: 280-430 mm; Tail: 112-294 mm; Weight: 80-450 g.

Distribution:

North America: Southern Canada south through most of the the US and Mexico.

Park region: Common over a broad elevation range from 5,700 to 8,500 feet (1,735-2590 m).

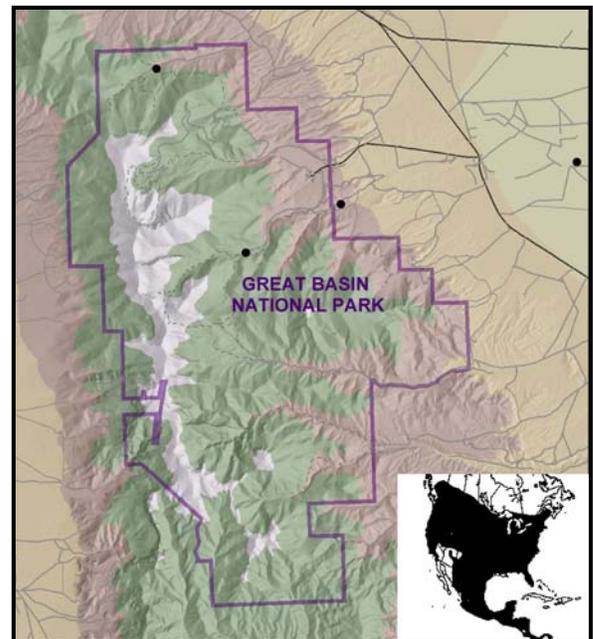
Ecology and diet:

The long-tailed weasel has a broad ecological range, but is most abundant in open habitats near water. Dens are often found in dense vegetation around waterways. They are generalist carnivores that prey on a wide variety of vertebrates from shrews and mice to rabbits. Weasels are most active at night, but are often seen foraging during the day.

Life History:

Mating occurs in mid-summer when several ova are fertilized but cease to develop for about 7.5 months. Following implantation, females bear a single litter of about 4-5 offspring in April or May after a post-implantation gestation of about 30 days. Females are sexually mature at 3-4 months, and males at 1 year.

References: Zeveloff 1988; Sheffield & Thomas 1997.



American Badger (*Taxidea taxus*)



Taxonomy:

Family Mustelidae. There are 4 subspecies including *Taxidea taxus jeffersonii* which occurs in the Park region.

Description:

Distinguished by its squat, short-legged body, lack and white facial markings, and relatively short tail that lacks rings.

Total length: 600-790 mm; Tail: 105-135 mm; Hind foot: 110-136 mm; Ear: 50-55 mm; Weight: 4-12 kg.

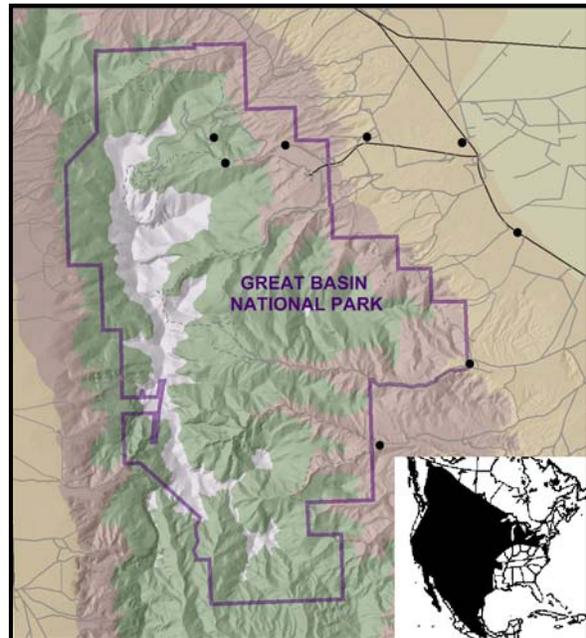
Distribution:

North America: From west-central Canada south through the Great Lakes region and central and western US into central Mexico including the Baja peninsula.

Park region: Common throughout the Park region, particularly at elevations below 8,000 feet (2,450 m).

Ecology and diet:

Badgers have a broad elevation distribution and are found in a wide variety of habitats ranging from desert to alpine meadows, and are particularly abundant in open habitats. They are specialized predators of burrowing rodents, using their powerful limbs and strong claws to dig for pocket gophers and ground squirrels; the latter often are taken while they are hibernating. Badgers also opportunistically consume other prey including birds, lizards, insects, and other invertebrates. They are solitary and generally active at night. They sleep in underground dens during much of the winter, but are often active on warm days.



Life History:

Mating occurs in the summer or fall, but implantation is delayed until February. Litters of 1-3 young are born in early spring and are weaned by autumn. Some females breed during their first year. Badgers may live for 14 years.

References: Zeveloff 1988; Long 1999.

Striped skunk (*Mephitis mephitis*)



Taxonomy:

Family Mephitidae (formerly placed in Mustelidae). There are 13 subspecies including *Mephitis mephitis major* which occurs in the Park region.

Description:

Easily recognized by its black color and conspicuous pair of white stripes extending from the head to shaggy tail.

Total length: 575-800mm; Tail: 173-340mm; Hind foot: 75-83mm; Weight: 1.2- 5.3 kg.

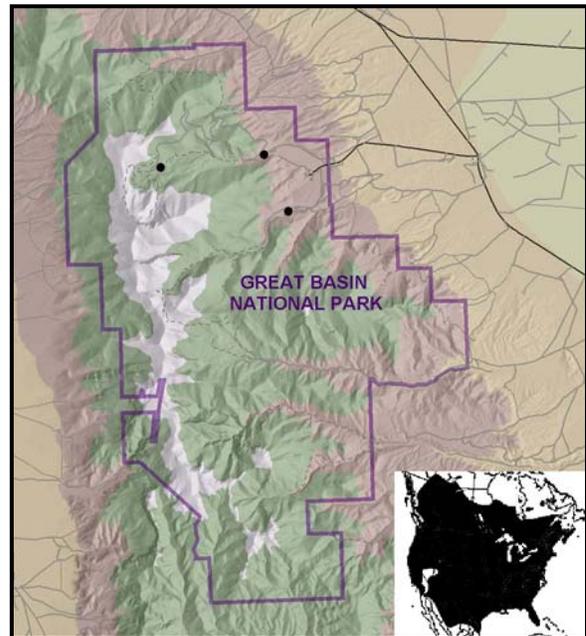
Distribution:

North America: Southern Canada through the US and northern Mexico except the most arid portions of the Sonoran Desert.

Park region: Recent sightings between 5,275 to 9,850 feet (1,600-3,000 m) elevation.

Ecology and diet:

Striped skunks occur in a wide variety of habitats but are probably most common near water. Although nocturnal, they often are seen at dusk and are easily detected by their lingering musky odor. Skunks are omnivorous, consuming insects, small mammals, birds, fruit, and other plant material. They live in above-ground dens during the summer and den below-ground during the winter.



Life History:

Reproduction occurs in late summer. Females bear a single litter of up to 10 kits. Gestation length is 59-77 days. Age at sexual maturity for females is about 10-12 months old. Maximum lifespan is about 4-5 years.

References: Wade-Smith and Verts 1982; Zeveloff 1988

Western spotted skunk (*Spilogale gracilis*)



Taxonomy:

Family Mephitidae (formerly included in Mustelidae). Also called polecat or hydrophobia cat. Formerly grouped with the eastern spotted skunk (*Spilogale putorius*). Ten subspecies are recognized, including *Spilogale gracilis saxatilis* from the Park region.

Description:

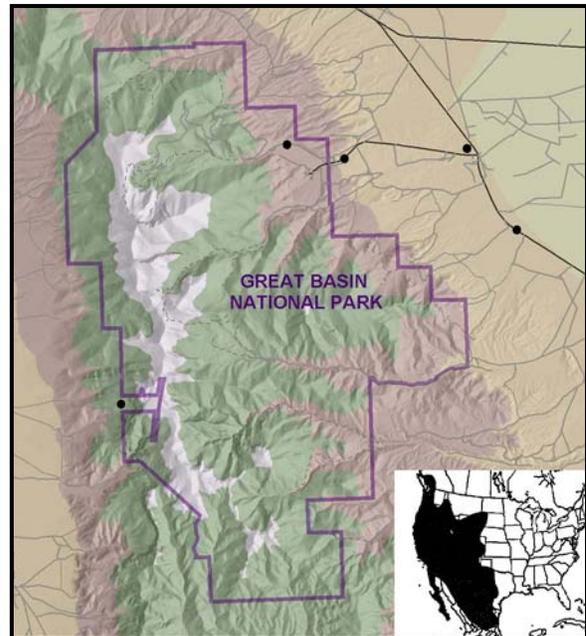
Likely to be confused only with the larger striped skunk, but distinguished from that species by the complex pattern of broken white lines and spots.

Total length: 320-581 mm; Tail: 85-203 mm; Hind foot: 38-47 mm; Ear: 22-28 mm; Weight: 200-900 g.

Distribution:

North America: Occurs from the central Great Plains west to the Pacific coast, and from southwestern British Columbia south to Central Mexico including the Baja Peninsula.

Park region: Common at low to mid-elevations within the Park region.



Ecology and diet:

Spotted skunks are common throughout the intermountain region, particularly in foothills and canyons at lower elevations where they prefer rocky, riparian areas. They generally den in burrows or in openings in rock outcrops. The diet consists mainly of small vertebrates, insects, and other invertebrates. They are active at night, and although they aren't true hibernators, they are much less active during the winter. The well-developed anal scent glands are effective deterrents for most mammals. However, large owls and other birds of prey are important predators.

Life History:

Mating occurs in the fall, and following fertilization there is a 6 month period of delayed implantation and arrested embryonic development. Embryos implant and resume development in early spring, and 2 to 6 young are born after about 1 month. Young are weaned at about 2 months. Captive animals may live more than 10 years.

References: Zeveloff 1988; Verts et al. 2001

Bobcat (*Lynx rufus*)



Taxonomy:

Family Felidae. There are 12 subspecies including *Lynx rufus pallescens* which occurs in the Park region.

Description:

Distinguished by its tawny coat color with dark spots, short, black-tipped tail, facial ruffs, and tufted ears with black backs.

Total length: 710-1252 mm; Tail: 95-195 mm; Hind foot: 143-223 mm; Weight: 5.7-31 kg.

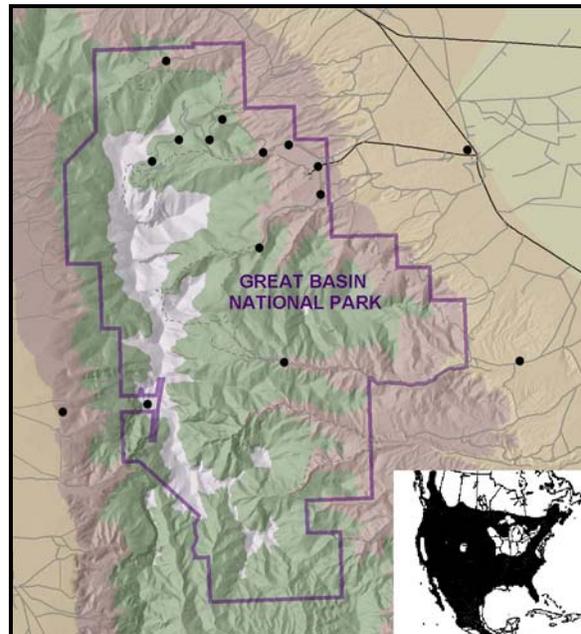
Distribution:

North America: Occurs from southern Canada south through most of the US and south into central Mexico and the Baja peninsula.

Park region: Widespread, occurring over the entire elevation range in the Park region.

Ecology and diet:

The bobcat is found in all regional habitats from low elevation desert to alpine meadows. They are mainly nocturnal but are often seen during the daytime. They feed on a wide variety of animals ranging from insects, mice and other small vertebrates to deer.



Life History:

Breeding occurs in the winter or spring. Litters of from 1 to 8 young are born following a gestation of 2 months. Kittens are weaned at about 2 months, but remain with the female until about 7 months. Bobcats reach mature at 1 to 2 years. Maximum longevity may be as long as 14 years.

References: Larivière & Walton 1997; Zeveloff 1988.

Cougar (*Puma concolor*)



Taxonomy:

Family Felidae. Also known as mountain lion, puma, or panther. Sixteen subspecies occur in North America, including *Puma concolor kaibabensis* which occurs in the Park region

Description:

Distinguished from other carnivores by the large size, long tail, and uniform gray to dark brown color.

Total length: 1.5-2.7 m; Tail: 534-784; Weight: 36-103 kg.

Distribution:

North America: Currently occurs from southeastern Alaska, British Columbia, and Alberta south through the western US and Mexico into Central and South America. Formerly occurring throughout the east and mid-western US, but now extirpated except for a remnant population in Florida. Recently documented in the Appalachian and Adirondack regions and the upper Midwest.

Park region: Widespread and common throughout the Park region, occurring most frequently at mid to high elevations.

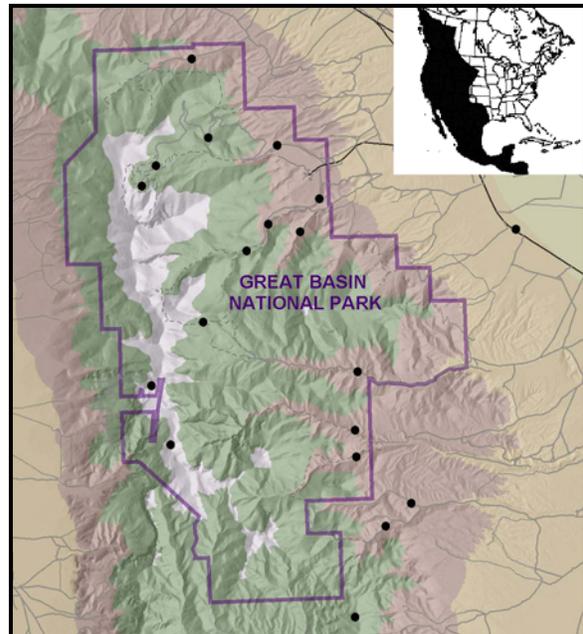
Ecology and diet:

Cougars occur in a wide range of regional habitats, from low elevation desert shrub communities to alpine habitats. They are principal predators of mule deer, but they also prey on a variety of small to large mammals including domestic livestock. Cougars are solitary and primarily nocturnal. They generally avoid contact with humans, but on rare occasions do attack people.

Life History:

Cougars may breed throughout the year. Females bear 1-6 cubs after a 3 month gestation. Young remain with the mother for up to 2 years, which represents the normal birth interval for females. Animals are sexually mature by age three. In the wild, cougars can live as long as 12 years.

References: Currier 1983; Hall 1981; Zeveloff 1988; Rickart & Robson 2005.



Cliff chipmunk (*Tamias dorsalis*)



Taxonomy:

Family Sciuridae. Six subspecies are recognized, including *Tamias dorsalis dorsalis*, the regional subspecies.

Description:

This medium-sized chipmunk has a smoky gray top, cinnamon colored sides, white underneath and pale grayish-white ears behind which is a bright white patch. A dark stripe runs down the center of the back, from shoulder to base of the tail, with fainter side stripes. Sides of face each have five contrasting brown and white stripes. The bushy tail is gray above and brownish-orange below.

Total length: 204-235 mm; Tail: 82-105 mm; Hind foot: 34-37 mm; Ear: 18-23 mm; Weight: 55-67 g.

Distribution:

North America: Distributed throughout the Rocky Mountain region of the US, Utah and Nevada south through New Mexico and Arizona into more central portions of northern Mexico.

Park region: Recorded, though relatively uncommon, at mid elevations between 6,000 and 7,700 feet (1,830-2,350 m).

Ecology and diet:

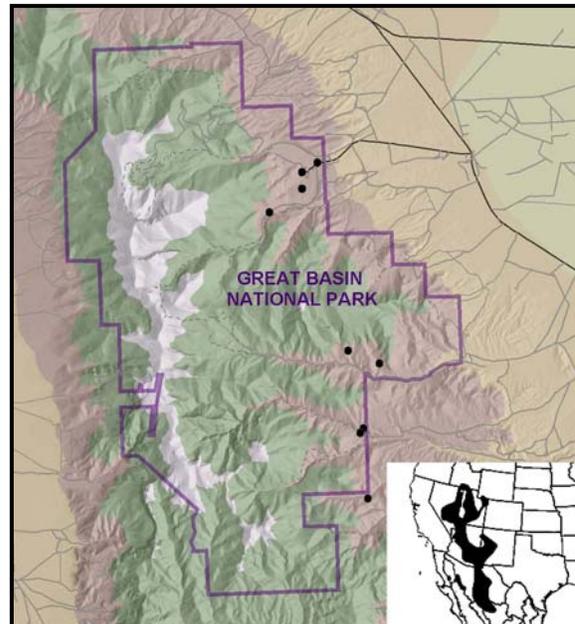
Cliff chipmunks live mid-elevation habitats, from sagebrush to piñon-juniper to montane forest plant communities. They are almost always associated with rocks, boulders, or cliffs (from which they get their common name) where they nest and cache food.

They predominantly eat seeds and other plant material, and occasionally insects and small vertebrates. Like other chipmunks they have internal pouches which they use to transport food items.

Life History:

This species has a long reproductive season extending from March to late autumn. Females have one litter of about 5 offspring annually. Gestation length is about 30 days. Young are probably sexually mature at 1 or 2 years.

References: Hart 1992; Rickart & Robson 2005



Least chipmunk (*Tamias minimus*)



Taxonomy:

Family Sciuridae. Twenty-one subspecies are recognized, including *Tamias minimus scrutator* which occurs in the park region.

Description:

Smallest of the chipmunks, with light cinnamon sides and a whitish belly. There are five dark and four light dorsal stripes on the body (including well-defined dark lower lateral stripes), and two light and two dark stripes on the face.

Total length: 173-203 mm; Tail: 71-113 mm; Hind foot: 28-32 mm; Weight: 30-54 g.

Distribution:

North America: Most widely distributed chipmunk occurring across Canada, from Yukon east to Hudson Bay and western Great Lakes region, and the mountainous western US from the Canadian border south to northern portions of New Mexico and Arizona and from the Sierra Nevada mountains east to the Rocky Mountains.

Park region: Common from low to high elevations between 5,300-9,200 feet (1,615 - 2,800 m).

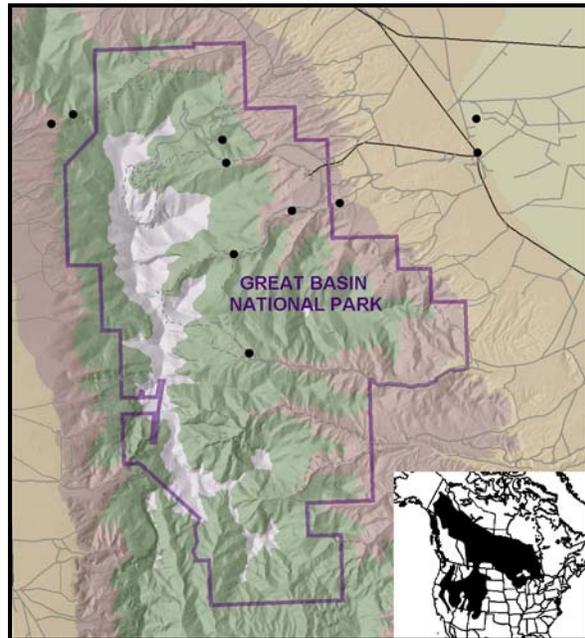
Ecology and diet:

Least chipmunks are generally found in open habitats, and in this region are often associated with sagebrush. They are diurnal, and primarily active on the ground but often climb or perch in trees and shrubs. They construct burrow systems with several tunnels each that include nesting and food-cache chambers. The diet consists mainly of seeds, but also includes green vegetation, insects, and fungi.

Life History:

Reproduction occurs in spring and early summer. Following a gestation of 28-30 days, females have one litter of 4-6 offspring. Young are sexually mature at 1 or 2 years. Maximum lifespan is 5-6 years.

References: Zeveloff 1988; Bergstrom 1999a; Rickart & Robson 2005.



Uinta chipmunk (*Tamias umbrinus*)



Taxonomy:

Family Sciuridae. Seven subspecies are recognized, including *Tamias umbrinus inyoensis* from the Park region.

Description:

Distinguished from the cliff chipmunk by its prominent dorsal stripes, and from the least chipmunk by its less well-defined dark lateral stripes and larger size (hind foot longer than 30 mm).

Total length: 210-240 mm; Tail: 84-119 mm; Hind foot: 30-34 mm; Ear: 17-19 mm; Weight: 51-80 g.

Distribution:

North America: Occurs in the central Rocky Mountain, Uintah, and Wasatch mountain systems, the southern Sierra Nevada range, and mountains of the interior Great Basin.

Park region: Found throughout the Park region, principally above 6,500 feet (1,980 m) elevation.

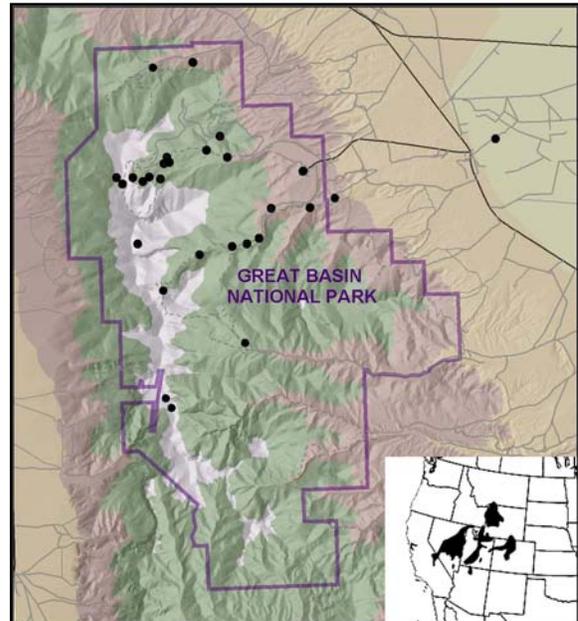
Ecology and diet:

Uinta chipmunks occur in wide variety of habitats over a broad elevational range, but are most numerous in forest and woodland habitat rather than open areas. They are good climbers and often forage in trees. Their diet consists primarily of seeds, but also includes other plant matter, fungi, and insects. As is the case with other chipmunks, this species is active during the day and hibernates during winter months. This is the most widespread and abundant chipmunk in the Park, often seen in campgrounds and picnic areas.

Life History:

Mating occurs in the spring upon emergence from hibernation. A litter of 4 to 5 young is born following a gestation of about 1 month. Only one litter is produced annually.

References: Bergstrom 1999b; Rickart & Robson 2005.



White-tailed antelope squirrel (*Ammospermophilus leucurus*)



Taxonomy:

Family Sciuridae. Nine subspecies are recognized, including *Ammospermophilus leucurus leucurus*, the regional subspecies.

Description:

Color pale brown-cinnamon above and whitish beneath with two white stripes down the back from shoulder to base of the tail. Tail is dark above and white below.

Total length: 188-223 mm; Tail: 43-71 mm; Hind foot: 35-40 mm; Ear: 8.5-10 mm; Weight: 96-117g.

Distribution:

North America: Southern Oregon east throughout Utah, western Colorado, northwest New Mexico, northern Arizona, the length of western California and the Baja peninsula.

Park region: Documented at low elevation sites between 5,275 and 7,000 feet (1,600-2,135 m).

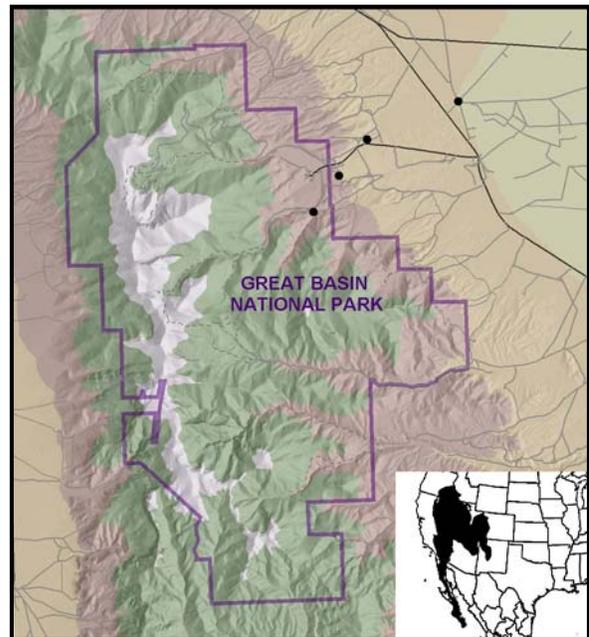
Ecology and diet:

Unlike other diurnal ground squirrels, this species does not hibernate during the winter but is active throughout the year. These squirrels have physiological and behavioral adaptations allowing them to cope with extremes of heat and aridity. They occur in a range of habitats from low elevation valley floors up to the juniper belt, although they are most common in desert shrub habitat with sandy or rocky soils. They are omnivorous, eating green vegetation, yucca, cacti, insects, and seeds.

Life History:

Reproduction occurs between February and June. Females have one litter annually of 5-14 young following a gestation of 30-35 days. Young are sexually mature at around one year old.

References: Belk & Smith 1990; Rickart & Robson 2005.



Golden-mantled ground squirrel (*Spermophilus lateralis*)



Taxonomy:

Family Sciuridae. Thirteen subspecies are recognized including *Spermophilus lateralis trepidus* from the Park region

Description:

Color grayish-brown above, with two white lateral stripes bordered by black stripes; yellowish-white below. Head, neck and shoulders reddish or buffy gold mantle. Tail brown above and yellowish below.

Total length: 355-410 mm; Tail: 120-158 mm; Hind foot: 35-46 mm; Ear: 12-24 mm; Weight (early spring): 325-500 g.

Distribution:

North America: Western US and Canada, from Colorado west to northern California, Oregon, southwestern Washington, western British Columbia and eastern Alberta south to New Mexico and northern Arizona.

Park region: Historical occurrence over a wide elevation range from 7,000 to 10,000 (2,135 - 3,050 m). Recently documented at higher elevations only.

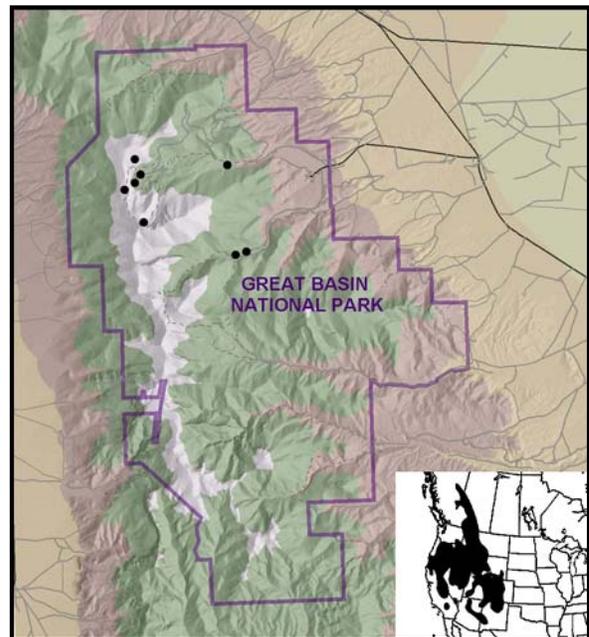
Ecology and diet:

Golden-mantled ground squirrels occupy a wide variety of habitats, from woodland and forest communities to alpine meadows. They may be more common in areas of natural or human-caused disturbance. They live in rock outcrops or underground burrow systems. The diet includes fungi, leaves, fruit, flowers, seeds, insects and some small vertebrates. They triple their body weight during the summer, fattening in preparation for long winter hibernation.

Life History:

Reproduction begins after the end of hibernation in March or April. Females have one litter of 5-6 offspring annually. Gestation length is 26-33 days. Young are sexually mature between 12-24 months. Maximum lifespan is 5-7 years.

References: Bartels & Thompson 1993; Rickart & Robson 2005.



Piute ground squirrel (*Spermophilus mollis*)



Taxonomy:

Family Sciuridae. Formerly considered a subspecies of *Spermophilus townsendii*, and therefore often referred to as Townsend's ground squirrel. Two subspecies are recognized including the regional form *Spermophilus mollis mollis*.

Description:

Distinguished from other diurnal ground squirrels in the region by the pale brownish-gray color, absence of stripes, and inconspicuous tail and ear.

Total length: 201-233 mm; Tail: 44-61 mm; Hind foot: 33-39 mm; Weight (during mating period): 82-205 g.

Distribution:

North America: Southeastern Oregon, southern Idaho, eastern California, western Utah, and most of Nevada. An isolated population occurs in south-central Washington.

Park region: Widespread, but restricted to sites in the Snake and Spring valleys below 6,100 ft (1,830 m) elevation.

Ecology and diet:

Piute ground squirrels occur in desert shrub habitat. During most of the year, they are dormant in underground burrows, in a combined period of hibernation and aestivation that includes both the coldest and hottest seasons. They emerge in the late winter to reproduce and to prepare for the long dormant period by laying up stores of body fat. They eat mainly green vegetation in the early spring, shifting to seeds as these become available, and occasionally eating insects and carrion.

Life History:

Males emerge from hibernation in late January or early February, and compete to mate with females which emerge later. A single litter of 6-14 young is produced annually following a gestation period of about 1 month. Young are weaned at about 1 month of age, and become sexually mature as yearlings. Adults may live for more than 5 years.

References: Hall 1946; Rickart 1987, 1999; Rickart & Robson 2005



Rock squirrel (*Spermophilus variegatus*)



Taxonomy:

Family Sciuridae. Eight subspecies are recognized. The regional subspecies is *Spermophilus variegatus robustus*.

Description:

Distinguished from other ground squirrels by its large size, variegated black, gray and white color, lack of stripes, and long bushy tail.

Total length: 430-540 mm; Tail: 172-252 mm; Hind foot: 53-65 mm; Ear: 15-29 mm; Weight: 450-875 g.

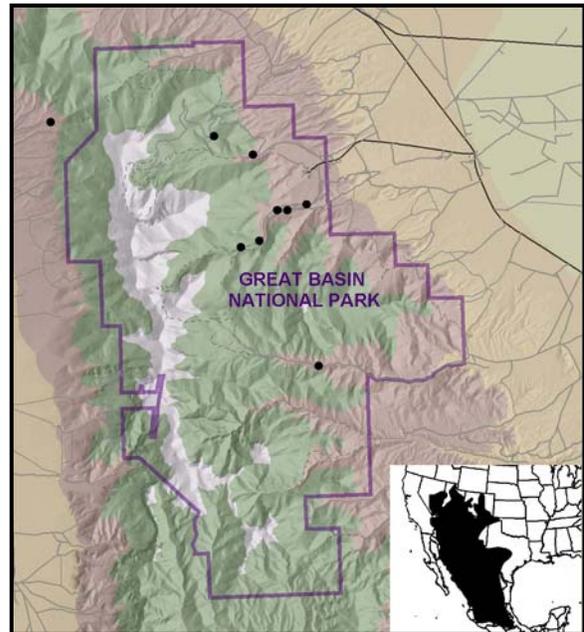
Distribution:

North America: Occurs from Colorado west to eastern Nevada and from northern Utah south into the Mexican state of Puebla.

Park region: Common at mid-elevations between 6,000 and 9,200 feet (1,830 - 2,800 m).

Ecology and diet:

As the common name implies, these squirrels are commonly seen in rocky habitats such as boulder fields, talus, rocky hillsides, cliffs, and steep canyons. They are active during the daytime and nest in burrows under rocks and trees. The broad diet includes nuts, seeds, fruit, green vegetation, insects, and some small vertebrates.



Life History:

Mating occurs in the spring. Females have one or sometimes two litters of 3-5 offspring annually. Gestation length is undocumented. Individuals are sexually mature as yearlings. Maximum lifespan is estimated at 2-3 years.

References: Oaks et al. 1987; Rickart & Robson 2005.

Yellow-bellied marmot (*Marmota flaviventris*)



Taxonomy:

Family Sciuridae. Also known as rockchuck. Eleven subspecies are recognized including *Marmota flaviventris avara* from the Park region.

Description:

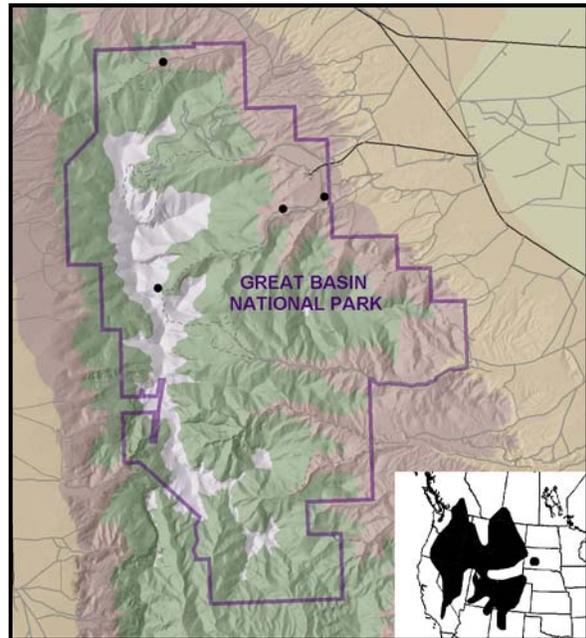
Large, thick-set body. Grayish saddle "frosted" with white, darker face, and yellowish-red below and along sides of the neck.

Total length: 470-700 mm; Tail: 126-220 mm;
Hind foot: 70-92 mm; Weight: 1.6-4.0 kg.

Distribution:

North America: Throughout the western US and Canada, from southern British Columbia and Alberta southward through Nevada, Utah, and Colorado. Found mainly at elevations above 6,000 feet (1,830 m).

Park region: Relatively uncommon. Documented at mid to high elevations between 7,000 and 12,200 feet (2,135-3,720 m).



Ecology and diet:

Marmots typically inhabit vegetated rocky slopes or rock outcrops in meadows. They burrow beneath the rocks where they nest and hibernate during the winter. They are herbivorous and eat a variety of grasses, flowers and forbs gaining substantial fat stores in preparation for winter hibernation.

Life History:

Reproduction begins soon after the end of hibernation in March or April. Females have one litter of 3-6 offspring annually. Gestation is about 30 days. Young are sexually mature at 2 years. Maximum lifespan is more than 10 years.

References: Frase & Hoffman 1980; Hoffmann 1999b.

Chisel-toothed kangaroo rat (*Dipodomys microps*)



Taxonomy:

Family Heteromyidae.
Also called Great Basin kangaroo rat. Thirteen subspecies are recognized including *Dipodomys microps bonnevilliei* which occurs in the Park region.

Description:

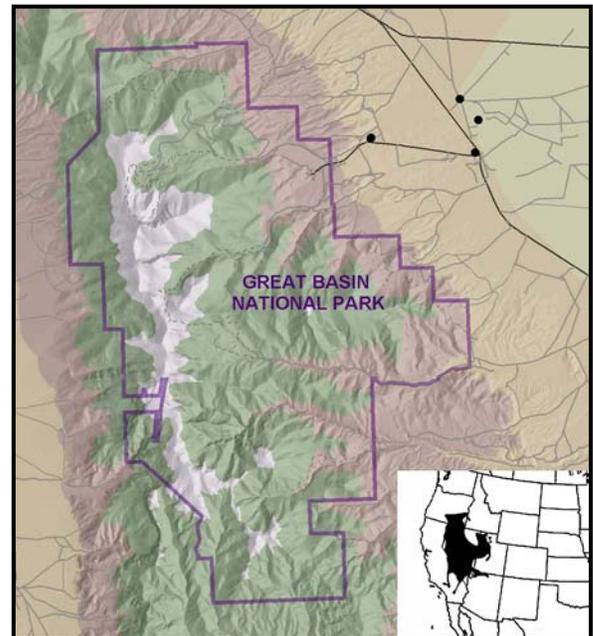
Color yellowish brown above and white below. Large head with large eyes and small ears. Disproportionately large hind feet and long tail with a tuft tip of dark hairs. Very similar to Ord's kangaroo rat. Distinguished by its lower incisors which have flattened anterior surfaces and wear to a straight, chisel-shaped tip.

Total length: 208-365 mm; Tail length: 127-129 mm;
Hind foot: 38-39 mm; Ear: 12-13 mm; Weight: 50-55 g.

Distribution:

North America: Restricted to the intermountain region from western California to central Utah, and southern Idaho south to northern Arizona.

Park region: Documented in the Spring and Snake valleys and adjacent bajadas from 5,220 to 6,300 feet (1,590-1,920 m) elevation.



Ecology and diet:

Whereas other kangaroo rats are strictly seed eaters, the chisel-toothed kangaroo also feeds on leaves of desert shrubs, particularly shadscale and blackbush, using its flat lower incisors to strip the salty outer leaf cuticle. Where this species occurs along with Ord's kangaroo rat, it is found on loose gravelly slopes and valley floors in close association with its preferred food plants. They are often seen on roads at night.

Life History:

Reproduction begins in early spring through late summer. Females have 1-2 litters of 1-4 offspring annually. Gestation length is 30-34 days. Age at sexual maturity is about 6-12 months old. Maximum lifespan is estimated at 4 years.

References: Hayssen 1991, 1999.

Ord's kangaroo rat (*Dipodomys ordii*)



Taxonomy:

Family Heteromyidae. Thirty-four subspecies are recognized including, including the regional form, *Dipodomys ordii celeripes*.

Description:

Fur is yellowish-brown above and white below. Large head with large eyes and small ears. Disproportionately large hind feet and long tail with a tuft tip of dark hairs. Very similar to chisel-toothed kangaroo rat, but distinguished by its rounded and pointed lower incisors.

Total length: 208-365 mm; Tail length: 127-129 mm; Hind foot: 38-39 mm; Ear: 12-13 mm; Weight: 50-55 g.

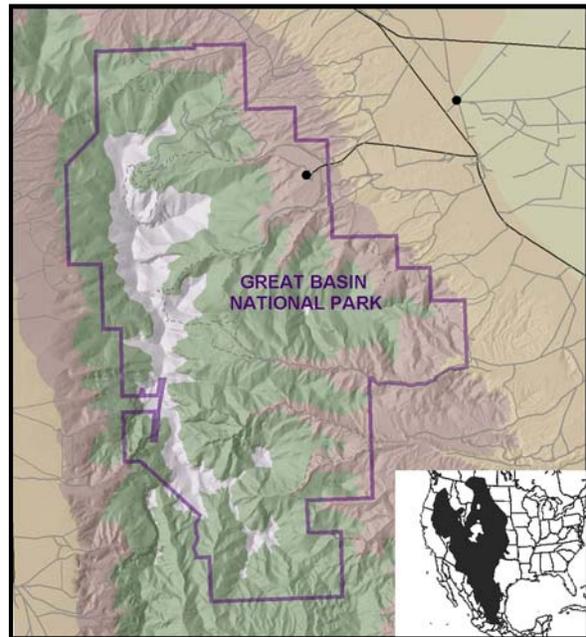
Distribution:

North America: Southern Alberta and Saskatchewan south through much of the western US to Hidalgo, Mexico.

Park region: Documented in Snake Valley and the eastern slopes of the Snake Range from 5,275 to 6,300 feet (1,605-1920 m).

Ecology and diet:

Ord's kangaroo rat lives in habitats associated with fine, sandy soils where they dig burrows for nesting and caching seeds collected in their fur-lined external cheek pouches. It is commonly associated with juniper, sagebrush, saltbush, and other desert scrub. Primarily a seed eater, it also eats green vegetation and occasionally insects. This species is active year round and is strictly nocturnal, but it is often seen along roads at night.



Life History:

Reproduction occurs from early spring through late summer. Females have 1-2 litters of 3-5 offspring annually. Gestation lasts 28-32 days. Age at sexual maturity is about 3 months, and maximum lifespan is 7 years.

References: Garrison & Best 1990.

Dark kangaroo mouse (*Microdipodops megacephalus*)



Taxonomy:

Family Heteromyidae. Twelve subspecies are recognized including *Microdipodops megacephalus paululus* from the Park region.

Description:

Brownish-gray above with lighter underparts. Tail thickest in the middle, covered with short hairs, and lacks a tufted tip. Soles of hind feet haired.

Total length: 140-177 mm; Tail: 68-103 mm; Hind foot: 23-27 mm; Weight: 12-15 g.

Distribution:

North America: Restricted to the Great Basin and southern Columbia Plateau, including southeastern Oregon, eastern California, western Utah, and much of Nevada. Elevation range from 3,900 to 8,000 feet (1,190-2,440 m).

Park region: Known only from Spring Valley, west of the Park, at 6,275 feet (1,912 m) elevation. No recent surveys have been done in Spring Valley to confirm their current presence. Appropriate habitat is also present in Snake Valley.

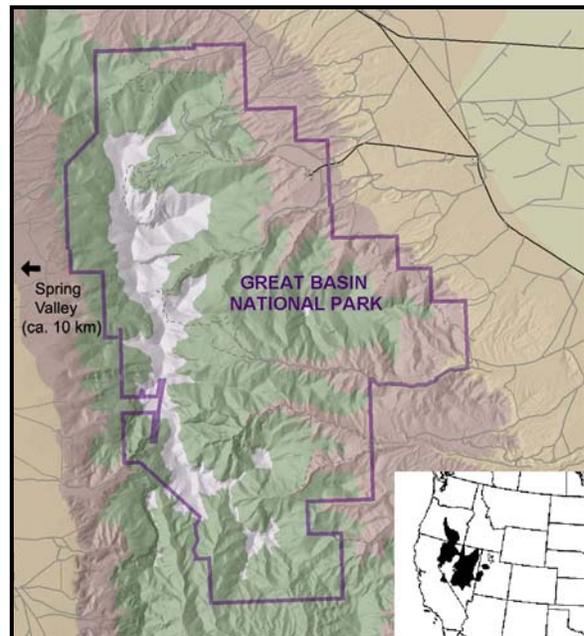
Ecology and diet:

Dark kangaroo mice live in stable sand dunes and sandy soils associated with sagebrush and shadscale. They are nocturnal with above-ground activity greatest during the first two hours after sunset. They dig simple burrows with several chambers where they hibernate during the winter months.

Life History:

Reproduction begins in early spring through late summer. Females have 1-2 litters of 2-7 offspring annually. Gestation length and age at sexual maturity is undocumented. Maximum lifespan is about 5 years.

References: Hall 1946; O'Farrell 1999.



Long-tailed pocket mouse (*Chaetodipus formosus*)



Taxonomy:

Family Heteromyidae. Formerly placed in the genus *Perognathus*. Seven subspecies are recognized including *Chaetodipus formosus incolatus*, the regional subspecies.

Description:

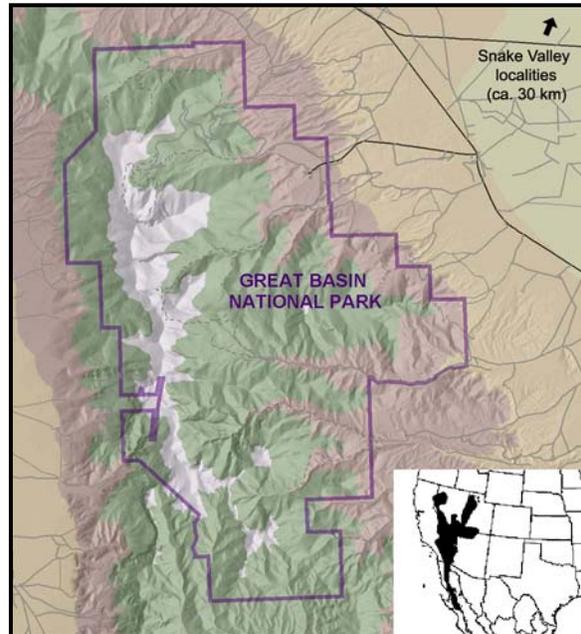
Medium-sized pocket mouse with external fur-lined cheek pouches. Tawny-brown above and lighter below. Tail is long with a distinctive dark stripe on the last third and a tufted tip.

Total length: 172-211 mm; Tail: 86-125 mm; Hind foot: 21-26 mm; Ear: 9 mm; Weight: 14-25 g.

Distribution:

North America: Found throughout the dry regions of western US and the eastern coast of the Baja peninsula.

Park region: Documented at sites in the northern Snake Valley between 5,800 and 6,300 ft (1,765-1,920 m) elevation. May occur more widely in suitable habitat.



Ecology and diet:

Long-tailed pocket mice are typically found in arid, rocky habitats at low- to mid-elevations. They construct underground burrow systems in open areas of desert shrubland with gravelly soil, along pebbly washes, and among large boulders. They are nocturnal and are inactive during cold nights and winter months. Primarily vegetarians, they eat mostly seeds, leaves, flowers, fruits, and some insects.

Life History:

Reproduction occurs in early April through July. Females have 1-2 litters annual, each averaging 5 young. Gestation length is between 26-33 days. Young are sexually mature between 12-24 months. Maximum lifespan is 4-5 years.

References: Geluso 1999; Hall 1946.

Little pocket mouse (*Perognathus longimembris*)



Taxonomy:

Family Heteromyidae. There are 16 subspecies, including the regional race *Perognathus longimembris gulosus*.

Description:

Distinguished by its long, tufted tail, external cheek pouches, small body size, and short hind foot with a naked sole.

Total length: 125-137 mm; Tail: 70-74 mm; Hind foot: 19 mm; Weight: 6-9 g.

Distribution:

North America: Southeastern Oregon, Nevada, western Utah, and south-central California south into southern Arizona, northern Baja California, and northwestern Sonora, Mexico.

Park region: The only regional records are from the Snake Valley, east and north of the Park. This species is probably restricted to areas below 5,500 ft (1,675 m) elevation.

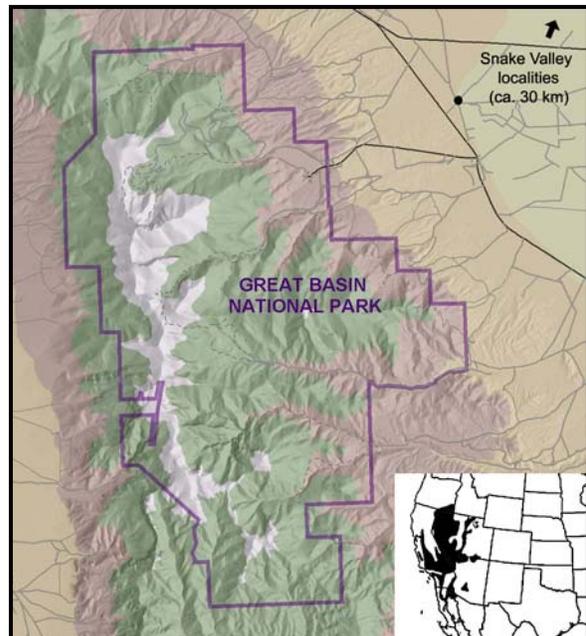
Ecology and diet:

Little pocket mice occur in some of the most arid habitats of the West, including the Great Basin and Mojave deserts. As with other heteromyid rodents, they forage at night for seeds, which are carried in their external cheek pouches and stored in underground caches. Little pocket mice hibernate during the coldest months.

Life History:

Breeding occurs in early spring following emergence from hibernation. Litters of 1 to 6 young are born after a gestation period of 25 days. Females may have multiple litters in wet years. Young are weaned in 2-3 weeks and reach sexual maturity when 6 weeks old. Captives have lived more than 8 years.

References: Hall 1946; Zveloff 1988; French 1999.



Great Basin pocket mouse (*Perognathus parvus*)



Taxonomy:

Family Heteromyidae. There are 12 subspecies including *Perognathus parvus olivaceous* which occurs in the Park region.

Description:

Small rounded ears and large feet. External, fur-lined cheek pouches. Color yellowish-gray above, whitish below, with a yellowish lateral line. Tail slightly longer than the head-body length, dark above and white below with a slight tuft at tip.

Total length: 160-190 mm; Tail length: 77-95 mm; Hind foot: 22-25 mm; Ear: 6-9 mm; Weight: 17-21 g.

Distribution:

North America: South-central British Columbia south through central Washington and Oregon and the Great Basin to the northernmost part of Arizona.

Park region: Common over a broad range of elevations from 5,275 to 8,000 feet (1,610 - 2,440 m).

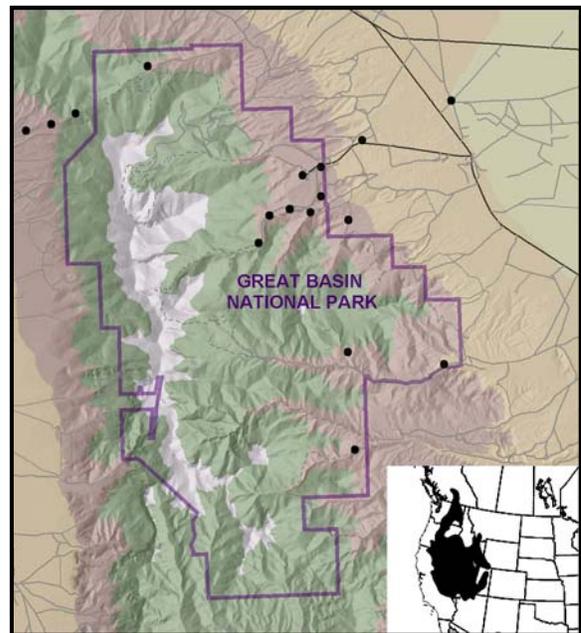
Ecology and diet:

Great Basin pocket mice typically occur in arid or semiarid habitats with sandy soil dominated by sagebrush. They occupy underground nests and are active at night, although occasionally are seen near dusk. They hibernate during winter months. They are primarily seed eaters but also consume succulent vegetation and insects.

Life History:

Reproduction occurs from early spring through late summer. Females have 1-3 litters of 2-8 offspring annually. Gestation length is 21-28 days.

References: Verts & Kirkland 1988; Kirkland 1999.



Botta's pocket gopher (*Thomomys bottae*)



Taxonomy:

Family Geomyidae. Also known as valley pocket gopher. More 195 subspecies have been named, including *Thomomys bottae centralis* from the Park region.

Description:

Body robust with a short tail and short, strong limbs. Small eyes and ears, strong incisors, and large fur-lined external cheek pouches. Color grayish brown, fur soft and velvety.

Total length: 150-280 mm; Tail: 55-92 mm; Hind foot: 27-32 mm; Weight: 80-250 g.

Distribution:

North America: Western US from southern Oregon to west Texas southward into northern Mexico, and the entire Baja peninsula.

Park region: Common at mid to high elevations from 6,000 to 10,500 feet (1,830-3,200 m).

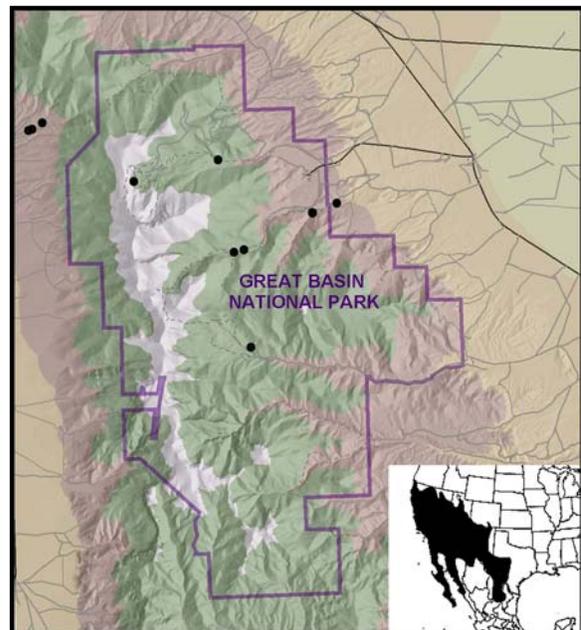
Ecology and diet:

Botta's pocket gophers typically occur in deep soils at low elevations, but in the Park region occur over a broader range of elevation and soil types. They are, however, particularly limited by hard soils. They use their large incisor teeth and powerful limbs to excavate elaborate burrow systems, typically leaving fan-shaped surface mounds where excavated dirt is deposited. In the spring, snake-like tubes of dirt (gopher eskers) are seen where gophers have been active beneath the winter snow. They are non-social, and burrow systems are occupied by single animals or females with dependent young. Gophers eat a variety of bulbs, underground tubers, green plant material, and seeds. They are active day and night, but above ground only at night.

Life History:

Breeding occurs during the spring and summer. Females may have up to four litters of 4-5 offspring each litter per year. Gestation is about 19-21 days. Gophers are sexually mature as yearlings. Average lifespan is 2-3 years.

References: Jones & Baxter 2004; Rickart & Robson 2005.



American beaver (*Castor canadensis*)



Taxonomy:

Family Castoridae. Also called Canadian beaver. About 24 subspecies have been named, including *Castor canadensis baileyi*, the regional subspecies.

Description:

Easily distinguished from other regional mammals by its size, and specializations for semi-aquatic life.

Total length: 1-1.2 m; Tail: 230-325 mm; Weight: 16-30 kg.

Distribution:

North America: Includes most of North America north of Mexico; absent only from the high arctic and portions of the southwest and Great Basin.

Park region: The Park is at the margin of the known historical range. There are no early specimen records, but evidence of former presence (old dams stumps) has been found in several areas of the Park. Recent occurrence in the lower Strawberry drainage.

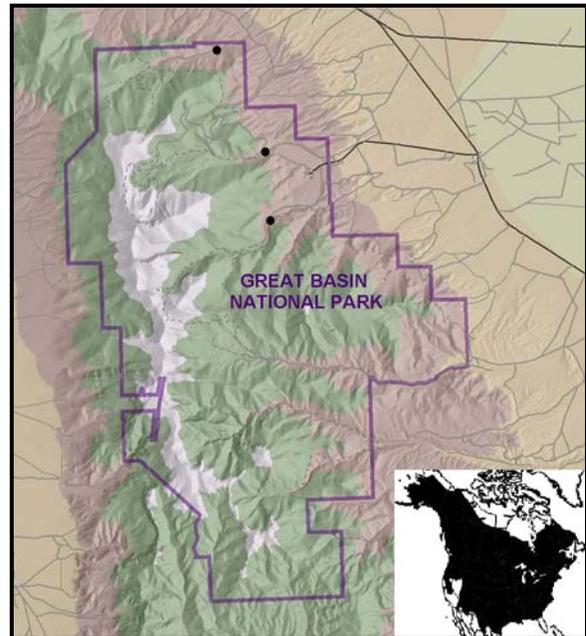
Ecology and diet:

Beaver are highly specialized semi-aquatic mammals that are closely associated with riparian habitats. In areas with steep gradient streams, they construct dams and channels to maintain sufficient water depths for living space and to gain safe access to feeding areas. The diet consists of leaves and inner bark of a wide variety of trees and shrubs, although the preferred species in the west are aspen and willows. Although beaver activity often involves extreme habitat modification, these changes result in much greater diversity in riparian areas.

Life History:

Unlike most mammals, beaver are generally monogamous and form long-term pair bonds. Colonies consist of a mated pair and dependent young from 1 or more litters. Mating occurs in mid to late winter, and after a gestation of about 100 days, litters of 1-7 young are born in late spring or early summer. Young remain in the colony after weaning but disperse at maturity (1.5-2.5 years). Adults may live for 20 years.

References: Hall 1946; Jenkins & Bushar 1979; Rickart & Robson 2005.



Western harvest mouse (*Reithrodontomys megalotis*)



Taxonomy:

Family Cricetidae. Sixteen subspecies are recognized, including the regional form *Reithrodontomys megalotis megalotis*.

Description:

Small size, color grayish-brown above and paler below. Tail about as long as the head-body and faintly bicolored. Front surface of upper incisors grooved.

Total length: 118-170 mm; Tail: 50-96 mm; Hind foot: 15-18 mm; Ear: 12-15 mm; Weight: 8-15 g.

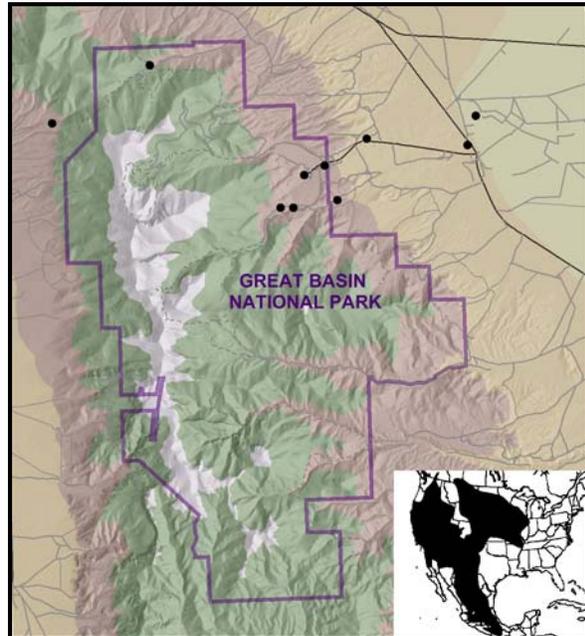
Distribution:

North America: Southwestern Canada south to southern Mexico, from California coastline east to the mid western US.

Park region: Common at low to mid elevations from 5,340 to nearly 8,000 feet (1,630-2,440 m).

Ecology and diet:

Western harvest mouse typically occur in grassy and weedy habitats. They live in nests on the ground under heavy grasses or fallen logs. They are primarily seed eaters but also eat green plant material. Recent surveys indicate that their regional distribution and abundance may be increasing with the rapid invasive expansion of cheatgrass and other non-native annual plants.



Life History:

Reproduction occurs from early spring to late autumn at higher elevations. Seasonally breeding females have multiple litters of 2-6 offspring each. Gestation length is 23-24 days and young are sexually mature at around 4 months. Average lifespan is less than 12 months.

References: Hall 1981; Webster & Jones 1982; Rickart & Robson 2005.

Canyon mouse (*Peromyscus crinitus*)



Taxonomy:

Family Cricetidae. Eight subspecies are recognized, including the regional subspecies *Peromyscus crinitus pergracilis*.

Description:

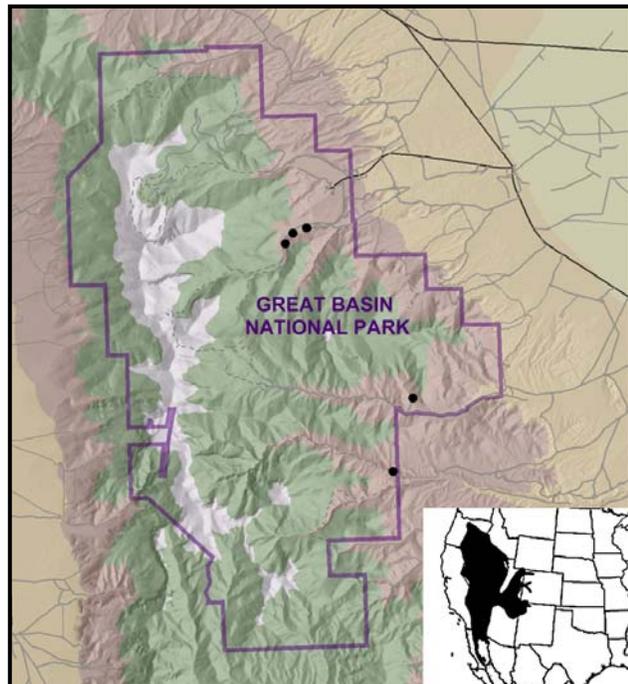
Yellowish-brown above and whitish-gray below. Sides are brighter than the back. Tail is longer than the head and body, bi-colored, and with a tufted tip. Ears are about as long as the hind foot.

Total length: 161-192 mm; Tail: 82-118 mm; Hind foot: 18-25 mm; Ear: 17-23 mm; Weight: 13-23 g.

Distribution:

North America: Western US from Oregon, Idaho, and Wyoming south to northwestern Sonora and Baja, Mexico. Occurs across a broad elevational gradient, sea-level to 10,000 feet (3,050 m)

Park region: Documented at low to mid elevations between 5,800 and 7,700 feet (1,770 – 2,350 m).



Ecology and diet:

Canyon mice are generally restricted to areas such as rock outcrops, boulder fields, and cliff faces. They are nocturnal and omnivorous, consuming seeds, insects, and green vegetation in amounts dependent upon seasonal availability.

Life History:

Reproduction occurs between April and October. Females average 2 litters of 1-4 offspring per year. Gestation length is about 24-30 days. Young are sexually mature within 4-6 months.

References: Johnson & Armstrong 1987; Rickart & Robson 2005.

Deer mouse (*Peromyscus maniculatus*)



Taxonomy:

Family Cricetidae. Also called wood mouse. More than 60 subspecies are recognized, including *Peromyscus maniculatus sonoriensis* which occurs in the Park region.

Description:

Distinguished from other species of *Peromyscus* by the combination of relatively short ears, and strongly bicolored tail which is shorter than the head and body and lacks a terminal tuft of hair.

Total length: 148-180 mm; Tail: 56-82 mm; Hind foot: 19-22 mm; Ear: 16-20 mm; Weight: 20-30 g.

Distribution:

North America: Occurs throughout the southern half of Canada and most of the contiguous US except for the parts of the southeast, south into central Mexico including the Baja peninsula.

Park region: Found throughout the Park region at all elevations.

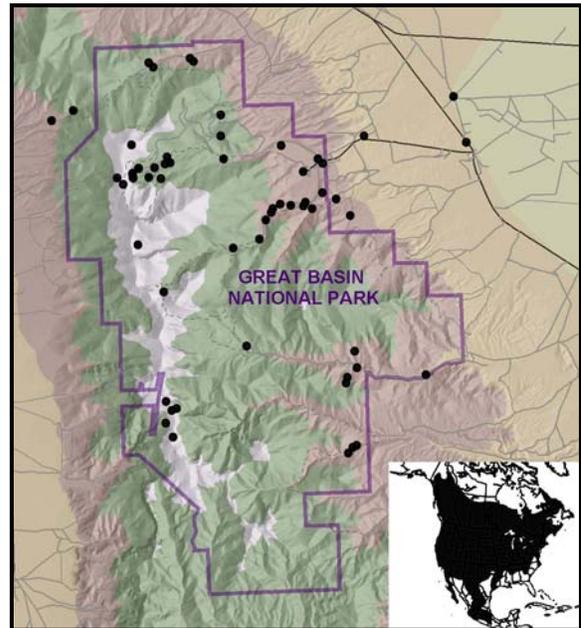
Ecology and diet:

The deer mouse is the most widespread and locally abundant mammal in western North America, occurring in virtually all habitats from arid deserts to alpine tundra. Within the Park region, it has been recorded from low-elevation valley bottoms to areas above timberline. Deer mice are active year-round and are nocturnal, although they are occasionally seen near dusk. Their diet consists mainly of seeds and wild fruits, but they feed opportunistically on a wide assortment of plant and animal matter.

Life History:

After gestation of 21-27 days, females give birth to 1-8 young. They may have up to 4 litters per year between late winter and fall, and the breeding season may be prolonged when winters are mild. Young animals may mature as early as 5 weeks of age. Adults generally do not live longer than 1 year.

References: Handley 1999; Rickart & Robson 2005.



Piñon mouse (*Peromyscus truei*)



Taxonomy:

Family Cricetidae. Also called big-eared mouse. Eleven subspecies are recognized, including *Peromyscus truei nevadensis* from the Park region.

Description:

Color grayish-brown above, white below. Tail is sharply bi-colored tail and nearly as long as the head-body length. Ears are very large, usually equal to or slightly longer than the hind feet.

Total length: 171-231 mm; Tail: 76-123 mm; Hind foot: 21-27 mm; Ear: 18-26 mm; Weight: 19-31 g.

Distribution:

North America: Northwest Texas to the Pacific coast, and from central Oregon to southern Mexico.

Park region: Documented at low to mid-elevations between 5,340 and 7,700 feet (1,630-2,350 m) and high elevations above 10,500 feet (3,200 m).

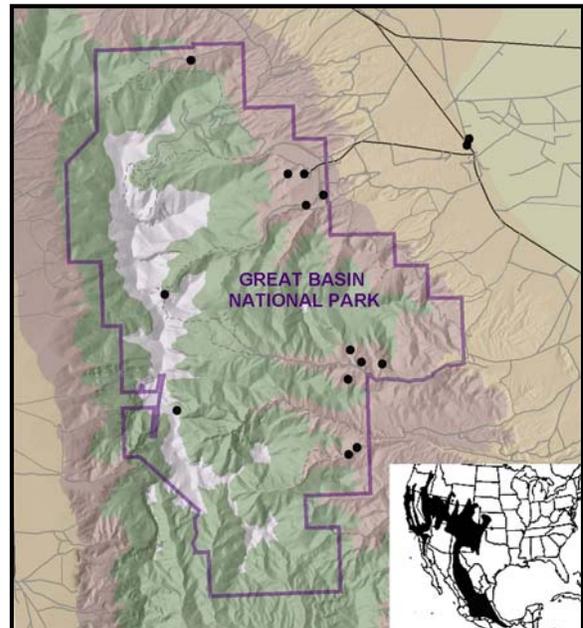
Ecology and diet:

Piñon mice are most closely associated with rocky areas in piñon-juniper habitat. However, they are also found in bristlecone and limber pine near timberline. They are excellent climbers and often nest in the hollows of juniper trees. Diet consists of piñon and other pine nuts, juniper berries, other plant material, and insects.

Life History:

Reproduction occurs between April and September. Females may have several litters of 3-6 offspring per year. Gestation length is about 25-27 days. Young may be sexually mature within 3 months. Average lifespan is about 1 year.

References: Hall 1946; Hoffmeister 1981; Rickart & Robson 2005.



Northern grasshopper mouse (*Onychomys leucogaster*)



Taxonomy:

Family Cricetidae. Eleven subspecies are recognized, including *Onychomys leucogaster brevicaudus*, the regional subspecies.

Description:

Robust body, grayish-brown above and white below. The tail is thick with a blunt tip, and is less than one-half the head-body length.

Total length: 119-190 mm; Tail: 29-62 mm; Hind foot: 17-25 mm; Ear: 12-17 mm; Weight: 25-38 g.

Distribution:

North America: Distributed from Saskatchewan, Alberta, and Manitoba, south throughout the intermountain western US into northern Mexico.

Park region: Documented at low elevations in the Snake Valley east of the Park.

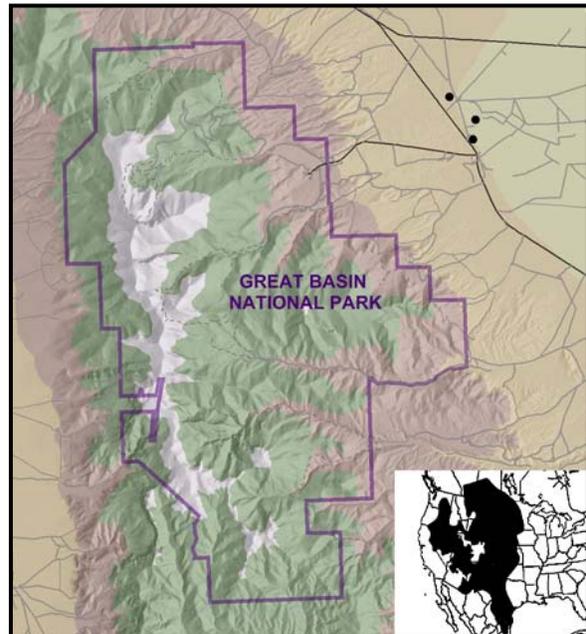
Ecology and diet:

Unlike other regional rodents, northern grasshopper mice are primarily insectivorous and carnivorous, eating grasshoppers, beetles, mice, and small vertebrates, but also consume seeds. They live in semi-arid and arid habitats and are active throughout the year. They utilize underground burrows as nest and places to cache food. Grasshopper mice have large ranges and aggressively defend their territories from intruders. They engage in complex courtship rituals and communicate with a variety of vocalizations.

Life History:

Reproduction begins in March or April. Females have 3-6 litters of 3-4 offspring annually. Gestation is about 27 days. Young are sexually mature between 6-12 months old. Maximum lifespan is 3-4 years.

References: Macarty 1978; Riddle 1999.



Bushy-tailed woodrat (*Neotoma cinerea*)



Taxonomy:

Family Cricetidae. Also called the pack rat or trade rat. Thirteen subspecies are recognized, including *Neotoma cinerea acraia*, the regional subspecies.

Description:

Largest of the woodrats with a bushy tail that is almost 75% of body length. Tail is sharply bi-colored, white below and dusky above. Body is brownish- gray above and white below.

Total length: 273-470 mm; Tail: 120-223 mm; Hind foot: 30-52 mm; Weight: 166-585 g.

Distribution:

North America: Southern Yukon south to the Sierra Nevada range, northeastern Arizona, and northern New Mexico. Elevational range from near sea level to 11,800 feet (3,600 m).

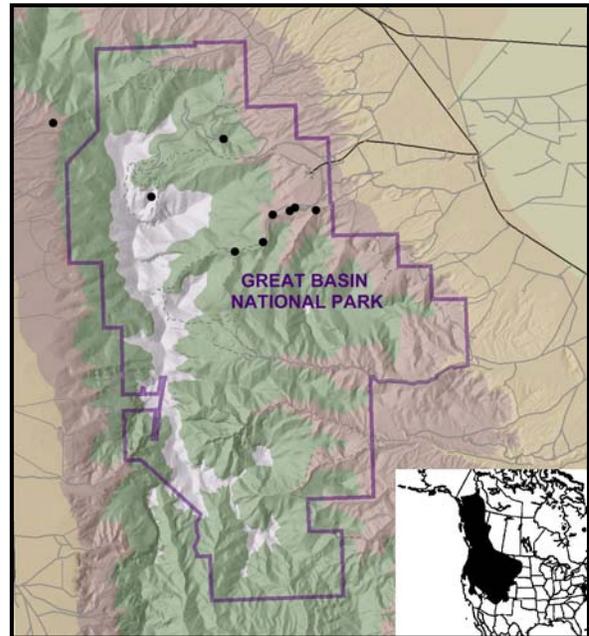
Park region: Documented at mid to high elevations from 7,200 to 10,800 feet (2,195 - 3,290 m). While historically widespread, records of current occurrence are sparse.

Ecology and diet:

Bushy-tailed woodrats have a broad diet that includes leaves, bark, seeds, and fruits. They live in sheltered rocky situations such as cave entrances or rock crevices in cliffs, talus slopes, and boulder fields, in habitats ranging from piñon-juniper woodland to alpine communities. In such areas they place sticks and other materials to build dens, which form middens which, over multiple generations of use, can become very large. Woodrats urinate on middens, producing encrustations called amberat. Over time, the accumulated amberat preserves midden materials, some of which may be tens of thousands of years old.

Life History: Reproduction occurs between May through August. Females have 1-3 litters of 3-5 offspring annually. Gestation length is 27-32 days. Young are sexually mature as yearlings. Lifespan is approximately 3 years.

References: Hall 1946; Rickart & Robson 2005; Smith 1997.



Desert woodrat (*Neotoma lepida*)



Taxonomy: Family Cricetidae. Also called desert pack rat. Twenty-three subspecies are recognized, including *Neotoma lepida lepida* from the Park region.

Description:

Relatively small with a short tail (about 75% of length of head and body) that is bi-colored and covered in short hairs. Ears are long (only slightly shorter than the hindfeet) and lightly furred. Body is pale buffy to dark gray above and white below.

Total length: 281-407 mm; Tail: 122-198 mm; Hind foot: 27-38 mm; Ear: 27-38 mm; Weight: 122-350 g.

Distribution:

North America: Southeastern Oregon, southwest Idaho, and northeastern California to western Utah and New Mexico, and throughout the Baja peninsula.

Park region: Documented at low to mid-elevations from 5,600 to 8,500 feet (1,700 – 2,600 m).

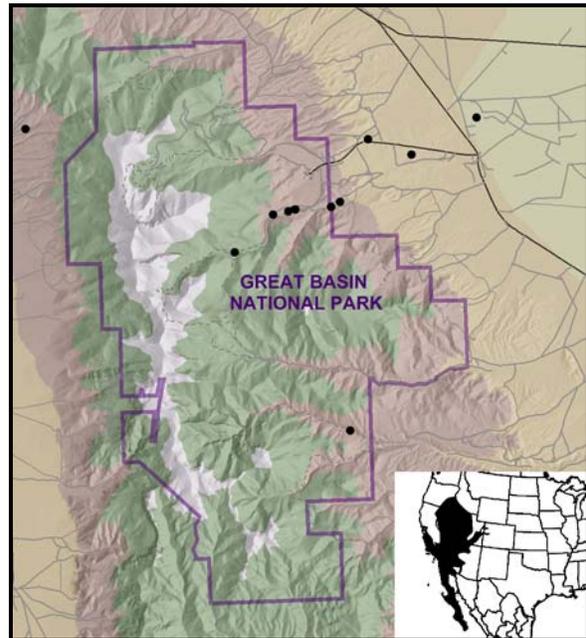
Ecology and diet:

Desert woodrats are closely associated with desert scrub and piñon-juniper habitat. They prefer alcoves and rocky crevices where they construct large, conspicuous nests from a variety of debris. Their nests are mortared by plant residue, unlike the urine encrustations of bushy-tailed woodrats. While shelters are simpler than those of bushy-tailed woodrats, they can be very extensive with up to 6 entrances and up to 8 internal chambers, some of which are used for storing food caches. Desert woodrats have specialized diets focusing on several plant species specific to their local ecology. They are active at night to avoid high daytime temperatures typical of low elevation.

Life History:

Reproduction occurs in early spring through summer. Females average 1-4 litters of 1-5 offspring per year. Gestation length is 30-36 days. Lifespan is 3-4 years.

References: Rickart & Robson 2005; Verts & Caraway 2002.



Long-tailed vole (*Microtus longicaudus*)



Taxonomy:

Family Cricetidae. Fourteen subspecies are recognized, including *Microtus longicaudus latus*, the regional subspecies.

Description:

Small-thick bodied vole with a long, bi-colored tail that is about 1/3 total length. Fur is dull gray or brownish-gray interspersed with long, black-tipped hairs.

Total length: 155-202 mm; Tail: 49-81 mm; Hind foot: 21-24mm; Weight:36-59 g.

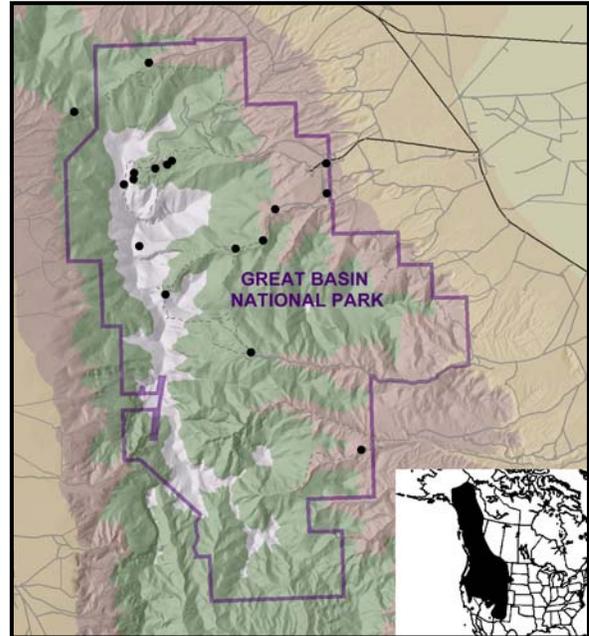
Distribution:

North America: Western US and Canada, from southern Alaska southward to northern California, Nevada, Arizona and west of the Rocky Mountains.

Park region: Abundant throughout the region at elevations above 7,000 feet (2,135 m).

Ecology and diet:

Long-tailed voles occur in a broad range of habitats, including dry grassland, riparian zones, sub-alpine meadows, and alpine tundra above timberline. They primarily eat green plant material but also consume fruits and seeds. Unlike montane voles, they do not ordinarily construct obvious surface runways. They are active year-round. Although active mainly at night, they often are seen during the daytime in areas of heavy grass cover.



Life History:

Reproduction occurs between May and October. Females have an average of two litters of 2-6 offspring annually. Average lifespan is less than one year.

References: Rickart & Robson 2005; Smolen 1999.

Montane vole (*Microtus montanus*)



Taxonomy:

Family Cricetidae. Fifteen subspecies are recognized, including *Microtus montanus micropus* from the Park region.

Description:

Color brown above, often with a buffy or gray wash and a mixture of black-tipped hairs. Sides are paler, and underparts grayish-white. Tail is less than 1/3 the total length and faintly bicolored.

Total length: 140-220 mm; Tail: 24-69 mm; Hind foot: 14-27 mm; Weight: 37-85 g.

Distribution:

North America: From the Rocky Mountains west to the eastern Cascade and Sierra Nevada ranges, and from south British Columbia, Canada to northern New Mexico.

Park region: Documented over a broad elevation range from 5,220 and 10,200 feet (1,590-3,110 m).

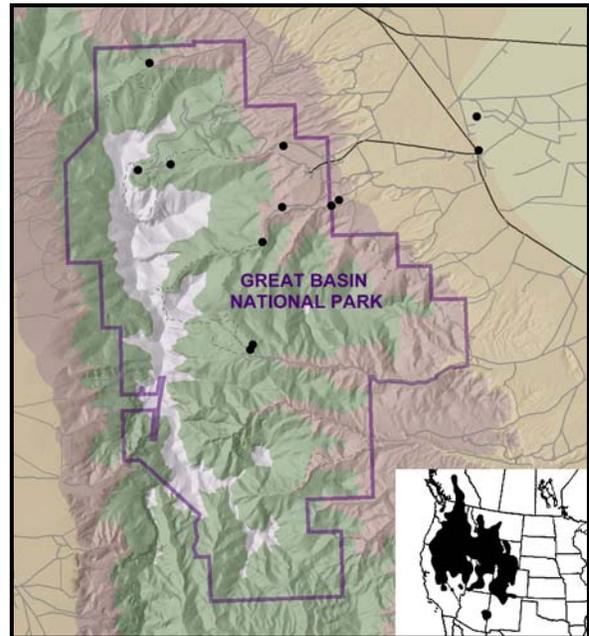
Ecology and diet:

Montane voles occur in a wide range of habitats, from low elevation marshes to alpine meadows, but are closely associated with wet areas dominated by grasses or sedges. They are active in all seasons and although they are primarily nocturnal are often seen moving along surface runways which they construct through grassy vegetation. They nest either in sub-surface burrows, or, where the soil is very wet, in surface nests of vegetation. Diet consists mainly of grasses, sedges, and rushes.

Life History:

Reproduction occurs in the spring after snowmelt (April-May) through September. Gestation length is about 21 days and young are sexually mature within 2 months. Females have two to three litters of 5-6 offspring each during a reproductive season. Average lifespan is approximately 6-9 months.

References: Rickart & Robson 2005; Sera & Early 2003.



Sagebrush vole (*Lemmiscus curtatus*)



Taxonomy:

Family Cricetidae. Formerly placed in the genus *Lagurus*. Six subspecies are recognized including *Lemmiscus curtatus intermedius* from the Park region.

Description:

Distinguished from other voles (*Microtus*) by its pale, grayish-brown color and very short tail.

Total length: 103-142 mm; Tail: 15-26 mm; Hind foot: 15-18 mm; Weight: 17-38 g.

Distribution:

North America: Northern Great Plains, central Rocky Mountains, Great Basin, and Columbia Plateau.

Park region: There are relatively few records from the Park region. Records from the North Snake Range span a broad elevation range from 5500 to 10,000 ft (1675-3050 m).

Ecology and diet:

As the common name implies, this species is mainly confined to regions dominated by sagebrush, particularly big sagebrush (*Artemisia tridentata*). Sagebrush voles often occur in colonies, characterized complex systems of burrows lined with vegetation. The diet consists of green vegetation, including sagebrush leaves, grass, and forbs. They are active both day and night throughout the year.

Life History:

Most reproduction occurs during the spring and summer, but may occur at any time when green vegetation is available. Gestation is 25 days, and females may produce 3 or 4 litters of up to 13 young per year. Young animals are weaned by 3 weeks, and become sexually mature at 2-3 months.

References: Hall 1946; Smith 1999.



Muskrat (*Ondatra zibethicus*)



Taxonomy:

Family Cricetidae. Sixteen subspecies are recognized, including the regional form *Ondatra zibethicus mergens*.

Description:

Most similar to the beaver, from which it is distinguished by its smaller size and relatively long slender tail.

Total length: 410-620 mm; Tail: 180-295 mm; Hind foot: 70-82 mm; Weight: 0.7–1.8 kg.

Distribution:

North America: Alaska and most of Canada excluding the high arctic, south through most of the US except portions of the southwest and southeast.

Park region: Historically absent from much of the interior Great Basin, but purposefully introduced to many wetland areas. There are no historical records from the Park region, but now present in Big Spring Creek and Pruess Lake in the southern Snake Valley and recently sighted on Baker Creek.

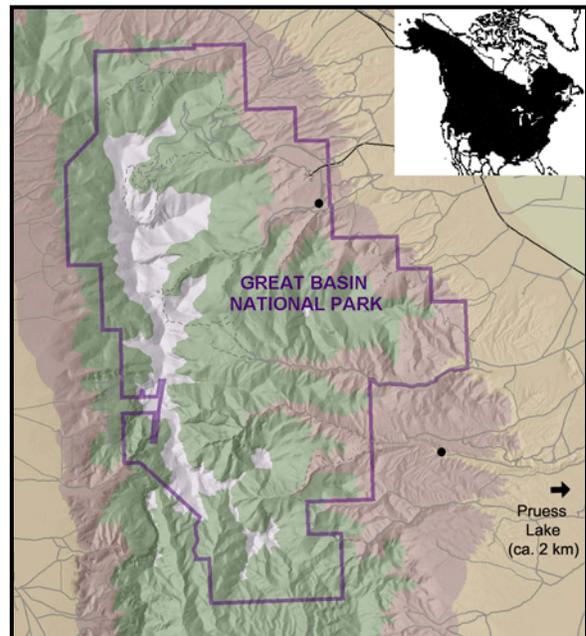
Ecology and diet:

Muskrats are semi-aquatic, occurring in a wide variety of habitats including streams, ponds, and marshes. Although they don't construct dams, they do build conspicuous lodges and swimming channels in marshes or tunnels and underground dens along streams. They are active year-round and are generally nocturnal but occasionally are seen during daylight. Muskrats feed on leaves, stems and tubers of a wide variety of aquatic plants, but also eat fish, crayfish, snails, and other aquatic animals.

Life History:

Reproduction occurs during the spring and summer. Litters of 4 to 8 young are born after a gestation of about 1 month. Under favorable conditions, females may produce as many as 4 litters per year. Young are weaned at about 1 month, and generally become sexually mature the spring following their birth. Life span is 3 to 4 years.

References: Hall 1981; Rickart & Robson 2005; Willner et al. 1980.



House mouse (*Mus musculus*)



Taxonomy:

Family Muridae. The Eurasian house mouse is a non-native species.

Description:

Distinguished from other small mice by its general dark color, lack of external cheek pouches, smooth upper incisors, and nearly naked tail with distinct scale rings

Total length: 130-190 mm; Tail: 70-93 mm; Hind foot: 14-19 mm; Ear: 10-14 mm; Weight: 15-30 g.

Distribution:

North America: Occurs throughout much of North America, principally in close association with humans.

Park region: Although house mice have been recorded from throughout Nevada, the only regional records are from Baker and Park buildings near Lehman Caves.

Ecology and diet:

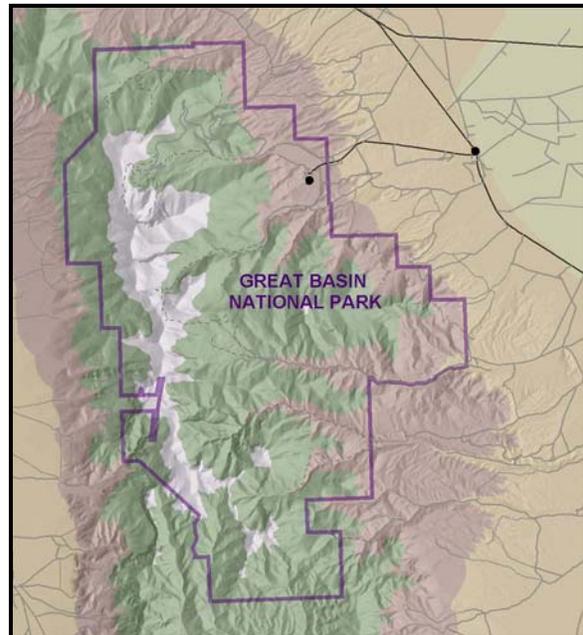
The house mouse is a non-native species that has a nearly world-wide distribution. It is a true commensal, nearly everywhere living in close association with humans. They are mainly found as pests in or

around buildings where they have shelter from severe weather and access to resources. They are omnivorous, consuming a wide variety of food including stored grains and other human foodstuff as well as naturally available food items. Harsh winter weather in the Great Basin probably limits their distribution away from buildings, but they can persist in riparian habitats and may be plentiful in areas surrounding warm springs.

Life History:

House mice tend to breed opportunistically wherever and whenever there are adequate resources. They mature rapidly and have high fecundity. Under optimal conditions, females have several litters per year averaging 6-8 young per litter.

References: Hall 1946; Rickart & Robson 2005; Robson et al., in prep.



North American Porcupine (*Erethizon dorsatum*)



Taxonomy:

Family Erethizontidae. Seven subspecies are recognized, including *Erethizon dorsatum epixanthum* which occurs in the Park region.

Description:

Readily identified by its large size and characteristic pelage that includes defensive quills.

Total length: 600-1300 mm; Tail: 175-250 mm; Hind foot: 95-115 mm; 3.5-18 kg.

Distribution:

North America: Alaska and Canada (except for the high arctic), south into New England and the mountainous western US.

Park region: Numerous early records from the Park region spanning a broad elevation range.

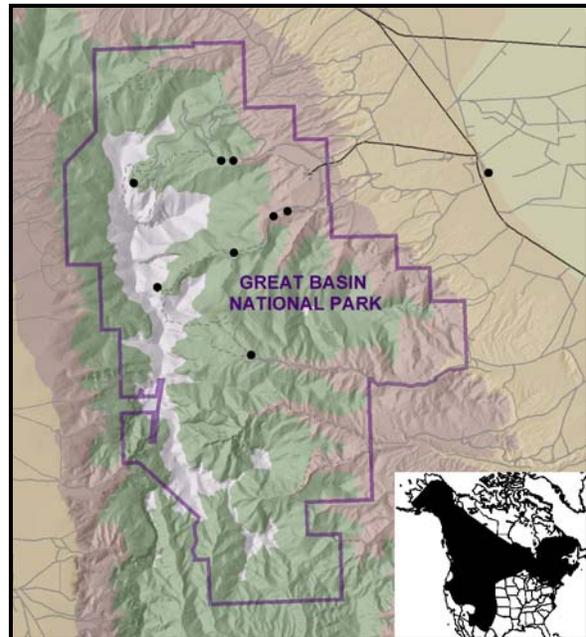
Ecology and diet:

Although porcupines are most commonly associated with forests, they have been recorded throughout the Great Basin in habitats ranging from desert shrub to alpine tundra. Although they were once common in the Park region, they are now rare, possibly due to predation by mountain lions. Porcupines consume a wide variety of plant matter during the warm season, including green vegetation, fruits and seeds. During winter, they primarily feed on woody vegetation. There is considerable seasonal fluctuation in adult weight.

Life History:

Mating occurs in the fall, and after a 7 month gestation, a single young (rarely twins) is born in the spring. Newborns are highly precocial and can feed on their own after 1 week although they remain with the mother through the summer. Adults can live for 10 years or more.

References: Hall 1941; Rickart & Robson 2005; Sweitzer et al. 1997; Woods 1973.



Wapiti or Elk (*Cervus elaphus*)



Taxonomy:

Family Cervidae. Known as wapiti or elk (North America) and red deer (Europe). North American populations formerly considered to be a separate species (*Cervus canadensis*). Four subspecies are recognized from North America. Animals from the Park region represent *Cervus elaphus nelsoni*.

Description:

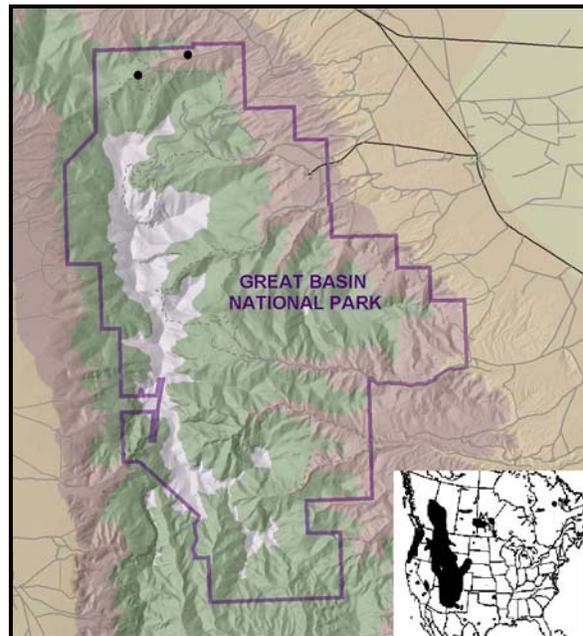
Distinguished from the mule deer by its larger size, dark head and neck, and large antler beam with a prominent brow tine.

Total length: 1.98-2.62 m; Tail: 80-170 mm; Weight: 171-498 kg.

Distribution:

North America: Originally occurred throughout most of North America, now restricted to the western mountains with local reintroductions in portions of the former range.

Park region: Reported from the Snake Range in 1859, but probably extirpated shortly after European Americans settled in the region. Animals from the Yellowstone region were introduced in the Schell Creek Range in the 1930's, and subsequently colonized the Snake Range. There is now a resident herd, mainly in the northern portion of the Park.



Ecology and diet:

Wapiti occur in a wide variety of habitats, but are most numerous in grassland, brushy habitat, or open forest park lands. They are gregarious, often forming large herds. Wapiti are principally grazers, with diet consisting of grasses and forbs but also including leaves and young shoots of trees and shrubs.

Life History:

Wapiti breed during autumn when adult males compete to establish harems. The gestation period is about 8 months, usually producing one young (occasionally twins). Both sexes can mature as yearlings, although maturity may be delayed until the second year depending on conditions. Adult life span can exceed 20 years.

References: Hall 1946; Peek 1999; Rickart & Robson 2005.

Mule deer (*Odocoileus hemionus*)



Taxonomy:

Family Cervidae. Also known as black-tailed deer. Nine subspecies are recognized. The regional race is *Odocoileus hemionus hemionus*.

Description:

Distinguished from the wapiti, or elk, by its smaller size, more uniform coloration, and branching pattern of the main antler beam.

Total length: 1.2–1.7 m; Tail: 120-220 mm; Weight: 30-120 kg.

Distribution:

North America: From SE Alaska south through much of western Canada, the western half of the continental US, and into central Mexico and the Baja peninsula.

Park region: Abundant throughout the Park region.

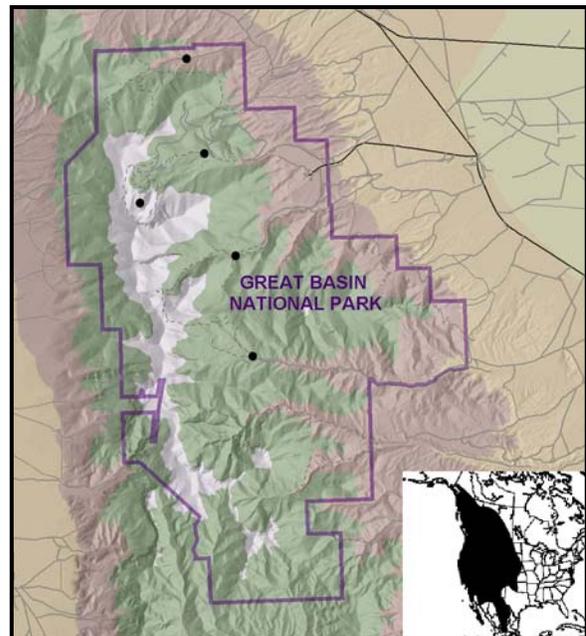
Ecology and diet:

Mule deer occur in a wide variety of habitats across a broad elevation range. They are most active during the morning and evening, moving between open feeding sites and protected areas with cover. Seasonally, they move from high elevation habitat during the growing season to low elevation winter range. They are mainly browsers, preferring young shoots, buds, and fruit of trees and shrubs, but also consuming a variety of herbaceous plants. Regionally, both deer and mountain lions (their principal predators) appear to have increased historically, perhaps due to habitat changes accompanying livestock grazing and logging.

Life History:

During the breeding season (October-November), males compete for access to breeding females which they guard and defend against rivals. Following a gestation period of about 7 months, females bear 1 or 2 fawns in early summer. The rate of twinning increases with the age and condition of the doe. Fawns are weaned at around 4 months. Both sexes may reach sexual maturity as yearlings. Individuals may live as long as 20 years.

References: Anderson & Wallmo 1984; Berger & Wehausen 1991; Zeveloff 1988.



Pronghorn (*Antilocapra americana*)



Taxonomy:

Family Antilocapridae. Also known as pronghorned antelope or American antelope. Four subspecies are recognized including *Antilocapra americana americana* from the Park region.

Description:

Distinguished from other large ungulates by the characteristic forked horns and distinctive white markings on the head and body.

Total length: 1.3-1.5 m; Tail: 104-145 mm; Weight: 40-60 kg.

Distribution:

North America: From south-central Canada south through the western plains and intermountain region, with scattered southern populations in Texas, New Mexico, Arizona, north-central Mexico and Baja California.

Park region: Common outside the Park at elevations below 6,500 ft (1,800 m).

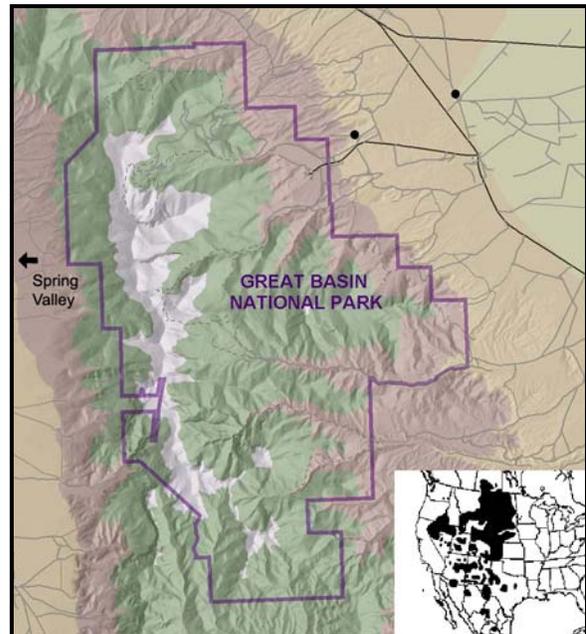
Ecology and diet:

Pronghorn are most abundant in open habitats, particularly in areas dominated by sagebrush. They have keen eyesight and are extremely swift runners, and they flee rather than hide when threatened. Mainly grazers, they feed on a wide variety of grasses and forbs. Because pronghorn do not jump readily, their movements are constrained by fences or other barriers they unable to pass under.

Life History:

Mating occurs in late summer or early autumn, during which time males defend female harems against access by rivals. After a gestation of about 250 days, females usually have twins. Young are precocial and capable of running within a few days. Most females reach sexual maturity as yearlings. Longevity in the wild is 9-10 years.

References: O’Gara 1978, 1999; Zeveloff 1988.



Bighorn sheep (*Ovis canadensis*)



Taxonomy:

Family Bovidae. Also known as mountain sheep or desert bighorn. Five subspecies are recognized. Though *Ovis canadensis nelsoni* is the regional subspecies, animals now in the Park are derived from Colorado and may represent a different subspecies.

Description:

Dark brown with white muzzle, rump, and hind legs. Adult rams display distinctive 'C'-shaped curling horns; ewe's horns are shorter. Total length: 1.2-2.0 m; Tail length: 70-150 mm; Weight: 75-150 kg.

Distribution:

North America: Found throughout the mountainous regions of the West, from Alberta and British Columbia south to northern Mexico.

Park region: At one time, bighorn sheep probably occurred throughout the Park region. They apparently were extirpated in the early 20th century, but were reintroduced in 1979. There is now a small resident population in the Park.

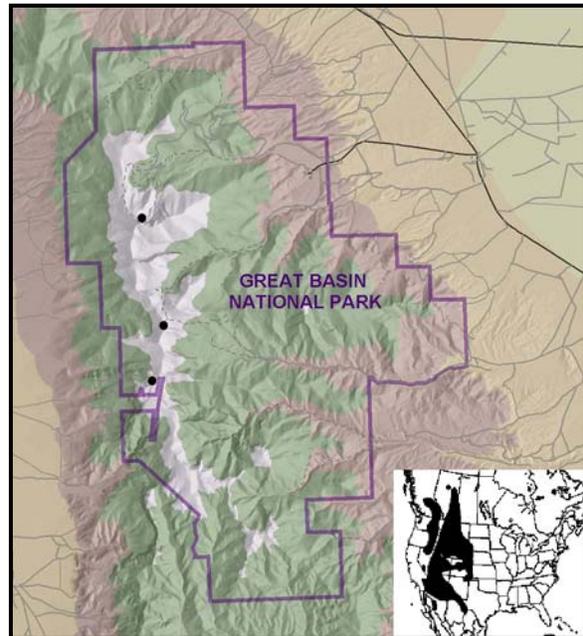
Ecology and diet:

Bighorn sheep are gregarious, and can form groups ranging from a few to several dozen individuals. They may occur in wide variety of habitats with local seasonal migration. They are excellent climbers with hooves adapted for gripping and traction. Many local populations are now generally restricted to remote areas, often at high elevations. They are susceptible to a number of diseases transmitted by domestic sheep. Principally grazers, they consume a variety of grasses and forbs.

Life History:

Groups are segregated by age and sex. Adult females, dependent lambs and immature males live in nursery groups, while older males form bachelor groups and disperse to join females during the fall mating season. Single lambs are born in late spring following a gestation of about 6 months. Females may reproduce at 2 or 3 years of age. Maximum life span is 14 years for males and 19 years for females.

References: Festa-Bianchet 1999; Rickart & Robson 2005; Shackleton 1985.



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