

MAMMALS OF GUADALUPE MOUNTAINS NATIONAL PARK¹

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Guadalupe Mountains National Park is a relatively new national park authorized by an act of Congress on 15 October 1966 and established on 30 September 1972. The park includes 76,468.6 acres of Culberson and Hudspeth Counties of Trans-Pecos Texas. The Guadalupe Mountains form a rugged V-shaped range extending from Southeastern New Mexico south into Texas and abruptly terminating in the spectacular cliff faces of 8,078 foot El Capitan. North of El Capitan several peaks rise over 8,000 feet including Guadalupe Peak (8,751 ft.), the highest point in Texas. A major geological feature of the park is the uplifted Capitan reef of Permian age. This 4,000 foot section of marine limestones is the world's largest known fossil reef (Mathews, 1973).

This paper is based upon a more extensive report to be published in a book, "Biological Investigations in the Guadalupe Mountains National Park" currently in press (Genoways, et al, 1977). Anyone interested in additional information concerning mammals or other aspects of the flora and fauna in the Guadalupe Mountains is referred to that work.

Vernon Bailey of the U.S. Biological Survey conducted the first mammal survey of the Guadalupe Mountains in August 1901 (Bailey, 1905). He reported 17 species of mammals inhabiting the Guadalupe Mountains and listed two species of possible occurrence. In 1938, 1939, and 1940, William B. Davis conducted field work in the Guadalupe Mountains and reported the presence of 35 species of mammals (Davis, 1940; Davis and Robertson, 1944). La Val (1973) studied the distribution and ecology of 13 species of bats in McKittrick Canyon in 1968 and 1970.

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This paper is based on our field work from late May, 1973 through August, 1975. The objectives of our study were to survey the mammals occurring in Guadalupe Mountains National Park and to correlate their distributions with major plant associations. Such an inventory is preliminary to the development of any sound management program.

Zoogeographically, the Guadalupe Mountains are an island inhabited by animals of Rocky Mountain affinities surrounded by Chihuahuan desert. Elevations within the park range from 3,650 feet to 8,751 feet. The lower elevations are characterized by floral and faunal elements of the Chihuahuan desert. The higher elevations contain montane elements. The complex interactions of many factors including the wide variation of elevations, a variety of soil types, and the rugged dissected topography of the mountains, have resulted in a unique and diverse community of plants and animals. The mammals of Guadalupe Mountains National Park are a unique mixture of desert, grassland, riparian woodland, montane, and widespread species.

DISCUSSION

During historical times, 65 species of mammals have occurred in the area now occupied by Guadalupe Mountains National Park. Included are 13 species of bats, three leporids, 29 rodents, 14 carnivores, and six artiodactyls. Another nine species possibly occur or have occurred in the park.

Extirpated Species

Nine of the 65 species known from the park have been extirpated from the area. Most, if not all, of these species have disappeared as the direct or indirect result of human activity.

Cynomys ludovicianus.--In 1901, prairie dogs were abundant in Dog Canyon, which derived its name from the numerous colonies in the area (Bailey, 1905). Davis (1940) reported scattered colonies along the eastern edge of the mountains. Presently, there are no prairie dogs within the park, although a few colonies persist on private land to the east. Prairie dogs were removed by poisoning because they were believed to compete with livestock for food.

Perognathus hispidus paradoxus.--One specimen of this grassland species was obtained in 1901 by Vernon Bailey (Bailey, 1905). The hispid pocket mouse has been eliminated from the area apparently by alteration of grassland habitat by overgrazing or environmental changes or both.

Canis lupus monstrabilis.--The gray wolf was removed from the park area by predator control activities. One specimen was preserved from the Guadalupe Mountains (Bailey, 1905). According to Bailey, the gray wolf was a troublesome killer of livestock in the area.

Ursus arctos.--The grizzly bear has been removed from much of its former geographic range. This species probably occurred in the Guadalupe Mountains at one time, but was eliminated by a

combination of habitat alterations and predator control.

Cervus elaphus merriami.--Merriam's elk once inhabited the Guadalupe Mountains, but is now extinct (Murie, 1951). The primary factor driving this species to extinction was probably hunting pressure, however, increasing aridity of the region and competition with livestock may have contributed to their demise. The Merriam's elk was probably gone from the Guadalupe Mountains prior to 1900 and was extinct by 1906 (Curry-Lindahl, 1972).

Odocoileus virginianus texanus.--White-tailed deer were never abundant in the park area and have not been reported in the area for many years. This species was probably removed by hunting.

Antilocapra americana americana.--Although pronghorn were probably never abundant in the park area, Bailey (1905) reported seeing them along edges of the Guadalupe Mountains. They were apparently eliminated by habitat alteration and hunting.

Bison bison bison.--The bison which once grazed around the periphery of the Guadalupe Mountains were removed by hunting and habitat alteration by the middle of the nineteenth century.

Ovis canadensis mexicana.--In 1901, mountain sheep were relatively common in the Guadalupe Mountains (Bailey, 1905). In 1940, Davis estimated that no more than 25 bighorns remained. Sporadic reports of bighorn sightings in the Guadalupe Mountains were received until 1959 (Gross, 1960). Mountain sheep no longer occur in the Guadalupe Mountains. A combination of hunting, disease introduced by domestic sheep, and competition with domestic livestock resulted in their extirpation from the park.

Species Rare in the Park

Five species are rare in their distribution in Guadalupe Mountains National Park. Four of these species are confined to the montane regions of the park. The montane areas consist of relict coniferous forest, including some deciduous elements, and grassy meadows. Due to protection from fire, much of the forested area is dense and contains a large amount of dead fall timber. Encroachment of the montane habitat by desert species of plants and animals could ensue with a continued trend toward aridity. If such conditions ever occur, the montane element of the mammalian fauna will undoubtedly be eliminated.

Sylvilagus floridanus robustus.--This large subspecies of cottontail is confined to dense coniferous forest stands in The Bowl and is the rarest mammal in the park. The taxon is confined to the Chisos, Chinati, Davis, and Guadalupe Mountains of Texas. These populations are evidently completely isolated; therefore, if the population in the Guadalupe Mountains is lost, no natural repopulation would be expected.

Eutamias canipes canipes.--Gray-footed chipmunks are found in wooded areas at intermediate to higher elevations in the park. This subspecies is known only from the Guadalupe Mountains; therefore, its existence must be protected. Chipmunks are relatively common in the park at the present time, but their populations should be periodically monitored.

Ammospermophilus intepres.--The Texas antelope

ground squirrel occurs in the park at intermediate elevations in grassland and desert areas. This species has a relatively restricted geographic range in northern Mexico, Texas, and New Mexico. These squirrels are not common in the park.

Thomomys bottae guadalupeensis.--The Guadalupe Mountains pocket gopher is endemic to the Guadalupe Mountains. It is primarily distributed in montane meadows and slopes. Although these pocket gophers are not common, we believe that they are in no present danger in the park.

Microtus mexicanus guadalupeensis.--The Guadalupe Mountains vole is found in isolated pockets of montane meadow in the park. This subspecies is restricted to the Guadalupe Mountains of Texas and the Manzano, Capitan, and Sacramento Mountains in New Mexico. Because the vole habitat is limited in the park and is very attractive to park visitors, the status of this mammal and its habitat will need periodic monitoring.

Mammalian Faunal Relationships Within the Park

Within the park, we recognize four mammalian distributional zones based upon major vegetation types (Gehlback, 1967, undated; Warnock, undated) and the distribution of some indicator species of mammals. For a species to be a good indicator, it should be relatively abundant and its distribution should be restricted, or nearly so, to the zone for which it is an indicator. The four zones and their indicator species of mammals are: desert--*Dipodomys merriami*, *D. spectabilis*, *Spermophilus spilosoma*, *Onychomys torridus*, and *Neotoma micropus*; grassland--*Sigmodon hispidus*, and *Reithrodontomys megalotis*; riparian woodlands--*Procyon lotor*; montane--*Sylvilagus floridanus*, *Peromyscus boylii*, *Neotoma mexicana*, and *Microtus mexicanus*.

The grassland habitat was found to contain the most mammalian species (41) and the montane the least (27). The desert habitat and the riparian woodland habitat each contained 31 species. The mammalian fauna of Guadalupe Mountains National Park is predominantly Southwestern in affinities with Chihuahuan Desert forms being the chief component.

The elimination of nine species of mammals from the park area in historic times and the presence of five additional species relatively rare in the park emphasize the need for sound resource management decisions in Guadalupe Mountains National Park. This survey must be considered a starting point not an end in itself. With this in mind, we have submitted the following recommendations to the National Park Service for future research and development in the park.

1. An inventory of the larger mammals in the park should be undertaken. A project is currently in progress to gather information on the resident elk herd, but similar work is needed on mule deer, bear, coyote, bobcat, mountain lion, and fox. These mammals play important roles in the ecosystem and it is imperative that more information be gathered about them.

2. A program of periodic censusing of mammals should be established to identify population trends. During these censuses, special efforts must be made to monitor the status of the species that are rare in the park. Careful monitoring of these mammals may prevent their loss from the park.

3. The following areas are considered to be

the most biologically significant from the standpoint of mammals in the park and as such should be protected: Upper Dog Canyon; The Bowl; Nipple Hill area; Lewis Well area; McKittrick Canyon; and every spring and waterhole in the park.

4. A special effort should be made to determine if the following mammals occur within the park boundaries: *Notiosorex crawfordi*; *Myotis evotis*; *Euderma maculatum*; *Lasiurus borealis*; *Spermophilus mexicanus*; *Tamiasciurus hudsonicus*; *Onychomys leucogaster*; *Vulpes macrotis*; and *Dicotyles tajacu*.

5. High priority should be given to repairing or rebuilding the boundary fences on the south and west sides of the park. During our survey, a

large number of cattle have been observed within the park boundaries and the number seems to have increased from 1973 to 1975. This area of the park recovers very slowly from grazing even in total absence of livestock; therefore, it is imperative that the fences be repaired and the cattle removed.

6. Most of the species rare in Guadalupe Mountains National Park probably occur in Carlsbad Caverns National Park as well. We strongly recommend that a mammal survey be conducted in Carlsbad Caverns National Park. A management program consistent in both parks could then be developed, increasing the chances of preserving rare species.

CHECKLIST OF RECENT MAMMALS OF GUADALUPE MOUNTAINS NATIONAL PARK

Species	Status	Habitat
<i>Myotis velifer</i>	common	widespread
<i>M. thysanodes</i>	"	"
<i>M. volans</i>	uncommon	montane
<i>M. californicus</i>	common	"
<i>M. leibii</i>	"	widespread
<i>Lasionycteris noctivagans</i>	uncommon	montane
<i>Pipistrellus hesperus</i>	common	widespread
<i>Eptesicus fuscus</i>	"	"
<i>Lasiurus cinereus</i>	"	montane
<i>Plecotus townsendii</i>	"	"
<i>Antrozous pallidus</i>	"	widespread
<i>Tadarida brasiliensis</i>	"	"
<i>T. macrotis</i>	uncommon	riparian woodland
<i>Sylvilagus floridanus</i>	rare	montane
<i>S. audubonii</i>	common	desert
<i>Lepus californicus</i>	"	"
<i>Eutamias canipes</i>	"	montane
<i>Ammospermophilus interpres</i>	uncommon	desert
<i>Spermophilus spilosoma</i>	"	"
<i>S. variegatus</i>	common	riparian woodland
<i>Cynomys ludovicianus</i>	extirpated	grassland
<i>Thomomys bottae</i>	uncommon	montane
<i>Pappogeomys castanops</i>	"	desert
<i>Perognathus flavus</i>	"	"
<i>Perognathus hispidus</i>	extirpated	grassland
<i>P. penicillatus</i>	common	desert
<i>P. intermedius</i>	uncommon	"
<i>Dipodomys ordii</i>	"	"
<i>D. spectabilis</i>	"	"
<i>D. merriami</i>	common	"
<i>Reithrodontomys megalotis</i>	"	grassland
<i>Peromyscus eremicus</i>	uncommon	desert
<i>P. maniculatus</i>	common	widespread
<i>P. leucopus</i>	uncommon	desert
<i>P. boylii</i>	common	montane
<i>P. pectoralis</i>	uncommon	grassland
<i>P. truei</i>	"	montane
<i>P. difficilis</i>	"	"
<i>Onychomys torridus</i>	common	desert
<i>Sigmodon hispidus</i>	"	grassland
<i>Neotoma micropus</i>	"	desert
<i>N. albigula</i>	"	widespread
<i>N. mexicana</i>	"	montane
<i>Microtus mexicanus</i>	uncommon	"
<i>Erithizon dorsatum</i>	common	widespread
<i>Canis latrans</i>	"	"
<i>C. lupus</i>	extirpated	"

Species	Status	Habitat
<i>Urocyon</i>	common	widespread
<i>Ursus americanus</i>	uncommon	montane
<i>U. arctos</i>	extirpated	"
<i>Bassariscus astutus</i>	uncommon	widespread
<i>Procyon lotor</i>	common	riparian woodland
<i>Mustela frenata</i>	uncommon	widespread
<i>Taxidea taxus</i>	"	desert
<i>Spilogale gracilis</i>	"	"
<i>Mephitis mephitis</i>	common	widespread
<i>Conepatus mesoleucus</i>	"	"
<i>Felis concolor</i>	uncommon	"
<i>F. rufus</i>	"	"
<i>Cervus elaphus merriami</i>	extinct	"
<i>C. e. nelsoni</i>	common	"
<i>Odocoileus hemionus</i>	"	"
<i>O. virginianus</i>	extirpated	"
<i>Antilocapra americana</i>	"	grassland
<i>Bison bison</i>	"	"
<i>Ovis canadensis</i>	"	montane

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