National Park Service
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Natural Resource Stewardship and Science

Mammals of the Rincon Mountain District, Saguaro National Park

Natural Resource Report NPS/SODN/NRR—2011/437

ON THE COVER

Jaguar killed in Rincon Mountains in 1902, photographed at saloon in downtown Tucson. Photograph courtesy Arizona Historical Society.

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Abstract

This technical report summarizes known current and historic information on all species of mammals in the Rincon Mountain District of Saguaro National Park, Arizona. It is a supplement to the comprehensive inventory of mammals completed during 2001–2005 by the Sonoran Desert Network, of the National Park Service Inventory and Monitoring Program (Swann and Powell 2006), and also includes additional data from many other studies, as well as historic information from park files and other sources. The report consists of accounts of each species and includes lists of specimens and photographs that document the species presence in the park; a voucher photo, if available; a distribution map; a summary of historic records, including references to research studies; a general assessment of abundance; and general comments about the species.

This is one in a series of reports that summarizes similar information on mammals, reptiles, and amphibian species in both the Rincon Mountain and Tucson Mountain districts of Saguaro National Park.

Acronyms

AGFD	Arizona Game and Fish Department
ft	feet
m	meters
NM	national monument
NP	national park
NPS	National Park Service
RMD	Rincon Mountain District
SDMNH	San Diego Museum of Natural History
SNP	Saguaro National Park
TM	Trailmaster infrared-triggered wildlife camera
TMD	Tucson Mountain District
UA	University of Arizona
UIMNH	University of Illinois Museum of Natural History
USFWS	U.S. Fish and Wildlife Service
UTM	Universal Transverse Mercator
WACC	Western Archeological Conservation Center

Acknowledgements

This document is based on the National Park Service comprehensive inventory of mammals at Saguaro National Park during 2001–2005 (Swann and Powell 2006), as well as many research studies cited in the text. We thank the many people, including park rangers (particularly Hal Coss, Barbara Lund, and Rich Hayes), biologists, researchers, and volunteers, who have contributed to knowledge of mammals in Saguaro National Park over the years. In particular, we want to acknowledge the contributions of Ronnie Sidner, Russell Davis, David Dalton, Sandy Wolf, Robert M'Closkey, Doug Duncan, Gerry Day, and others who have carried out important long-term studies of rodents and bats in the Rincon Mountain District. Russ Davis, Ronnie Sidner, and Lowell Sumner led two previous inventories that provided essential historic information. Two major field-collecting trips in the Rincons were led by H. Brown, in 1911, and Lawrence Huey, in 1932.

The 2001–2005 inventory effort by the Sonoran Desert Network, of the National Park Service Inventory and Monitoring Program, carried out in cooperation with the U.S. Geological Survey, Sonoran Desert Field Station, and the University of Arizona, was an important effort that involved many people. Thanks in particular to Brian Powell, who led the entire project, as well as Andy Hubbard, Bill Halvorson, Eric Albrecht, Ronnnie Sidner, Neil Perry, and Jason Schmidt.

Much of the historic information on mammals came from park records currently archived at the Western Archeological Conservation Center. Melanie Bucci pored over and summarized these records in 2006 (Bucci 2007). There is still a great deal to be learned from these archives, which are excellent sources of information about the park. We thank Lynn Mitchell and Kahleel Sabah for their assistance in making this information available.

Finally, this comprehensive effort would not have been possible without the help of many Saguaro National Park and Sonoran Desert Network employees, student interns, and volunteers. In particular, we thank Kristen Beaupré, Matt Caron, Melanie Bucci, Chuck Perger, and Sandy Wolf for contributing to data analysis, historical research, and writing; Mike Chehoski, Albi von Dach, Mike Ward, Sandy Wolf, and Jay Loughlin for fieldwork to set up and maintain wildlife cameras; Chuck Conrad, Louise Conrad, and Alice Perger for photo analysis, copying, and data entry; and Natasha Kline and Meg Weesner for support from the park. Finally, we are most appreciative to Matt Daniels and Erin Zylstra for their help in preparing the maps. Mike Jones finalized the maps and made many additional improvements to the manuscript. We greatly appreciated detailed reviews of this report by Russ Davis, Andy Hubbard, Natasha Kline, Meg Weesner, Kris Ratzlaff, Ronnie Sidner, Sandy Wolf, and Erin Zylstra, which greatly improved this document.

Introduction

This account of mammals at Saguaro National Park, Rincon Mountain District, is intended as a supplement to the comprehensive inventory of mammals completed during 2001–2005 by the Sonoran Desert Network, of the National Park Service Inventory and Monitoring Program (Swann and Powell 2006). The intention of this supplement is to summarize, for park interpreters, researchers, and managers, known information on each mammal species that occurs (or once occurred) in this district of the park.

There has never really been a comprehensive account of mammals in Saguaro National Park (NP), and previously published species lists (e.g., Doll et al. 1986; Swann 2003) were based on incomplete historical information. In this document, we have tried, as much as possible, to evaluate, summarize, and cite the actual data for each species. Voucher specimens and photographs that include documentation of location, collector, and date are essential for confirming the presence of species in an area. In an effort to be comprehensive, we also provide historic records and references to the scientific literature. The main sources for this report are results from the comprehensive inventory (Swann and Powell 2006, plus supplemental material); specimen information summarized and mapped in published sources, particularly Hoffmeister's Mammals of Arizona (Hoffmeister 1986); and material from the park's library and extensive natural resource bibliography (NR-Bib). We have also included references to the park's collection of records archived at the Western Archeological Conservation Center (WACC) in Tucson; these include Monthly Narratives and Superintendent's Reports.

Distribution maps in this report include locations of individuals photographed or trapped by the inventory and monitoring effort and, where available, locations of museum specimens. In addition, we included sighting records from the park's Wildlife Observation database, but because visitor and staff sightings are not always reliable, we used separate symbols and removed some records that were doubtful without further evidence. Because there are many data sets on mammals collected by park staff and researchers, these distribution maps are not comprehensive; in particular, the rodent and bat maps include a relatively small number of locations that do not reflect the true distribution of each species. However, the maps do document where species have occurred in the park, and they will likely be improved in the future. We have not mapped the distribution of one species we believe to be especially vulnerable, the Lesser Long-nosed Bat, nor provided location information of major bat roosts. All UTM locations provided in this report are in NAD 83 datum unless otherwise specified.

Abundance categories in this document are not based on a rigorous definition, as the methods for gathering data for each species generally do not provide estimates of absolute abundance. "Common" animals are those that regular visitors to the park might expect to see (for large mammals), or that researchers might expect to capture on a regular basis (for small mammals and bats). "Uncommon" animals are those seen or trapped occasionally, and "rare" animals are rarely seen or trapped. A few species, such as feral cats, may be present only "occasionally" in the park. Some species, such as jaguar or mountain sheep, are considered "extirpated," or no longer present at the RMD. Vertebrate species names are always being revised. For this document, we used Baker et al. (2003) as the source for English and scientific names.

The sections that follow are arranged into chapters by family. Each account includes information on current status, habitat, and abundance in the park, a list of specimens and photographs documenting the species presence in the park; a summary of historic records, including references to research studies; general comments about the species; a voucher photo, if available; and, in most cases, a distribution map. It is safe to say that such a compilation can never be considered complete, as additional historic data on mammals are newly discovered and we learn more about different species through research projects. If the mammal community in the Rincon Mountain District (RMD) changes in the future, as we expect it will, then we hope this document will provide at least a general baseline of the community in the park at the turn of the 21st century.

Marsupials

VIRGINIA OPOSSUM

Didelphis virginiana

Infraclass Metatheria
Order Didelphimorphia (Opossums)
Family Didelphidae (Opossums)

Current status: Confirmed
Habitat: Generalists in woodlands and lower elevation riparian areas
Abundance: Rare

Records

Sight observation during NPS inventory project: No

Number of infrared-triggered photographs: 2

Number of records in SNP Wildlife Observations database: 0

Voucher photo(s): SNP-14 (TM photo #2009), Madrona Pools area (UTMSs 536879, 3557519S), December 8, 1999

Museum specimen(s): None

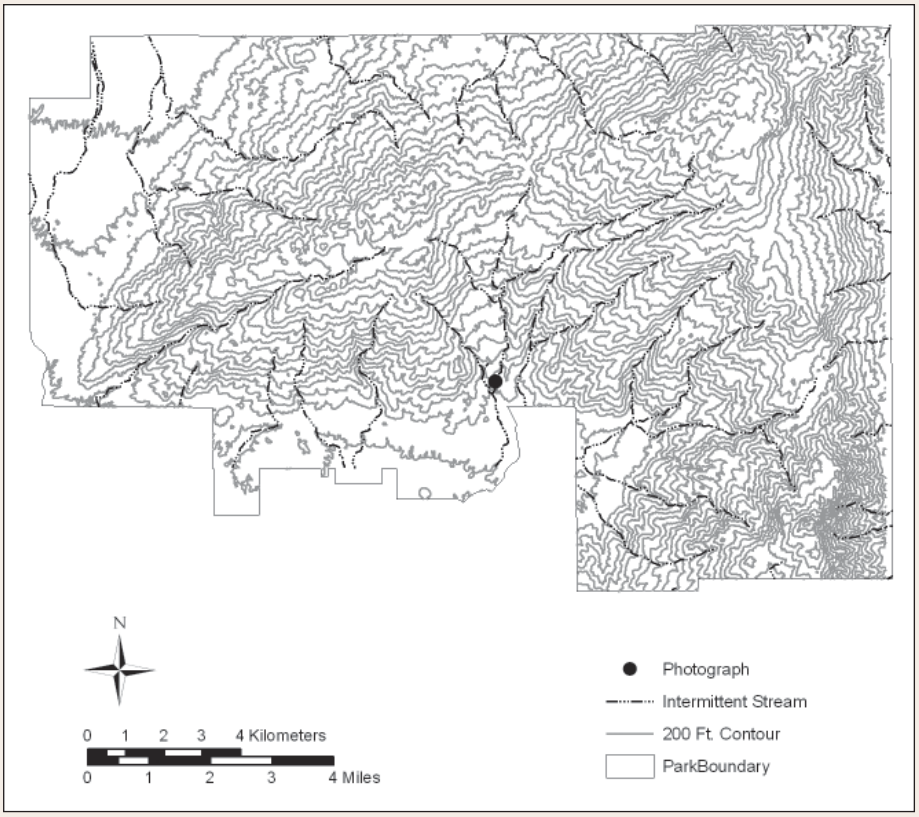
Historic and recent records: No historic records known. The voucher photo for the park is of the Mexican subspecies and is one of two photos (certainly of the same individual) obtained at Madrona Ranger Station in 1999. As of 2009, no other photos had been obtained from Madrona or any other location in the RMD.

Comments

The Virginia Opossum is Arizona's only marsupial, or pouched mammal. The Mexican "race" of the Virginia Opossum is brown in color, not gray like opossums found elsewhere in the U.S. Opossums were not native to Arizona historically. Hoffmeister (1986) reported that opossums were introduced into the state several times in the past, but he did not believe that they occurred in the state in 1986. However, brown opossums now occur in many of the Sky Island mountain ranges (Swann et al. 2000; Babb et al. 2004).

The Madrona photos represent the northernmost official record of the subspecies, approximately 130 km (70 miles) north of any previously known localities (Babb et al. 2004), although Don Swann (unpublished data) has also trapped individuals and collected a skull of this species in Florida Canyon in the Santa Rita Mountains.

Virginia Opossum (*Didelphis virginiana*).



Location for Virginia Opossum.

Insectivores

DESERT SHREW

Notiosorex crawfordi

Infraclass Eutheria
Order Insectivora (Insectivores)
Family Soricidae (Shrews)

Current status: Confirmed
Habitat: Generalist in desert, grassland, woodland, and forest areas where suitable cover is present
Abundance: Rare

Records

Number of individuals captured in NPS inventory: 6

Voucher photo(s): None

Museum specimen(s): Five specimens in University of Arizona mammal collection:
(1) UA26017, collected by R. M. Sidner, Manning Camp, 8,000 ft, June 2, 1988;
(2–3) UA26910–UA26911, collected by R. M. Sidner, North Slope Trail ca. 0.5 mi northeast of Spud Rock (T14S, R18E), ca. 8,200 ft, September 13, 2001;
(4) UA26913, collected by R.M. Sidner, North Slope Trail ca. 0.5 mi northeast of Spud Rock (T14S, R18E), ca. 8,200 ft, September 24, 2001;
(5) UA26915, collected by R. M. Sidner, North Slope Trail ca. 0.5 mi northeast of Spud Rock (T14S, R18E), ca. 8,200 ft, September 13, 2001.

Historic and recent records: Davis and Sidner (1992) captured a Desert Shrew at Manning Camp, and discussed the presence of this species in the park. Sidner (1991, Appendix, p. 28) observed one during the late afternoon on June 22, 1991, in Box Canyon. Other records are summarized below.

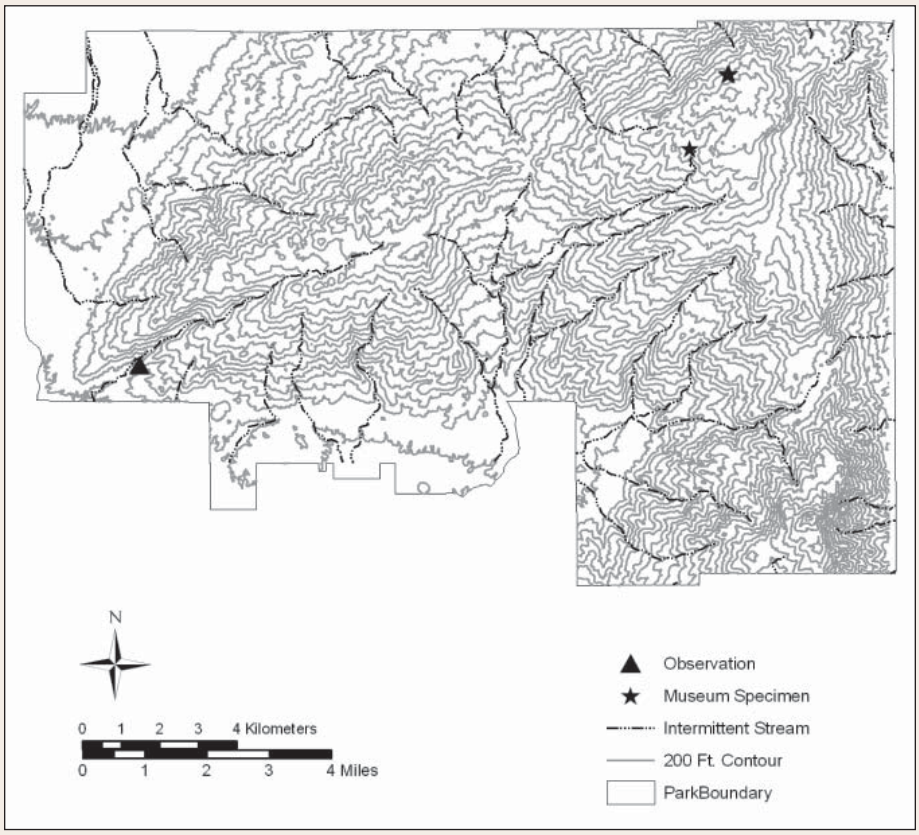
Comments

The Desert Shrew is America's smallest mammal. It is a fascinating, desert-adapted species that has specially-adapted kidneys that allow it to live without free water. Desert Shrews can lower their body temperature by approximately 20°F below normal during torpor, which may allow them to conserve energy (Hoffmeister 1986).

Desert Shrews were confirmed during this study only from a pitfall trap array on the North Slope Trail. They have been captured incidently in several previous studies, including near Manning Camp in 2000–2001 (Karen Short, personal communication), in the Rocking K Ranch immediately adjacent to the park (Harris 1996), and from the Loop Road area (Duncan 1990). In 2003, the Desert Shrew was split into two species (Baker et al. 2003). The new spe-

cies, which can only be distinguished by genetic analysis, occurs nearby, in Cienega Creek, and is named Cockrum's Desert Shrew (*Notiosorex cockrumi*, after the eminent UA mammalogist E. Lendell Cockrum). It is unknown which species occurs in the RMD. Two other species of shrews found near the Rincons have never been confirmed here: Dusky Shrew (*Sorex monticolus*, which occurs in the Santa Catalinas) and Arizona Shrew (*Sorex arizonae*, which occurs in the Santa Ritas).

(Photo not available)



Locations for Desert Shrew.

Bats

MEXICAN LONG-TONGUED BAT

Choeronycteris mexicana

Infraclass Eutheria
Order Chiroptera (bats)
Family Phyllostomidae (leaf-nosed bats)

Current status: Confirmed
Habitat: Riparian areas from desert up through mixed oak-conifer forests
Abundance: Uncommon

Records

Number of individuals captured in NPS inventory: 2

Voucher photo(s): Unnumbered photo by R. Sidner, Madrona pools in Chimenea Creek, May 2003 (Sidner 2003b).

Museum specimen(s): Three specimens in UA mammal collection:
(1) UA7906, collected by B. J. Hayward, October 7, 1960;
(2) UA7955, collected by B. J. Hayward, Box Canyon, October 4, 1960;
(3) UA26677, collected by J. Wallner, RMD Visitor Center, November 21, 1999.

Historic and recent records: There are several records from Box Canyon. Sidner (1991) observed two on June 18, six on June 22, and seven on July 27, 1991. Sidner and Davis (1994) observed three each on May 8, 1992 and May 11, 1993. Wolf and Dalton (2003) observed 20 on March 15, 2003. Individuals were also captured in Lower Rincon Creek on September 30, 2002, and Madrona Pools in May 2003 (Sidner 2003a).

Comments

The Mexican Long-tongued Bat is a mine/cave obligate that roosts in small groups and migrates to and from Mexico, although some may over-winter in the Santa Catalina and Rincon mountains. The species is nectarivorous, eating nectar, pollen, and probably some insects. Like the Lesser Long-nosed Bat, it also forages at hummingbird feeders in Tucson. Mexican Long-tongued Bats are distinguished from Lesser Long-nosed Bats by a longer and cylindrical muzzle, and the presence of a small tail in a short tail membrane. This species appears to be relatively uncommon at the RMD.

Mexican Long-Tongued Bat (*Choeronycteris mexicana*).

(Map not provided due to sensitivity of this species)

LESSER LONG-NOSED BAT

Leptonycteris curasoae

Infraclass Eutheria
Order Chiroptera (bats)
Family Phyllostomidae (leaf-nosed bats)

Current status: Confirmed. Listed as Endangered Species by USFWS.
Habitat: Desert, desert grasslands, up to oak woodlands
Abundance: Common

Records

Number of individuals captured in NPS inventory: 0

Voucher photo(s): Unnumbered photo by Linda deVon, taken at private residence approximately 1 mile NW of Visitor Center, August 25, 2006.

Museum specimen(s): Twenty-three specimens in UA mammal collection:
(1–11) UA3651– UA3660, collected by R. E. Carpenter on May 23, 1957;
(12–13) UA7748–UA7749, collected by P. J. Gould, B. J. Hayward, and others, August 24, 1960;
(14) UA14491, collected by R. J. Baker at a rock slide, June 6, 1966;
(15–18) UA14492–UA14495, collected by R. J. Baker, June 6, 1966;
(19) UA16011, collected by J. T. Mascarello, May 12, 1967;
(20–22) UA16115– UA16117, collected by J. T. Mascarello, May 12, 1967;
(23) UA17013, collected by J. T. Mascarello, May 12, 1967.

Historic and recent records: The following records and observations are from a roost (location-sensitive) in the park:

- 35 observed in May and 2 collected in August 1960 (Cockrum and Petryszyn 1991),
- 211 observed in May 1967 (Cockrum and Petryszyn 1991),
- 50 observed in May and 5 observed in July 1986 (Sidner and Davis 1988),
- 1 observed in May and 1 in July 1991 (Sidner 1991),
- 1 observed on May 11, 1993 (Sidner and Davis 1994),
- 6 observed on May 13, 2001 (R. Sidner, field notes), and
- an estimated 3,000 observed in September 2005 by S. Wolf and D. Dalton (S. Wolf, field notes).

Comments

The Lesser Long-nosed Bat is listed by the U.S. Fish and Wildlife Service as an Endangered Species.

Females migrate from Mexico to south-central Arizona in the spring and feed on saguaro nectar, pollen, and fruit. In late summer, mostly females and young appear in southeastern Arizona and eat nectar and pollen from agaves, saguaros, and other plants before returning to Mexico in the fall. Characteristics that distinguish this species from the Mexican Long-tongued Bat are the shape and length of muzzle (shorter and more conical), and extremely

abbreviated membrane and lack of tail.

Because the Lesser Long-nosed Bat feeds on, and pollinates, the saguaro cactus, it has long been associated with the park and featured in interpretive programs and exhibits. A number of studies have been conducted on this species in RMD, including a series of experiments in the early 1960s that examined the relationship between saguaros and Lesser Long-nosed Bats. Much of this research is summarized in McAuliffe (1996), who studied the history of the relationship between saguaro research and management at Saguaro NP. For many years, many people believed that Lesser Long-nosed Bats were the primary pollinator of the saguaro and that the dramatic decline of the saguaro in the park's Cactus Forest was associated with the decline of the bat. In particular, park officials were alarmed when the large maternity colony (more than 5,000 individuals) at Colossal Cave disappeared following the installation of an exhaust-fan system in 1961. The importance of Lesser Long-nosed Bats as pollinators of saguaros and organ pipe cacti was a factor in the listing of this species as endangered in 1988. Indeed, on the day that the species was listed, the park superintendent commented that if the bats were eliminated, the saguaro would decline (McAuliffe 1996).

However, data from studies of bats at the park do not support this conclusion. Alcorn and others (1961) and McGregor and others (1962) indicated that nighttime pollination could be important, but that the majority of fruit set was determined by daytime pollinators, such as bees. These same researchers also introduced bats, honeybees, and white-winged doves into an exclosure with saguaro flowers, and found that all three species were equally efficient. They concluded that pollination and seed production was not a limiting factor in saguaro reproduction at the RMD (McAuliffe 1996). It is not currently known whether, since the loss of the maternity colony in Colossal Cave, Lesser Long-nosed Bats currently pollinate saguaros in the park (R. Sidner and S. Wolf, personal communications), as it is possible that they are not present in the area during the saguaro pollination season of May–June.

In late summer, Lesser Long-nosed Bats currently can only be considered to be common at the RMD. They roost in large numbers in at least one known location (a sensitive location, not mapped). Lesser Long-nosed Bats from the park also forage at hummingbird feeders at homes near the Santa Catalina and Rincon mountains (Wolf 2006).

(Map not provided due to sensitivity of this endangered species)

Lesser Long-Nosed Bat (*Leptonycteris curasoae*).

SOUTHWESTERN MYOTIS

Myotis auriculus

Infraclass Eutheria
Order Chiroptera (bats)
Family Vespertilionidae (vesper bats)

Current status: Confirmed
Habitat: Pine forests, other semi-arid woodland habitats
Abundance: Unknown

Records

Number of individuals captured in NPS inventory: 4

Voucher photo(s): NPS267a and NPS267b, by R. Sidner, pool 100 m below Devil's Bathtub (UTMs 542733, 3562240S), September 23, 2001.

Museum specimen(s): One specimen in SDMNH collection: SD10093, collected by T. W. Sefton and L. M. Huey, Rincon Mts., Spud Rock Ranger Station, June 18, 1932. Four specimens in UA mammal collection:
(1) UA25350, collected by R. Davis, Manning Camp, 8,000 ft, May 30, 1985;
(2) UA25519, collected by R. M. Sidner, Manning Camp Pond, 8,000 ft, June 6, 1986;
(3) UA25521, collected by R. M. Sidner, Manning Camp Pond, 8,000 ft, June 4, 1986;
(4) UA25525, collected by R. M. Sidner, Manning Camp Pond, 8,000 ft, June 6, 1986.

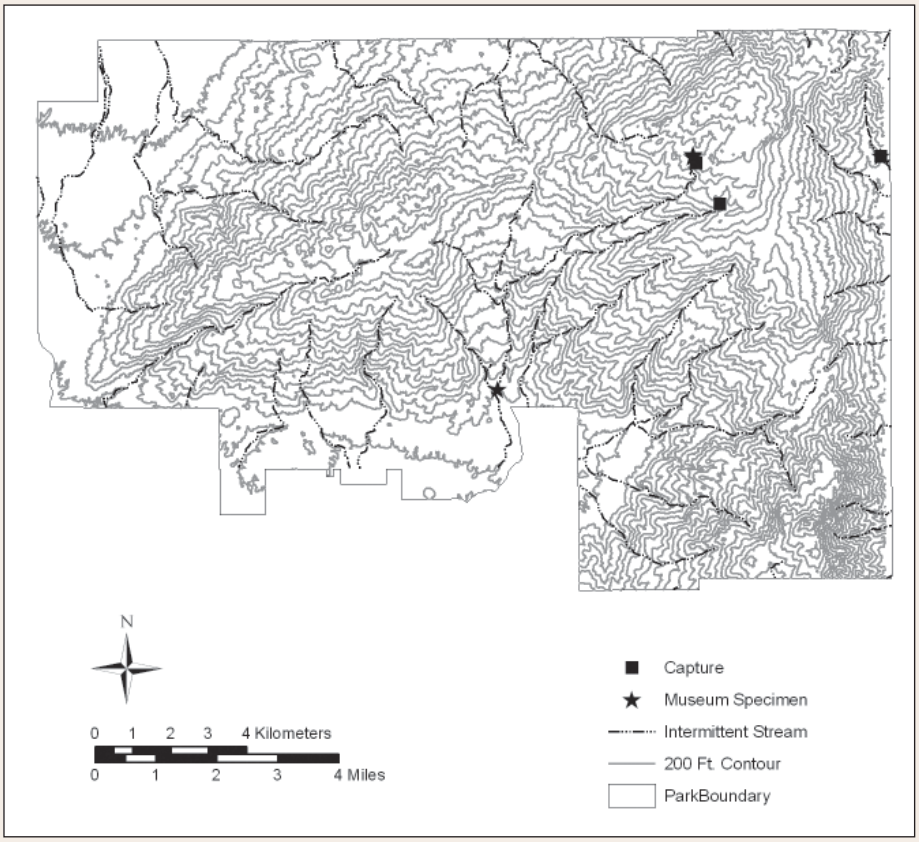
Historic and recent records: Lawrence M. Huey, a well-known mammalogist of the early 20th century (Hoffmeister 1986), collected an individual at the Spud Rock cabin site on June 18, 1932, and identified it as *Myotis evotis auriculus* (SDMNH collection). Davis and Sidner (1992) captured six in June 1985, three in June 1986, one in June 1988, four at Manning Camp in July 1991, and one at Devil's Bathtub in September 2001.

Comments

The small bats of the genus *Myotis* are represented by nine species in Arizona, and at least seven species in the RMD. *Myotis auriculus* was not recognized as a species until 1960; it was formerly grouped with *Myotis evotis*. *M. auriculus* is distinguished from *M. evotis* by its very long, light-brown, translucent ears, rather than black ears, and somewhat naked face.

This bat is typically found at high elevations in forests of pine and fir trees, but is sometimes found in oak woodlands. In the RMD, Southwestern Myotis has been observed at Manning Camp, Spud Rock, and Devil's Bathtub in the high country.

Southwestern Myotis (*Myotis auriculus*).



Locations for Southwestern Myotis.

CALIFORNIA MYOTIS

Myotis californicus

Infraclass Eutheria
Order Chiroptera (bats)
Family Vespertilionidae (vesper bats)

Current status: Confirmed
Habitat: Desert scrub up through oak woodland, uncommon in pine and spruce forest
Abundance: Unknown

Records

Number of individuals captured in NPS inventory: 8

Voucher photo(s): SNPMad91 by R. M. Sidner, Madrona Ranger Station (R17E, SE1/4 Sect. 4), 3,370 ft, September 18, 2001.

Museum specimen(s): Three specimens in UA mammal collection:
(1) UA25520, collected by R. M. Sidner, Manning Camp Pond, 8,000 ft, June 3, 1986;
(2) UA26854, collected by R. M. Sidner, Deer Creek (T14S, R18E, Sect 16), (UTMs X12S0546983, Y3563501), ca. 5,100 ft, May 5, 2002;
(3) UA26855, collected by R. M. Sidner, Chimenea Creek, Madrona Ranger Station (T15S, R17E, SE1/4 Sect. 4), 3,370 ft, September 18, 2001.

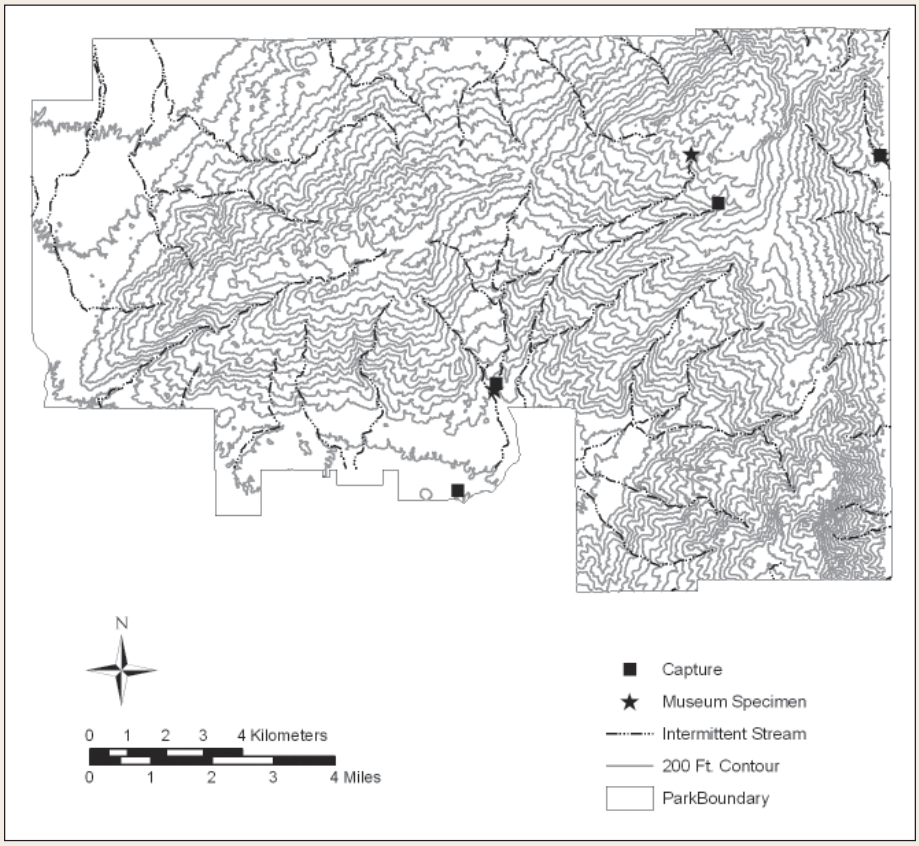
Historic and recent records: Davis and Sidner (1992) captured one in June 1986, one in June 1988, and one in July 1991 at Manning Camp. One each was captured at Deer Creek in May 2002, at Madrona Pools on September 18, 2001, and (species identification tentative) at Madrona Pools in May 2003 (Sidner 2003a).

Comments

The California Myotis is difficult to distinguish from the Western Small-footed Myotis (*Myotis ciliolabrum*); it is necessary to examine the skull to positively identify the species, and both occur in Saguaro NP. It roosts singly or in small colonies in crevices in places such as rocks, buildings, and tree bark.

This species is a habitat generalist in southern Arizona, and it has been found at low, middle, and high elevations in the park.

California Myotis (*Myotis californicus*).



Locations for California Myotis.

WESTERN SMALL-FOOTED MYOTIS

Myotis ciliolabrum

Infraclass Eutheria
Order Chiroptera (bats)
Family Vespertilionidae (vesper bats)

Current status: Confirmed
Habitat: Oaks, chaparral, and riparian areas
Abundance: Unknown

Records

Number of individuals captured in NPS inventory: 1

Voucher photo(s): NPS266a and NPS266b, by R. Sidner, Manning Camp Pond (UTMs 542099, 3563320S), September 22, 2001.

Museum specimen(s): Two specimens in UA mammal collection:
(1) UA25523, collected by R. M. Sidner, Manning Camp Pond, 8,000 ft, June 3, 1986;
(2) UA26946, collected by R. M. Sidner at pool 100 m below Devil's Bathtub Spring, Madrona Canyon (T14S, R18E), 7,440 ft, September 23, 2001.

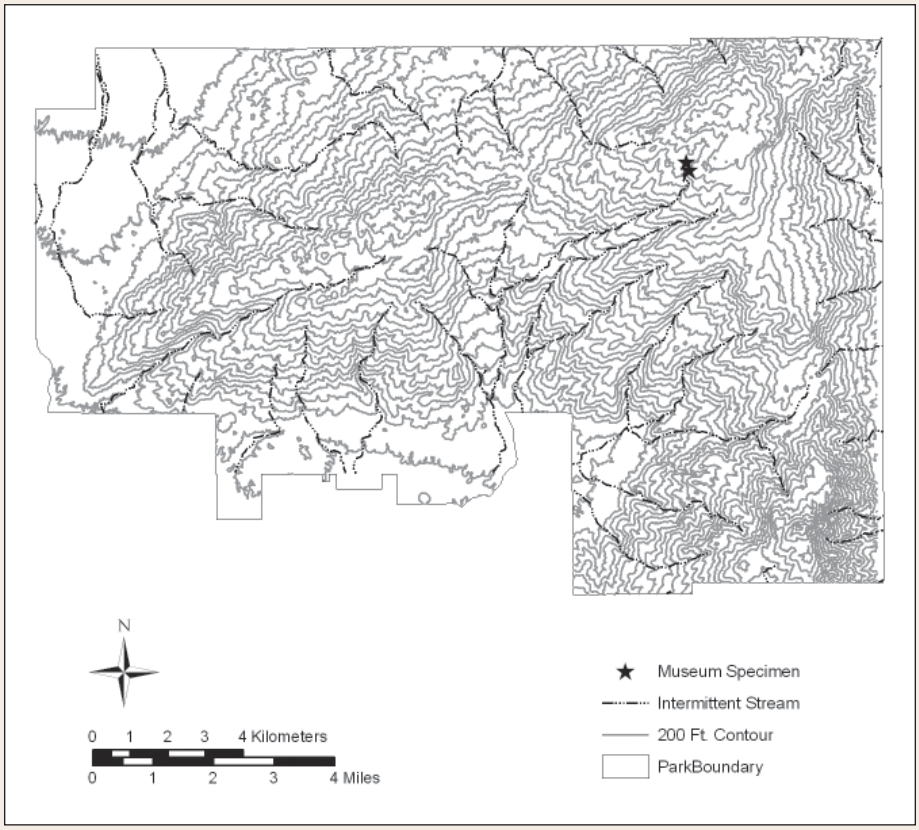
Historic and recent records: Two captured by Davis and Sidner (1992) at Manning Camp in June 1986, and one collected by Sidner (see above) at Devil's Bathtub on September 23, 2001.

Comments

Listed as a Species of Concern by the USFWS. Formerly considered a subspecies of *M. leibii*, this species is very easy to confuse with the California Myotis (*Myotis californicus*); see account for that species. *M. ciliolabrum* is distinguished from *M. yumanensis* by the well-developed keel on its calcar. It roosts singly or in small colonies in rock crevices, buildings, caves, mines, and under loose tree bark.

Little is known about the natural history of Western Small-footed Myotis in Arizona (Hoffmeister 1986), but it is a habitat generalist that ranges from desert to high elevations. At the RMD, it has been documented only at relatively high elevations.

Western Small-Footed Myotis (*Myotis ciliolabrum*).



Location for Western Small-Footed Myotis.

FRINGED MYOTIS

Myotis thysanodes

Infraclass Eutheria
Order Chiroptera (bats)
Family Vespertilionidae (vesper bats)

Current status: Confirmed
Habitat: Most common in oak-pinyon and coniferous mid-elevation forests but found from desert scrub to spruce-fir forests
Abundance: Unknown

Records

Number of individuals captured in NPS inventory: 2

Voucher photo(s): NPS257a (May 21, 2001) and NPS257b (May 19, 2001), by R. Sidner, Manning Camp Pond (UTMs 542099, 3563320S).

Museum specimen(s): Eight specimens in UA mammal collection:
(1–3) UA15333–UA15335, collected by B. A. Lund, Manning Camp, August 11, 1966;
(4) UA15361, collected by B. A. Lund, Manning Camp, August 11, 1966;
(5) UA25349, collected by R. Davis, Manning Camp, 8,000 ft, May 30, 1985;
(6) UA25352, collected by R. Davis, Manning Camp, 8,000 ft, June 6, 1985;
(7) UA25522, collected by R. M. Sidner, Manning Camp Pond, 8,000 ft, June 3, 1986;
(8) UA25524, collected by R. M. Sidner, Manning Camp Pond, 8,000 ft, June 5, 1986.

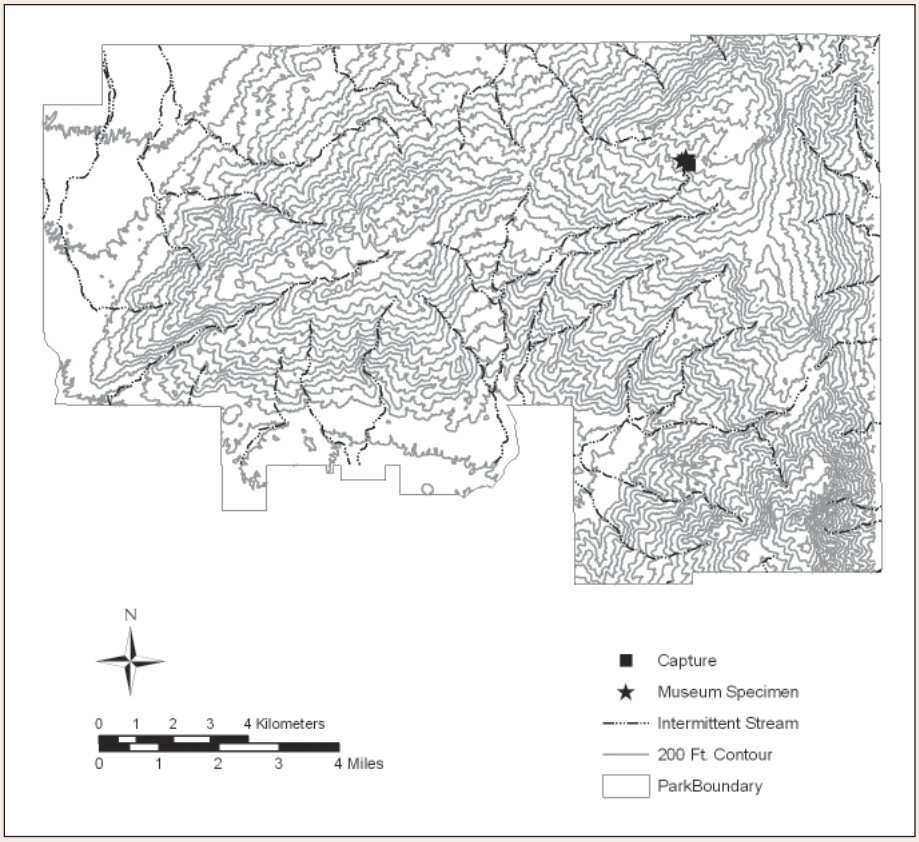
Historic and recent records: Barbara Lund captured four individuals at Manning Camp in 1966 (see above). Davis and Sidner (1992) captured six in June 1985, two in June 1986, one in June 1988, and 19 in July 1991, at Manning Camp. Sidner captured two in May 2001, at Manning Camp.

Comments

Listed as a Species of Concern by the USFWS. This species is distinguished from other Long-eared Myotis by its fringe of hair on the bottom edge of the tail membrane. It roosts in caves, mines, and buildings.

The Fringed Myotis is widespread in Arizona, where it is generally associated with woodlands and forests (Hoffmeister 1986). The RMD is on the western edge of the range in southern Arizona, and the species has only been confirmed at Manning Camp.

Fringed Myotis (*Myotis thysanodes*).



Location for Fringed Myotis.

CAVE MYOTIS

Myotis velifer

Infraclass Eutheria
Order Chiroptera (bats)
Family Vespertilionidae (vesper bats)

Current status: Confirmed
Habitat: Primarily desert scrub
Abundance: Common

Records

Number of individuals captured in NPS inventory: 3

Voucher photo(s): Unnumbered photo by R. Sidner, Madrona pools in Chimenea Creek, May 2003 (Sidner 2003).

Museum specimen(s): Five specimens in UA mammal collection:
(1) UA7750, collected by P. J. Gould, B. J. Hayward, and others, Box Canyon, August 24, 1960;
(2) UA7751, collected by P. J. Gould, B. J. Hayward, and others, Box Canyon, August 22, 1960;
(3) UA7752, collected by P. J. Gould, B. J. Hayward, and others, Box Canyon, August 24, 1960;
(4–5) UA7753– UA7754, collected by P. J. Gould, B. J. Hayward, and others, Box Canyon, August 22, 1960.

Historic and recent records: All observations are from a single roost in the park (not identified due to sensitivity of location). Sidner (1991) observed ~1,000 in July 1985, ~1,000 in May and July 1986, and up to ~3,000 in May and July 1991. Sidner and Davis (1994) observed ~1,000–1,500 in May 1992, ~500–1,000 in May 1993, and ~1,800 in June 1993. Wolf and Dalton (S. Wolf field notes) observed ~2,000–3,000 in June, and ~200 in September 2005. In addition, Sidner (2003a) captured three at the Madrona Pools in May 2003.

Comments

Cave Myotis is is listed as a Species of Concern by the USFWS. It is a wide-ranging species associated with caves and mine shafts, where they often roost in large colonies. Some individuals in Arizona apparently migrate, while others hibernate.

A large maternity colony of Cave Myotis roosts in the RMD, and a large bachelor colony roosts in the TMD. Cave Myotis are present in the park spring through fall.

Cave Myotis (*Myotis velifer*).

(Map not provided due to sensitivity of this species)

LONG-LEGGED MYOTIS

Myotis volans

Infraclass Eutheria
Order Chiroptera (bats)
Family Vespertilionidae (vesper bats)

Current status: Confirmed
Habitat: Forested mountains, pinyon-juniper to coniferous, but most common in ponderosa pine and conifers
Abundance: Unknown

Records

Number of individuals captured in NPS inventory: 3

Voucher photo(s): NPS260 by R. Sidner, Manning Camp Pond (UTMs 542099, 3563320S), May 21, 2001.

Museum specimen(s): One specimen in SDMNH: SD10084, collected by L. M. Huey and J. W. Sefton, Rincon Mts., Spud Rock Ranger Station, June 16, 1932.

Five specimens in UA mammal collection:
(1) UA25351, collected by R. Davis, Manning Camp, 8,000 ft, June 3, 1985;
(2) UA25515, collected by R. M. Sidner, Manning Camp Pond, 8,000 ft, June 3, 1986;
(3) UA25516, collected by R. M. Sidner, Manning Camp Pond, 8,000 ft, June 6, 1986;
(4) UA25517, collected by R. M. Sidner, Manning Camp Pond, 8,000 ft, June 5, 1986;
(5) UA25526, collected by R. M. Davis, Manning Camp Pond, 8,000 ft, June 1, 1986.

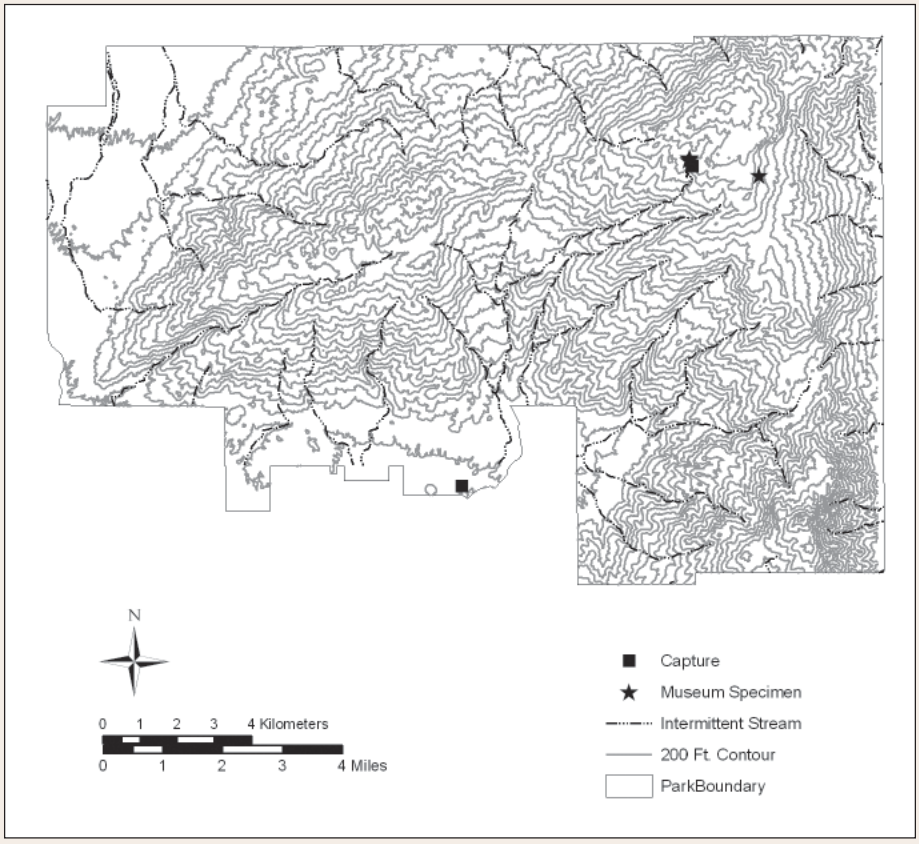
Historic and recent records: At Manning Camp, Davis and Sidner (1992) captured four in June 1985, four in June 1986, one in June 1988, and 18 in July 1991. R. Sidner (field notes) also captured two at Manning Camp in May 2001, and one in lower Rincon Creek in August 2002.

Comments

The Long-legged Myotis is listed as a Species of Concern by the USFWS. It is one of the larger Myotis species, with short, rounded ears and long, dense fur. It roosts in buildings, rock crevices, cliffs, and trees.

This species is typically associated with forests, and the RMD is on the western edge of its range. It has been found in the park only at higher elevations.

Long-Legged Myotis (*Myotis volans*).



Location for Long-Legged Myotis.

YUMA MYOTIS

Myotis yumanensis

Infraclass Eutheria
Order Chiroptera (bats)
Family Vespertilionidae (vesper bats)

Current status: Confirmed
Habitat: Usually low desert to pinyon-juniper, associated with water
Abundance: Unknown

Records

Number of individuals captured in NPS inventory: 0

Voucher photo(s): UA25581-Davis#265, by R. Sidner, Manning Camp Pond (UTMs 542099, 3563320S), June 6, 1986.

Museum specimen(s): One specimen in UA mammal collection: UA25518, collected by R. M. Sidner, Manning Camp Pond, 8,000 ft, June 6, 1986.

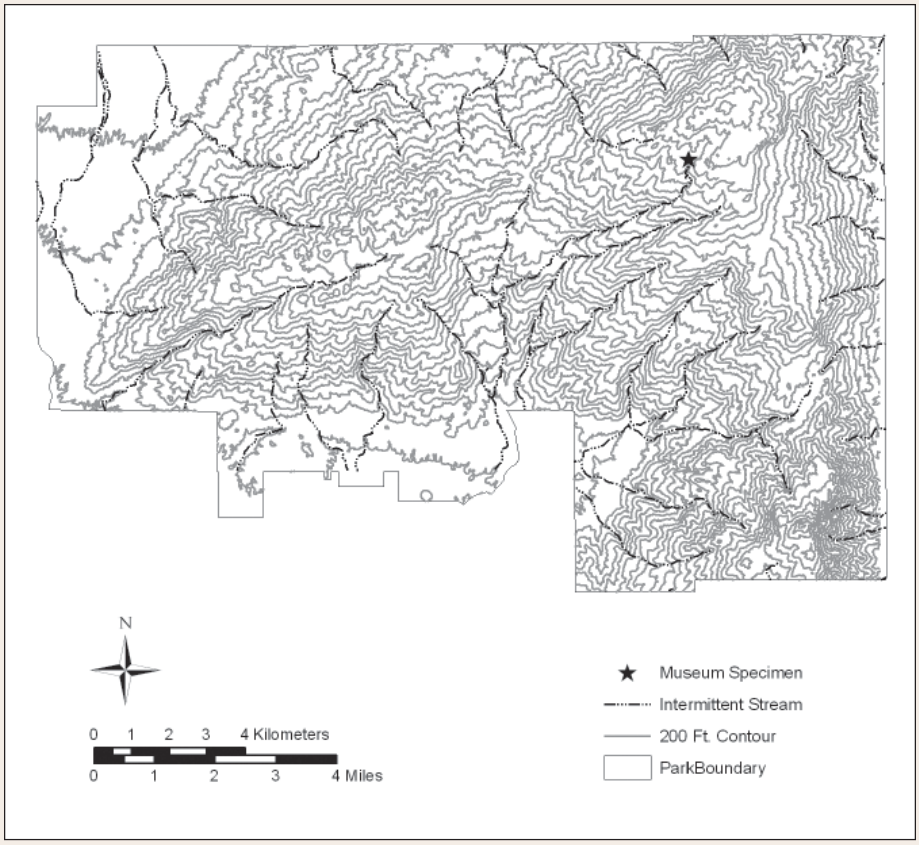
Historic and recent records: One captured in June 1986 at Manning Camp by Davis and Sidner (1992).

Comments

Yuma Myotis often forage over open water (Hoffmeister 1986). They eat moths and other small insects. They commonly roost in buildings and bridges, and also use caves and mines. Maternity colonies can contain thousands of individuals.

Yuma Myotis are migratory, and probably occur in the RMD only during summer. They are widespread in Arizona, but the only record from the RMD is at Manning Camp.

Yuma Myotis (*Myotis yumanensis*).



Location for Yuma Myotis.

WESTERN RED BAT

Lasiurus blossevillii

Infraclass Eutheria
Order Chiroptera (bats)
Family Vespertilionidae (vesper bats)

Current status: Confirmed
Habitat: Riparian areas with deciduous broadleaf trees
Abundance: Rare

Records

Number of individuals captured in NPS inventory: 1

Voucher photo(s): Unnumbered photo by R. Sidner, Rincon Creek, August 13, 2002.

Museum specimen(s): None

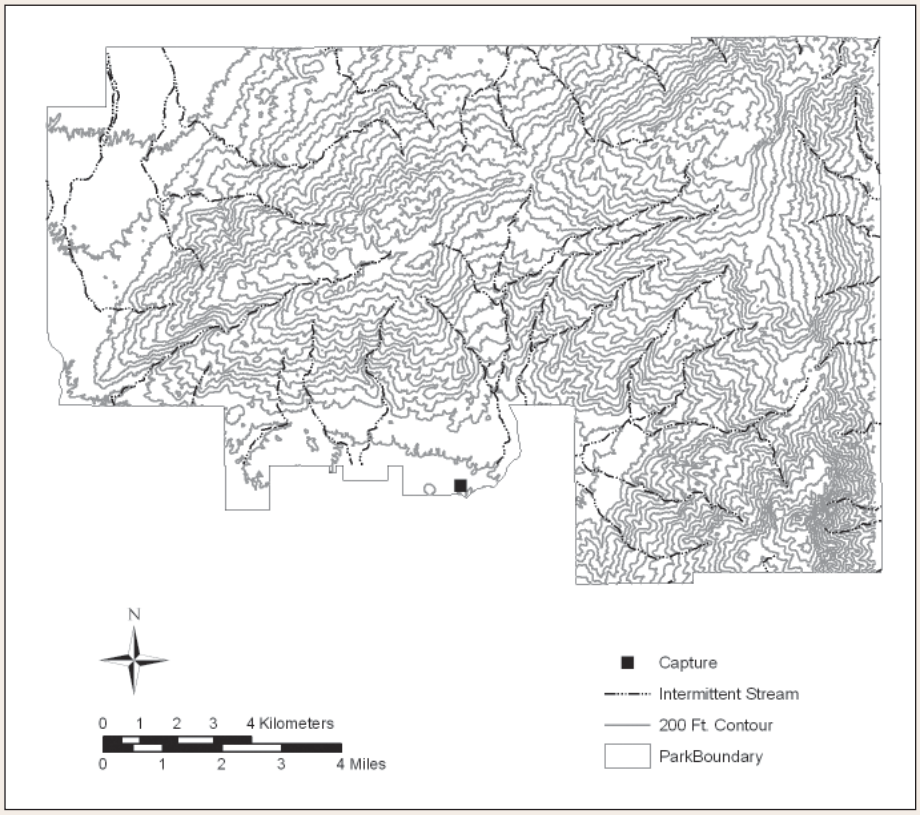
Historic and recent records: Sidner and Davis (1995) captured three in the Rincon Mountains in Coronado National Forest adjacent to the park, two at Turkey-Paige Creek in July 1992, and one at Paige Well in August 1994.

Comments

Like other *Lasiurus* in Arizona, the Western Red Bat roosts singly in the foliage of broadleaf trees, shaded above and open below. It migrates in groups. It is distinguished from the Western Yellow Bat and Hoary Bat by a shorter forearm (38–43 mm) and reddish dorsal fur that is especially bright in males.

Formerly considered *Lasiurus borealis*, Arizona specimens were designated as a separate species in the 1990s. Western Red Bats are listed as a Species of Special Concern by the Arizona Game and Fish Department. This species was not detected in Saguaro NP prior to this study, and its presence in the riparian woodland area of Rincon Creek is significant.

Western Red Bat (*Lasiurus blossevillii*).



Location for Western Red Bat.

HOARY BAT

Lasiurus cinereus

Infraclass Eutheria
Order Chiroptera (bats)
Family Vespertilionidae (vesper bats)

Current status: Confirmed
Habitat: Woodlands and forests
Abundance: Unknown

Records

Number of individuals captured in NPS inventory: 7

Voucher photo(s): NPS255 by R. Sidner, Lower Rincon Creek (UTMs 535896, 3554693S), May 17, 2001.

Museum specimen(s): None

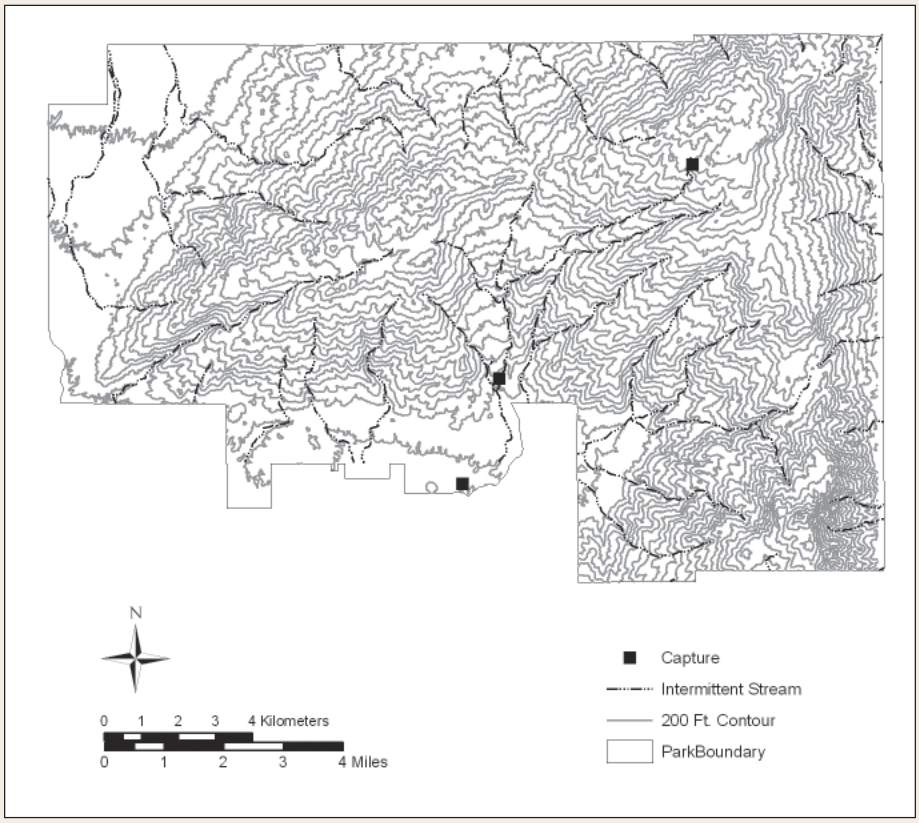
Historic and recent records: At Manning Camp, Davis and Sidner (1992) captured three in June 1985, six in June 1986, three in June 1988, three in May 2001, and one in September 2001. In Rincon Creek, R. Sidner (field notes) captured one in May 2001, and two in September 2001. R. Sidner (2003a) captured one at Madrona Pools in May 2003.

Comments

The Hoary Bat is the largest *Lasiurus* in Arizona. It has gray, brown, and black hairs tipped with white, giving it a frosted appearance. It roosts in trees with dense foliage. Hoary Bats are strong fliers, and can migrate long distances. They are the most widespread of American bats, ranging from Canada to Argentina and on isolated oceanic islands, such as Hawai'i.

In the RMD, this species appears to be present at all elevations from the desert to Manning Camp, although at lower elevations is probably is restricted to riparian areas.

Hoary Bat (*Lasiurus cinereus*).



Location for Hoary Bat.

SILVER-HAIRED BAT

Lasionycteris noctivagans

Infraclass Eutheria
Order Chiroptera (bats)
Family Vespertilionidae (vesper bats)

Current status: Confirmed
Habitat: Coniferous forests, and riparian areas at lower elevations
Abundance: Uncommon/Unknown

Records

Number of individuals captured in NPS inventory: 4

Voucher photo(s): NPS258 by R. Sidner, Manning Camp Pond (UTMs 542099, 3563320S), May 20, 2001.

Museum specimen(s): One specimen in UA mammal collection: UA25514, collected by R. M. Sidner, Manning Camp Pond, 8,000 ft, June 3, 1986.

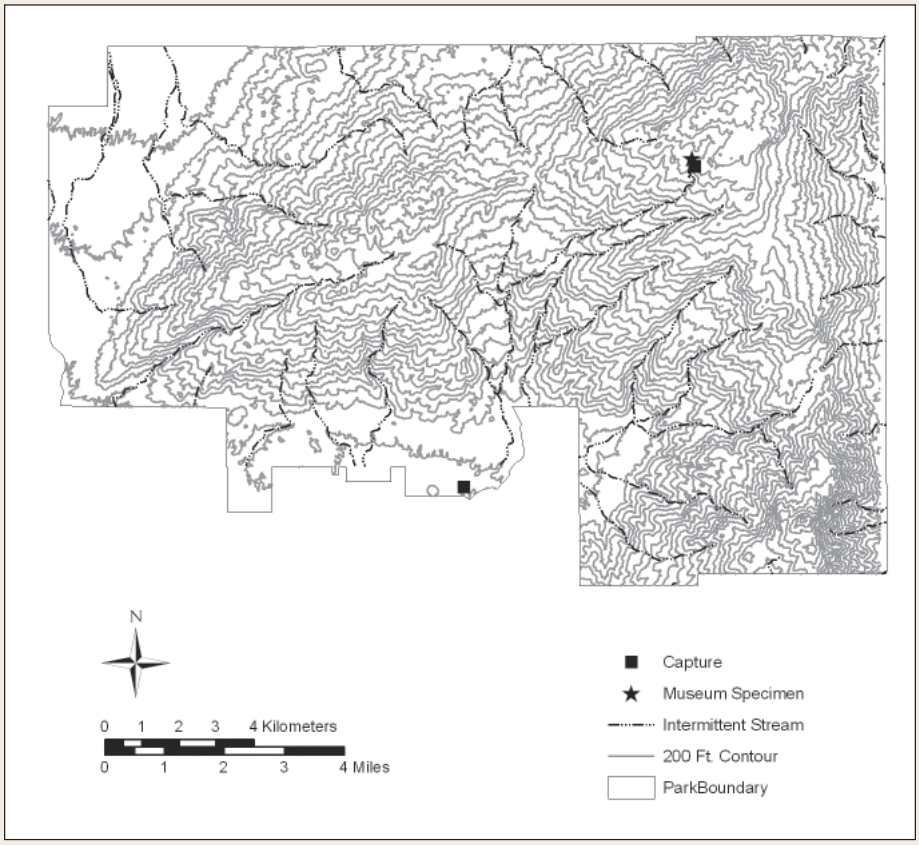
Historic and recent records: At Manning Camp, Davis and Sidner (1992) captured four in June 1985, 11 in June 1986, and six in June 1988. In Rincon Creek, during the inventory, R. Sidner (field notes) captured one in May 2001 and three in May 2001.

Comments

Silver-haired Bats are named for the silver-tipped hairs on their back. They roost alone under bark or in crevices in both deciduous and coniferous trees, and also use human-made structures. It is unknown whether females form maternity colonies or remain solitary before giving birth.

This species is associated with mountains in Arizona, but has been found at all elevations in the RMD.

Silver-Haired Bat (*Lasionycteris noctivagans*).



Location for Silver-Haired Bat.

WESTERN PIPISTRELLE

Pipistrellus hesperus

Infraclass Eutheria
Order Chiroptera (bats)
Family Vespertilionidae (vesper bats)

Current status: Confirmed
Habitat: Always near rocky canyons, cliffs, or outcroppings; from desert scrub to pine forests
Abundance: Common

Records

Number of individuals captured in NPS inventory: 0

Voucher photo(s): Unnumbered photo by R. Sidner, Madrona pools in Chimenea Creek, May 2003 (Sidner 2003).

Museum specimen(s): None

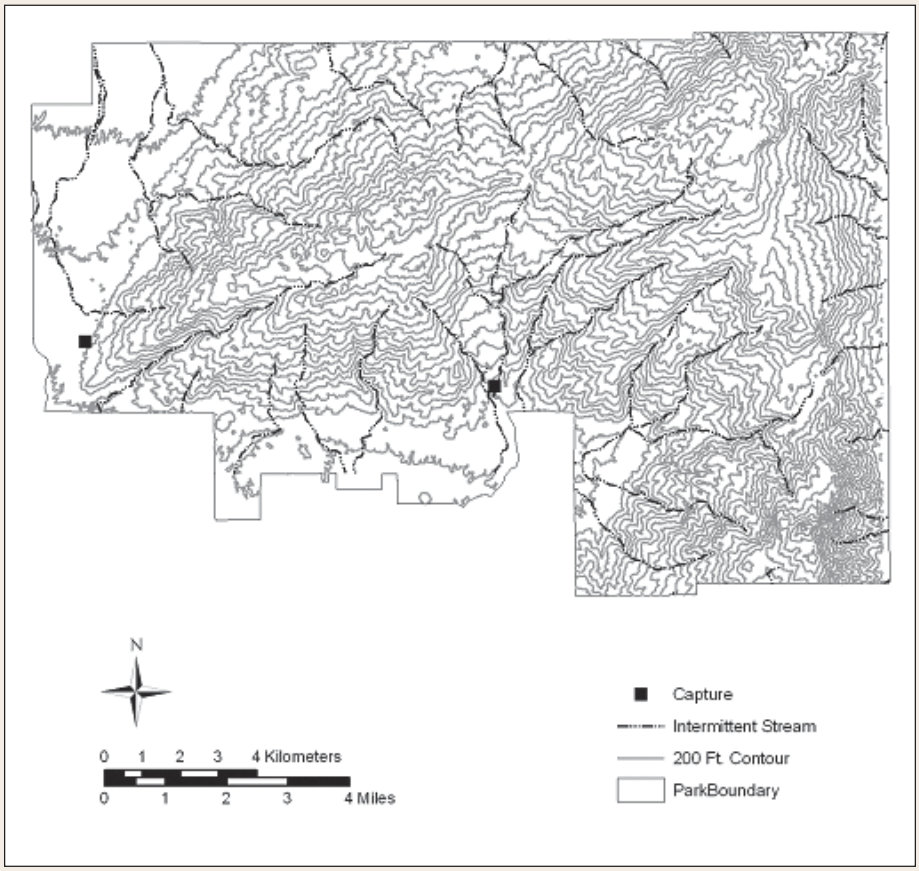
Historic and recent records: Sidner and Davis (1994) found one dead on the ground at Javelina Picnic Area in January 1994. Sidner (2003a) captured 20 at Madrona Pools in May 2003.

Comments

This bat is often seen because it emerges early in the evening, well before dark, and has a distinctive, butterfly-like flight. It roosts in cliff crevices, but also human-made structures, and is common in the Tucson metropolitan area. It most often roosts singly. It hibernates in winter, but can been seen foraging occasionally, even on cold nights. The Western Pipistrelle can be distinguished from small *Myotis* species by its club-shaped tragus. It is the smallest bat in the U.S.

This species has been captured in large numbers in the Madrona Pools and is probably very common at lower elevations in the RMD.

(No photo available)



Location for Western Pipistrelle.

BIG BROWN BAT

Eptesicus fuscus

Infraclass Eutheria
Order Chiroptera (bats)
Family Vespertilionidae (vesper bats)

Current status: Confirmed
Habitat: Generalist
Abundance: Common

Records

Number of individuals captured in NPS inventory: 52

Voucher photo(s): NPS265, by R. Sidner, Manning Camp Pond (UTMs 542099, 3563320S), September 22, 2001.

Museum specimen(s): Two specimens in SDMNH collection:
(1) SD10076, collected by L. M. Huey & J. W. Sefton, Spud Rock Ranger Station, June 15, 1932;
(2) SD10105, collected by T. W. Sefton & L. M. Huey, Spud Rock Ranger Station, June 20, 1932.

Two specimens in UA mammal collection:
(1) UA810, collected by H. Brown, Manning Camp, July 23, 1911;
(2) UA811, collected by H. Brown, Manning Camp, July 25, 1911.

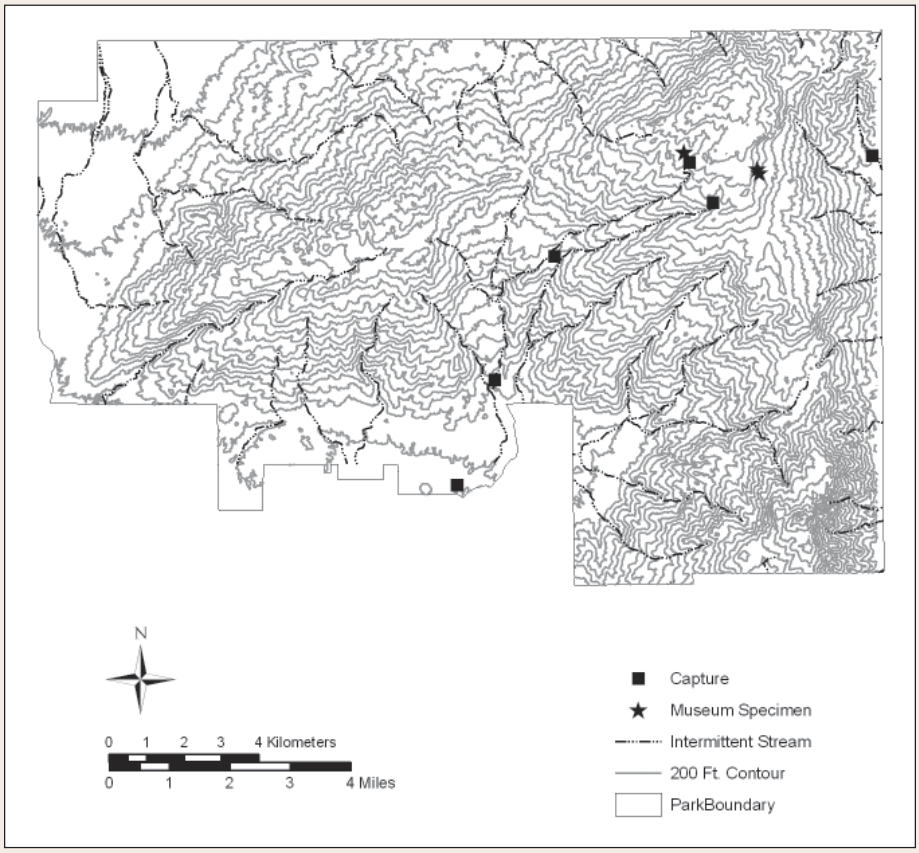
Historic and recent records: H. Brown collected two individuals at Manning Camp in 1911 (UA collection), and Huey collected two at the Spud Rock cabin site in June 1932 (SDMNH collection). Davis and Sidner (1992) captured individuals at Grass Shack in 1983. At Manning Camp, Davis and Sidner (1992) captured 35 in June 1985, 3 in August 1985, 12 in June 1986, 14 in June 1988, and 6 in July 1991. At Madrona, four individuals were captured during the inventory in May 2001, and nine were captured in May 2003 (Sidner 2003). During the inventory, R. Sidner also captured 10 in Rincon Creek in 2001–2002, 21 at Manning Camp in September 2001, 1 at Devil's Bathtub in September 2001, and 2 at Deer Creek in May 2002 (Sidner 2001, 2003b).

Comments

The Big Brown Bat is a large species that is widespread in the U.S. It commonly roosts in buildings, so it is frequently seen by people. This species can be distinguished from larger *Myotis* by its blunt, shorter tragus. Natural roost sites include tree hollows and caves, and these bats have been known to use saguaro cavities (Cross and Huibregtse 1964).

Big Brown Bats are common throughout the Tucson area, including in most city neighborhoods. At the RMD, they have been frequently captured at Manning Camp, but also at Rincon Creek, Deer Creek, and other sites.

Big Brown Bat (*Eptesicus fuscus*).



Location for Big Brown Bat.

TOWNSEND'S BIG-EARED BAT

Corynorhinus townsendii

Infraclass Eutheria
Order Chiroptera (bats)
Family Vespertilionidae (vesper bats)

Current status: Confirmed
Habitat: Desert scrub up through oak woodland, pinyon-juniper to coniferous forest
Abundance: Uncommon

Records

Number of individuals captured in NPS inventory: 1

Voucher photo(s): Unnumbered photo by R. Sidner, Box Canyon, 1980s.

Museum specimen(s): Eight specimens in UA mammal collection, all from a rock slide on north side of Sentinel Butte:
(1–2) UA16113–UA16114, collected by J. T. Mascarello, May 12, 1967;
(3) UA16746, collected by G. C. Mitchell on August 23, 1967;
(4–5) UA16747–UA16748, collected by G. C. Mitchell, August 23, 1967;
(6–7) UA16875–UA16876, collected by G. C. Mitchell, August 23, 1967;
(8) UA16974, collected by G. C. Mitchell, August 23, 1967.

Historic and recent records: Davis and Sidner (1992) captured one each at Manning Camp in August 1985, June 1988, and July 1991. Sidner (1991) observed one in a Tanque Verde cavelet on May 16, 1991. J. T. Mascarello collected two in Box Canyon on May 12, 1967. Sidner and Davis (1994) observed 27 on October 25, 1984, 100 (including juveniles) on July 18, 1985, 50 (including juveniles) on May 14, 1986, 3 on July 27, 1991, at least one on May 8, 1992, 65 on March 28, 1993, 90 on May 11, 1993, and >35 (including juveniles) on June 25, 1993. Wolf and Dalton (2003) observed two at the same location on March 15, 2003. During the NPS inventory, R. Sidner also observed one individual at Rincon Creek.

Comments

Listed as a Species of Concern by the USFWS. Formerly known as *Plecotus townsendii*. The Townsend's Big-eared Bat is distinguished from other large-eared bat species by the presence of a glandular lump on each side of its nose projecting upward in the shape of a horseshoe. Townsend's do not use crevices or cracks, but instead hang from open areas of ceilings. Males are usually solitary; females form maternity colonies of up to ~200. Townsend's hibernate in winter in small groups or as individuals. This species appears to be very common throughout the RMD.

Townsend's Big-Eared Bat (*Corynorhinus townsendii*).

(Map not provided due to sensitivity of this species)

PALLID BAT

Antrozous pallidus

Infraclass Eutheria
Order Chiroptera (bats)
Family Vespertilionidae (vesper bats)

Current status: Confirmed
Habitat: Deserts and grasslands, sometimes occurring at higher elevations
Abundance: Unknown

Records

Number of individuals captured in NPS inventory: 1

Voucher photo(s): Unnumbered photo by R. Sidner, Manning Camp Pond (UTMs 542099, 3563320S), June 3, 1986.

Museum specimen(s): None

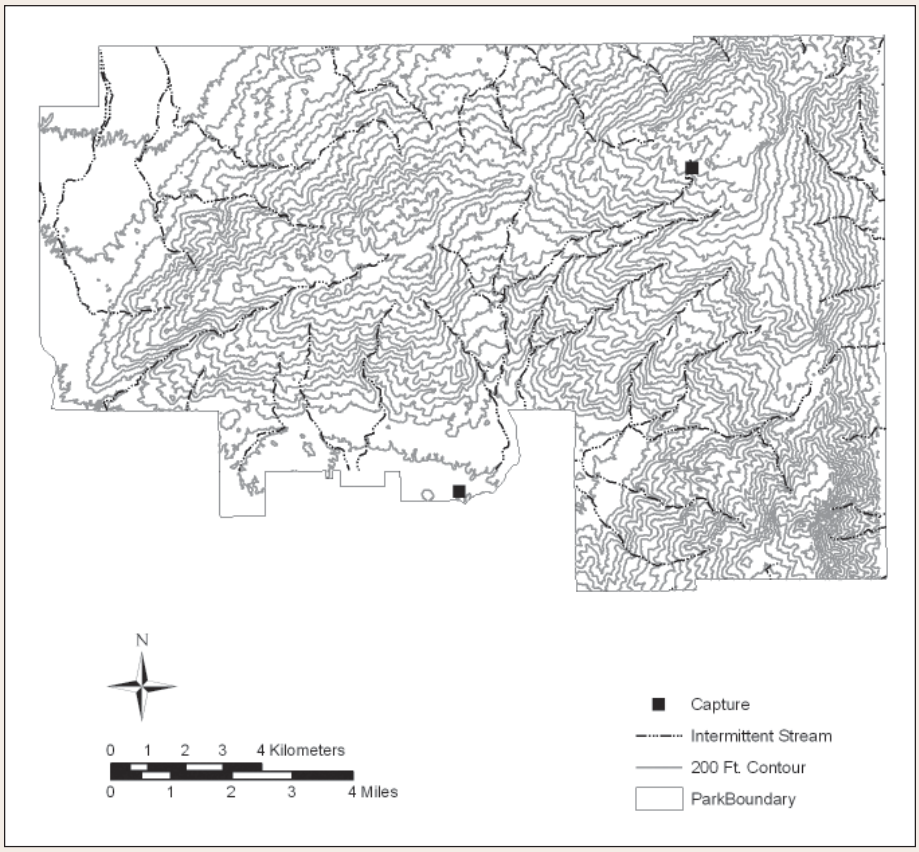
Historic and recent records: Davis and Sidner (1992) captured one individual at Manning Camp in June 1986. R. Sidner also captured, but was unable to photograph, one individual in Rincon Creek on August 13, 2002.

Comments

Pallid Bats glean large, hard-bodied insects, such as centipedes, scorpions, beetles, and grasshoppers, primarily from the ground. They roost in cliff crevices, usually in small colonies. Pallid Bats also roost in buildings and bridges, but only in outlying areas in the Tucson metropolitan area. They are present spring through fall in Arizona.

We are aware of only one record of this species from the RMD. In the voucher photograph, note the white thread around the neck of the bat. During sampling in 1986, Ronnie Sidner and Russell Davis attached white threads as temporary markers; this bat was not recaptured, but a Big Brown Bat was (R. Sidner, personal communication).

Pallid Bat (*Antrozous pallidus*).



Location for Pallid Bat.

BRAZILIAN (MEXICAN) FREE-TAILED BAT

Tadarida brasiliensis

Infraclass Eutheria
Order Chiroptera (bats)
Family Molossidae (free-tailed bats)

Current status: Confirmed
Habitat: In Arizona, roosts primarily in desert scrub
Abundance: Common

Records

Number of individuals captured in NPS inventory: 16

Voucher photo(s): NPS259 by R. Sidner, Manning Camp Pond (UTMs 542099, 3563320S), May 20, 2001.

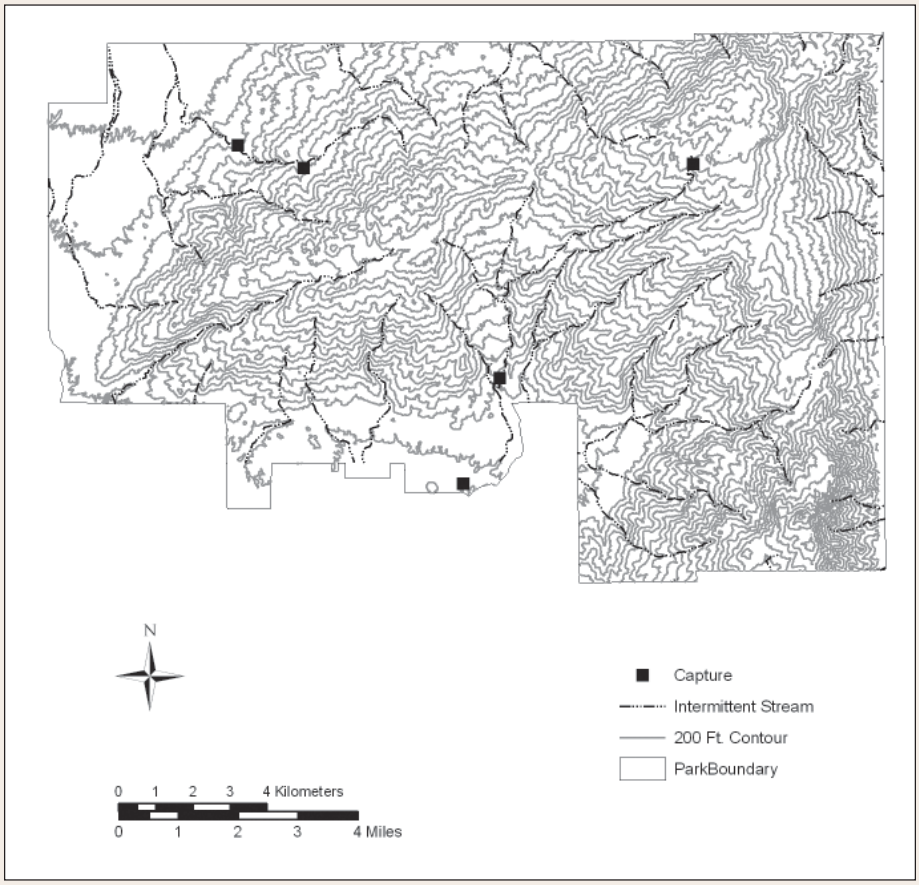
Museum specimen(s): None

Historic and recent records: Davis and Sidner (1992) captured one each in June 1988 and July 1991, at Manning Camp. During the NPS inventory, four were captured at Manning Camp in May 2001, 11 were captured at Rincon Creek in 2001–2002, and one was captured at Wild Horse Canyon on May 1, 2001. Sidner (2003a) captured seven at Madrona Pools in May 2003.

Comments

Brazilian (commonly known as Mexican) Free-tailed Bats roost in colonies of up to several million bats, using caves, mines, bridges, and buildings. The species is present year-round in the Tucson area, although the same individuals may not remain the entire year. They feed primarily on moths, foraging at altitudes up to 10,000 feet (3,048 m), and traveling many miles. They are widespread in the RMD, and probably fairly common.

Brazilian (Mexican) Free-Tailed Bat (*Tadarida brasiliensis*).



Location for Brazilian (Mexican) Free-Tailed Bat.

POCKETED FREE-TAILED BAT

Nyctinomops femorosaccus

Infraclass Eutheria
Order Chiroptera (bats)
Family Molossidae (free-tailed bats)

Current status: Confirmed
Habitat: Roosts in rocky cliffs and tall rocky outcrops in desert scrub
Abundance: Unknown

Records

Number of individuals captured in NPS inventory: 2

Voucher photo(s): NPS256a and NPS256b by R. Sidner, Lower Rincon Creek (UTMs 535896, 3554693), May 17, 2001.

Museum specimen(s): One specimen in UA mammal collection: UA26856, collected by Sidner, Lower Rincon Creek (T15S, R17E, junction of sections 16 and 17) (UTMs 535899, 3554689), ca. 3,150 ft, September 30, 2001.

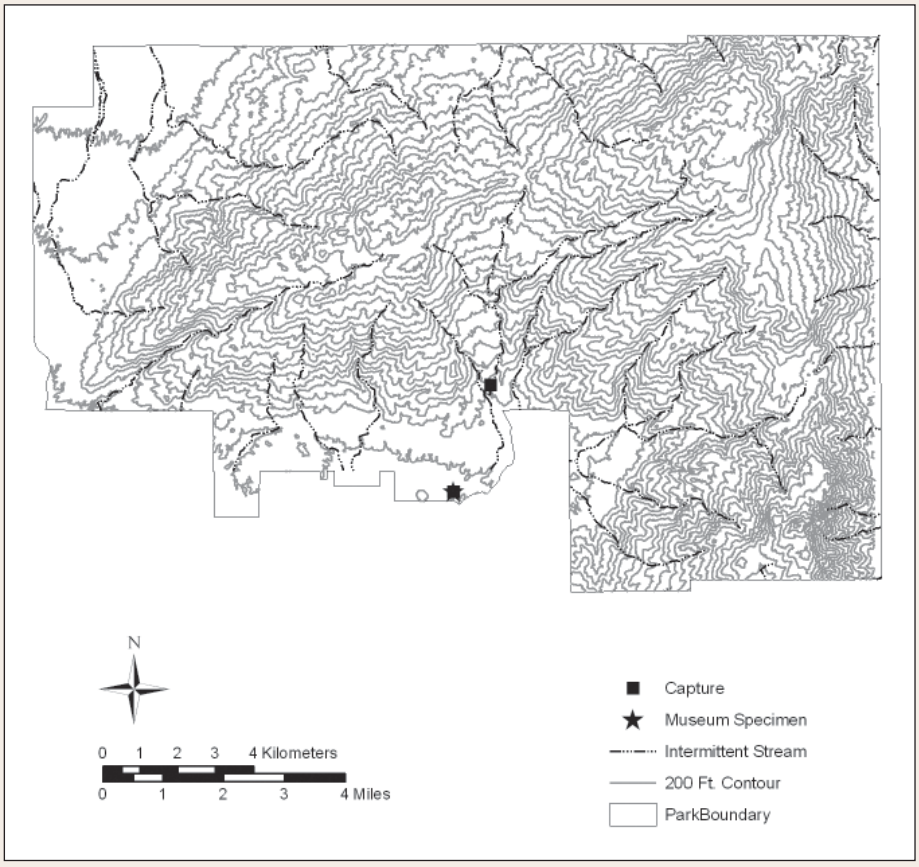
Historic and recent records: During the NPS inventory, one was captured in Rincon Creek on May 17, 2001, and one was captured on September 30, 2002. Sidner (2003a) captured three at the Madrona Pools in May 2003.

Comments

The Pocketed Free-tailed Bat is listed as a Species of Concern by the USFWS. This species is slightly larger than the Brazilian (Mexican) Free-tailed Bat, has ears joined at the base rather than separate, and has a small fold in the uropatagium (tail membrane) near the knee. It roosts in relatively small colonies of up to about 100 bats in caves and rock crevices.

A colony lived in the roof tiles of the Old Chemistry building at the UA in the 1960s. Only a few have been captured in the RMD, and their abundance is unknown.

Pocketed Free-Tailed Bat (*Nyctinomops femorosaccus*).



Location for Pocketed Free-Tailed Bat.

Rabbits

DESERT COTTONTAIL

Sylvilagus audubonii

Infraclass Eutheria
Order Lagomorpha (rabbits and kin)
Family Leporidae (rabbits and jackrabbits)

Current status: Confirmed
Habitat: Generalist in desert and grassland areas
Abundance: Very common

Records

Sight observation during NPS inventory project: Yes

Number of infrared-triggered photographs: 51

Number of records in SNP Wildlife Observations database: 147

Voucher photo(s): SNP-8 (TM photo #2570), Loop Drive area (UTMs 526330, 3564512), November 14, 2000.

Museum specimen(s): Three specimens in UIMNH:
(1) UI23360, collected by W. & L. Goodpaster, "Saguaro National Forest", 10 mi east of Tucson, May 10, 1946;
(2) UI26220, collected by W. W. Goodpaster, Saguaro National Monument, 10 mi east of Tucson, May 10, 1946;
(3) UI26221, collected by W. W. Goodpaster, Saguaro National Monument, 10 mi east of Tucson, May 24, 1946.

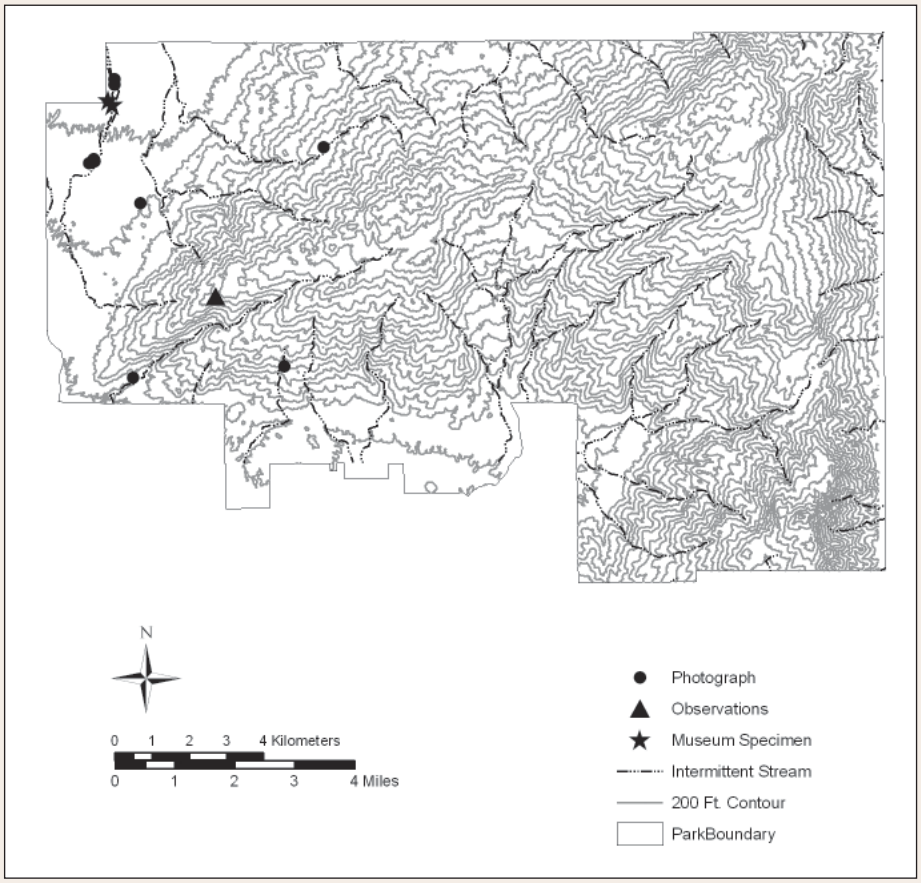
Historic and recent records: Observed and considered common at low elevations by Sumner (1951). Park wildlife reports from the 1930s through the 1960s (SNP-WACC records, Annual Wildlife Reports) frequently mention cottontails and suggest that this species has been abundant throughout the history of the park.

Comments

Cottontails are both common and diurnal. The Desert Cottontail is associated with deserts and desert grasslands. During hot summer days, it utilizes shade in burrows or under trees. This species is difficult to distinguish in the field from the Eastern Cottontail (*S. floridanus*), which may occur at higher elevations in the RMD. For information on distinguishing the two species, see the account for Eastern Cottontail.

Visitors to Saguaro National Park are probably more likely to see a Desert Cottontail than any other mammal. They can be commonly observed along the Loop Road or trails in the Cactus Forest.

Desert Cottontail (*Sylvilagus audubonii*).



Location for Desert Cottontail.

EASTERN COTTONTAIL

Sylvilagus floridanus

Infraclass Eutheria
Order Lagomorpha (rabbits and kin)
Family Leporidae (rabbits and jackrabbits)

Current status: Not confirmed; see below
Habitat: Generalist in desert and grassland areas
Abundance: Unknown

Records

Sight observation during NPS inventory project: Yes

Number of infrared-triggered photographs: 3

Number of records in SNP Wildlife Observations database: 0

Voucher photo(s): No voucher photo available due to uncertain status. SNP-1 (TM Photo #5418), Happy Valley Saddle (UTMs 545275, 3557649), September 30, 2003, is a photo of a cottontail in appropriate habitat for this species.

Museum specimen(s): None

Historic and recent records: Tracks observed by Sumner (1951) as high as the slopes of Rincon Peak; see below. This species was assumed to be present by some employees early in the history of the park, and is listed on annual wildlife reports as present in 1940 and 1947 (SNP-WACC records, Annual Wildlife Reports).

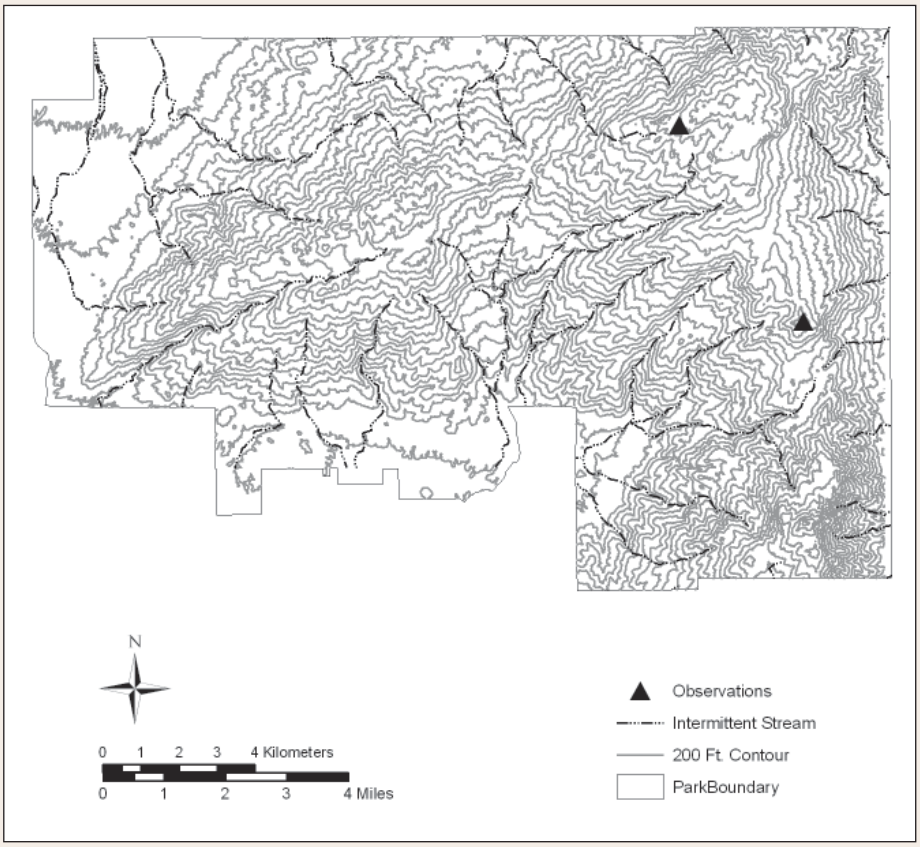
Comments

Eastern Cottontails and Desert Cottontails are difficult to distinguish in the field, and the two species are known to hybridize. In general, Eastern Cottontails have smaller ears and more reddish hindquarters than Desert Cottontails, and a pink, versus chestnut-colored, nape and dorsal surface of the tail, with or without a border of white.

Eastern Cottontails may be somewhat common at elevations above 6,000 feet (1,829 m) in the Rincons, but this species has never been confirmed at the park. Photographs of cottontails taken at high elevations during this study are possibly this species. Both Sumner (1951) and Davis and Sidner (1992) believed that this species occurred in the Rincons, and Sumner felt that it was "quite common at the higher elevations." Sumner based his observation on tracks in the snow at high elevations; Don Swann also observed tracks in snow in 2004, on Heartbreak Ridge near Happy Valley Lookout, and saw individuals that exhibited characteristics of this species at Grass Shack junction in 2006.

Because so little is known about this species in southern Arizona, it would be a prime candidate for future studies at the park, particularly if other areas and genetic analysis were included. Eastern cottontails have been confirmed at low elevations at Tonto National Monument and reported in the inventory of mammals at Coronado National Memorial (Swann et al. 2000).

Eastern Cottontail (*Sylvilagus floridanus*).



Locations for Eastern Cottontail.

ANTELOPE JACKRABBIT

Lepus alleni

Infraclass Eutheria
Order Lagomorpha (rabbits and kin)
Family Leporidae (rabbits and jackrabbits)

Current status: Confirmed
Habitat: Open riparian areas and semi-desert grassland
Abundance: Uncommon

Records

Sight observation during NPS inventory project: Yes

Number of infrared-triggered photographs: 7

Number of records in SNP Wildlife Observations database: 20

Voucher photos: SNP-3a (TM Photo #488), near Broadway Trailhead (UTMs 526536, 3565580), August 21, 2001. SNP-3b (TM Photo #489), near Broadway Trailhead (UTMs 526536, 3565580S), August 21, 2001.

Museum specimen(s): One specimen in UA mammal collection: UA12007, collected by G. L. Hathaway at 2.5 mi. east, 1 mi. south of Freeman & Speedway Rds., Tucson, October 12, 1964.

One specimen in UIMNH collection: UI26244, collected by W. W. Goodpaster, Saguaro National Monument, 10 mi east of Tucson, May 11, 1946.

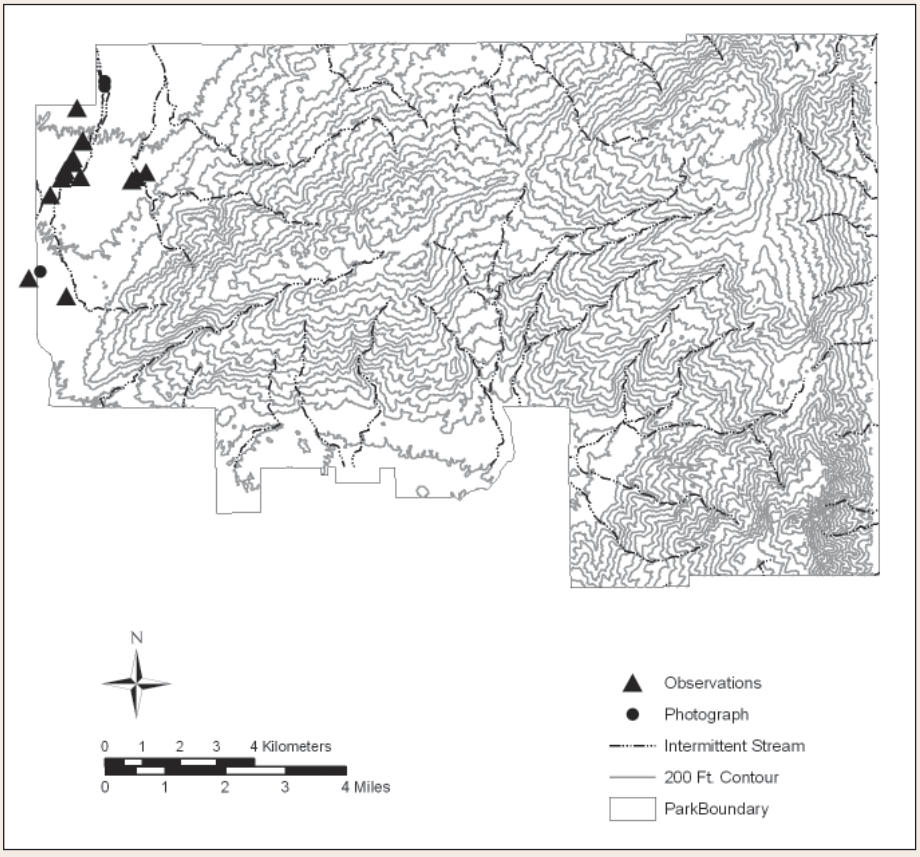
Historic and recent records: Observed by Sumner (1951), who noted that both species of jackrabbits, as well as cottontails, were "common at lower elevations." The park's annual mammal reports and other reports often do not distinguish the two jackrabbit species, but this species was listed as present in 1940, 1947, 1950, and 1951 (SNP-WACC records, Annual Wildlife Reports).

Comments

Antelope Jackrabbits have been called "the desert dwellers of southernmost Arizona" (Hoffmeister 1986). They have been observed walking single-file in large groups of as many as 13 individuals (Vorhies and Taylor 1933). Individuals of this species can be distinguished from Black-tailed Jackrabbits by their larger size, broad white swath on their flanks and hindquarters, and white edges on the ears (compared to black edges on the ears of Black-tailed Jackrabbits).

In the Rincon Mountains, they appear to be relatively uncommon, but are found in sandy areas near washes, such as near the Loma Verde trailhead. The difficulty of distinguishing this species from Black-tailed Jackrabbits makes most visitor observations suspect.

Antelope Jackrabbit (*Lepus alleni*).



Locations for Antelope Jackrabbit.

BLACK-TAILED JACKRABBIT

Lepus californicus

Infraclass Eutheria
Order Lagomorpha (rabbits and kin)
Family Leporidae (rabbits and jackrabbits)

Current status: Confirmed
Habitat: Open areas in desert and grasslands
Abundance: Common

Records

Sight observation during NPS inventory project: Yes

Number of infrared-triggered photographs: 10

Number of records in SNP Wildlife Observations database: 4

Voucher photo(s): SNP-26 (TM Photo #480), Cactus Forest area (UTMs 526821, 3565540), August 15, 2001.

Museum specimen(s): Two specimens in UA mammal collection:
(1) UA7091, collected by G. V. R. Bradshaw, Saguaro National Monument, 15 mi. east of Tucson, August 3, 1959;
(2) UA12000, collected by J. H. Nelson at 2.5 mi. east, 1 mi south of Speedway Boulevard on Freeman Road, October 12, 1964.

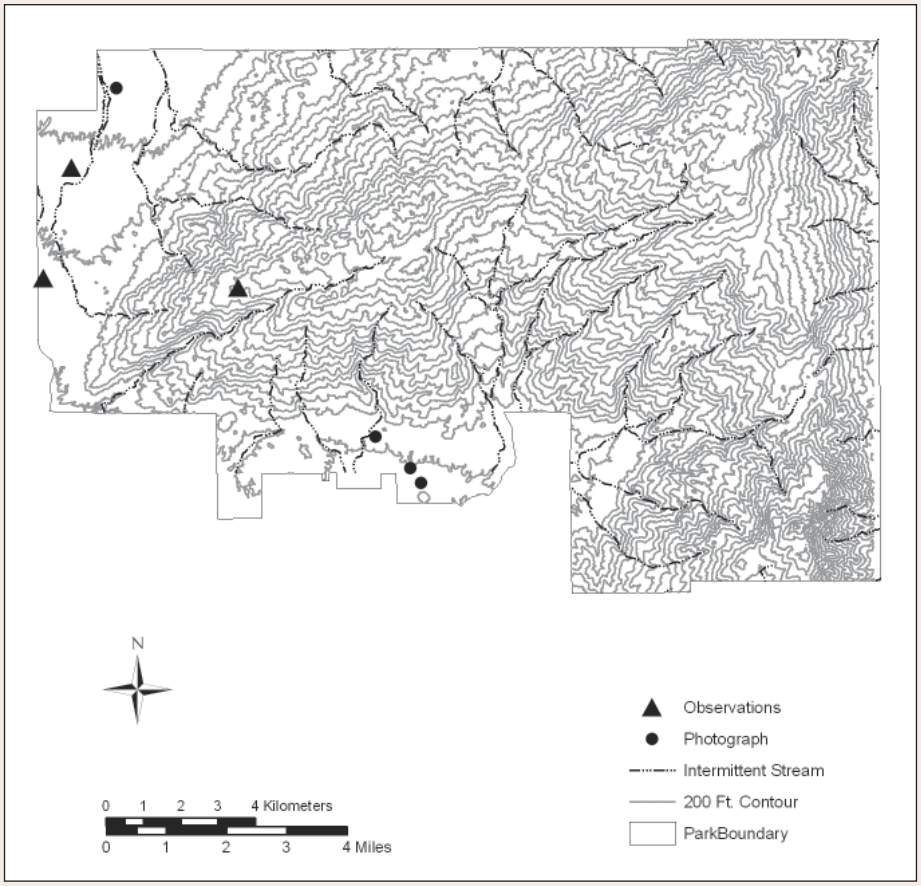
Historic and recent records: Observed and considered common at low elevations by Sumner (1951); not observed in the Rincon high country by Davis and Sidner (1992). The two species of jackrabbit are often not distinguished from each other in the park's annual mammal reports and other documents, but this species was listed as present in 1940, 1947, 1950, and 1951 (SNP-WACC records, Annual Wildlife Reports).

Comments

Black-tailed Jackrabbits are distinguished from Antelope Jackrabbits by their smaller size, black-tipped ears, and black-tipped tail. In Arizona, Black-tailed Jackrabbits are generally found in flat, open areas, including desert, grasslands, and open woodlands. They are browsers, with mesquite as a major part of their diet (Vorhies and Taylor 1933).

In the RMD, Black-tailed Jackrabbits are commonly observed in the Cactus Forest Loop Road area.

Black-Tailed Jackrabbit (*Lepus californicus*).



Locations for Black-Tailed Jackrabbit.

Rodents

CLIFF CHIPMUNK

Neotamius dorsalis

Infraclass Eutheria
Order Rodentia (rodents)
Family Sciuridae (squirrels)

Current status: Confirmed
Habitat: Rocky areas at higher elevations, or rocky desert riparian areas
Abundance: Common

Records

Sight observation during NPS inventory project: Yes
Number of individuals captured in NPS inventory: 39
Number of infrared-triggered photographs: 0
Number of records in SNP Wildlife Observations database: 4
Voucher photo(s): Unnumbered photo by D. Swann, Manning Camp, June 11, 2006.
Museum specimen(s): Twenty-one specimens in SDMNH collection:
(1) SD10067, collected by L. M. Huey, Spud Rock Ranger Station, June 14, 1932;
(2) SD10071, collected by L. M. Huey & S. G. Harter, Spud Rock Ranger Station, June 15, 1932;
(3–4) SD10089–SD10090, collected by L. M. Huey & L. H. Cook, Happy Valley Trail, June 17, 1932;
(5–6) SD10094–SD10095, collected by T. W. Sefton & L. M. Huey, Spud Rock Ranger Station, June 18, 1932;
(7–9) SD10096–SD10098, collected by L. H. Cook & L. M. Huey, Manning Camp, June 18, 1932;
(10–11) SD10099–SD10100, collected by L. H. Cook & L. M. Huey, Manning Camp, June 19, 1932;
(12–13) SD10101–SD10102, collected by J. W. Sefton & L. M. Huey, Spud Rock Ranger Station, June 19, 1932;
(14–15) SD10118–SD10119, collected by L. H. Cook & L. M. Huey, Manning Camp, June 21, 1932;
(16) SD10120, collected by L. M. Huey, Manning Camp, June 21, 1932;
(17) SD10124, collected by J. W. Sefton & L. M. Huey, Spud Rock Ranger Station, June 22, 1932;
(18) SD10125, collected by J. W. Sefton & L. M. Huey, Manning Camp, June 22, 1932;
(19) SD10132, collected by L. M. Huey, Spud Rock Ranger Station, June 23, 1932;
(20) SD10143, collected by L. M. Huey, Manning Camp, June 25, 1932;
(21) SD10144, collected by L. M. Huey, Manning Camp, June 26, 1932.

Six specimens in UA mammal collection:
(1) UA879, collected by H. Brown, Manning Camp, August 10, 1911;
(2) UA15035, collected by T. Mulhern, Manning Camp, July 20, 1966;
(3) UA16464, collected by L. Christianson at ca. 0.3 mi. (by fire trail) west of Italian Springs on north side of Mica Mountain, August 21, 1966;
(4–5) UA16465–UA16466, collected by L. Christianson, Manning Camp, August 20, 1966;
(6) UA25346, collected by R. Davis, Manning Camp, ca. 8,000 ft, August 14, 1984.

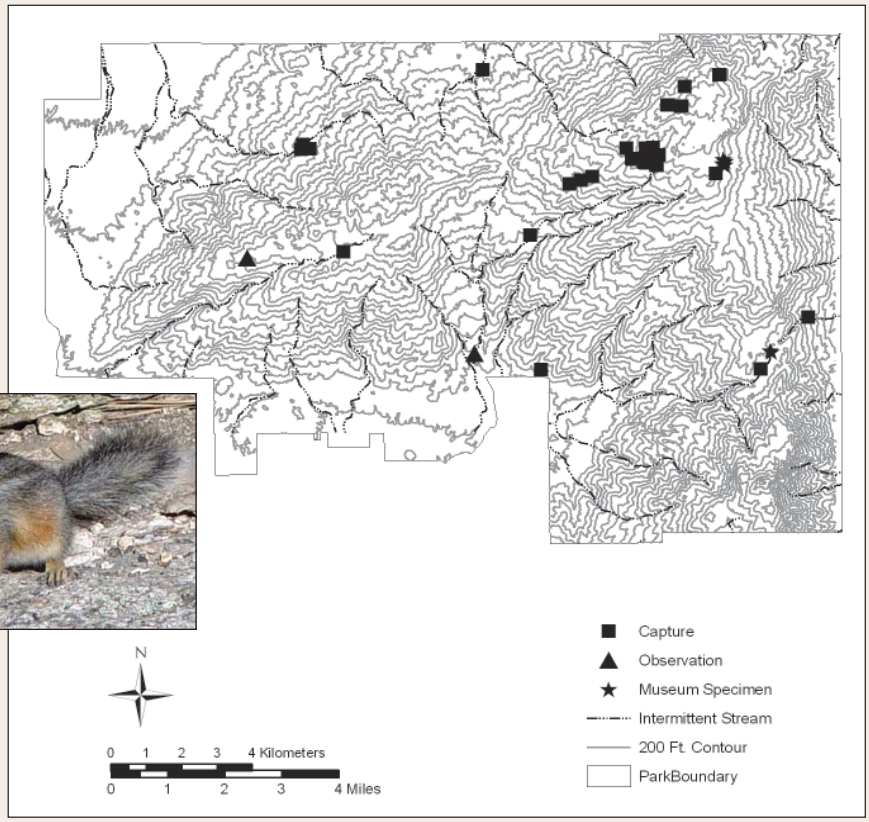
Historic and recent records: In addition to the collections listed, Cliff Chipmunks were observed by Sumner (1951), who noted that their tracks were second in abundance only to White-tailed Deer tracks. They were also observed and collected by Davis and Sidner (1992). They were listed on the park's wildlife report in 1940, and consistently listed in annual reports during the 1950s and 1960s (Saguaro NP-WACC records, Annual Wildlife Reports).

Comments

Cliff Chipmunks are a wide-ranging species in Arizona. Although associated with coniferous forests (Hoffmeister 1986), they can occur in desert areas where riparian vegetation is nearby. This nimble species can be distinguished from the only local species that resembles it, Harris's Antelope Squirrel, by the lack of prominent body stripes and the presence of a stripe on its face.

Cliff Chipmunks are very abundant above 6,500 feet (1,981 m) in the Rincons, such as at Manning Camp, but they also occur at lower elevations and will be seen in oak woodland around trees as well as in riparian areas. Swann (2003) reported observations from Madrona Ranger Station, where they are sometimes seen on the rocks near the Madrona pools.

Cliff Chipmunk (*Neotamius dorsalis*).



Locations for Cliff Chipmunk.

HARRIS'S ANTELOPE SQUIRREL

Ammospermophilus harrisii

Infraclass Eutheria
Order Rodentia (rodents)
Family Sciuridae (squirrels)

Current status: Confirmed
Habitat: Generalist in rocky desert areas
Abundance: Common

Records

Sight observation during NPS inventory project: Yes

Number of individuals captured in NPS inventory: 0

Number of infrared-triggered photographs: 7

Number of records in SNP Wildlife Observations database: 142

Voucher photo(s): Saguaro NP-22 (TM Photo #2346), Loop Drive area (UTMs 526731, 3559918S), April 8, 2000.

Museum specimen(s): Three specimens in UA mammal collection:
(1) UA2817, collected by R. E. Dingman, Saguaro NM Service Road Area (note: probably north end of Cactus Forest Loop Drive);
(2–3) UA2944–UA2945, collected by J. L. Patton, 1.2 mi. north of Old Spanish Trail, Madrona Canyon Road, November 9, 1963.

Three specimens in UIMNH collection:
(1) UI18325, captured by I. A. Nadr, Saguaro NM western boundary, June 18, 1958;
(2–3) UI23983–UI23984, collected by W. W. Goodpaster, Saguaro NM, 10 mi east of Tucson, May 27, 1946;

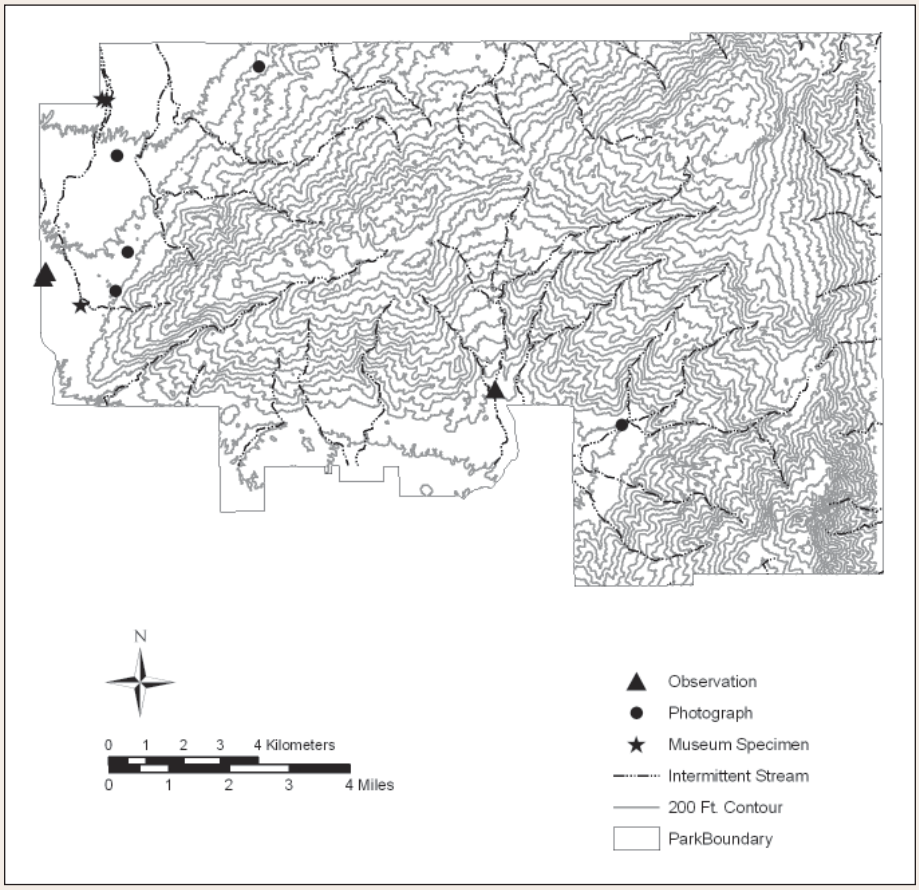
Historic and recent records: Harris's Antelope Squirrels were listed in the park's annual wildlife report in 1940, and consistently mentioned in wildlife reports from the 1950s (Saguaro NP-WACC records, Annual Wildlife Reports).

Comments

Harris's Antelope Squirrels can be distinguished from Cliff Chipmunks and Round-tailed Ground Squirrels by the prominent stripe along their sides. Also, Cliff Chipmunks are found at higher elevations and Round-tailed Ground Squirrels are found in more open desert environments than Harris's Antelope Squirrels. They are quite desert-adapted and can live in areas with no free water.

These species are diurnal throughout the year and are often seen eating the fruit of barrel cacti when it is available. They are commonly observed by visitors to the park along the Cactus Forest Loop Drive.

Harris's Antelope Squirrel
(*Ammospermophilus harrisii*).



Locations for Harris's Antelope Squirrel.

ROUND-TAILED GROUND SQUIRREL

Spermophilus tereticaudus

Infraclass Eutheria
Order Rodentia (rodents)
Family Sciuridae (squirrels)

Current status: Confirmed
Habitat: Open desert areas with sandy soils
Abundance: Uncommon

Records

Sight observation during NPS inventory project: No

Number of individuals captured in NPS inventory: 0

Number of infrared-triggered photographs: 1

Number of records in SNP Wildlife Observations database: 17

Voucher photo(s): Saguaro NP-23 (TM Photo #2537), Wildhorse Canyon area (UTMs 526769, 3563546S), November 2, 2000.

Museum specimen(s): Seven specimens in UA mammal collection:
(1) UA2809, collected by R. E. Dingman, Saguaro NM Service Road Area, May 18, 1963;
(2–4) UA2810–UA2812, collected by R. E. Dingman, Saguaro NM Service Road Area, August 26, 1963;
(5–7) UA2814–UA2816, collected by R. E. Dingman, Saguaro NM Service Road Area, August 26, 1963.

Four specimens in UIMNH collection:
(1) UI23976, collected by W. W. Goodpaster, Saguaro NM, 10 mi east of Tucson, May 6, 1946,
(2) UI23977, collected by W. W. Goodpaster, Saguaro NM, 10 mi east of Tucson, May 7, 1946,
(3) UI23978, collected by W. W. Goodpaster, Saguaro NM, 10 mi east of Tucson, May 8, 1946,
(4) UI23979, collected by W. W. Goodpaster, Saguaro NM, 10 mi east of Tucson, May 27, 1946.

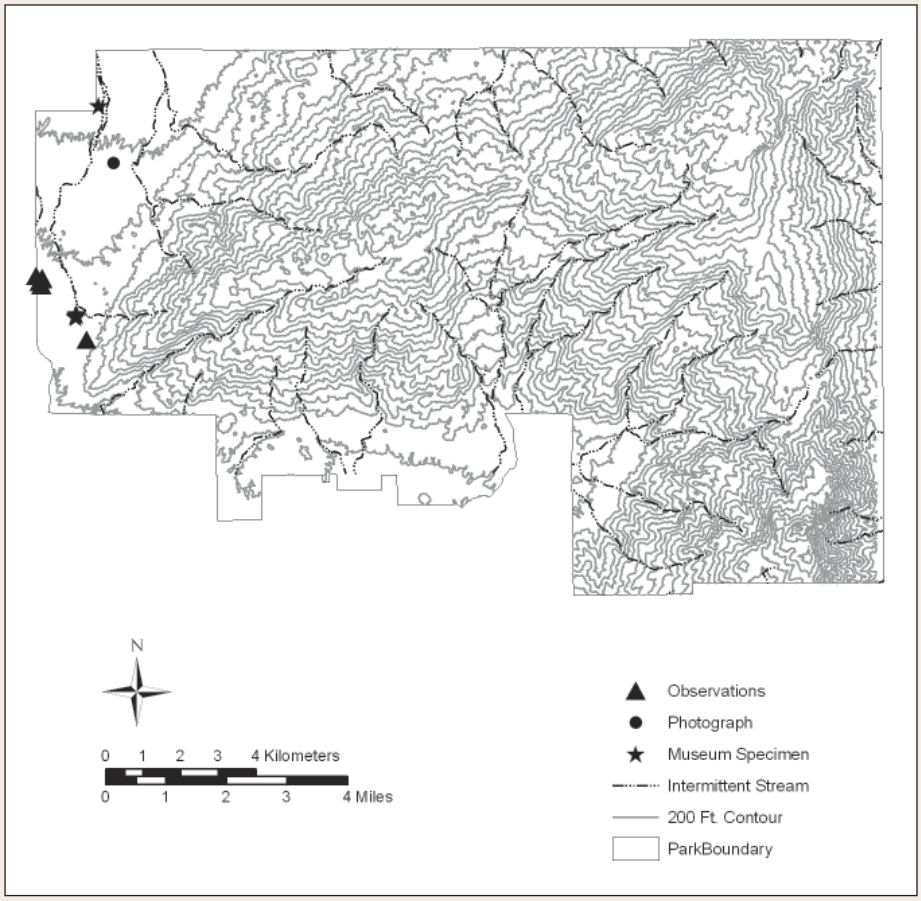
Historic and recent records: Listed in the park's annual wildlife report in 1940 and consistently mentioned in annual reports during the 1950s (Saguaro NP-WACC records, Annual Wildlife Reports).

Comments

Round-tailed Ground Squirrels prefer open desert areas with low slope and sandy, friable soils where they can dig burrows. This species forms colonies, similar to prairie dogs. Studies by E. Lendell Cockrum and his students in Tucson in the 1970s revealed that these animals are highly social. Young males disperse at maturity, but young females stay in the colony where they were born.

In the RMD, they are often seen in the Mica View Picnic area and occasionally in the area between the Visitor Center and administration buildings.

Round-Tailed Ground Squirrel (*Spermophilus tereticaudus*).



Locations for Round-Tailed Ground Squirrel.

ROCK SQUIRREL

Spermophilus variegatus

Infraclass Eutheria
Order Rodentia (rodents)
Family Sciuridae (squirrels)

Current status: Confirmed
Habitat: Usually rocky areas, but possible anywhere in park
Abundance: Common

Records

Sight observation during NPS inventory project: Yes

Number of individuals captured in NPS inventory: 1

Number of infrared-triggered photographs: 16

Number of records in SNP Wildlife Observations database: 10

Voucher photo(s): Saguaro NP-17 (TM Photo #978), Wildhorse Canyon area (UTMs 528888, 3563468S), November 11, 2001.

Museum specimen(s): Four specimens in SDMNH collection:
(1) SD10087, collected by L. M. Huey & J. W. Sefton, Spud Rock Ranger Station, June 17, 1932;
(2) SD10116, collected by S. G. Harter & L. M. Huey, Spud Rock Ranger Station, June 21, 1932;
(3) SD10129, collected by J. W. Sefton & L. M. Huey, Manning Camp, June 22, 1932;
(4) SD10145, collected by L. M. Huey, Manning Camp, June 26, 1932.

One specimen in UIMNH collection: UI24013, collected by W. W. Goodpaster, Saguaro NM, May 27, 1946.

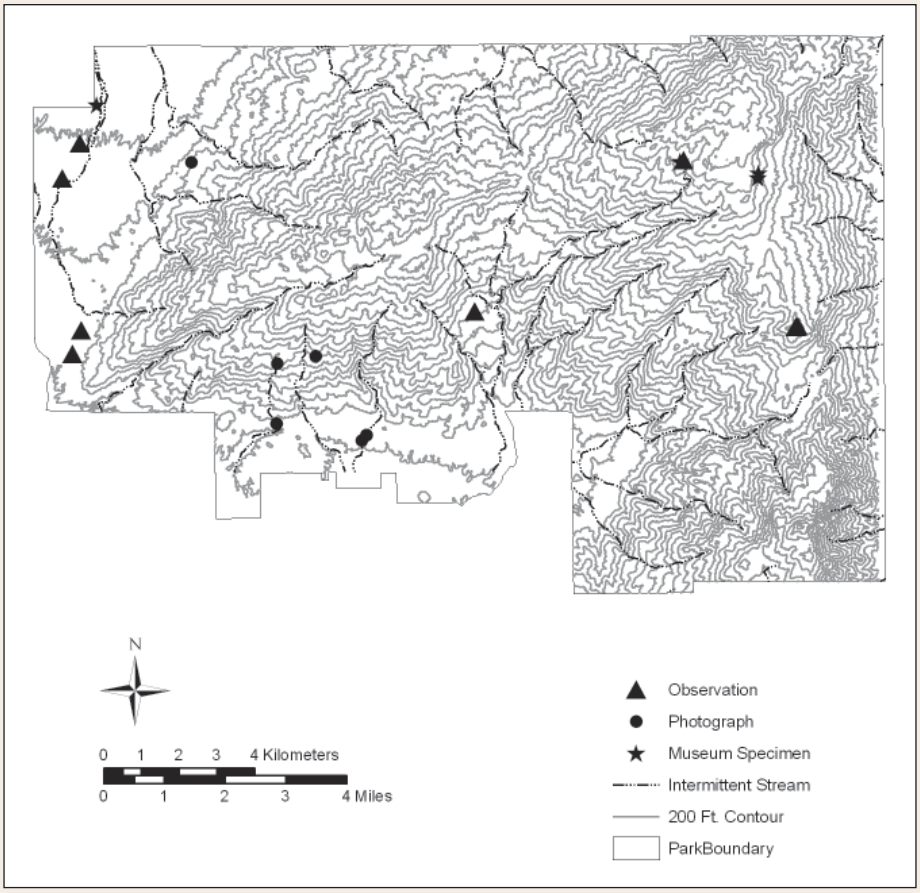
Historic and recent records: Rock Squirrels were collected by Huey in 1932 at Spud Rock campsite and Manning Camp (SDNHM collection). They were observed by Davis and Sidner (1992). They were listed in the park's annual wildlife report in 1940, and consistently mentioned during the 1950s (Saguaro NP-WACC records, Annual Wildlife Reports).

Comments

Rock Squirrels are large squirrels and can only be confused with Arizona Gray Squirrels. They are larger than Arizona Gray Squirrels and typically run toward a hole in the ground (rather than up a tree) when disturbed. True to their name, Rock Squirrels tend to prefer rocky areas, but they sometimes occupy large holes in the ground in open desert areas.

Rock Squirrels are one of the most common, and commonly seen, mammals in the park. They are diurnal and occur throughout the RMD, from the lowest desert areas to Manning Camp.

Rock Squirrel (*Spermophilus variegatus*).



Locations for Rock Squirrel.

ABERT'S SQUIRREL

Sciurus aberti

Infraclass Eutheria
Order Rodentia (rodents)
Family Sciuridae (squirrels)

Current status: Confirmed; non-native
Habitat: Forested areas, including ponderosa and other large pines
Abundance: Common

Records

Sight observation during NPS inventory project: Yes

Number of individuals captured in NPS inventory: 1

Number of infrared-triggered photographs: 8

Number of records in SNP Wildlife Observations database: 6

Voucher photo(s): Saguaro NP-2 (TM Photo #2765) (UTMs 541992, 3563487), August 12, 2000.

Museum specimen(s): None

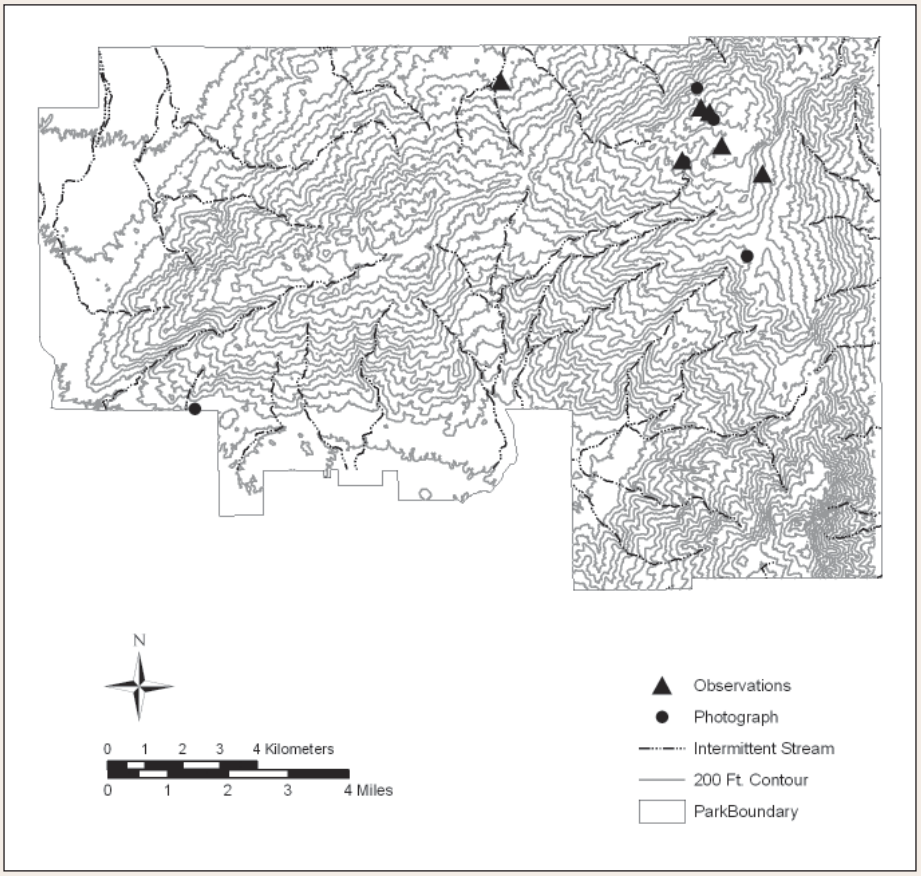
Historic and recent records: Not mentioned by Sumner (1951), but the presence of Abert's Squirrels in the Rincon Mountains was discussed by Davis and Sidner (1992) and in a scientific paper by Davis and Brown (1989). In 1941, the the Arizona Game and Fish Department successfully introduced Abert's Squirrels (as a game species) into the Santa Catalina Mountains; no transplants into the Rincons were recorded (Brown 1970). The first record in the Rincons was in 1959, at Spud Rock (Davis and Sidner 1992). They were also observed at Manning Camp in May 1967 (1967 Superintendent's Report, Saguaro NP-WACC records, Box 6-17). Although it is unknown whether this species dispersed to the Rincons from the Catalinas, where it was transplanted, or was transplanted by someone unknown, all of the evidence strongly suggests that the squirrels did disperse from the Catalinas (Brown 1970).

Comments

Abert's Squirrel is currently the tree squirrel most frequently seen in the RMD. It is native to Arizona, but not to southern Arizona and Saguaro National Park.

Brown (1970) discussed whether this species may be a threat to Arizona Gray Squirrels, but did not see evidence that it was a significant threat due to the different habitat associations of the two species (pines for Abert's Squirrel, oaks for the Arizona Gray Squirrel). However, there is recent evidence (Koprowski 2008) that Abert's Squirrels have indeed resulted in the decline of the native Arizona Gray Squirrel in Saguaro NP. John Koprowski and his graduate students are continuing to study the interactions between these two species.

Abert's Squirrel (*Sciurus aberti*).



Locations for Abert's Squirrel.

ARIZONA GRAY SQUIRREL

Sciurus arizonensis

Infraclass Eutheria
Order Rodentia (rodents)
Family Sciuridae (squirrels)

Current status: Confirmed
Habitat: In areas of deciduous trees, such as oak, sycamore, and walnut
Abundance: Uncommon

Records

Sight observation during NPS inventory project: Yes

Number of individuals captured in NPS inventory: 0

Number of infrared-triggered photographs: 3

Number of records in SNP Wildlife Observations database: 4

Voucher photo(s): Saguaro NP-4 (TM Photo #9022), Happy Valley campsite (UTMs 544876, 3557012S), December 10, 2004.

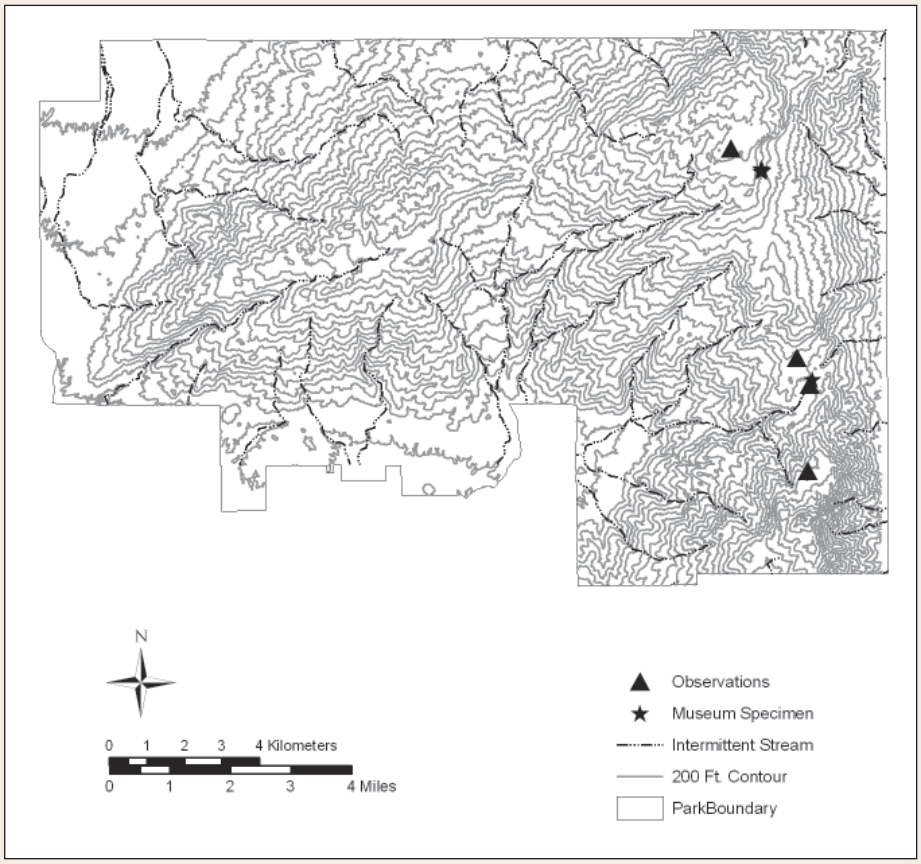
Museum specimen(s): Four specimens in SDMNH collection:
(1) SD10079, collected by L. M. Huey & J. W. Sefton, Spud Rock Ranger Station, June 16, 1932;
(2) SD10086, collected by S. G. Harter & J.W. Sefton, Spud Rock Ranger Station, June 17, 1932;
(3) SD10092, collected by L. M. Huey & L. H. Cook, Happy Valley Trail, June 18, 1932;
(4) SD10130, collected by L. M. Huey, Spud Rock Ranger Station, June 22, 1932.

Historic and recent records: Several individuals of this species were collected by Huey at the Spud Rock campsite in 1932. Not mentioned by Sumner (1951), but Davis and Sidner (1992) observed this species at Grass Shack campground and discussed its history in the Rincons. This species was first listed in an annual park wildlife report in 1955 (Saguaro NP-WACC records, Annual Wildlife Reports).

Comments

The Arizona Gray Squirrel is a native species that has apparently declined since Abert's Squirrels arrived in the Rincons prior to 1959, from their introduction site in the Santa Catalina Mountains (see account for that species). Brown (1970) wrote that the native species "continued to be recorded in numbers," but noted that there was concern about the impacts of Abert's Squirrels (see account for that species). Arizona Gray Squirrels and their interactions with Abert's Squirrels are currently being studied by John Koprowski from the University of Arizona (Koprowski 2008). Research in 2005–2006 revealed that the species still occurs in the park in areas where large oak trees occur, such as near Happy Valley saddle.

Arizona Gray Squirrel (*Sciurus arizonensis*).



Locations for Arizona Gray Squirrel.

BOTTA'S POCKET GOPHER

Thomomys bottae

Infraclass Eutheria
Order Rodentia (rodents)
Family Geomyidae (pocket gophers)

Current status: Confirmed
Habitat: Generalists in soft soils where plants are present
Abundance: Common

Records

Number of individuals captured in NPS inventory: 1

Voucher photo(s): Unnumbered photo by Toni Torpey, Cactus Forest area, 2005.

Museum specimen(s): Thirty-nine specimens in SDMNH collection:
(1–5) SD10062–SD10066, collected by L. M. Huey, Spud Rock Ranger Station, June 14, 1932;
(6–8) SD10068–SD10070, collected by L. M. Huey, Spud Rock Ranger Station, June 15, 1932;
(9–12) SD10072–SD10075, collected by L. M. Huey & S. G. Harter, Spud Rock Ranger Station, June 15, 1932;
(13–15) SD10077–SD10080, collected by L. M. Huey, Spud Rock Ranger Station, June 16, 1932;
(16–18) SD10081–SD10083, collected by L. M. Huey, Spud Rock Ranger Station, June 17, 1932;
(19) SD10085, collected by L. M. Huey & J. W. Sefton, Spud Rock Ranger Station, June 17, 1932;
(20) SD10088, collected by L. M. Huey, Spud Rock Ranger Station, June 17, 1932;
(21–25) SD10106–SD10110, collected by L. M. Huey, Manning Camp, June 20, 1932;
(26) SD10117, collected by J. W. Sefton & L. M. Huey, Manning Camp, June 21, 1932;
(27–28) SD10127–SD10128, collected by J. W. Sefton & L. M. Huey, Manning Camp, June 22, 1932;
(29–30) SD10133–SD10134, collected by L. H. Cook & L. M. Huey, Manning Camp, June 23, 1932;
(31–36) SD10135–SD10140, collected by S. G. Harter & L. M. Huey, Manning Camp, June 24, 1932;
(37–38) SD10141–SD10142, collected by S. G. Harter & L. M. Huey, Manning Camp, June 25, 1932;
(39) SD10151, collected by J. W. Sefton & L. M. Huey, Manning Camp, June 22, 1932.

Two specimens in UA mammal collection:
(1) UA875, collected by H. Brown, Manning Camp, July 29, 1911;
(2) UA27040, collected by N. Perry, Saguaro NP/RMD, Italian Spring (N-32° 13' 30"; W-110° 32' 04"), July 22, 2001.

Four specimens in UIMNH collection:
(1–2) UI24281–UI24282, collected by W. & L. Goodpaster, Saguaro NM, May 9, 1946;
(3–4) UI24283–UI24284, collected by W. & L. Goodpaster, Saguaro NM, May 24,1946.

Historic and recent records: Despite the many specimens collected in the park, little ecological research has been done on this species. However, an interesting older publication is Blumer (1910). J. C. Blumer explored the Rincons prior to the establishment of the park and

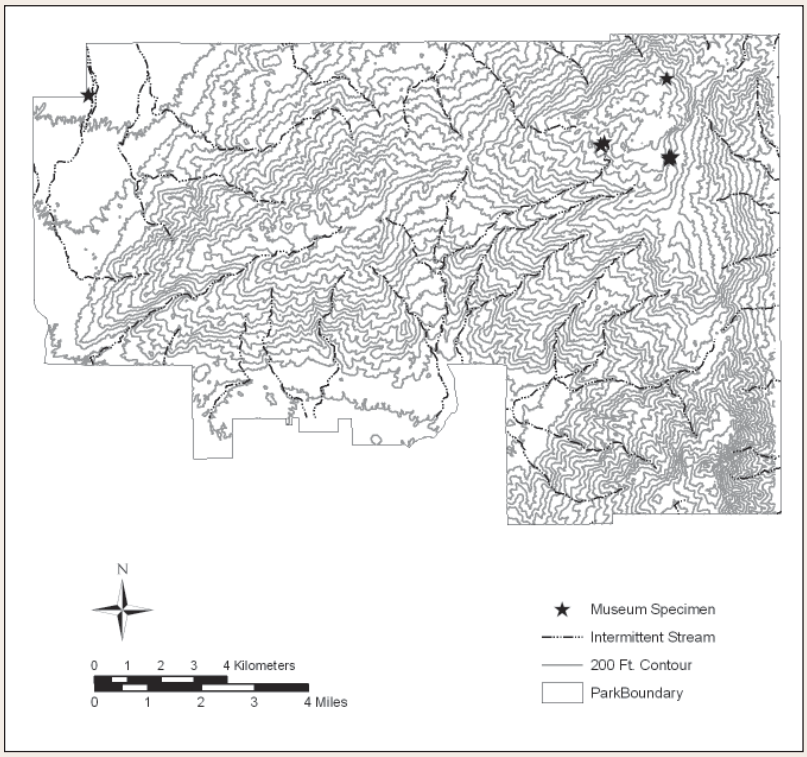
discussed pocket gophers, identified only as *Thomomys* spp. In describing the great degree of soil moved by gophers, Blumer wrote, "This animal may thus be responsible to a considerable extent for the unusually large proportion of annuals in the flora of many parts of the high Rincons."

Comments

The sign of pocket gophers is difficult to confuse with that of any other mammal, and consists of small piles of loose soil at the surface. Botta's Pocket Gopher is the only species of pocket gopher known from the Rincons, but based on range maps, it is possible that another species, the Southern Pocket Gopher (*T. umbrinus*) may also occur.

Because pocket gophers are difficult to live-trap, they are seldom studied by modern ecologists working in national parks. However, they are very abundant in riparian areas throughout the RMD, including higher elevations (for example, they are common in the riparian area north of the heliport at Manning Camp), and probably have a significant impact on the environment.

Botta's Pocket Gopher (*Thomomys bottae*).



Locations for Botta's Pocket Gopher.

ARIZONA POCKET MOUSE

Perognathus amplus

Infraclass Eutheria
Order Rodentia (rodents)
Family Heteromyidae (kangaroo rats and pocket mice)

Current status: Confirmed
Habitat: Desert areas with loose soils
Abundance: Common

Records

Number of individuals captured in NPS inventory: 0

Voucher photo(s): None

Museum specimen(s): Twenty-three specimens in UA mammal collection:
(1) UA3003, collected by G. V. R. Bradshaw, Saguaro NM, 15 mi. east of Tucson, August 5, 1959;
(2) UA3005, collected by G. V. R. Bradshaw, Saguaro NM, 15 mi. east of Tucson, August 5, 1959;
(3) UA3006, collected by G. V. R. Bradshaw, Saguaro NM, 15 mi. east of Tucson, August 6, 1959;
(4) UA7096, collected by G. V. R. Bradshaw, Saguaro NM, August 3, 1959;
(5) UA7097, collected by G. V. R. Bradshaw, Saguaro NM, 15 mi. east of Tucson, August 3, 1959;
(6–9) UA7099– UA7102, collected by G. V. R. Bradshaw, Saguaro NM, 15 mi. east of Tucson, August 3, 1959;
(10–11) UA7121–UA7122, collected by G. V. R. Bradshaw, Saguaro NM, 15 mi. east of Tucson, August 4, 1959;
(12) UA12222, collected by D. Wright, Saguaro NM Service Road Area (note: probably north from Cactus Forest Loop Drive), May 18, 1963;
(13–22) UA12223– UA12232, collected by D. Wright, Saguaro NM Service Road Area, May 18, 1963;
(23) UA16751, collected by J. L. Patton, Saguaro NM East, September 17, 1966.

Seven specimens in UIMNH collection:
(1) UI4812, collected by W. & L. Goodpaster, Saguaro NM, 10 mi east of Tucson, May 8, 1946;
(2) UI4813, collected by W. & L. Goodpaster, Saguaro NM, 10 mi east of Tucson, May 11, 1946;
(3) UI24374, collected by W. & L. Goodpaster, Saguaro NM, 10 mi east of Tucson, May 10, 1946;
(4) UI24375, collected by W. & L. Goodpaster, Saguaro NM, 10 mi east of Tucson, May 25, 1946;
(5) UI24382, collected by W. & L. Goodpaster, Saguaro NM, 10 mi east of Tucson, May 10, 1946;

(6–7) UI18373–UI18374, collected by D. F. Hoffmeister, Saguaro NM western boundary, June 19, 1958.

Historic and recent records: Captured by Robert M'Closkey during his studies (e.g., M'Closkey 1980) and by Duncan (1990).

Comments

Arizona Pocket Mice are somewhat similar in appearance to Sonoran Desert Pocket Mice, but have a more delicate appearance, silkier fur, and smaller feet. Although this species was not captured during the Inventory and Monitoring effort, we have no reason to believe that it is not common at the park. Matt Goode (personal communication) trapped this species frequently near the southwest end of Tanque Verde Ridge in the early 2000s, and it was also trapped during the Rocking K studies (Harris 1996, Bucci 2001). M'Closkey (1980) discussed the interactions between this species and other rodents in a series of publications based on research at the park.

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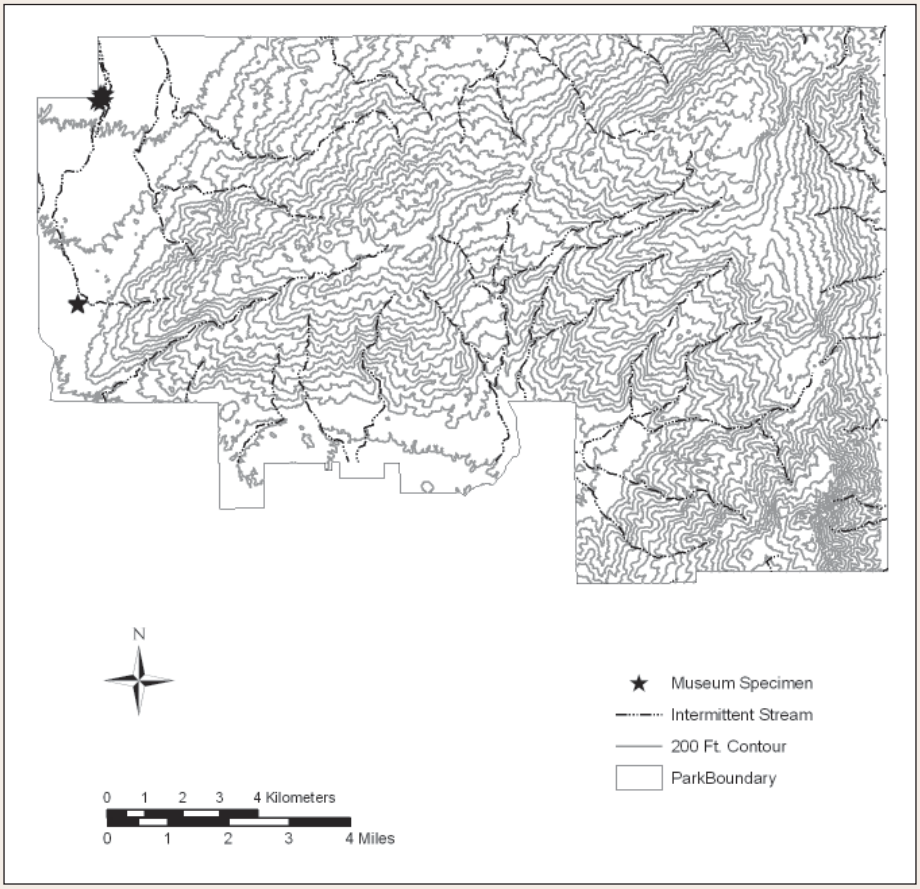

Locations for Arizona Pocket Mouse.

BAILEY'S POCKET MOUSE

Chaetodipus baileyi

Infraclass Eutheria
Order Rodentia (rodents)
Family Heteromyidae (kangaroo rats and pocket mice)

Current status: Confirmed
Habitat: Generalist in desert areas
Abundance: Common

Records

Number of individuals captured in NPS inventory: 13

Voucher photo(s): None

Museum specimen(s): Seven specimens in UA mammal collection:
(1) UA7095, collected by G. V. R. Bradshaw, Saguaro NM, 15 mi. east of Tucson, August 3, 1959;
(2–3) UA24604–UA24605, collected by R. Davis ca. 1 mi. SE of the Douglas Spring trail head (at east end of Speedway Boulevard) ca. 3,400 ft, January 15, 1984;
(4) UA25347, collected by R. Davis, Madrona Ranger Station, October 30, 1983;
(5) UA25725, collected by D. Johnson, 6.5 mi. W, 2.5 mi. N of Sentinel Butte (T14S, R16E, southwest quarter of Sect. 32), 3,150 ft, March 5, 1984;
(6) UA25726, collected by D. Johnson, 6.5 mi. W, 2.5 mi. N of Sentinel Butte (T14S, R16E, southwest quarter of Sect. 32), 3,150 ft, March 5, 1984;
(7) UA25727, collected by D. Johnson, 6.5 mi. W, 2.5 mi. N of Sentinel Butte (T14S, R16E, southwest quarter of Sect. 32), 3,150 ft, March 5, 1984).

Six specimens in UIMNH collection:
(1) UI18375, collected by D. F. Hoffmeister, Saguaro NM western boundary, June 19, 1958;
(2) UI18376, collected by I. A. Nadr, Saguaro NM western boundary, June 19, 1958;
(3–4) UI18377–UI18378, collected by D. F. Hoffmeister, Saguaro NM eastern boundary, June 19, 1958;
(5–6) UI24411–UI24412, collected by W. W. Goodpaster, Saguaro NM, 10 mi E Tucson on 11 May 1946.

Historic and recent records: Captured by Robert M'Closkey during his studies (e.g., M'Closkey 1980) and by Duncan (1990).

Comments

Bailey's Pocket Mouse is larger than the Sonoran Desert Pocket Mouse, which it otherwise closely resembles. Visitors sometimes confuse this large pocket mouse with Merriam's Kangaroo Rat because both species have large feet and hop; however, kangaroo rats have much larger feet and much longer tails.

As with other small heteromyids, this species was studied at the park by M'Closkey (1980) in the 1970s and 1980s. It is very abundant in desert areas at Saguaro NP.

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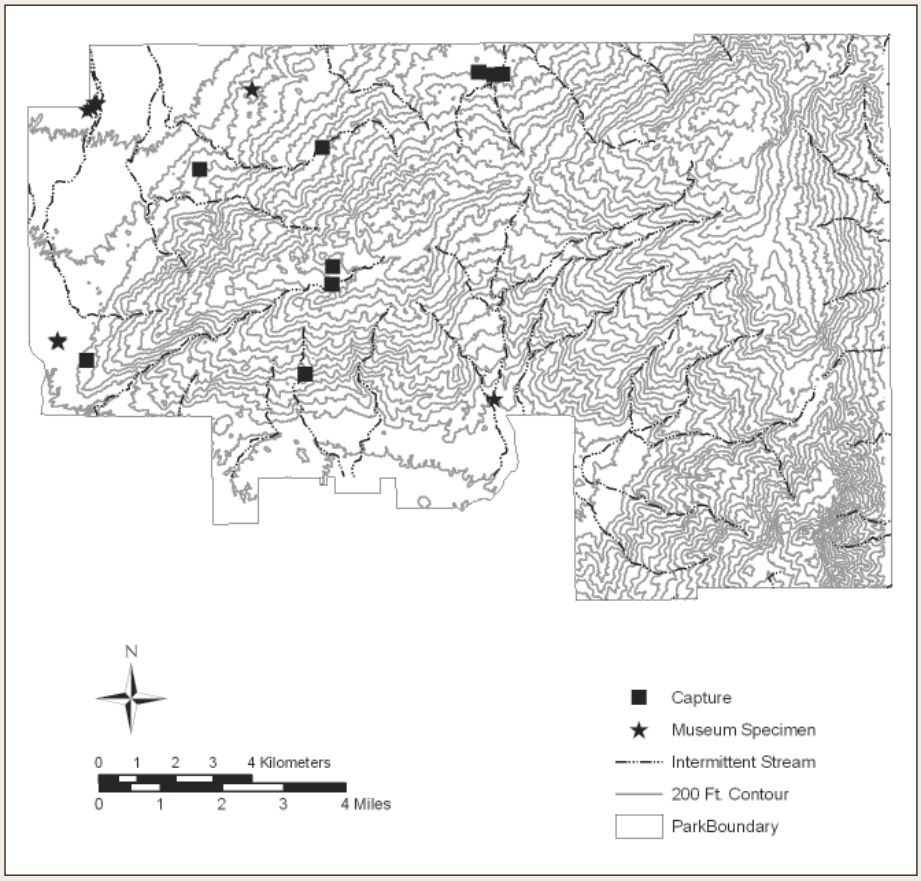


Locations for Bailey's Pocket Mouse.

ROCK POCKET MOUSE

Chaetodipus intermedius

Infraclass Eutheria
Order Rodentia (rodents)
Family Heteromyidae (kangaroo rats and pocket mice)

Current status: Confirmed
Habitat: Almost exclusively found in rocky areas
Abundance: Common

Records

Number of individuals captured in NPS inventory: 115

Voucher photo(s): None

Museum specimen(s): One specimen in UA mammal collection: UA26921, collected by N. Perry, Douglas Spring Campground (UTMs 36888, 3565767), October 31, 2002.

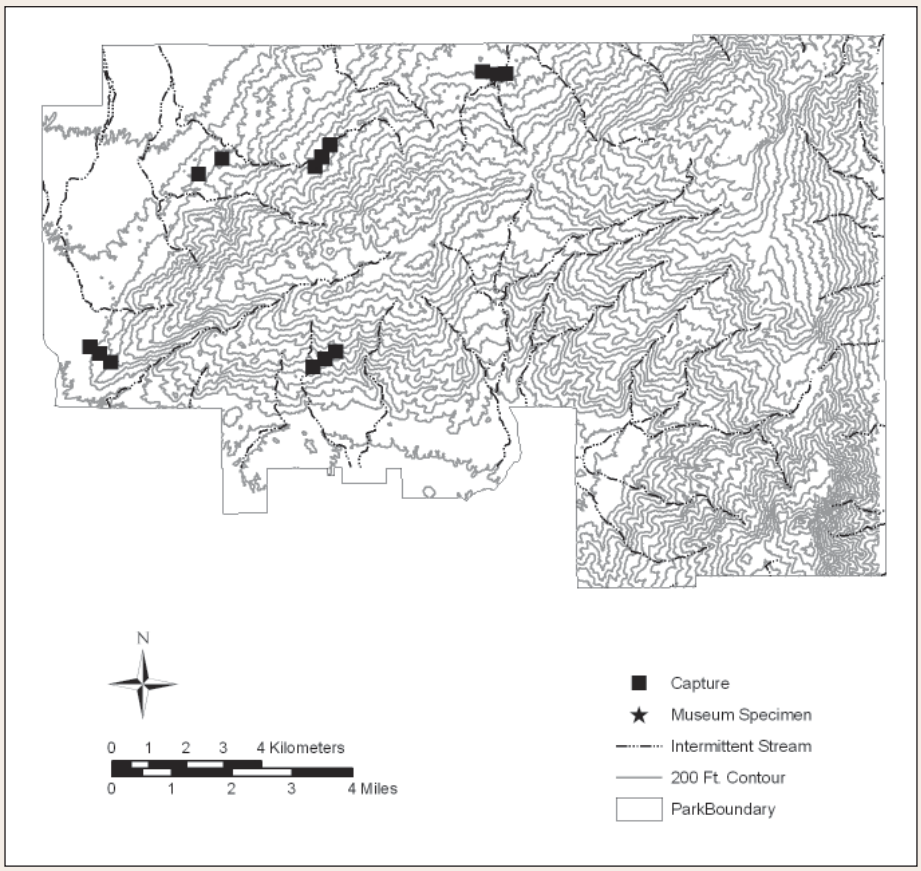
Historic and recent records: Captured by Robert M'Closkey during his studies (e.g., M'Closkey 1980) and by Duncan (1990).

Comments

This species can be confused with the Bailey's Pocket Mouse, which is larger, and with the Sonoran Desert Pocket Mouse, which is very similar except for a few key features found in the Rock Pocket Mouse: the presence of stiff guard hairs, dark tubercules on the hind feet, and (sometimes) a dark patch of fur on the nose. Most importantly, Rock Pocket Mice are almost always found in rocky areas, whereas Sonoran Desert Pocket Mice usually occur in sandy soils. This species can also be confused with the Arizona Pocket Mouse, but has stiffer hairs and is found in rocky areas.

This species may be more common in the RMD than the number of captures suggests, because it is often misidentified and occurs in rocky areas where it is more difficult to trap.

(No photo available)



Locations for Rock Pocket Mouse.

SONORAN DESERT POCKET MOUSE

Chaetodipus penicillatus

Infraclass Eutheria
Order Rodentia (rodents)
Family Heteromyidae (kangaroo rats and pocket mice)

Current status: Confirmed
Habitat: Found in areas of sparse vegetation at lower elevations
Abundance: Common

Records

Number of individuals captured in NPS inventory: 42

Voucher photo(s): None

Museum specimen(s): Four specimens in UA mammal collection:
(1–3) UA26886–UA26888, collected by N. Perry, Rincon Creek (UTMs 535835, 3554763), April 17, 2002;
(4) UA26916, collected by N. Perry, Rincon Creek (UTMs 535761, 355505), April 15, 2002.

Three specimens in UIMNH collection:
(1–2) UI24425–UI24426, collected by W. W. Goodpaster, Saguaro NM, 10 mi east of Tucson, May 8, 1946;
(3) UI24427, collected by W. W. Goodpaster, Saguaro NM, 10 mi east of Tucson, May 11, 1946.

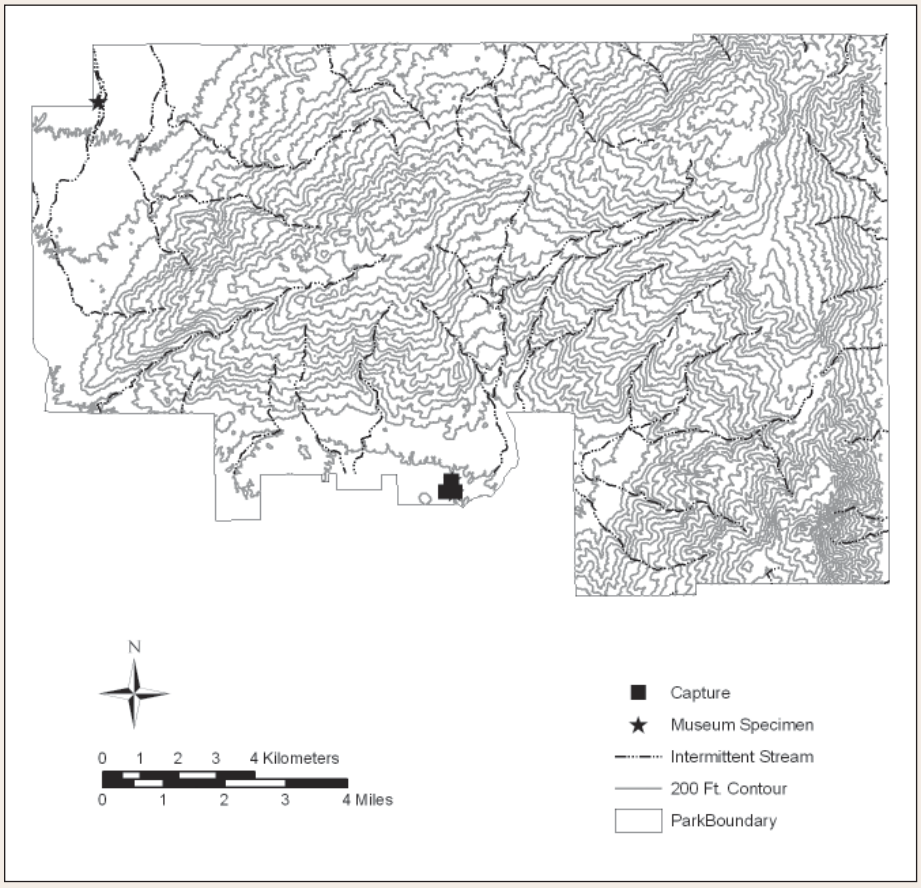
Historic and recent records: Captured by Robert M'Closkey during his studies (e.g., M'Closkey 1980) and by Duncan (1990).

Comments

This species resembles Bailey's Pocket Mouse and Rock Pocket Mice; see accounts for those species.

Like both of these species, Sonoran Desert Pocket Mice are very common in Saguaro NP. Their small holes are abundant in desert areas around the Cactus Forest area. This species was studied by M'Closkey (1980) at the park during the 1970s and 1980s.

(No photo available)



Locations for Sonoran Desert Pocket Mouse.

MERRIAM'S KANGAROO RAT

Dipodomys merriami

Infraclass Eutheria
Order Rodentia (rodents)
Family Heteromyidae (kangaroo rats and pocket mice)

Current status: Confirmed
Habitat: Open desert and grassland areas with sandy soil
Abundance: Uncommon

Records

Number of individuals captured in NPS inventory: 9

Voucher photo(s): None

Museum specimen(s): Two specimens in UA mammal collection:
(1) UA7094, collected by G. V. R. Bradshaw, Saguaro NM, 15 mi. east of Tucson, August 3, 1959;
(2) UA27036, collected by J. M. Goode, Douglas Spring trailhead, August 11, 2003.

Seven specimens in UIMNH collection:
(1) UI18465, collected by J. S. Hall, Saguaro NM western boundary, June 19, 1958;
(2–3) UI18466–UI18467, collected by A. B. Sargeant, Saguaro NM western boundary, June 19, 1958;
(4–5) UI18468–UI18469, collected by D. F. Hoffmeister, Saguaro NM western boundary, June 19, 1958;
(6–7) UI24342–UI24343, collected by W. W. Goodpaster, Saguaro NM, May 27, 1946.

Historic and recent records: Captured by Robert M'Closkey during his studies (e.g., M'Closkey 1980) and by Duncan (1990).

Comments

Merriam's Kangaroo Rat is an impressive rodent with large feet, a long tail, and an array of adaptations that make it well-suited for desert life. Famously, it can live without free water, deriving water from the seeds it eats and stores in underground chambers. This species can best be distinguished from a similar species, Ord's Kangaroo Rat (*D. ordii*) by the presence of a fifth toe on the hind foot. Ord's Kangaroo Rat has not been confirmed at the park.

We speculate that Merriam's Kangaroo Rat may be declining at Saguaro NP, because it prefers open areas with little cover, and shrub cover has increased at the park during the past several decades. Robert M'Closkey observed in 2007 (personal communication) that many of the areas where he trapped this species in the 1980s no longer appear to be suitable habitat because of increased brush cover. However, the attached map likely does not reflect the full distribution of this species in the park.

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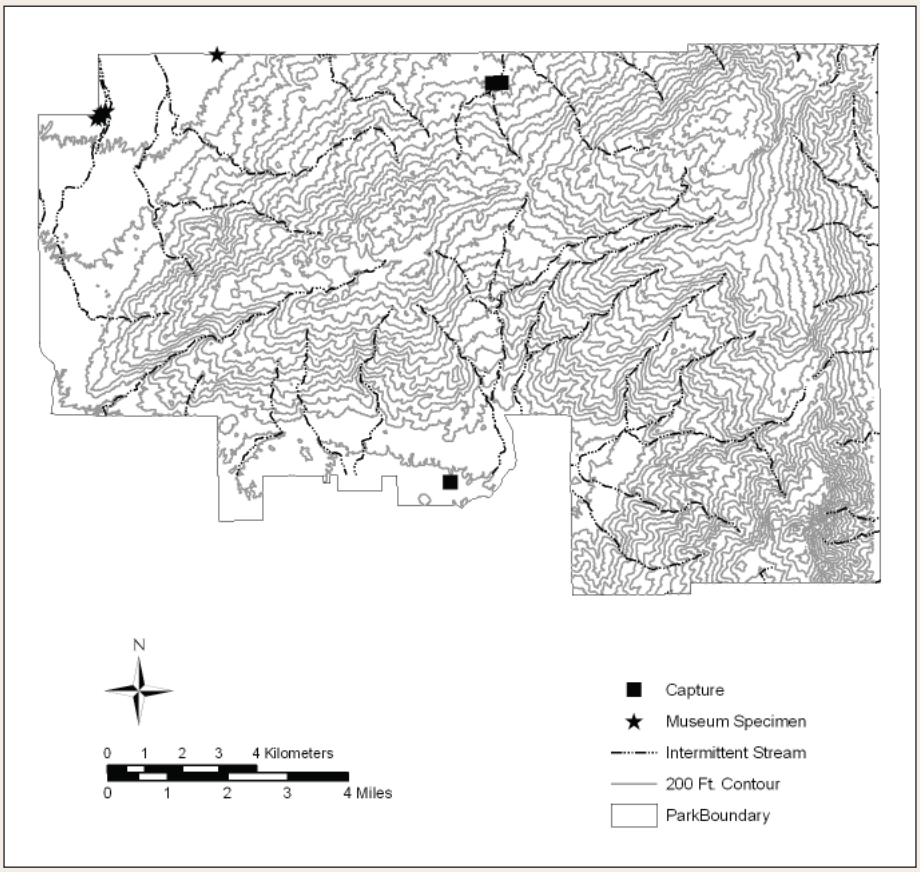

Locations for Merriam's Kangaroo Rat.

BANNER-TAILED KANGAROO RAT

Dipodomys spectabilis

Infraclass Eutheria
Order Rodentia (rodents)
Family Heteromyidae (kangaroo rats and pocket mice)

Current status: Confirmed in past; probably extirpated
Habitat: Open desert areas
Abundance: Probably extirpated

Records

Number of individuals captured in NPS inventory: 0

Voucher photo(s): None

Museum specimen(s): Three specimens in UIMNH collection:
(1) UI24329, collected by W. W. Goodpaster, Saguaro NM, 10 mi east of Tucson, May 29, 1946;
(2) UI24330, collected by W. W. Goodpaster, Saguaro NM, 10 mi east of Tucson, May 27, 1946;
(3) UI24331, collected by W. W. Goodpaster, Saguaro NM, 10 mi east of Tucson, May 25, 1946.

Historic and recent records: Other than the specimens collected, we are not aware of any historic records.

Comments

The Banner-tailed Kangaroo Rat is a large, granivorous "keystone" species in deserts and desert grasslands of the southwestern U.S. This species forms large soil mounds, with large burrow openings, that are very distinctive and serve as habitat for many other animals, including lizards, snakes, and toads.

We can only speculate about the past status of this species at Saguaro NP. It was captured in the RMD in the 1940s, but was probably never very common. Goodpaster found them at the west end of the park, near the end of Broadway Boulevard, at the park's lowest elevations. We are not aware of any observations of mounds associated with this species in the park in recent years, which supports the idea that it is currently extirpated. Quite possibly, significant vegetative change at the park during the past century, especially increased shrub cover, led to changes in the rodent community that included the loss of the Banner-tailed Kangaroo Rat.

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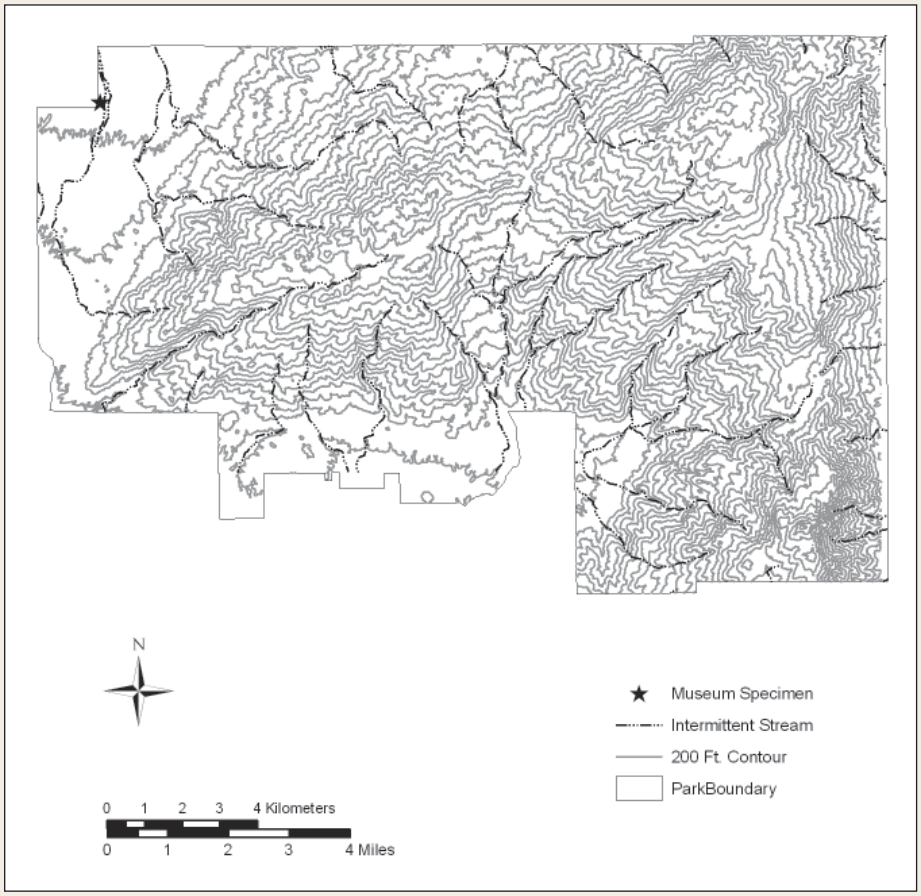

Locations for Banner-Tailed Kangaroo Rat.

FULVOUS HARVEST MOUSE

Reithrodontomys fulvescens

Infraclass Eutheria
Order Rodentia (rodents)
Family Muridae (rats and mice)

Current status: Confirmed
Habitat: Habitat generalist in grassy areas
Abundance: Rare

Records

Number of individuals captured in NPS inventory: 4

Voucher photo(s): None

Museum specimen(s): Two specimens in UA mammal collection:
(1) UA26887, collected by N. Perry, Rincon Creek (UTMs 535761, 3555051), April 16, 2002;
(2) UA26895, collected by N. Perry, Rincon Creek (UTMs 540412, 3556543), April 11, 2002.

Historic and recent records: Newly discovered at Saguaro NP; not captured in previous studies.

Comments

Fulvous Harvest Mice are generally found in grasslands where deciduous trees occur. They are generally more reddish than mice in the genus *Peromyscus*, and their tails are much longer than their bodies.

The capture of several individuals of this species during our inventory effort was very significant, as they represent the first records of this species from the park, as well as a range extension; the nearest previous records are from the Santa Cruz River, southwest of Tucson, about 20 miles (32 km) from Rincon Creek (Hofffmeister 1986). To our knowledge, these are the first records from the Rincon or Santa Catalina mountains.

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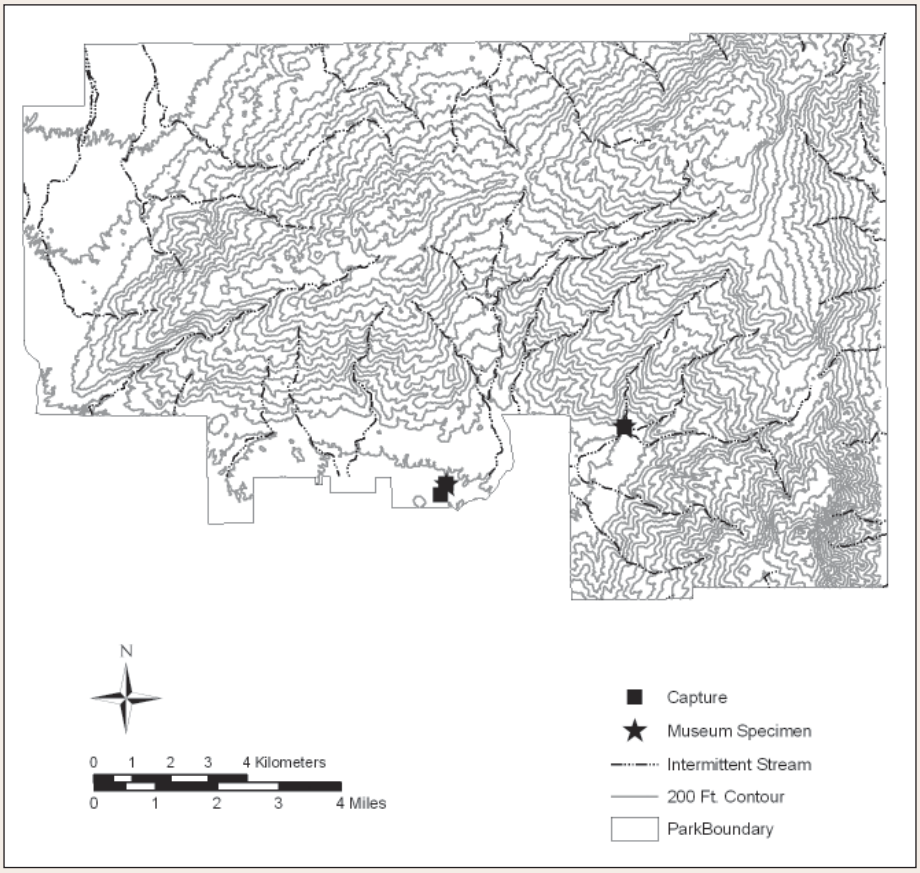


Locations for Fulvous Harvest Mouse.

WESTERN HARVEST MOUSE

Reithrodontomys megalotis

Infraclass Eutheria
Order Rodentia (rodents)
Family Muridae (rats and mice)

Current status: Confirmed
Habitat: Grasslands
Abundance: Uncommon

Records

Number of individuals captured in NPS inventory: 4

Voucher photo(s): None

Museum specimen(s): Two specimens in UA mammal collection:
(1) UA25348, collected by R. Davis, Rincon Mtns., Mica Meadow, ca. 8,300 ft.;
(2) UA26827, collected by N. Perry, Italian Spring (T14S, R18E), July 23, 2001.

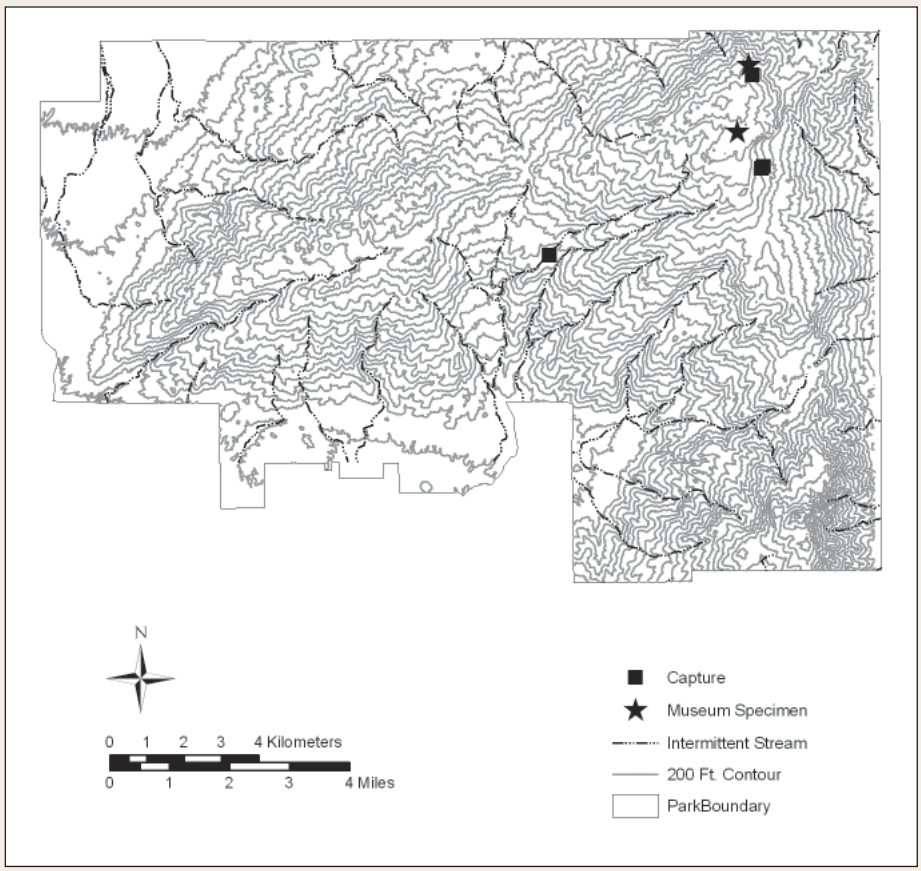
Historic and recent records: Davis and Sidner (1992) trapped one individual of this species in Mica Meadow.

Comments

Western Harvest mice are generally grassland species with small bodies and long tails, although the tail of this species is shorter than that of the Fulvous Harvest Mouse.

Individuals found in the RMD have all been trapped at higher elevations, but Western Harvest Mice may be more common in grassland areas in the park than our study or previous studies suggest because of the very limited amount of trapping done in these habitats.

(No photo available)



Locations for Western Harvest Mouse.

BRUSH MOUSE

Peromyscus boylii

Infraclass Eutheria
Order Rodentia (rodents)
Family Muridae (rats and mice)

Current status: Confirmed
Habitat: Riparian areas and oak woodlands
Abundance: Common

Records

Number of individuals captured in NPS inventory: 165

Voucher photo(s): None

Specimen, this study: Yes

Museum specimen(s): Ten specimens in SDMNH collection:
(1–2) SD10103–SD10104, collected by L. M. Huey, Spud Rock Ranger Station, June 20, 1932;
(3–6) SD10112–SD10115, collected by L. M. Huey, Spud Rock Ranger Station, June 21, 1932;
(7–8) SD10121–SD10122, collected by L. M. Huey, Spud Rock Ranger Station, June 22, 1932;
(9) SD10126, collected by J. W. Sefton & L. M. Huey, Manning Camp, June 22, 1932;
(10) SD10131, collected by L. M. Huey, Spud Rock Ranger Station, June 23, 1932.

Thirteen specimens in UA mammal collection:
(1) UA1387, collected by W. Collins, Saguaro NM, Rincon Mts., 8,000 ft, January 7, 1954;
(2–4) UA1390–UA1392, collected by W. Collins, Saguaro NM, Rincon Mts., 8,000 ft, January 7, 1954;
(5) UA26826, collected by N. Perry, 40 m downstream from Manning Camp Spring (T14S, R17E), June 6, 2001;
(6) UA26837, collected by J. Schmidt, 500 m south of Manning Camp (T14S, R17E), June 10, 2001;
(7) UA26889, collected by N. Perry, 500 m south of Manning Camp (T14S, R17E), June 10, 2001;
(8) UA26901, collected by R. M. Sidner, North Slope Trail ca. 0.5 mi northeast of Spud Rock (T14S, R18E), ca. 8,200 ft, September 13, 2001;
(9) UA26939, collected by R. Davis, top of Spud Rock, August 14, 1985;
(10) UA26940, collected by R. Davis, southern base Helen's Dome, August 15, 1985;
(11) UA26941 collected by R. Davis, upper Mica Meadow, August 12, 1985;
(12–13) UA26942–UA26943, collected by R. Davis, Devil's Bath Tub area, August 16, 1985.

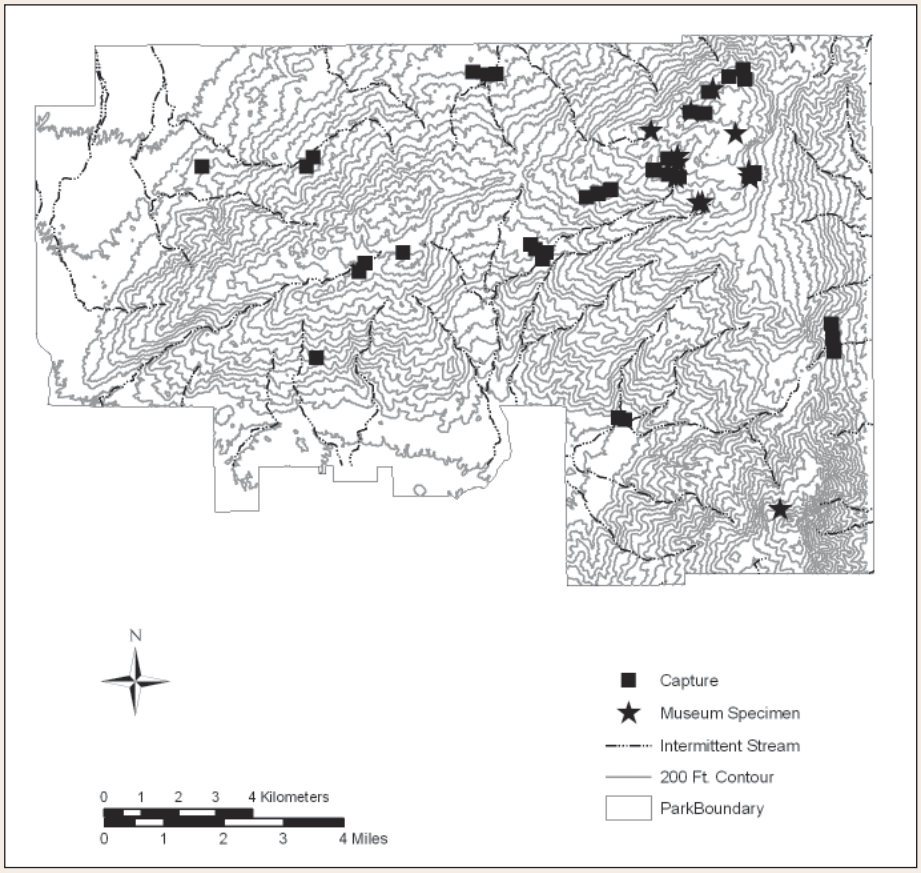
One specimen in UIMNH collection: UI24549, collected by A. Walker, Rincon Creek, northwest base Rincon Peak, March 25, 1932.

Historic and recent records: Collected by Huey at Spud Rock campground and Manning Camp in 1932, and by Collins at a site in the Rincons (probably Manning Camp) in 1954. Live-trapped in August 1966 (Monthly Narrative Report, September 8, 1966). Captured throughout the Rincons by Davis and Sidner (1992). All evidence suggests that this species has long been abundant in the Rincons.

Comments

Like other members of the genus *Peromyscus*, Brush Mice may carry the disease, hantavirus, which is potentially fatal in humans. Deer Mice are the major carriers of hantavirus. In a study in southern Arizona, only 0.05% of Brush Mice tested positive for hantavirus (Kuenzi et al. 1998), and as of 2005, no known human deaths had been associated with this species. Brush Mice occur as low in elevation as the Madrona Ranger Station (Swann 2003), but they are very common at high elevations, including Manning Camp.

(No photo available)



Locations for Brush Mouse.

CACTUS MOUSE

Peromyscus eremicus

Infraclass Eutheria
Order Rodentia (rodents)
Family Muridae (rats and mice)

Current status: Confirmed
Habitat: Generalist in desert areas
Abundance: Common

Records

Number of individuals captured in NPS inventory: 35

Voucher photo(s): None

Museum specimen(s): Eight specimens in UA mammal collection:
(1) UA1389, collected by W. Collins, Rincon Mountains, 8,000 ft, January 7, 1954;
(2) UA24882, collected by R. Davis, 1.5 mi. south of Saguaro NM headquarters on Old Spanish Trail in a wash at ca. 3,000 ft, January 1, 1984;
(3) UA26006, collected by R. Davis, Madrona Ranger Station, October 30, 1983;
(4) UA26008, collected by R. Davis, Madrona Ranger Station, October 30, 1983;
(5) UA26852, collected by N. Perry, Rincon Creek (UTMs 535835, 3554763), April 15, 2002;
(6–7) UA26893–UA26894, collected by N. Perry, Rincon Creek (UTMs 540412, 3556543), April 11, 2002;
(8) UA27039, collected by N. Perry, Saguaro NP/RMD (N-32° 13' 25"; W-110° 33' 05"), July 22, 2001.

Three specimens in UIMNH collection:
(1) UI18659, collected by I. A. Nadr, Saguaro NM, 10 mi east of Tucson, June 19, 1958;
(2–3) UI24564–UI24565, collected by W. W. Goodpaster, Saguaro NM, 10 mi east of Tucson, May 28, 1946.

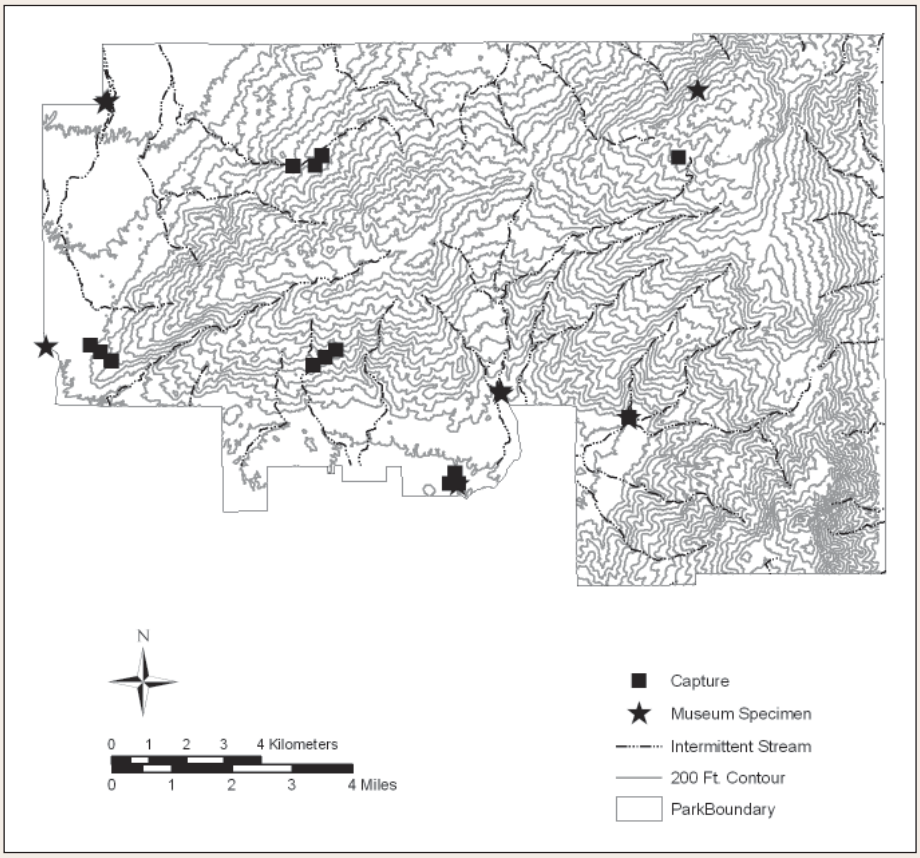
Historic and recent records: Captured by Robert M'Closkey during his studies (e.g., M'Closkey 1980) and by Duncan (1990), as well as by Davis and Sidner (1992) in desert areas.

Comments

Cactus Mice are one of the most abundant species of mice in the desert areas of southern Arizona. These murid mice are known to increase dramatically in abundance during repeated wet winters and decrease during drought periods (Morrison et al. 2002).

In the RMD, this species is quite common at lower elevations, but also occurs in grassland areas at higher elevations.

(No photo available)



Locations for Cactus Mouse.

DEER MOUSE

Peromyscus maniculatus

Infraclass Eutheria
Order Rodentia (rodents)
Family Muridae (rats and mice)

Current status: Confirmed in past; current status unknown
Habitat: Generalist in wooded areas
Abundance: Rare or extirpated

Records

Number of individuals captured in NPS inventory: 0

Voucher photo(s): None

Museum specimen(s): One specimen in UA mammal collection: UA1388, collected by W. Collins, near Manning Camp, January 7, 1954 (identification confirmed by Y. Petryszyn, February 2006).

Historic and recent records: Not captured by Davis and Sidner (1992), who could find no evidence that this species occurred in the Rincons. Until the recent confirmation of Collins's specimen by Petryszyn, this species was not confirmed within the park.

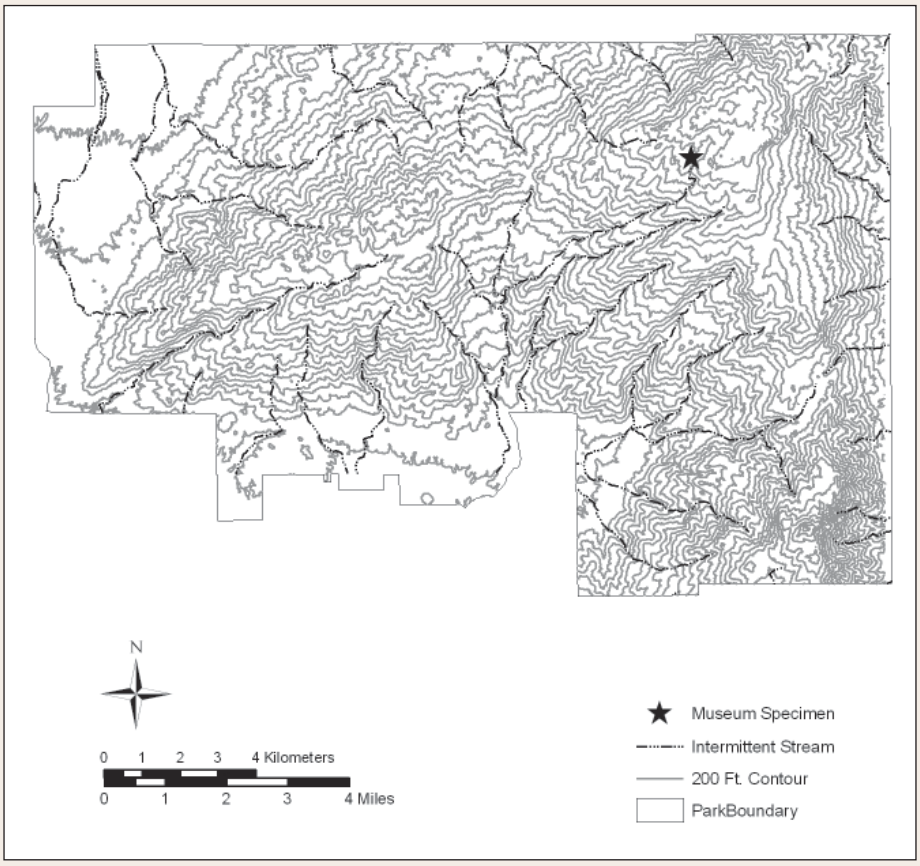
Comments

All of the species in the genus *Peromyscus* are difficult to distinguish from one another. Deer Mice have relatively short tails compared to Brush Mice and Cactus Mice, and are associated with more mesic (wetter) areas in Arizona.

Davis and Sidner (1992) were struck by the absence of other species of *Peromyscus* from the Rincons. Based on specimens and their own work, Brush Mouse was the only species identified from the high country (Cactus Mice occur in desert areas). Similarly, our inventory confirmed only the Brush Mouse, and failed to confirm the White-footed Mouse (*P. leucopus*) and Deer Mouse (*P. maniculatus*). Because these species are so difficult to identify, and because logistical difficulties limited the amount of trapping conducted in ours and previous studies, additional studies that target *Peromyscus* species would be desirable.

Owl-pellet analysis by DeRosier (2002) did not identify *Peromyscus* to species, but 48% of bones in Mexican Spotted Owl pellets from the Rincon Mountains high country were from this genus.

(No photo available)



Location for Deer Mouse.

SOUTHERN GRASSHOPPER MOUSE

Onychomys torridus

Infraclass Eutheria
Order Rodentia (rodents)
Family Muridae (rats and mice)

Current status: Confirmed
Habitat: Deserts and desert grasslands
Abundance: Uncommon

Records

Number of individuals captured in NPS inventory: 0

Voucher photo(s): None

Museum specimen(s): Four specimens in UIMNH collection:
(1) UI18672, collected by John S. Hall, Saguaro NM western boundary, June 19, 1958;
(2) UI25566, collected by W. W. Goodpaster, Saguaro NM, 10 mi east of Tucson, May 9, 1946;
(3) UI25567, collected by W. W. Goodpaster, Saguaro NM, 10 mi east of Tucson, May 25, 1946;
(4) UI25568, collected by W. W. Goodpaster, Saguaro NM, 10 mi east of Tucson, May 29, 1946.

Historic and recent records: Trapped by M'Closkey (1980, and unpublished data).

Comments

Grasshopper mice are well-known among mammalogists because their habits are quite unusual for mice. Grasshopper mice are very aggressive predators, known to eat other mice as well as insects; they communicate with each other by loud vocalizations similar to howling; and they emit a very strong, almost skunk-like, scent.

Southern Grasshopper Mice may be more common in the park than the results of this inventory suggests, because they may not be as attracted to live traps baited with seed or oatmeal. Don Swann observed a roadkilled individual near the Douglas Spring trailhead in the late 1990s (verified by Yar Petryszyn at the UA mammal collection, but not acquisitioned), so although not captured during the Inventory and Monitoring effort, the species surely still occurs in the park.

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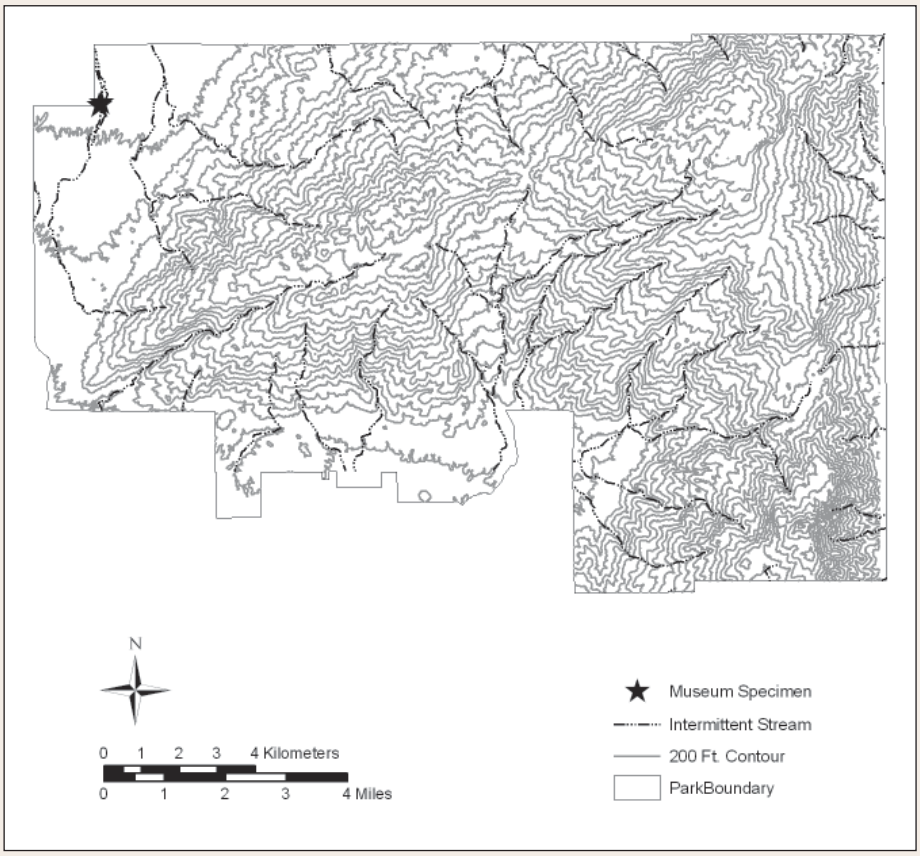

Location for Southwestern Grasshopper Mouse.

ARIZONA COTTON RAT

Sigmodon arizonae

Infraclass Eutheria
Order Rodentia (rodents)
Family Muridae (rats and mice)

Current status: Confirmed
Habitat: Thick grassy areas, particularly riparian areas
Abundance: Uncommon

Records

Number of individuals captured in NPS inventory: 4

Voucher photo(s): None

Museum specimen(s): Two specimens in UA mammal collection:
(1) UA25191, collected by R. Davis, Madrona Ranger Station, 3,400 ft, October 30, 1983;
(2) UA26833, collected by N. Perry, south slope of Wildhorse Canyon (T14S, R16E), May 13, 2001.

Historic and recent records: Trapped at Madrona Ranger Station and Box Canyon by Davis and Sidner (1992). Trapped by M'Closkey (unpublished data) near the Loop Road during the 1980s.

Comments

Arizona Cotton Rats have robust bodies, thick dark tails, and thick, brown, "salt and pepper" colored fur. They prefer areas with thick vegetation, where they make trails instead of burrowing like most typical desert rodents. Younger individuals of this species can be confused with Yellow-nosed Cotton Rats, but older individuals are much larger.

In Arizona, this species is strongly associated with grassy areas near large rivers, but it is believed to expand its range and abundance outward from river bottoms during times when conditions are wetter and vegetative cover is greater. Arizona and Yellow-nosed Cotton Rats probably respond favorably to fires that convert woodlands to areas with abundant bunchgrasses. They have been captured only at relatively low elevations in the Rincons.

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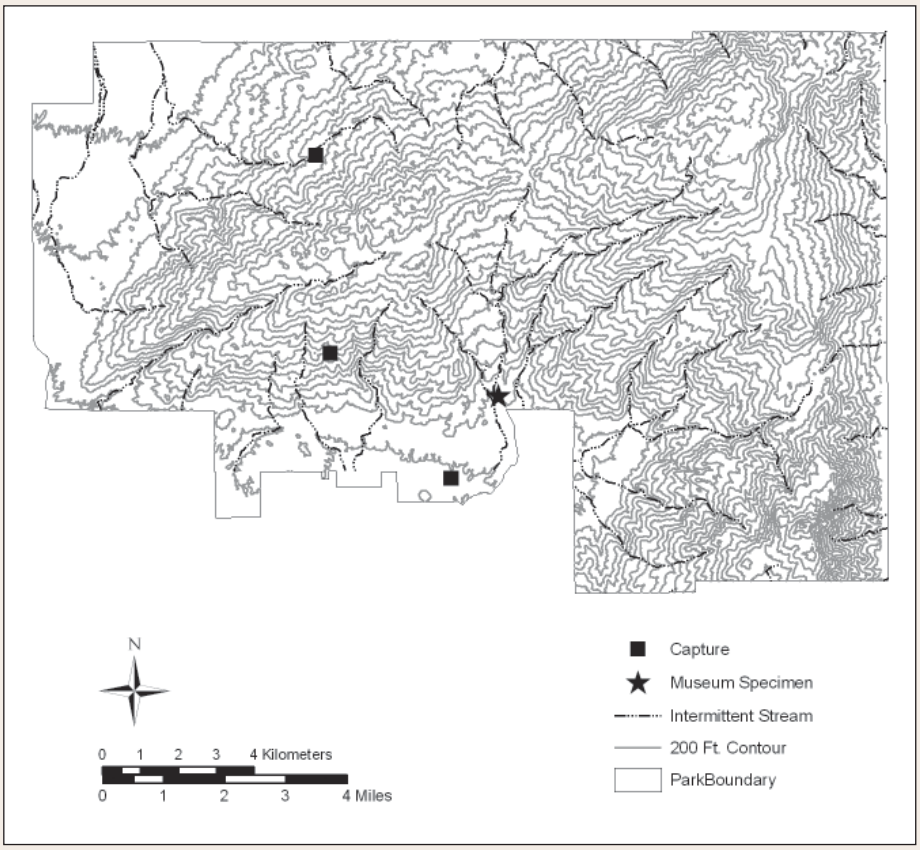


Locations for Arizona Cotton Rat.

YELLOW-NOSED COTTON RAT

Sigmodon ochrognathus

Infraclass Eutheria
Order Rodentia (rodents)
Family Muridae (rats and mice)

Current status: Confirmed
Habitat: Grassy areas at most elevations
Abundance: Common

Records

Number of individuals captured in NPS inventory: 12

Voucher photo(s): None

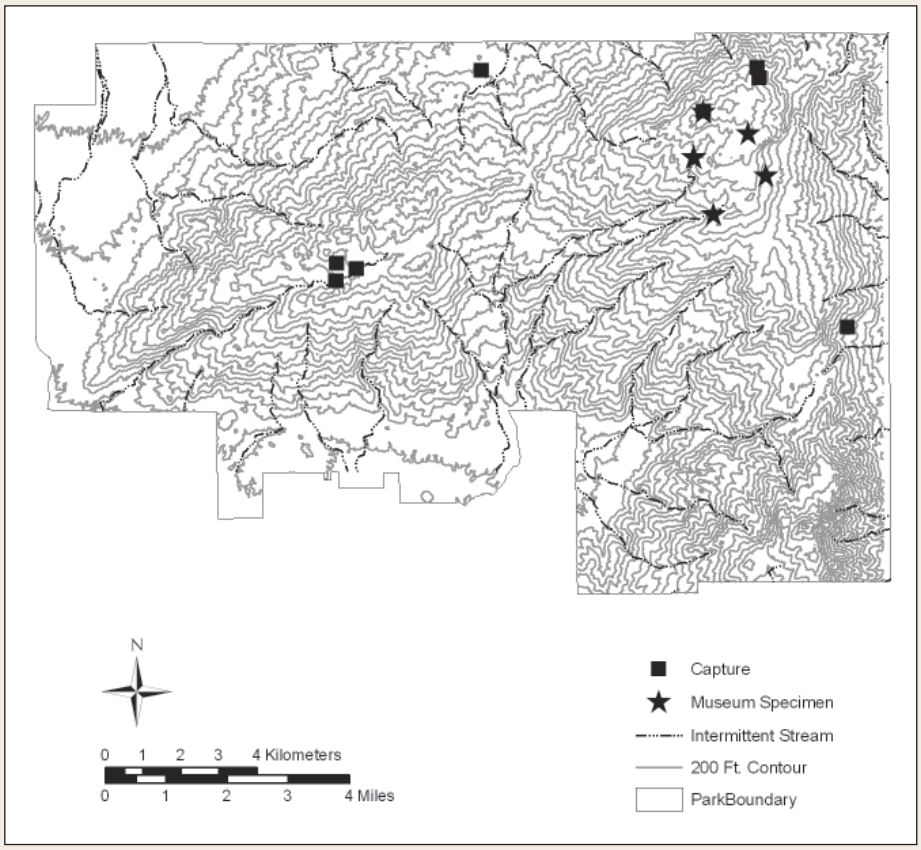
Museum specimen(s): Nine specimens in UA mammal collection:
(1–2) UA25192–UA25193, collected by R. Davis, Manning Camp Meadow, 8,000 ft, August 15, 1984;
(3) UA25194, collected by R. Davis, Devil's Bath Tub Canyon, 7,300 ft, August 19, 1984;
(4) UA26011, collected by R. Davis, Spud Cabin Site Meadow, 7,300 ft, August 17, 1984;
(5–6) UA26012–UA26013, collected by R. Davis, top of Spud Rock, 8,590 ft, August 14, 1984;
(7–8) UA26014–UA26015, collected by R. Davis, Manning Camp Meadow, 8,000 ft, August 11, 1984;
(9) UA26016, collected by R. Davis, Mica Meadow, on top, August 12, 1984.

Historic and recent records: This species was captured at Manning Camp, Spud Rock, and a number of other locations (Davis and Sidner 1992). Davis could find no previous evidence that this species occurred in the Rincons, and wrote a paper suggesting that this species is a recent invader of high elevations in the Sky Islands (Davis and Dunford 1987).

Comments

Yellow-nosed Cotton Rats are generally associated with thick grasses. In the Sky Island mountain ranges of southeastern Arizona, they are widespread in grasslands but are also found where grasses are well-developed at higher elevations. They were captured at high elevations during this study, as in the Davis-Sidner study. However, Don Swann and R. Sidner also captured an individual (not collected) that they identified as this species at Madrona Ranger Station in 2002 (Swann 2002), suggesting that this species may also occur riparian grasslands at lower elevations.

(No photo available)



Locations for Yellow-Nosed Cotton Rat.

WESTERN WHITE-THROATED WOOD RAT

Neotoma albigula

Infraclass Eutheria
Order Rodentia (rodents)
Family Muridae (rats and mice)

Current status: Confirmed
Habitat: Generalist found in all desert areas where trees or shrubs are present
Abundance: Common

Records

Number of individuals captured in NPS inventory: 75

Number of infrared-triggered photographs: 14

Voucher photo(s): Unnumbered photo by D. Dalton, Rocking K plot 10 (UTMs 529171, 3555465; NAD27), April 28, 2001.

Museum specimen(s): Three specimens in UA mammal collection:
(1) UA7093, collected by G. V. R. Bradshaw, Saguaro NM, 15 mi. east of Tucson, August 3, 1959;
(2) UA25655, collected by R. Dickson, ½ mi. northwest of Saguaro NM headquarters, 3,060 ft. (T15S, R16E, Sec. 30, northeast quarter), October 17, 1974;
(3) UA26857, collected by N. Perry, ½ km south of Javelina Picnic Area (T14S, R16E), May 15, 2000.

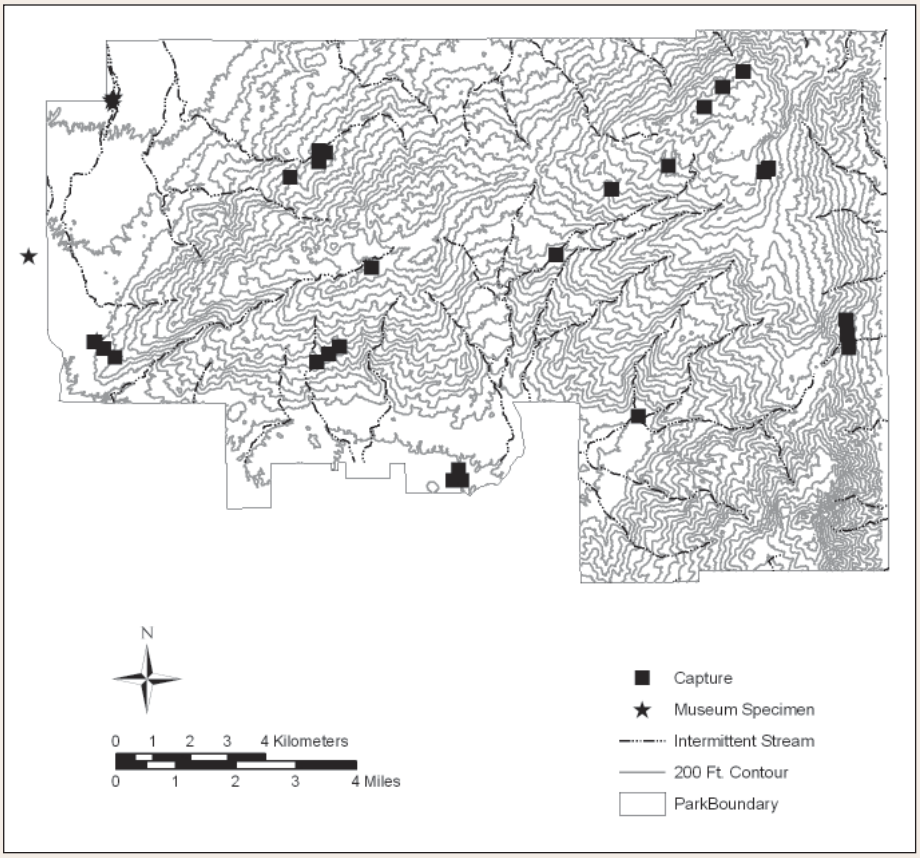
Ten specimens in UIMNH collection:
(1) UI18700, collected by J. S. Hall, Saguaro NM western boundary, June 19, 1958;
(2) UI18709, collected by A. B. Sargeant, Saguaro NM western boundary, June 19, 1958;
(3) UI18710, collected by J. P. Kelly, Saguaro NM western boundary, June 19, 1958;
(4) UI25844, collected by W. W. Goodpaster, Saguaro NM, 10 mi. east of Tucson, May 8, 1946;
(5) UI25845, collected by W. W. Goodpaster, Saguaro NM, 10 mi. east of Tucson, May 9, 1946;
(6–7) UI25846–UI25847, collected by W. W. Goodpaster, Saguaro NM, 10 mi. east of Tucson, May 11, 1946;
(8–10) UI25848–UI25850, collected by W. W. Goodpaster Goodpaster, Saguaro NM, 10 mi. east of Tucson, May 12, 1946.

Historic and recent records: Captured by Robert M'Closkey during his studies (e.g., M'Closkey 1980) and by Duncan (1990). Also captured at Grass Shack by Davis and Sidner (1992).

Comments

Western White-throated Woodrats are probably the best-known rodent in Saguaro NP, due to their easily identified nests of sticks, rocks, cacti, and other debris. In the 1950s, woodrat herbivory was believed to be a factor in the decline of the saguaro, but this herbivory declined after an increase in prickly pear in the park beginning in the 1970s (Ray Turner, personal communication). Some high-elevation records are suspect due to initial problems with identification of woodrats during the NPS inventory.

Western White-Throated Woodrat (*Neotoma albigula*).



Locations for Western White-Throated Woodrat.

MEXICAN WOODRAT

Neotoma mexicana

Infraclass Eutheria
Order Rodentia (rodents)
Family Muridae (rats and mice)

Current status: Confirmed
Habitat: Woodlands and forests at higher elevations
Abundance: Uncommon

Records

Number of individuals captured in NPS inventory: 25

Voucher photo(s): None

Museum specimen(s): Two specimens in SDMNH collection:
(1) SD10111, collected by L. M. Huey, Spud Rock Ranger Station, June 21, 1932;
(2) SD10123, collected by L. M. Huey, Spud Rock Ranger Station, June 22, 1932.

Four specimens in UA mammal collection:
(1–2) UA16461–UA16462, collected by L. Christianson, Manning Camp, August 20, 1966;
(3) UA16463, collected by L. Christianson, ca. 0.3 mi. (by fire trail) west of Italian Springs on north side of Mica Mountain, August 20, 1966;
(4) UA26938, collected by R. Davis, top of Spud Rock, August 14, 1985.

Historic and recent records: This species was captured by Huey in 1932, and observed and trapped throughout the history of the park at higher elevations (for example, it was live-trapped in August 1966 (Monthly Narrative Report, September 8, 1966). It was trapped at Spud Rock and Manning Camp by Davis and Sidner (1992).

Comments

Mexican Woodrats are a high-elevation species in the Sky Islands of Arizona, including the Rincons. They are smaller than White-throated Woodrats, darker in color, and have hairs at the base of the throat that are gray at the base, as compared to the white basal throat hairs in the White-throated Woodrat.

It is believed that the field crew misidentified some individuals captured during our study (Brian Powell, personal communication). Mexican Woodrats may be an important food source for Mexican Spotted Owls. DeRosier (2002) found woodrat bones in Mexican Spotted Owl pellets at high elevations in the Rincons that were presumed to be this species; 19% of bones in pellets were of woodrats.

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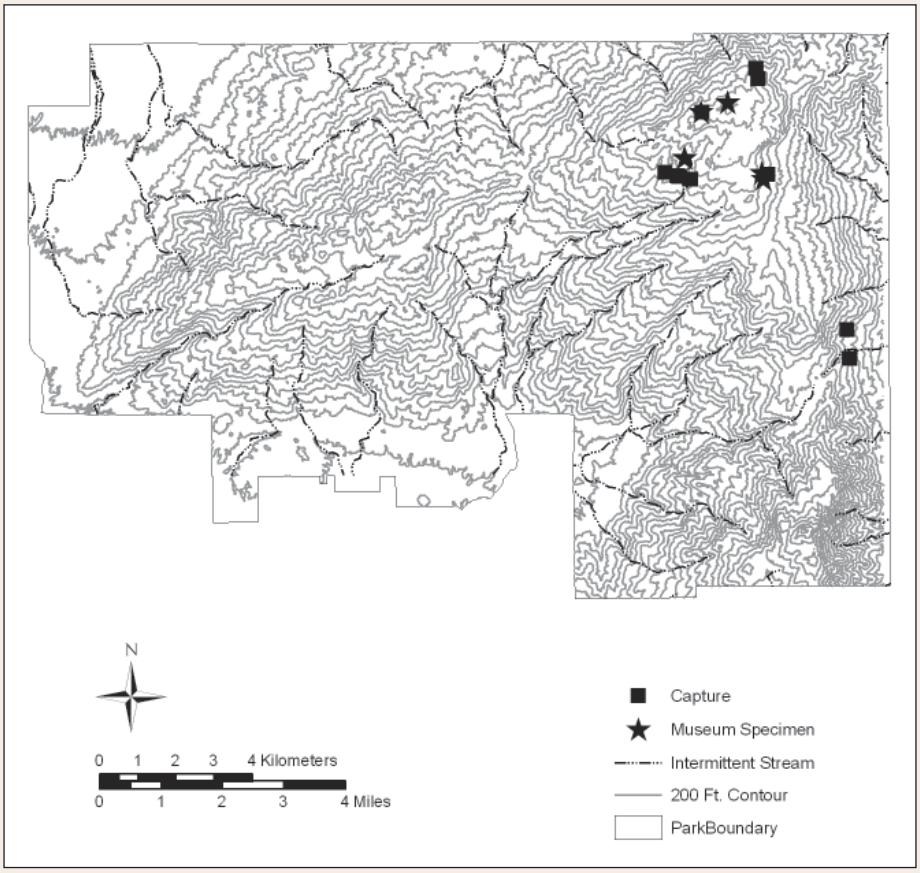


Locations for Mexican Woodrat.

NORTH AMERICAN PORCUPINE

Erethizon dorsatum

Infraclass Eutheria
Order Rodentia (rodents)
Family Erethizontidae (New World Porcupines)

Current status: Confirmed in past; may be extirpated.
Habitat: Generalist in southern Arizona
Abundance: Extirpated or very rare

Records

Sight observation during NPS inventory project: No

Number of infrared-triggered photographs: 0

Number of records in SNP Wildlife Observations database: 6

Voucher photo(s): None; a photograph "by Rubinowitz" has been in Saguaro NP collection for >15 years and may be from park.

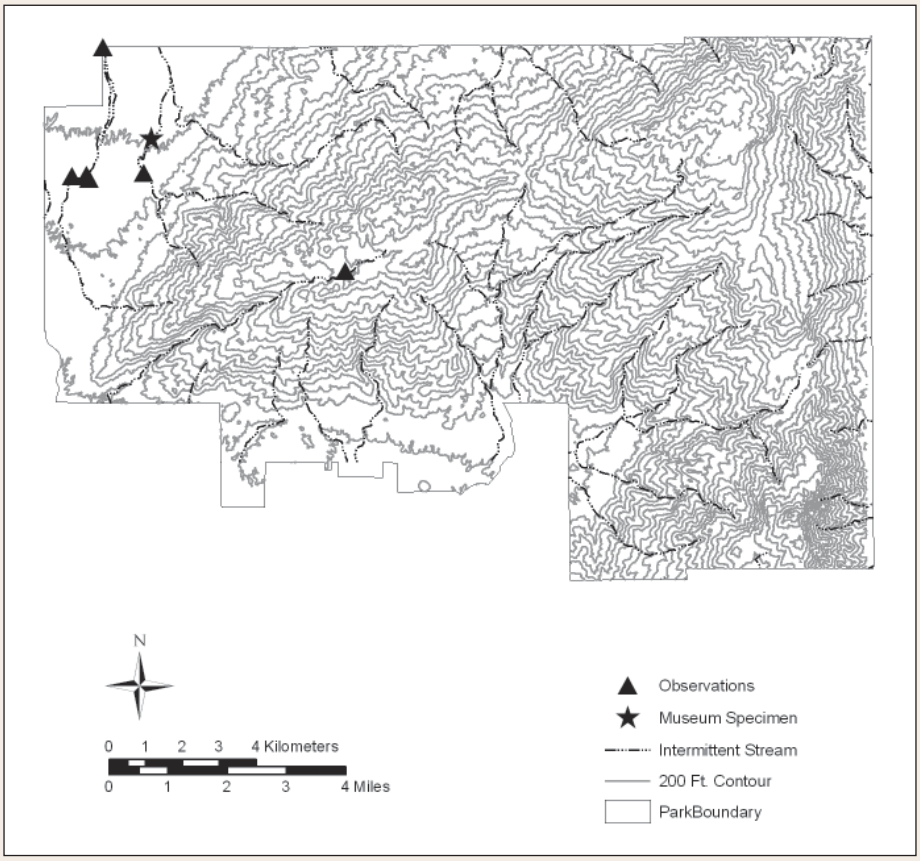
Museum specimen(s): One specimen in Saguaro NP collection: Saguaro NP536, collected by B. Lund, ¼ mi. north of Converse Well in cave (T14S, R16E, Section 16), September 29, 1963.

Historic and recent records: Porcupines were consistently listed in park annual wildlife reports from the 1940s through the 1960s. They were considered scarce during the 1940s, and not many (one or two at most) were observed in the park during that period (Saguaro NP-WACC records, Annual Wildlife Reports, 1940s). Records from the 1950s are sparse, but they were still considered rare (Saguaro NP-WACC records, file on Mammals by Barbara Lund). The most sightings for porcupines were from 1961, when eight were reported. On nocturnal surveys conducted on the Loop Road nearly every night from December 1964 through July 1966, only one porcupine was recorded (Saguaro NP-WACC records, mammal records). Porcupines were not observed by Sumner (1951).

Comments

North American Porcupines occur in the Sky Island region of southeastern Arizona, but appear to be increasingly rare. In addition to the one specimen from the RMD (a quill in the Saguaro NP collection) there have been several sight records over the years. The most recent sighting of which we are aware was by Ranger Bob Lineback, in the late 1990s. It is unknown if North American Porcupines still occur in the Rincons; recent searches by mammal researchers in the high country have not revealed any porcupine sign. One search strategy for this species in the Sky Island region is to look for sign in riparian areas with cottonwood trees in spring, before the trees leaf out (R. Davis, personal communication).

(No photo available)



Locations for North American Porcupine.

Carnivores

FERAL DOG

Canis familiaris

Infraclass Eutheria
Order Carnivora (carnivores)
Family Canidae (dogs and foxes)

Current status: Confirmed; non-native
Habitat: Generalist
Abundance: Uncommon or occasional

Records

Sight observation during NPS inventory project: No

Number of infrared-triggered photographs: 2

Number of records in SNP Wildlife Observations database: 3

Voucher photo(s): SNP-23 (TM Photo #9129), Rincon Creek (UTMs 535311, 3555370), March 2005.

Museum specimen(s): None

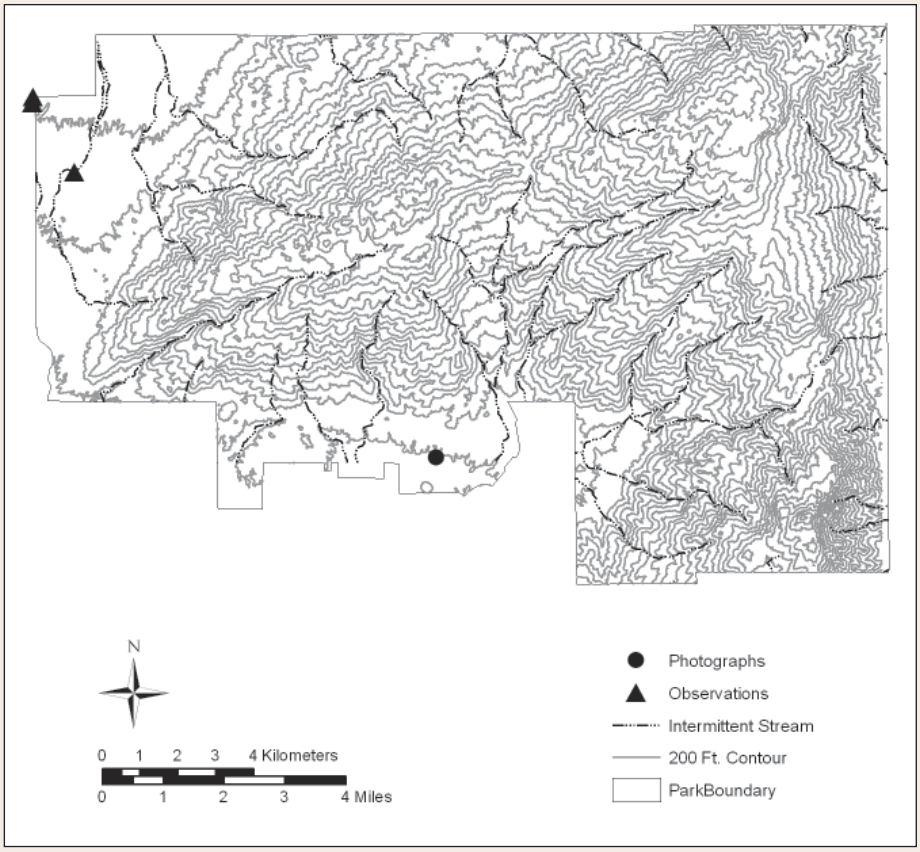
Historic and recent records: Occasional reports in historic records.

Comments

Feral Dogs occur occasionally in the RMD, usually in visitor-use areas. We speculate that these are pets abandoned by their owners. Dog tracks are not particularly common on trails or in washes in the RMD, although there was an increase in dog sightings in late 2007, and in that year a pack of dogs attacked a javelina south of the Visitor Center (Mike Ward, personal observation). Dogs also trespass from the X-9 Ranch in areas of the park not frequented by visitors, such as Rincon Creek and the Madrona Ranger Station. Dogs accompanied by people are sometimes encountered on trails, but law enforcement over the years has kept violations to a minimum.

Zylstra (2008) found few injuries to desert tortoises that could be attributed to dogs in the RMD, in contrast to the TMD, where more than 15% of tortoises observed had injuries consistent with attacks by Feral Dogs.

Feral Dog (*Canis familiaris*).



Locations for Feral Dog.

COYOTE

Canis latrans

Infraclass Eutheria
Order Carnivora (carnivores)
Family Canidae (dogs and foxes)

Current status: Confirmed
Habitat: Generalist at lower elevations
Abundance: Common

Records

Sight observation during NPS inventory project: Yes

Number of infrared-triggered photographs: 97

Number of records in SNP Wildlife Observations database: 151

Voucher photo(s): SNP-25 (TM Photo #8154), Cactus Forest area (UTMs 356719, 3564528), December 2002.

Museum specimen(s): None

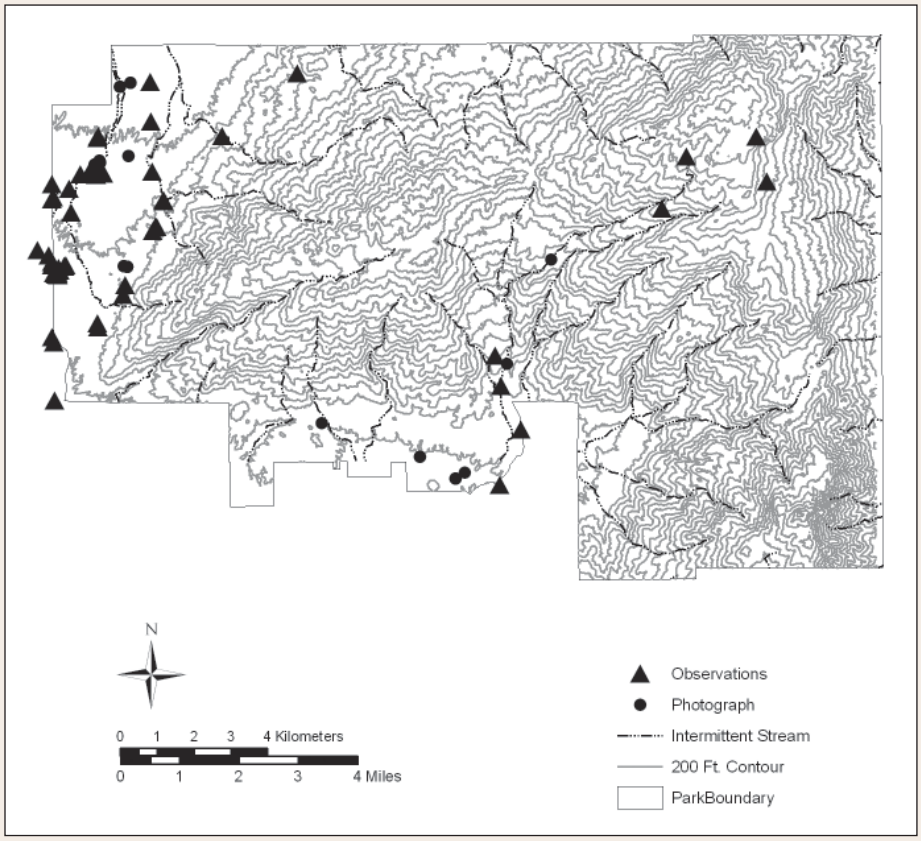
Historic and recent records: Sumner (1951), Bounds (1993) and McClure and others (1995; 1996) studied Coyotes in the RMD. They have been consistently listed in park annual wildlife reports throughout the history of the park (SNP-WACC records, Annual Wildlife Reports).

Comments

Coyotes are extremely common in desert areas of the RMD, and have been common since the park was established in 1933. Predator control of this species was common throughout the 20th century, but the park appears to have rejected this idea at least once, in 1949, when it was proposed by ranchers and the Arizona Game and Fish Department (SNP-WACC records, memo from Superintendent Samuel A. King, September 30, 1949). Sumner (1951) studied Coyote diet in response to concerns expressed by hunters and ranchers that Coyotes were reducing the deer population. He found that a very small percentage of the Coyote diet at the park was made up of deer. Both Sumner (1951) and Davis and Sidner (1992) noted that Coyotes occurred at higher elevations but were rare. In this study, we never photographed Coyotes at elevations above 6,000 feet (1,828 m) in the Rincons.

McClure and others (1995) studied diet of Coyotes at Saguaro NP and found that major foods included mesquite, prickly pear fruit, rodents, rabbits and hares, deer, other mammals, and dog food, bread, and other human-related items. McClure and others (1996) found that the densities of Coyotes at the boundary between the RMD and the urban area were the highest reported in the scientific literature. They believed that this was due to a combination of excellent food sources in nearby neighborhoods and protected areas within the park.

Coyote (*Canis latrans*).



Locations for Coyote.

GRAY WOLF

Canis lupus

Infraclass Eutheria
Order Carnivora (carnivores)
Family Canidae (dogs and foxes)

Current status: Extirpated
Habitat: Generalist in woodlands and forests
Abundance: Extirpated

Records

Sight observation during NPS inventory project: No

Number of infrared-triggered photographs: 0

Number of records in SNP Wildlife Observations database: 0

Voucher photo(s): None

Museum specimen(s): None

Historic and recent records: Wolves were certainly present historically in the Rincons and Saguaro NP. Mr. A. B. Carey reported them in the Rincons in January 1939 (SNP-WACC records, Bureau of Biological Survey, April 6, 1939), near Taylor Ranch (SNP-WACC records, Memorandum for Superintendent Miller, September 29, 1940). Individuals were shot near Tanque Verde Ranch in 1939 and 1942, by James Converse (SNP-WACC records, Memo to Regional Director from Don Egermayer, January 11, 1948). A specimen was noted by a rancher adjacent to the monument near Reddington Pass in 1943 (SNP-WACC records, Annual Animal Census Report for Saguaro NM, 1943). Two individuals were trapped within three miles of the monument in 1947 (SNP-WACC records, Annual Wildlife Report, October 1, 1947).

In 1948, Saguaro NM custodian Don Egermayer shot and killed a wolf on the X-9 Ranch while he was off-duty, but reported it in his monthly narrative report. Egermayer was certain it was a gray wolf, as its mate was also shot and turned in for a $50.00 bounty (SNP-WACC records, Memo from Natt Dodge to Egermayer, January 5, 1948; Memo to Regional Director from Egermayer, January 11, 1948). This appears to be the last confirmed record of a Gray Wolf in the Rincons. However, there was a sighting of a wolf on January 25, 1966, at X-9 Ranch, five miles from Madrona (SNP-WACC records, Monthly Narrative Report for January 1966).

Comments

Gray Wolves were extirpated from Arizona following many decades of intensive predator control efforts (Brown 1992; Robinson 2005). They were recently reintroduced to parts of east central Arizona and western New Mexico.

(No photo or map available)

COMMON GRAY FOX

Urocyon cinereoargenteus

Infraclass Eutheria
Order Carnivora (carnivores)
Family Canidae (dogs and foxes)

Current status: Confirmed
Habitat: Generalist
Abundance: Common

Records

Sight observation during NPS inventory project: Yes

Number of infrared-triggered photographs: 1,018

Number of records in SNP Wildlife Observations database: 50

Voucher photo(s): SNP-9 (TM Photo #2016), Madrona Pools area (UTMs 536879, 3557519S), December 19, 1999.

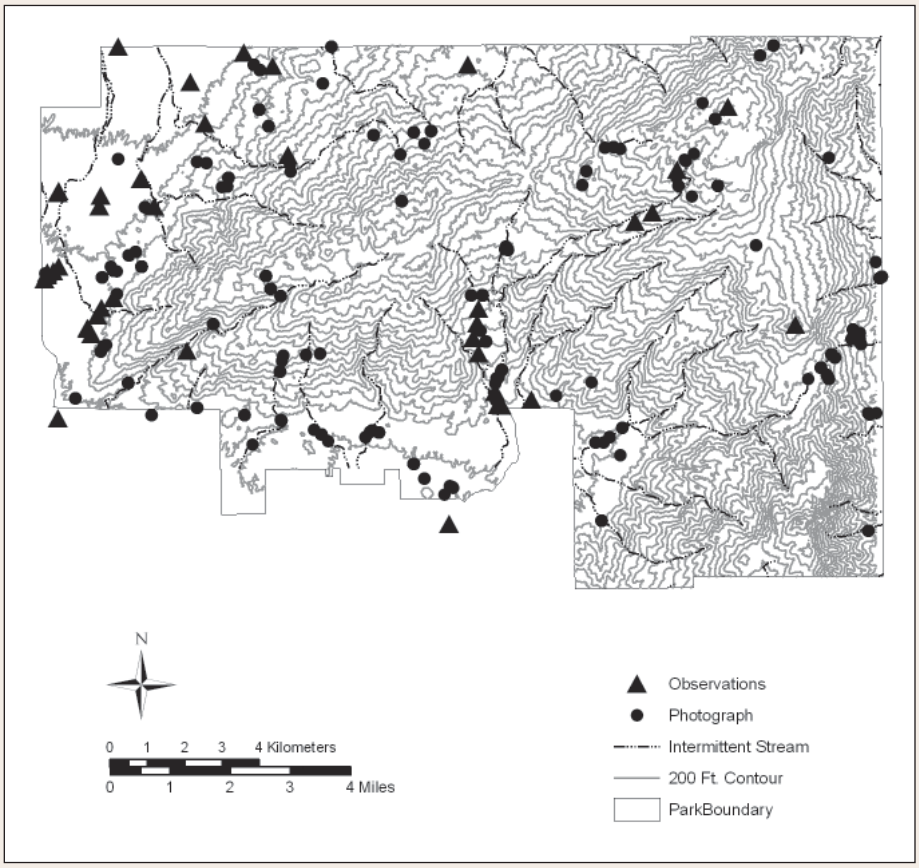
Museum specimen(s): Two specimens in UA mammal collection:
(1) UA25992, collected by R. Davis and found dead on trail, voucher for Saguaro NM;
(2) UA26774, collected by M. Wall, N-32° 12' 24.7"; W-110° 40' 04.0", May 1, 2001.

Historic and recent records: Davis and Sidner (1992) did not consider this species to be "common or typical" in the high country of the RMD, based on sightings. However, Sumner (1951) reported that they were "fairly common" below 6,000 ft. (1,829 m). Foxes, presumed to be this species, were consistently listed in annual wildlife reports in the 1940s, with gray foxes listed every year beginning in 1949 through the 1960s (SNP-WACC records, Annual Wildlife Reports).

Comments

Common Gray Foxes are a widespread carnivore common in many different vegetation types throughout the U.S. In the RMD, Common Gray Fox was one of the most commonly photographed species during the NPS inventory, and was found in all areas of the park. However, a large number of foxes were found dead during 2003; there were several attacks on visitors by Gray Foxes, and at least one individual fox tested positive for rabies. For several years, we obtained few photographs of this species, but they began to increase again in 2007.

Common Gray Fox (*Urocyon cinereoargenteus*).



Locations for Common Gray Fox.

AMERICAN BLACK BEAR

Ursus americanus

Infraclass Eutheria
Order Carnivora (carnivores)
Family Ursidae (bears)

Current status: Confirmed
Habitat: Generalist at higher elevations
Abundance: Uncommon

Records

Sight observation during NPS inventory project: Yes

Number of infrared-triggered photographs: 33

Number of records in SNP Wildlife Observations database: 55

Voucher photo(s): SNP-5 (TM Photo #8751), Heartbreak Ridge (UTMs 544543, 3560110), November 5, 2004.

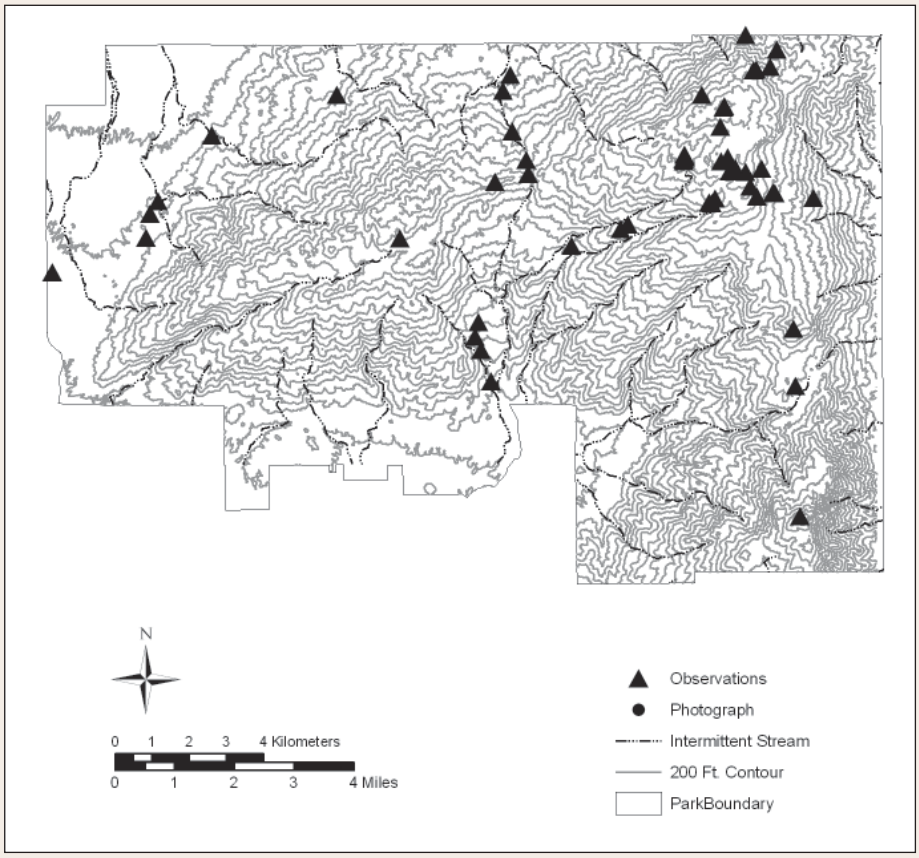
Museum specimen(s): None

Historic and recent records: American Black Bears were always listed in park annual wildlife reports beginning in 1939, although these reports in the 1940s commented on the rarity of this species. Estimated abundance in these early years ranged from 2 to 10 (SNP-WACC records, Memorandum for Superintendent Miller, September 29, 1940 and annual wildlife reports). Sumner (1951) found no evidence that American Black Bears occurred in the park at that time; Davis and Sidner (1992) saw no bears and no certain sign during their study but did report sightings by other observers. Discussion of potential reintroduction of bears into the Rincons ocurred between the AGFD and NPS (SNP-WACC records, Tree Squirrel Status in the Catalina and Rincon Mountains, May 18, 1970, and Letter to Robert A Jantzen, May 21, 1970). By the late 1970s, bears were rarely observed (SNP-WACC records, Natural and Cultural Resources Management Plan and Environmental Assessment, June 1978).

Comments

American Black Bears have increased in abundance in the Rincons during the past five decades. We found that with cameras set on trails above 6,500 feet (1,981 m), we often photographed this species, and found bear sign to be abundant throughout the park wherever manzanita, oaks, and similar food plants were present. American Black Bears also eat prickly pear; on occasion, we photographed individuals in riparian areas below 4,500 feet (1,372 m), and Black Bears have been observed from the Loop Road several times in the past decade. The increase in bears in the Rincons may be related to better forage due to improved fire management, but is likely also due to relaxed hunting pressure. The park and UA are currently studying black bears using genetic methods, and the park recently completed an American Black Bear Management Plan (SNP 2007).

American Black Bear (*Ursus americanus*).



Locations for American Black Bear.

GRIZZLY BEAR

Ursus arctos

Infraclass Eutheria
Order Carnivora (carnivores)

Current status: Extirpated
Habitat: Generalist
Abundance: Extirpated

Family Ursidae (bears)

Records

Sight observation during NPS inventory project: No

Number of infrared-triggered photographs: 0

Number of records in SNP Wildlife Observations database: 0

Voucher photo(s): None

Museum specimen(s): None

Historic and recent records: Grizzly Bears occurred in the Rincons historically, but there is scant evidence of specific records except for one bear that was reported as having been roaming in the Rincon Mountains in 1921. According to Ollie Barney, an accomplished hunter who grew up on the Barney Ranch in Happy Valley, this bear was killed by A. B. Carey, a rancher who was friendly with Barney and his father. In an interview with Don Swann in 2006, Barney stated that Carey trapped this last grizzly at a spring near the top of Wrong Mountain, then shot it. Barney believed that this occurred in 1921. A skull of a bear from the Rincons, possibly this grizzly, was once in the collection of the Arizona Historical Society, but is now lost.

Comments

Historically, Grizzly Bears occurred in southern Arizona and south into the Sierra Madre, in Mexico. They began to decline when Europeans first settled the area, then were targeted for extirpation by a U.S. federal predator control program beginning in 1914 (Robinson 2005). The last known Grizzly Bear in Arizona was killed in 1925 (Hoffmeister 1986).

(No photo or map available)

RINGTAIL

Bassariscus astutus

Infraclass Eutheria
Order Carnivora (carnivores)
Family Procyonidae (raccoons and their relatives)

Current status: Confirmed
Habitat: Rocky areas at all elevations
Abundance: Common

Records

Sight observation during NPS inventory project: Yes

Number of infrared-triggered photographs: 229

Number of records in SNP Wildlife Observations database: 7

Voucher photo(s): SNP-16 (TM Photo #7667), West of C. Loma Alta (UTMs 528610, 3556868), August 12, 1999.

Museum specimen(s): One specimen in UA mammal collection: UA26769, collected by D. Bell, Rincon Creek (UTMs 540469, 3556980), July 16, 2002.

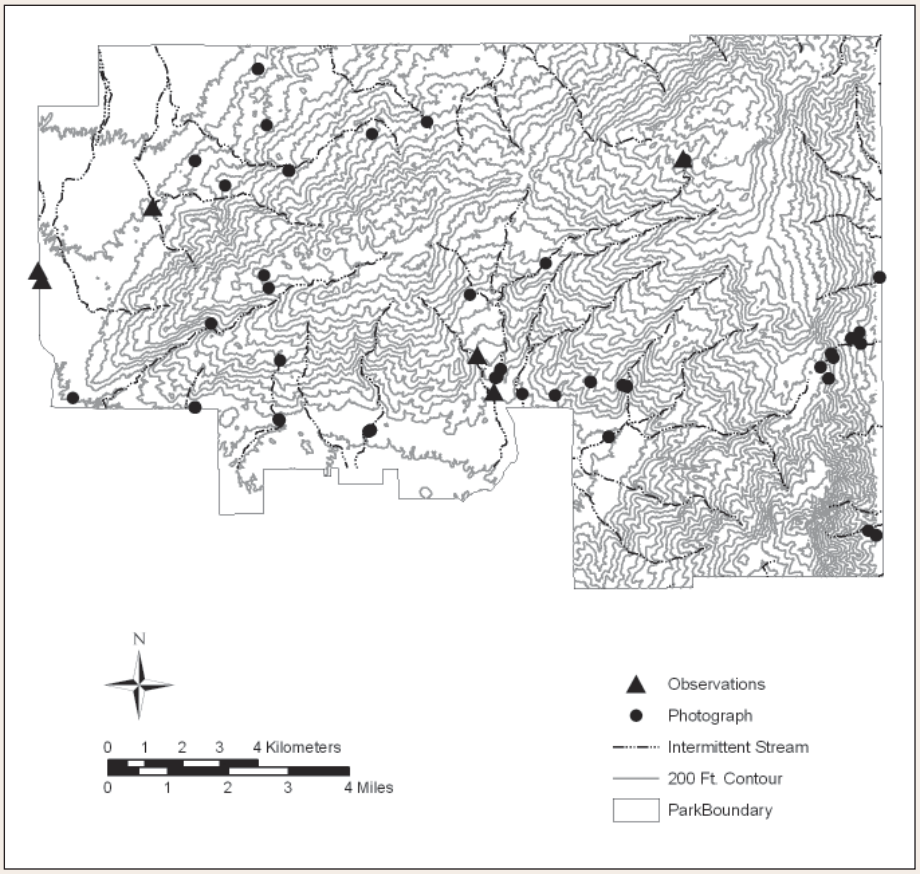
Historic and recent records: Sumner (1951) did not find sign of ringtails but reported that they were present at Madrona and the Visitor Center; Davis and Sidner (1992) noted their presence in the high country. This species was consistently listed in annual wildlife reports throughout the first three decades of the park's history (SNP-WACC records, Annual Wildlife Reports).

Comments

Ringtails are strictly nocturnal, fairly secretive, and usually confined to rocky areas away from roads and trails. They are often associated with mines and with humans in rural areas. Hoffmeister (1986) noted that ringtails "are either bold or indifferent to the presence of man for they are not hesitant to take up quarters in the attic of an occupied house or to enter a camp and carry off items."

This species is remarkably abundant in Saguaro NP, judging from infrared-triggered photography results. In contrast, there are few recorded visitor observations.

Ringtail (*Bassariscus astutus*).



Locations for Ringtail.

WHITE-NOSED COATI

Nasua narica

Infraclass Eutheria
Order Carnivora (carnivores)
Family Procyonidae (raccoons and their relatives)

Current status: Confirmed
Habitat: Generalist at high elevations; riparian specialist at lower elevations
Abundance: Common

Records

Sight observation during NPS inventory project: Yes

Number of infrared-triggered photographs: 28

Number of records in SNP Wildlife Observations database: 41

Voucher photo(s): SNP-7a (TM Photo #1373), Lower Miller Creek (UTMs 547196, 3560346), October 21, 2002. SNP-7b (TM Photo #8864), Madrona Pools area (UTMs 536839, 3557253), November 2004.

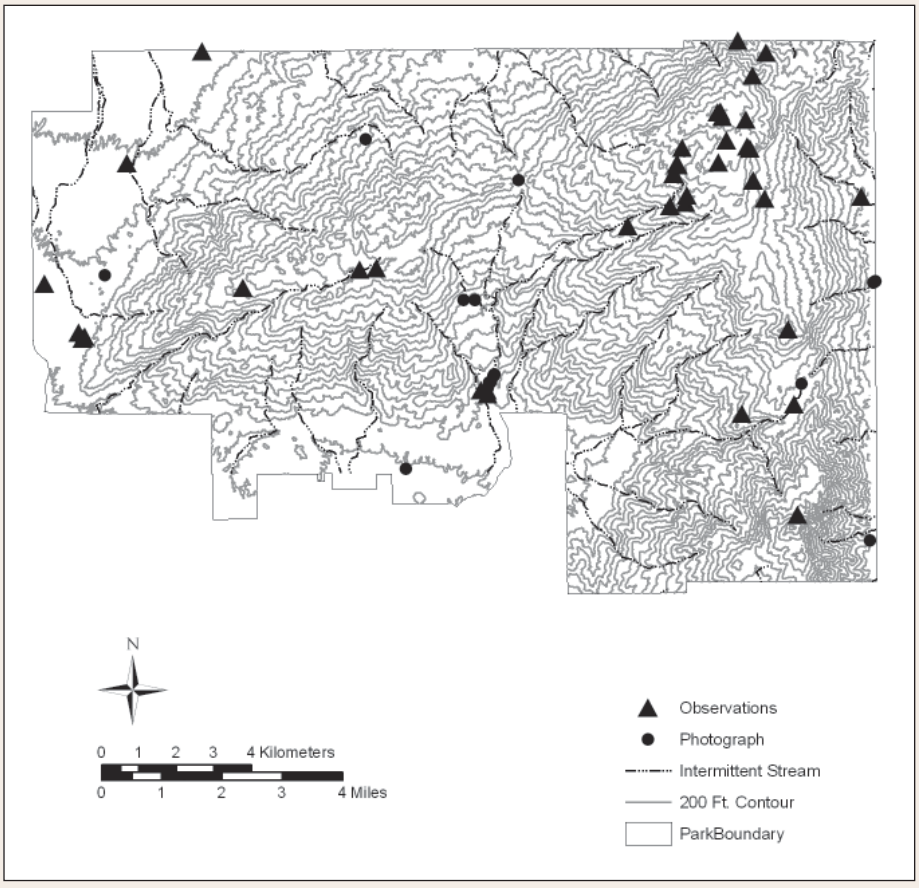
Museum specimen(s): None

Historic and recent records: Not mentioned by Sumner (1951); discussed by Davis and Sidner (1992), who noted that the earliest record from the Rincons was in 1957, at Deer Head Spring. However, Olin (1954) stated that "eyewitness accounts by ranchers established that they were in the Rincon Mountains in what is now part of the Saguaro National Monument in the very early 1900s." In 1959, coatis were reported as "regular at Manning Camp" by packer George Hanley and others (SNP-WACC records, Saguaro NP Naturalist Monthly Narrative). During the 1960s, they were considered infrequent or rare by park naturalists, although the park's wildlife report (SNP-WACC records, records) from 1964 stated, "These animals are definitely more numerous than our records would suggest. There have been many observations that went unrecorded for one reason or another, like that made by the Santo Domingo Indian fire fighters in 1958. They returned to camp one evening with the story of approximately twenty monkeys in the trees and rocks on the Happy Valley Knoll Trail. This could only have been coatimundi."

Comments

Coatis are currently common and distributed throughout the Rincons. In addition to the photographs of single individuals in this study, we photographed breeding groups at Madrona and observed three individuals in lower Box Canyon (personal observation by author). Since 2000, large breeding groups (20 to >30 individuals) have been observed near Miller Creek (Jim Williams, personal communication), the Happy Valley campsite (Brad Donaldson, personal communication), Cowhead Saddle (visitor observation) and the Madrona Ranger Station (Don Swann, personal observation). Some evidence suggests that coatis have extended their range northward during the past century and may be a relatively recent arrival to Arizona. However, Hoffmeister (1986) believed they occurred historically and that their numbers fluctuate over long time scales; Olin's (1954) oral records suggested that this may be true for the Rincons, as well.

White-Nosed Coati (*Nasua narica*).



Locations for White-Nosed Coati.

NORTHERN RACCOON

Procyon lotor

Infraclass Eutheria
Order Carnivora (carnivores)
Family Procyonidae (raccoons and their relatives)

Current status: Confirmed
Habitat: Riparian areas
Abundance: Uncommon

Records

Sight observation during NPS inventory project: No

Number of infrared-triggered photographs: 5

Number of records in SNP Wildlife Observations database: 22

Voucher photo(s): SNP-15 (TM Photo #5551), Visitor Center (UTMs 524820, 3560484), March 6, 2003.

Museum specimen(s): None

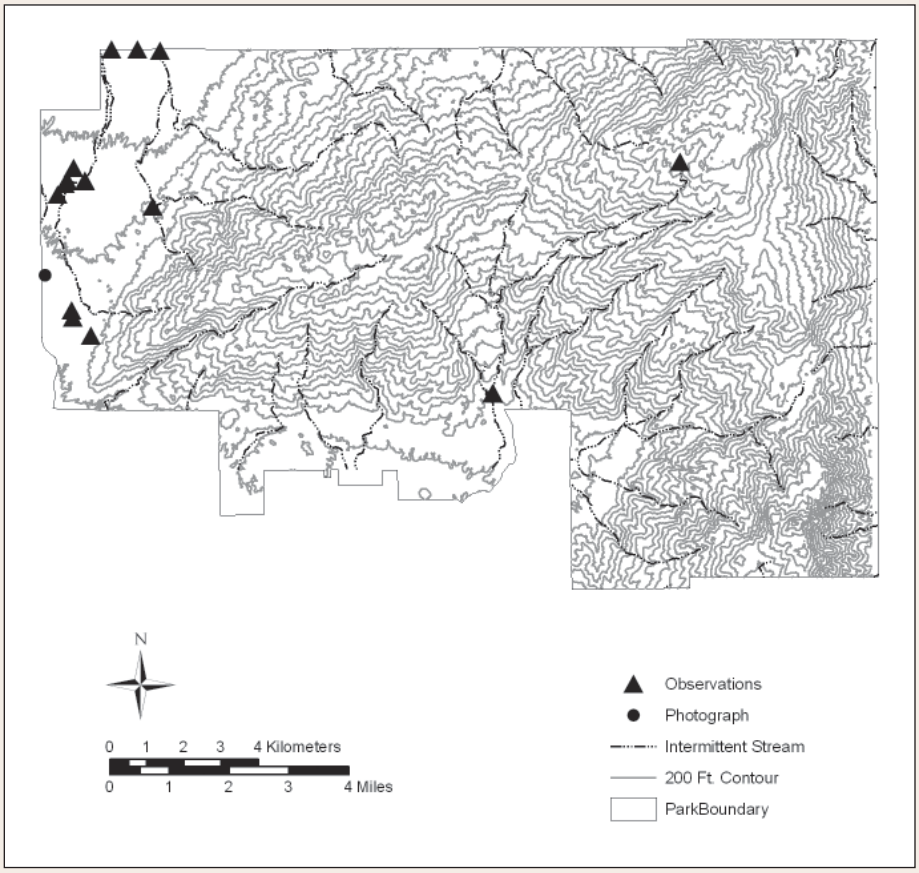
Historic and recent records: Davis and Sidner (1992) observed tracks of this species at Manning Camp, and summarized historic observations at the park. Sumner (1951) reported this species from the Madrona Ranger Station. Wildlife annual reports from the 1940s to 1960s usually listed Northern Raccoons as present in the park; many historic observations were from the Madrona Ranger Station area (SNP-WACC records, Annual Wildlife Reports).

Comments

Northern Raccoons are a riparian species in Arizona, associated with standing water. Like many carnivores, they sometimes carry rabies and appear to undergo large population fluctuations.

Raccoons occur in Saguaro NP, but do not appear to be common outside the boundary area. During the past decade, they have been observed or photographed near the Visitor Center, along Old Spanish Trail, at Rincon Creek, and on Speedway Boulevard, but only one photograph has been obtained from the interior of the park. Raccoons are also occasionally seen or photographed in the Madrona Ranger Station area, and their tracks were often observed along Rincon Creek in 2007 (Don Swann and Chuck Perger, personal observations).

Northern Raccoon (*Procyon lotor*).



Locations for Northern Raccoon.

AMERICAN BADGER

Taxidea taxus

Infraclass Eutheria
Order Carnivora (carnivores)
Family Mustelidae (weasels, otters, and badgers)

Current status: Confirmed
Habitat: Grasslands and deserts
Abundance: Rare or occasional

Records

Sight observation during NPS inventory project: No

Number of infrared-triggered photographs: 0

Number of records in SNP Wildlife Observations database: 20

Voucher photo(s): Unnumbered photo by Park Ranger John Williams, Wildhorse Trailhead, March 24, 2006.

Museum specimen(s): One specimen in UA mammal collection: UA17900, collected by Wade, 4 mi. south of Saguaro NM entrance on Old Spanish Trail (D.O.R), June 18, 1968.

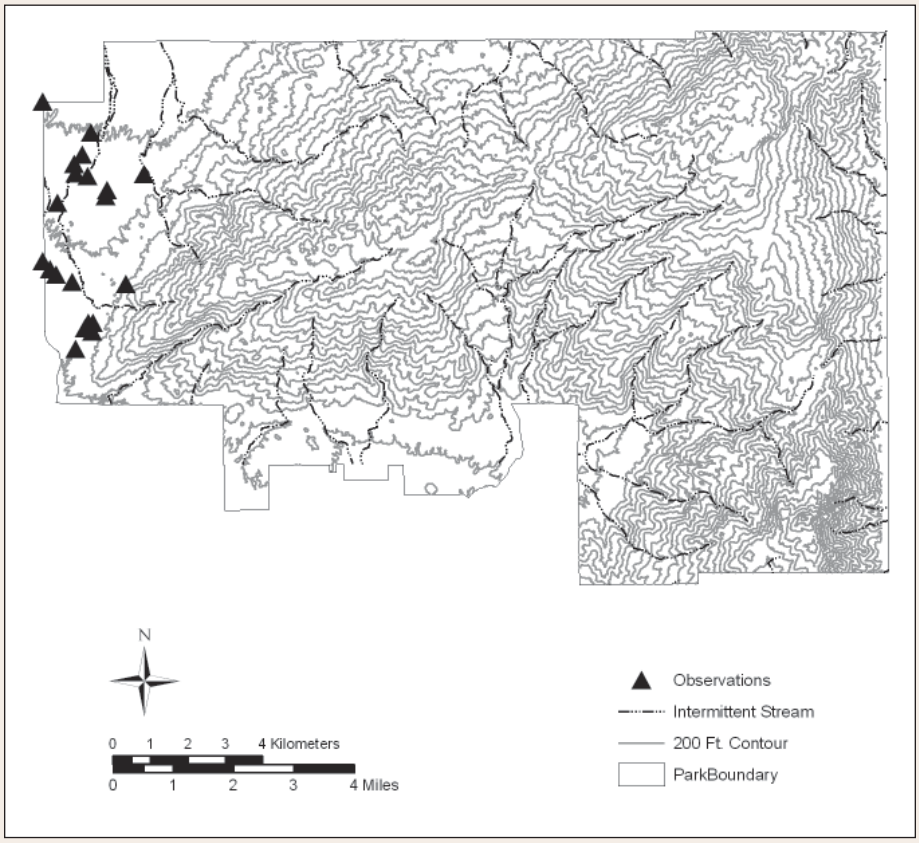
Historic and recent records: Badgers were frequently listed, but considered scarce in the monument during the 1940s (SNP-WACC records, Annual Wildlife Reports), but four were observed in one year (1940) for which records exist. During the mid 1950s and early 1960s, increased numbers (20–30) of badgers were reported (SNP-WACC records, file on mammals by Barbara Lund, park naturalist) and the species was considered "common." For example, during nocturnal surveys conducted nearly every night from December 1964 through July 1966, four badgers were recorded on the Cactus Forest Loop Drive.

Comments

The current status of badgers in the RMD is uncertain. The species is very rare, but at least three reliable observations in recent years have confirmed that badgers still occur in the park. Despite an intensive effort to photograph animals emerging from badger-like holes in this study, we did not photograph any individuals with infrared-triggered cameras. However, ranger John Williams observed and photographed an individual at the end of Speedway Boulevard in 2006.

We expect that the apparent decline and potential extirpation of this species in the park is the result of habitat loss outside park boundaries. Badger habitat generally consists of desert and grasslands with low slope and friable soils; these areas west and south of the park have nearly all been developed into housing in the past several decades. Potential badger habitat still occurs in the park in the expansion area near Rincon Creek, and in the Cactus Forest area near Mica View picnic area.

American Badger (*Taxidea taxus*).



Locations for American Badger.

WESTERN SPOTTED SKUNK

Spilogale gracilis

Infraclass Eutheria
Order Carnivora (carnivores)
Family Mephitidae (skunks)

Current status: Confirmed
Habitat: Generalist
Abundance: Rare

Records

Sight observation during NPS inventory project: No

Number of infrared-triggered photographs: 6

Number of records in SNP Wildlife Observations database: 4

Voucher photo(s): SNP-19 (TM Photo #3210), Box Canyon (UTMs 529323, 3559127), December 17, 2002.

Museum specimen(s): None

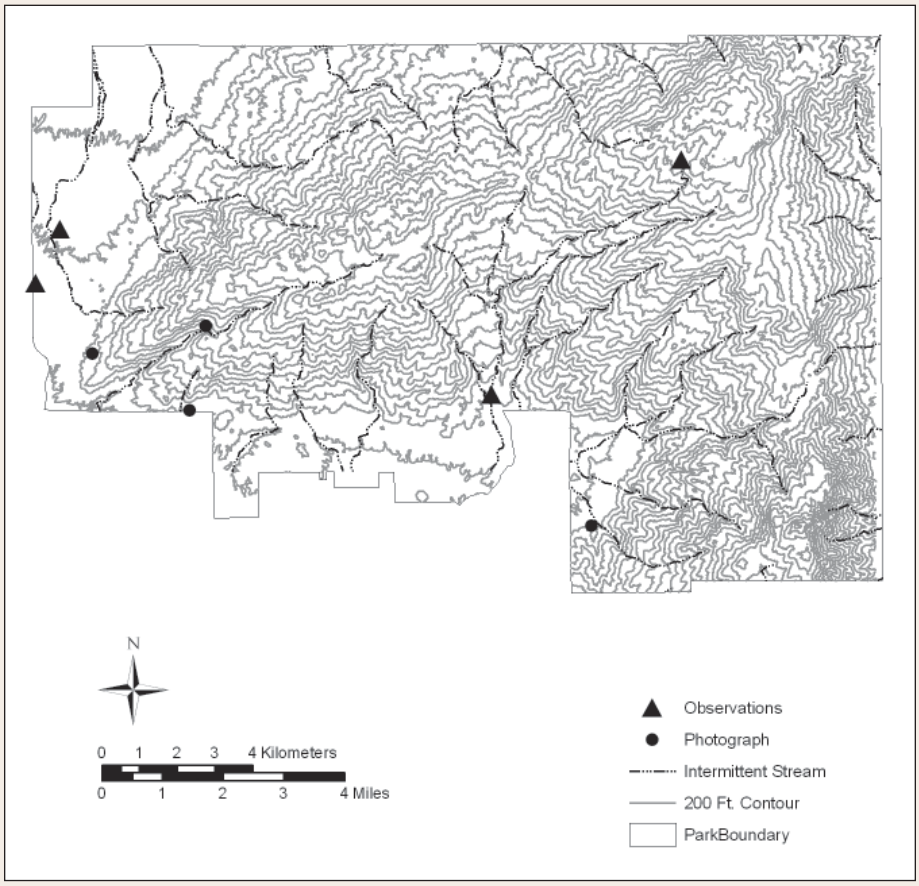
Historic and recent records: Not observed by Davis and Sidner (1992). Sumner (1951) did not discuss specific species of skunks. Not listed in any annual wildlife report from 1939 through the 1960s, although "skunks" were listed starting in the late 1950s (SNP-WACC records, Annual Wildlife Reports).

Comments

This species, the smallest skunk in the park, appears to be the least common of the skunks present in Saguaro NP. It probably occurs in low numbers throughout the park, but is rarely observed by visitors, and has been rarely photographed by wildlife cameras during the decade or so that these cameras have been used at the park.

Saguaro NP, along with several other southern Arizona parks, provides good habitat for skunks. Four of the five species found in the United States are present in the park. In contrast to Hooded and Common Hog-nosed Skunks, which are both limited to the Southwest, Western Spotted Skunks are widespread throughout the western U.S. and are closely related to the Eastern Spotted Skunk (*Spilogale putorius*).

Western Spotted Skunk (*Spilogale gracilis*).



Locations for Western Spotted Skunk.

HOODED SKUNK

Mephitis macroura

Infraclass Eutheria
Order Carnivora (carnivores)
Family Mephitidae (skunks)

Current status: Confirmed
Habitat: Generalist
Abundance: Common

Records

Sight observation during NPS inventory project: No

Number of infrared-triggered photographs: 182

Number of records in SNP Wildlife Observations database: 2

Voucher photo(s): SNP-10 (TM Photo #8829), Lower Rincon Creek (UTMs 535753, 3554722), December 13, 2004.

Museum specimen(s): None

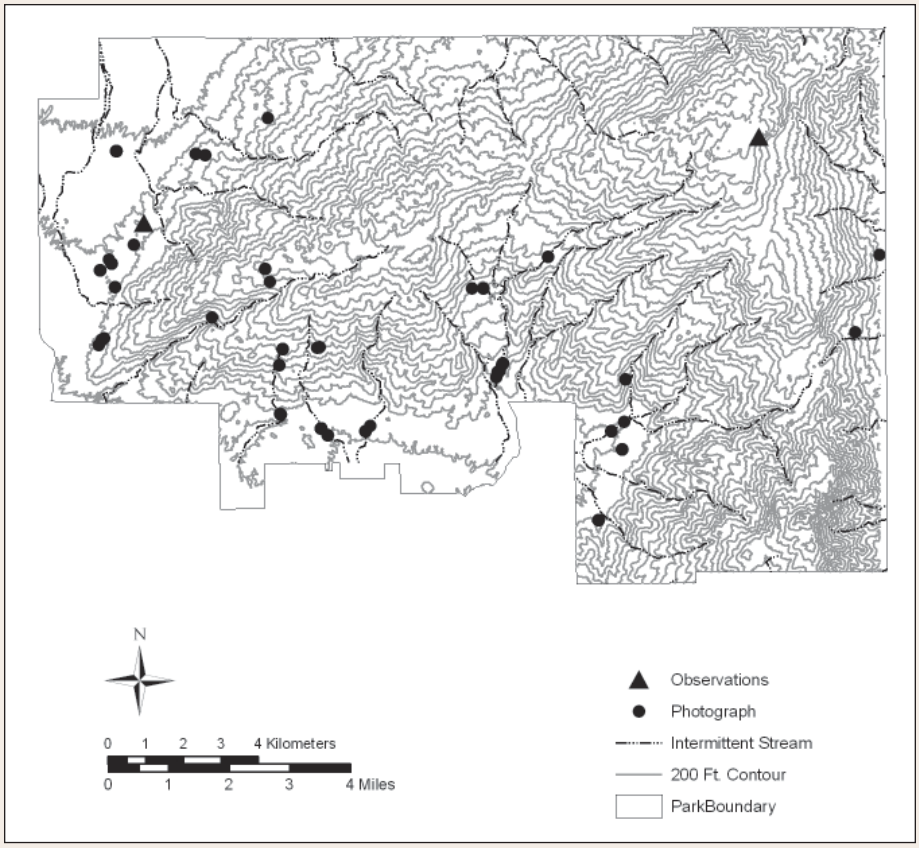
Historic and recent records: Not observed by Davis and Sidner (1992). Sumner (1951) did not discuss specific species of skunks. Not listed in any annual wildlife report from 1939 through the 1960s, although "skunks" were listed starting in the late 1950s (SNP-WACC records, Annual Wildlife Reports).

Comments

Hooded Skunks can be confused with Striped Skunks, but they lack the V-shaped wedge of black in the white fur above the tail. However, there is also a color phase of the Hooded Skunk that is all-black; we photographed one individual in this phase. Hooded Skunks can also be confused with White-backed Hog-nosed Skunks; see account for that species.

Based on infrared-triggered camera photographs, this species is the most common species of skunk at Saguaro NP. They are very common in desert areas and occur, but are far less common, at higher elevations.

Hooded Skunk (*Mephitis macroura*).



Locations for Hooded Skunk.

STRIPED SKUNK

Mephitis mephitis

Infraclass Eutheria
Order Carnivora (carnivores)
Family Mephitidae (skunks)

Current status: Confirmed
Habitat: Generalist
Abundance: Common

Records

Sight observation during NPS inventory project: Yes

Number of infrared-triggered photographs: 162

Number of records in SNP Wildlife Observations database: 11

Voucher photo(s): SNP-18 (TM Photo #1790), 1 mi north of the Madrona Ranger Station (UTMs 536546, 3559882), September 21, 1999.

Museum specimen(s): None

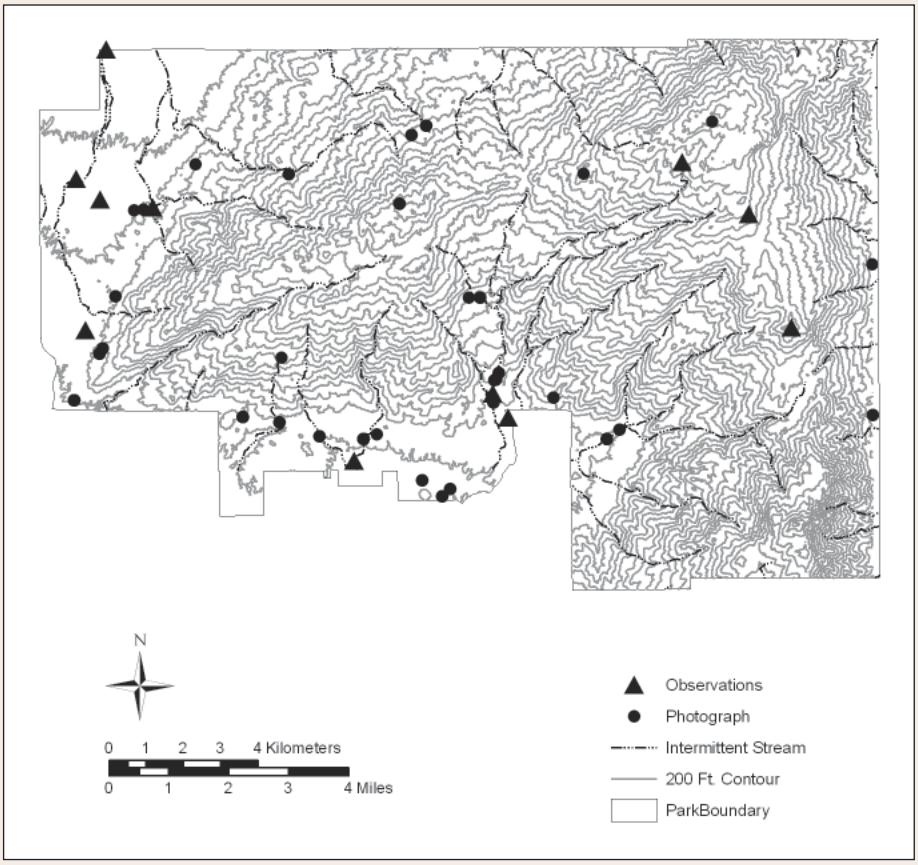
Historic and recent records: Sumner (1951) did not discuss specific species of skunks. Observed at Manning Camp by Davis and Sidner (1992). Not listed in any annual wildlife report from 1939 through the 1960s, although "skunks" were listed starting in the late 1950s (SNP-WACC records, Annual Wildlife Reports).

Comments

Striped Skunks can be easily confused with the Hooded Skunk, which also has a white line down the center of a black nose; see description for that species. In this study, we made some effort to distinguish the two species, but in many photographs it is not always possible to tell the difference.

Like Hooded Skunks, Striped Skunks occur at higher elevations but appear to be more common at lower elevations in the park.

Striped Skunk (*Mephitis mephitis*).



Locations for Striped Skunk.

WHITE-BACKED HOG-NOSED SKUNK

Conepatus leuconotus

Infraclass Eutheria
Order Carnivora (carnivores)
Family Mephitidae (skunks)

Current status: Confirmed
Habitat: Generalist
Abundance: Uncommon

Records

Sight observation during NPS inventory project: Yes

Number of infrared-triggered photographs: 27

Number of records in SNP Wildlife Observations database: 2

Voucher photo(s): SNP-26 (TM Photo), Cactus Forest area (UTMs 526446, 3563409), November 21, 2002.

Museum specimen(s): None

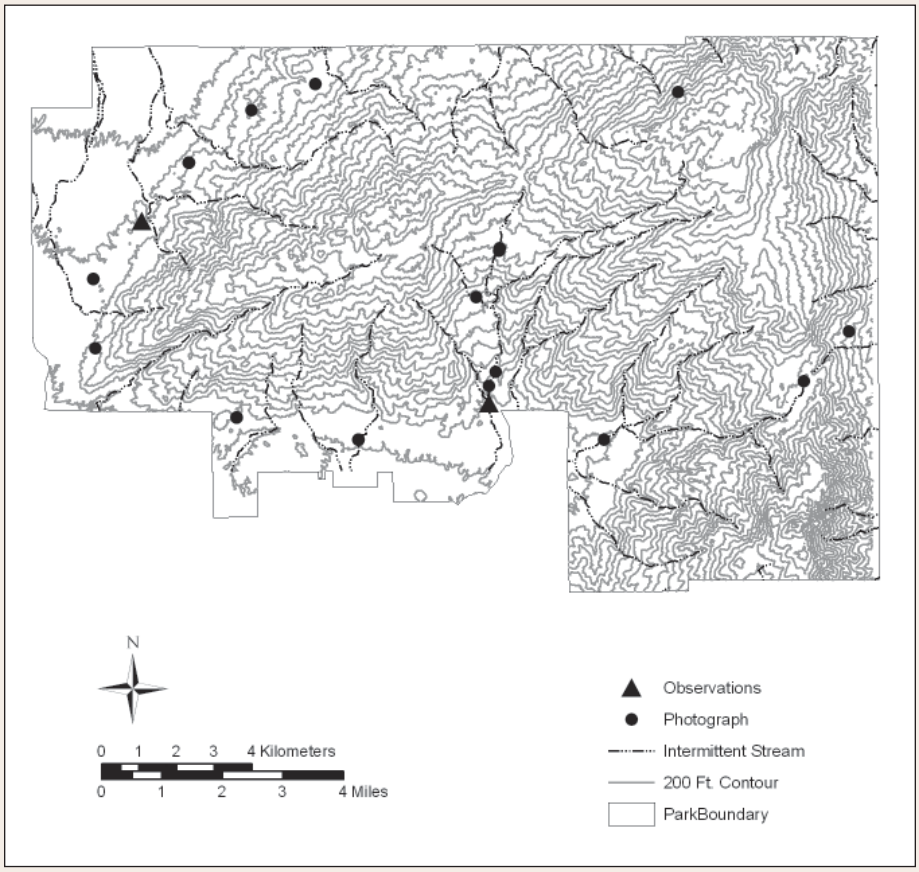
Historic and recent records: Not observed by Davis and Sidner (1992). Sumner (1951) did not discuss specific species of skunks. Not listed in any annual wildlife report from 1939 through the 1960s, although "skunks" were listed starting in the late 1950s (SNP-WACC records, Annual Wildlife Reports).

Comments

White-Backed Hog-Nosed Skunks can be distinguished from Striped and Hooded Skunks by their relatively short, all-white tail, and by the lack of a thin white stripe running down their rostrum, or muzzle. As the name implies, the large nose of this species is also a distinguishing feature.

This species is not common in the park, but does seem to be found at all elevations and in most habitats. White-backed Hog-nosed Skunks are not widely distributed in the U.S., and only occur in the desert Southwest.

White-Backed Hog-Nosed Skunk (*Conepatus leuconotus*).



Locations for White-Backed Hog-Nosed Skunk.

FERAL CAT

Felis catus

Infraclass Eutheria
Order Carnivora (carnivores)
Family Felidae (cats)

Current status: Confirmed; non-native
Habitat: Generalist, usually associated with human dwellings
Abundance: Rare or occasional

Records

Sight observation during NPS inventory project: No

Number of infrared-triggered photographs: 0

Number of records in SNP Wildlife Observations database: 0

Voucher photo(s): SNP-21 (TM photo), Visitor Center (UTMs 524820, 3560484), February 23, 2005.

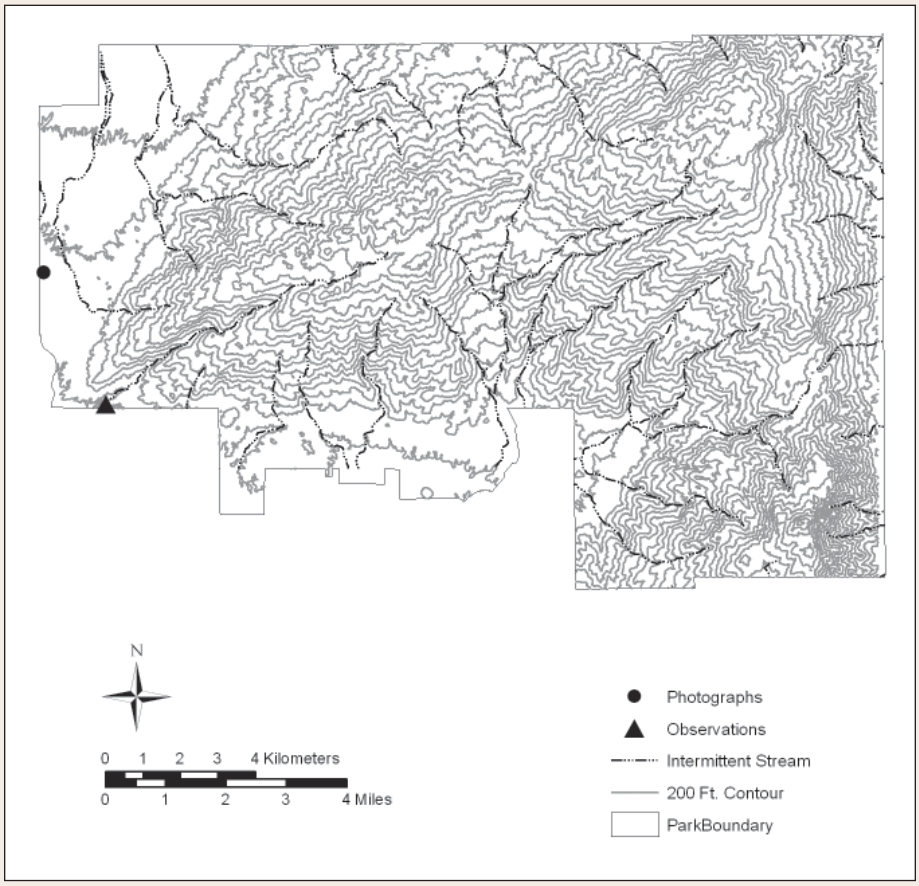
Museum specimen(s): None

Historic and recent records: Not mentioned by previous mammal researchers, and not listed in historic wildlife reports (SNP-WACC records, Annual Wildlife Reports).

Comments

Feral cats are extremely rare in the park. In addition to the photograph from the Visitor Center, a cat that acted in a feral manner was observed by Saguaro NP biotech Michael Ward in Box Canyon, approximately 200 m north of the park boundary, on March 9, 2005.

Feral Cat (*Felis catus*).



Location for Feral Cat.

MOUNTAIN LION

Puma concolor

Infraclass Eutheria
Order Carnivora (carnivores)
Family Felidae (cats)

Current status: Confirmed
Habitat: Generalist
Abundance: Common

Records

Sight observation during NPS inventory project: Yes

Number of infrared-triggered photographs: 73

Number of records in SNP Wildlife Observations database: 78

Voucher photo(s): SNP-12 (TM Photo #1549), near Deer Camp (UTMs 531139, 3556536), June 15, 1999.

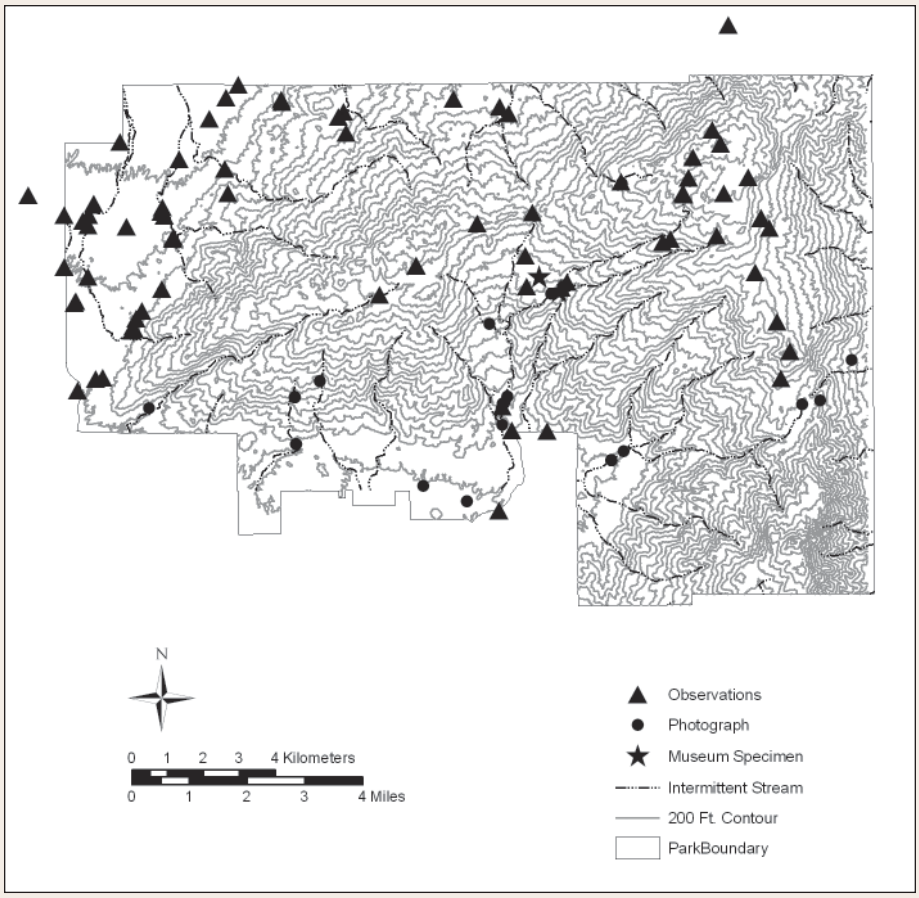
Museum specimen(s): One specimen in UA mammal collection: UA25756, collected by R. M. Sidner at Saguaro NP, Manning Camp Trail, 0.4 mi. west of Grass Shack (T4S, R17E, Sect. 27), 5,440 ft, June 2, 2001; 7–10-year-old female, killed by another mountain lion based on puncture marks in cranium.

Historic and recent records: Mountain Lions were present in the late 1930s; however, drought, declining deer populations, and hunting may have caused declines (SNP-WACC records, Project Estimate and Allotment Request, January 25, 1937). Eighteen lions were reported taken by predator control hunters from 1935 to 1939 (SNP-WACC records, Bureau of Biological Survey (BBS), December 7, 1939); however, the park objected, and the BBS ceased to send hunters into the park (SNP-WACC records, memo to NPS director from W. C. Henderson, April 20, 1940). It was estimated that there were 2–7 lions in the park during the late 1930s (SNP-WACC records, Memorandum for Superintendent Pinkley, December 20, 1939). Not many more lions were estimated from the park during the 1940s (SNP-WACC records, Annual Wildlife Reports, 1940s). Knipe (1949) believed that they were common in 1949, but Sumner (1951) could find no evidence they occurred during his survey. Davis and Sidner (1992) commented on how few sightings there had been of this species and considered them to be "not common now."

Comments

Like American Black Bears, Mountain Lions have become more abundant in the Rincon Mountains in recent years. While it is difficult to estimate the size of the population, it is clear from visitor sightings, track presence on trails, and infrared-triggered photographs that Mountain Lions are present throughout the park, and in relatively high numbers. This is likely the result of less hunting pressure than existed in the past, as well as a healthy population of White-tailed Deer. Hackl and others (2006) summarized status of Mountain Lions in Saguaro NP and other southern Arizona parks based on DNA and non-invasive techniques. Saguaro NP recently developed a management plan for Mountain Lions (SNP 2007).

Mountain Lion (*Puma concolor*).



Locations for Mountain Lion.

BOBCAT

Lynx rufus

Infraclass Eutheria
Order Carnivora (carnivores)
Family Felidae (cats)

Current status: Confirmed
Habitat: Generalist
Abundance: Common

Records

Sight observation during NPS inventory project: Yes

Number of infrared-triggered photographs: 56

Number of records in SNP Wildlife Observations database: 139

Voucher photo(s): SNP-6 (TM Photo #5553), Visitor Center (UTMs 524820, 3560484), March 2003.

Museum specimen(s): None

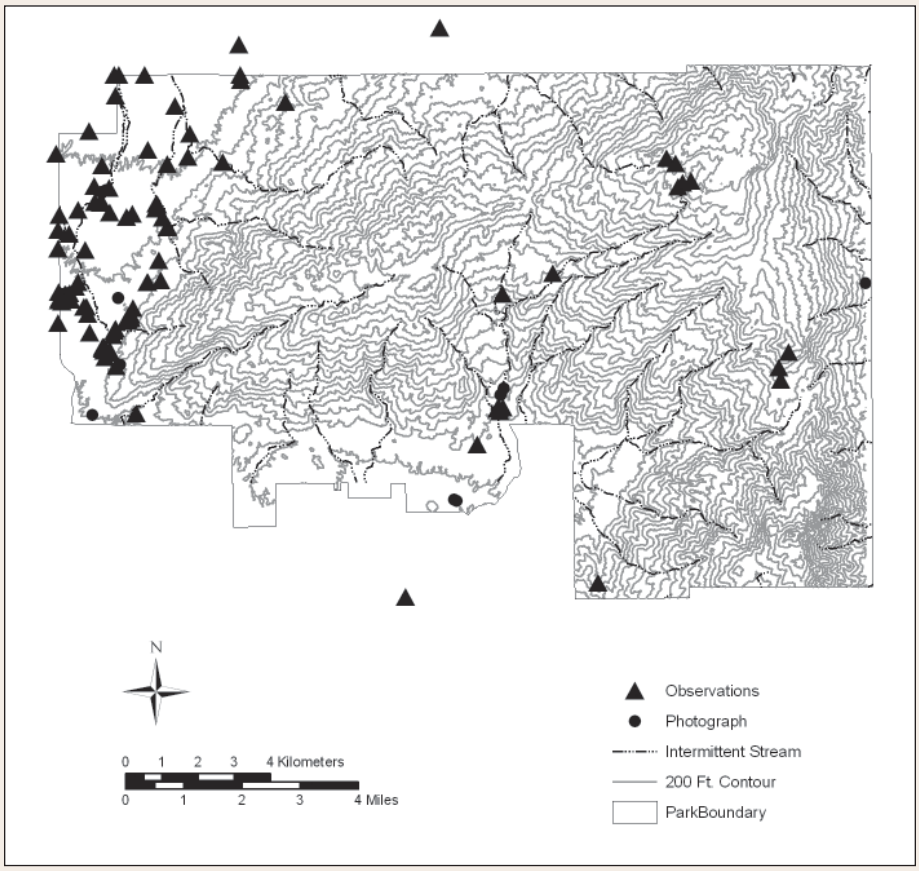
Historic and recent records: Sumner (1951) observed tracks below 6,000 ft. (1,829 m); Davis and Sidner (1992) did not consider them to be very common at high elevations. Consistently listed in park annual wildlife reports beginning in 1940 (SNP-WACC records, Annual Wildlife Reports).

Comments

Photographs of Bobcats were rare during the first few years of using infrared-triggered cameras in the RMD, and most photos came from near the park boundary. However, we have recently obtained more photos from the high country and a large number of photos from the Madrona Ranger Station and Visitor Center areas. Judging by sightings by park neighbors, Bobcats are abundant just outside the park boundary, and studies suggest that the species is starting to thrive in suburban and exurban Tucson (Haynes et al. 2007).

Mountain Lions prey upon Bobcats, and Don Swann and several volunteers observed a Mountain Lion present at the site of a Bobcat that had been killed and eviscerated next to Rincon Creek in 2002.

Bobcat (*Lynx rufus*).



Locations for Bobcat.

JAGUAR

Panthera onca

Infraclass Eutheria
Order Carnivora (carnivores)
Family Felidae (cats)

Current status: Extirpated
Habitat: Generalist in woodlands and forests
Abundance: None detected

Records

Sight observation during NPS inventory project: No

Number of infrared-triggered photographs: 0

Number of records in SNP Wildlife Observations database: 0

Voucher photo(s): Unnumbered photo (Arizona Historical Society #51506), photographer unknown, March 1902 (see below).

Museum specimen(s): Two originally in UA mammal collection: UA588 and UA589, collected by Hunter Wilson, Rincon Mountains, March 1932. Specimens are missing (see below).

Historic and recent records: There are four confirmed records from the Rincons, although details are not available for two records. A male Jaguar was shot in March 1902, by "bounty hunters who were out with their dogs after mountain lions" (Carmony 1995). This Jaguar was photographed after it was killed (see next page) and the skin and skull were preserved, but the current location of this specimen is unknown. A Jaguar was also shot in early January 1920, by a hunting party that included J. W. McDonald (Coconino *Sun*, January 16, 1920). A photograph of this Jaguar survives in the files of Henrietta Barassi of Tucson; the skin and "tusks" were collected but it is unknown if they have survived. Two Jaguars (a female and a male) killed by "Hunter Wilson" in the Rincons in March 1932 were formerly in the UA mammal collection; these specimens have also disappeared.

There have been a number of Jaguar sightings in Saguaro NP, some of which are credible. A report of a Jaguar was given to Associate Wildlife Technician Fred Gallagher in February 1939; he also received an earlier record for the monument by Drs. Scott and McGinnies at an earlier unspecified date (SNP-WACC records, Grazing Reconnaissance on Saguaro NM, March 1939). A Jaguar was also observed by Ranger Benson near Madrona Ranger Station in August 1950 (SNP-WACC records, Animal Census Report, September 20, 1950 and Facts from Superintendents monthly reports, Saguaro NM 1933–1965).

Comments

It is unlikely that Jaguars occur in the Rincons presently, but they could return. We targeted this species with infrared-triggered cameras located on major game trails in fairly remote areas, and photographed Mountain Lions and American Black Bears, but no Jaguars. The Rincons have excellent Jaguar habitat, however, and this species has been observed and photographed in nearby mountain ranges in southern Arizona in the past several years (McCain and Childs 2008).

Jaguar (*Panthera onca*).

(No map available)

COLLARED PECCARY

Pecari tajacu

Infraclass Eutheria
Order Carnivora (carnivores)
Order Artiodactyla (even-toed ungulates)
Family Tayassuidae (peccaries)

Current status: Confirmed
Habitat: Generalist at lower and mid-elevations
Abundance: Common

Records

Sight observation during NPS inventory project: Yes

Number of infrared-triggered photographs: 588

Number of records in SNP Wildlife Observations database: 210

Voucher photo(s): SNP-11 (TM Photo #114), Madrona Pools area (UTMs 536958, 3557686), November 28, 2000.

Museum specimen(s): Two specimens in UA mammal collection:
(1) UA26760, collected by J. Schmidt, near focal point 121 (T15S, R16E, Sect. 1), 4,429 ft, May 9, 2001;
(2) UA26772, collected by N. Perry, (R17E, T14S, Sect. 16), June 7, 2001.

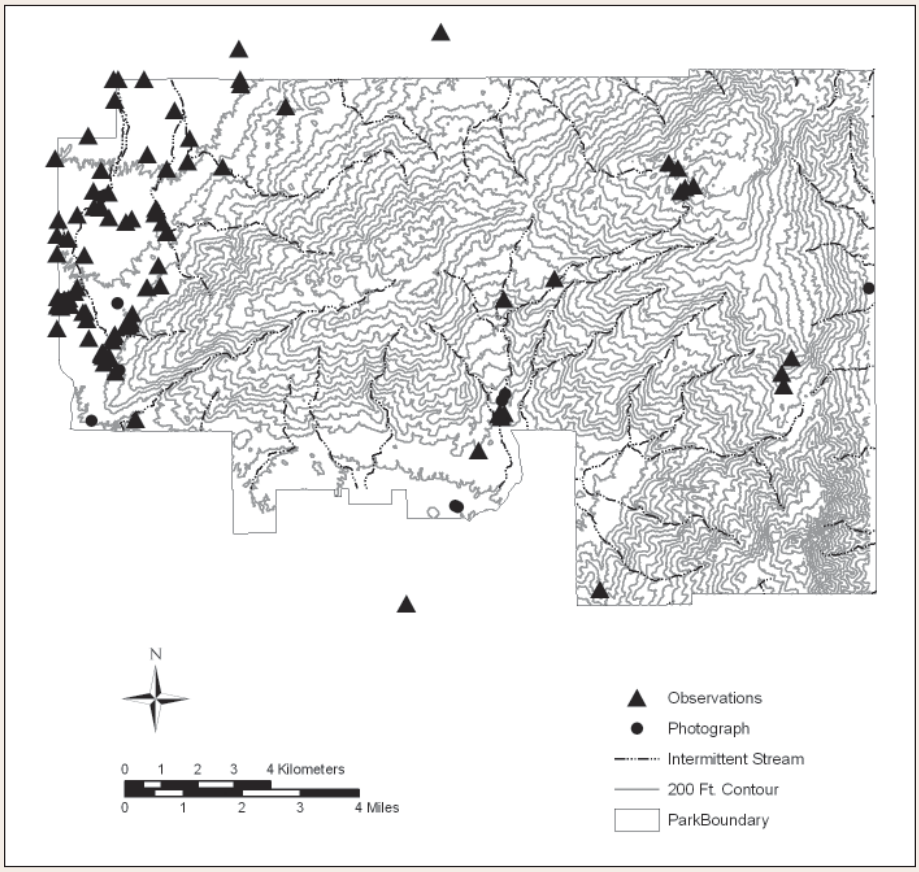
Historic and recent records: Observed at Grass Shack by Davis and Sidner (1992). A census in 1950 estimated 200 individuals in the park (Sumner 1951); Sumner also observed tracks up to 6,800 ft (2,073 m). During 1961–1974, Collared Peccaries were surveyed annually by NPS biologists on 18-foot survey routes (summarized in Day 1977 and Bucci 2007). Consistently listed in park annual wildlife reports beginning in 1939 (SNP-WACC records, Annual Wildlife Reports).

Comments

Collared Peccary, usually called Javelina, are one of the most commonly-seen mammals at Saguaro NP. Davis and Sidner (1992) noted that although they are usually associated with desert habitats, they can be found in lower numbers in the high country, and there have been a number of sightings near Manning Camp over the years. Sumner (1951) noted that Collared Peccary numbers were low at the park prior to World War II but had increased, he believed, due to the reduction of Mountain Lions and Gray Wolves.

During the past decade, the AGFD has conducted aerial surveys of Javelina in cooperation with Saguaro NP. Bucci (2007) summarized the results of these surveys. Although abundance of this species has fluctuated, the population in the park appears to be very healthy.

Collared Peccary (*Pecari tajacu*).



Locations for Collared Peccary.

Ungulates

MULE DEER

Odocoileus hemionus

Infraclass Eutheria
Order Artiodactyla (even-toed ungulates)
Family Cervidae (deer and elk)

Current status: Confirmed
Habitat: Generalist in open desert and grasslands
Abundance: Uncommon

Records

Sight observation during NPS inventory project: Yes

Number of infrared-triggered photographs: 28

Number of records in SNP Wildlife Observations database: 163

Voucher photo(s): SNP-13 (TM Photo #800), inside Loop Road (UTMs 526732, 3560539), November 4, 2001.

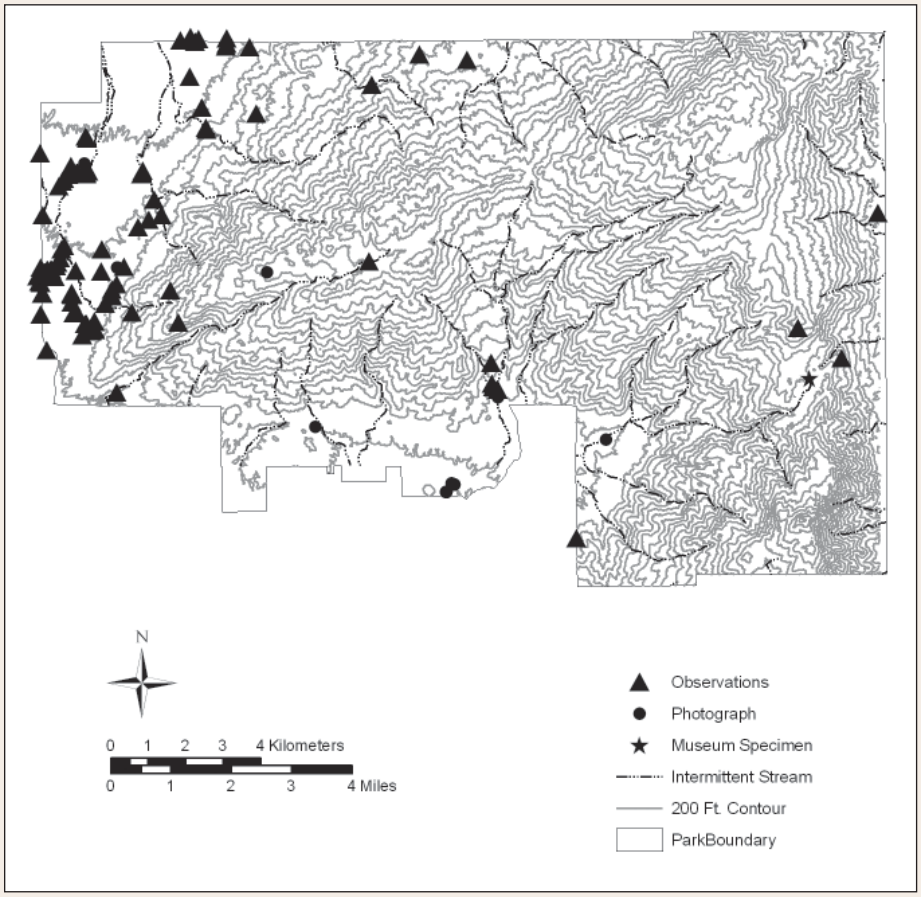
Museum specimen(s): One specimen in SDMNH collection: SD10091, collected by L. M. Huey & L. H. Cook, Rincon Mts., Happy Valley Trail, June 18, 1932.

Historic and recent records: The history of this species in the park is summarized in Bucci (2007). Declining populations during the late 1930s were attributed to disease, cougars, forage, and drought (SNP-WACC records, Memorandum for Superintendent Pinkley, December 20, 1939). Hunting was banned in the park beginning in 1938 (SNP-WACC records, mammal files). Populations fluctuated during the 1940s (SNP-WACC records, Annual Wildlife Reports, 1940s), appeared to decline in the 1950s, and appeared to be stable in the 1960s (SNP-WACC records, file on Mammals by Lund). This species was studied by Sumner (1951) as part of an assessment of deer and their predators at the park, and in response to a proposal by the AGFD to create a game management unit in the Rincons (Knipe 1949).

Comments

Historically, Mule Deer have been the dominant deer species in desert and grassland areas at Saguaro NP, and they were commonly seen along the Loop Road. Sumner (1951) noted that White-tailed Deer occurred above 7,000 ft (2,134 m) in elevation, while Mule Deer occurred below 5,000 ft (1,524 m); a map in Knipe (1949) appears to support this general distribution. In recent years, this distribution has shifted dramatically. White-tailed Deer are commonly seen in the Cactus Forest area, and Mule Deer appear to be declining in the park. Reasons for this are not clear, but it may be the result of increased brush cover throughout the park since grazing was eliminated in the 1960s and 1970s, as well as the significant loss of Mule Deer habitat outside park boundaries during the past decade.

Mule Deer (*Odocoileus hemionus*).



Locations for Mule Deer.

WHITE-TAILED DEER

Odocoileus virginianus

Infraclass Eutheria
Order Artiodactyla (even-toed ungulates)
Family Cervidae (deer and elk)

Current status: Confirmed
Habitat: Generalist in woodlands and forests, but also found at lower elevations
Abundance: Common

Records

Sight observation during NPS inventory project: Yes

Number of infrared-triggered photographs: 190

Number of records in SNP Wildlife Observations database: 142

Voucher photo(s): SNP-20 (TM Photo #6742), Cowhead Saddle (UTMs 537739, 3560294), April 28, 2004.

Museum specimen(s): None

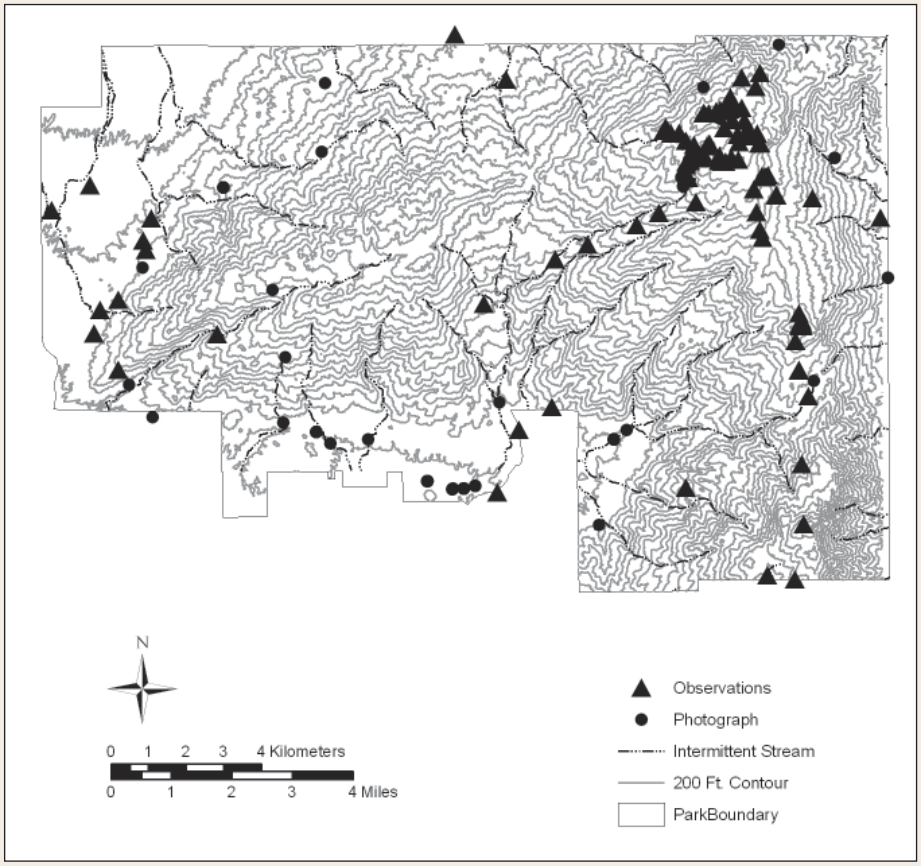
Historic and recent records: Studied by Sumner (1951); observed regularly by Davis and Sidner (1992). Bucci (2007) summarized what is known about the history of this species and Mule Deer in the park.

Comments

White-tailed and Mule Deer can be difficult to distinguish, especially using photographs, and we are not completely certain that all our identifications in this study were correct. White-tails have longer, whiter tails than Mule Deer, and they are less robust in overall appearance. Also, the tines on their antlers branch from a single stem, whereas Mule Deer antlers can have multiple branches.

White-tailed Deer are very common in the park, and appear to be becoming more so (see account for Mule Deer). They are found throughout the park from desert areas to the highest elevations. Sumner (1951) found White-tailed Deer to be distributed widely above 7,000 ft (2,134 m) and most abundant on the north slope of Mica Mountain.

White-Tailed Deer (*Odocoileus virginianus*).



Locations for White-Tailed Deer.

DOMESTIC CATTLE

Bos taurus

Infraclass Eutheria
Order Artiodactyla (even-toed ungulates)
Family Bovidae (cattle, sheep, and relatives)

Current status: Confirmed; non-native
Habitat: Generalist
Abundance: Occasional

Records

Sight observation during NPS inventory project: Yes

Number of individuals captured in NPS inventory: 0

Number of infrared-triggered photographs: 1

Number of records in SNP Wildlife Observations database: 0

Voucher photo(s): SNP-24 (TM Photo #162), Expansion area (UTMs 527665, 3556680), February 14, 2000.

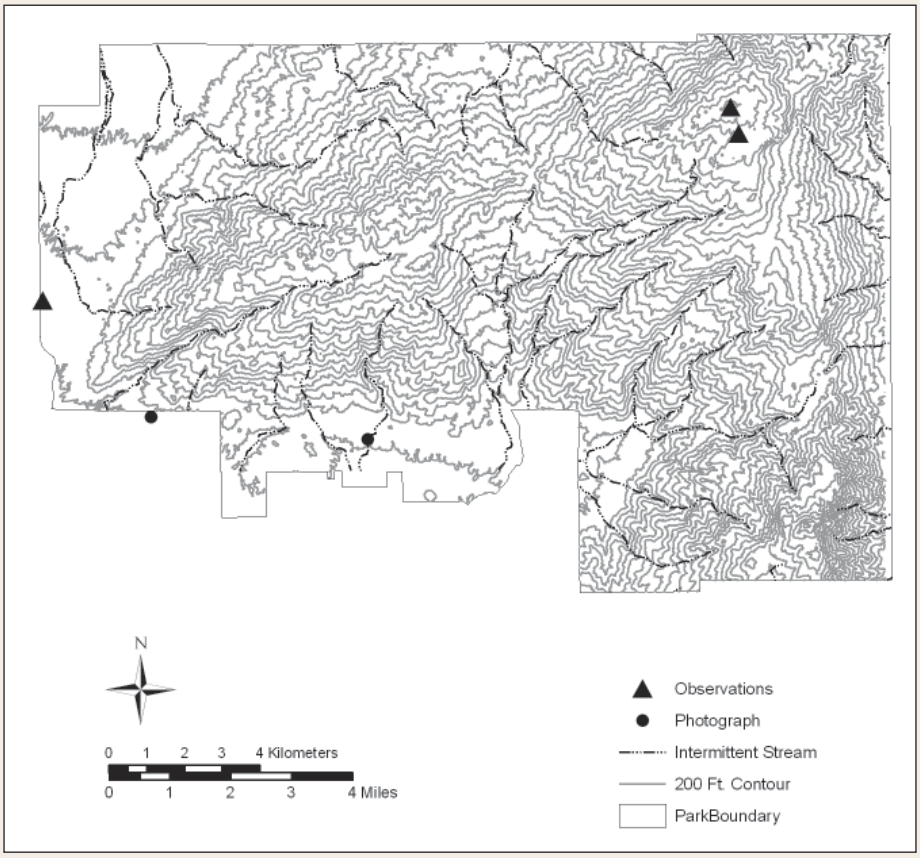
Museum specimen(s): None

Historic and recent records: Cattle grazing occurred in the Rincon Mountains for many years, including several decades after Saguaro NP was established. Clemensen (1987) summarized the grazing history of the park, and the park is planning to conduct a detailed history of grazing in the near future. The last grazing permit in the park, in the Douglas Springs area, was retired in the mid-1970s. Subsequently, there were so many feral cattle in the park that the NPS conducted a cattle hunt (SNP-WACC records, grazing files).

Comments

There have been no resident cows in the park in the past few years, but Domestic Cattle do enter the park regularly. We occasionally captured them on wildlife cameras during this study. In the early 2000s, a breached fence allowed a large number of cows into the park near the Douglas Spring campground, and in 2008, a large number from the X-9 Ranch grazed for several weeks inside Box Canyon. Grazing continues on state and U.S. Forest Service lands in the Rincon Valley and Tanque Verde areas.

Domestic Cattle (*Bos taurus*).



Locations for Domestic Cattle.

MOUNTAIN (BIGHORN) SHEEP

Ovis canadensis

Infraclass Eutheria
Order Artiodactyla (even-toed ungulates)
Family Bovidae (cattle, sheep, and relatives)

Current status: Extirpated
Habitat: Rocky slopes
Abundance: Extirpated

Records

Sight observation during NPS inventory project: No

Number of individuals captured in NPS inventory: 0

Number of infrared-triggered photographs: 0

Number of records in SNP Wildlife Observations database: 0

Voucher photo(s): Photo shown on the next page is an old slide in the Saguaro NP collection. It is believed to be from the park, but no information is available.

Museum specimen(s): Specimen formerly in Saguaro NP collection, collected on Tanque Verde Ridge in 1957, by Bob Galati; horn is no longer in collection. See additional notes below.

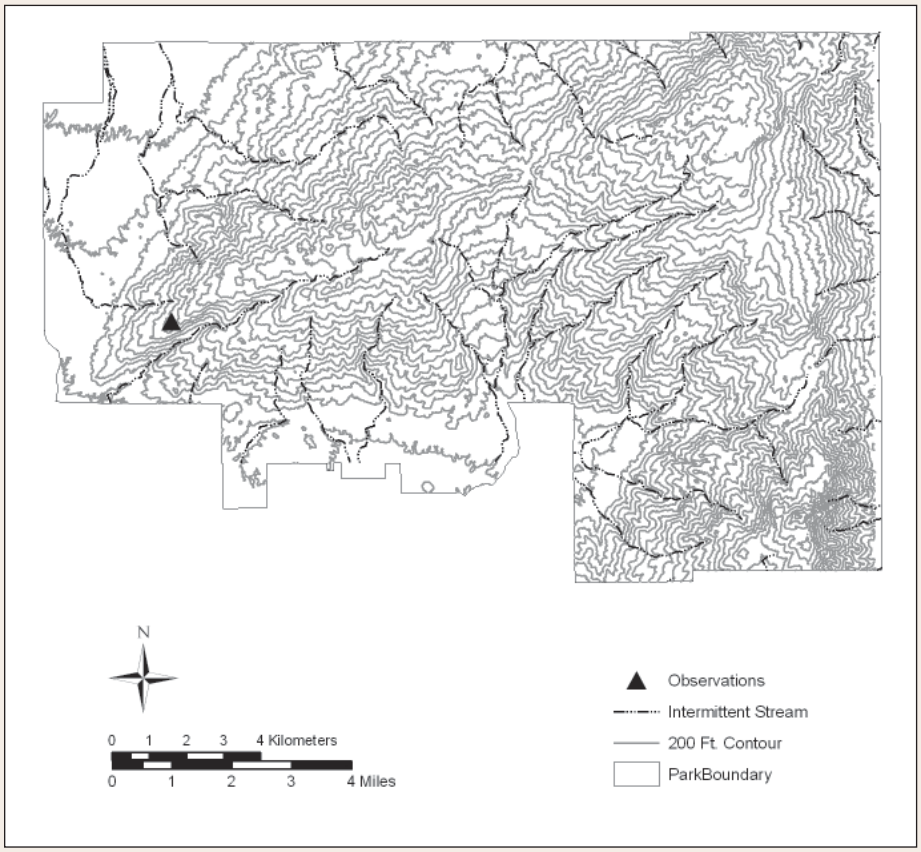
Historic and recent records: Bighorn Sheep occurred in the park in the past, but are now extirpated. Desert Bighorn petroglyphs have been found in the RMD, and bones of this species were excavated in a prehistoric site dated 1100–1400 A.D. (Coss 1969). Bighorns were observed on Mica Mountain by Gilbert Sykes in 1920 (SNP-WACC records, Natural and Cultural Resources Management Plan and Environmental Assessment, June 1978). Ollie Barney, who grew up in Happy Valley in the 1920s and 1930s, reported that his father saw them on the east side of the Rincons throughout the 1920s (Coss 1969, and personal communication to author).

After Saguaro National Monument was created, three carcasses that had been killed for meat were found during the winter of 1939–1940 by Custodian Don Egermayer (SNP-WACC records, Memorandum to Superintendent Miller, September 29, 1940 and Special Report on the Wildlife of SNM, June 11, 1947). In 1947, Egermayer observed that none had been reported since (Memo to Regional Director, November 9, 1947) Bighorn surveyors from the AGFD did not observe bighorns in the Rincons in 1936 and 1937, but the maps associated with those surveys appear to indicate that fresh sign was found (Coss 1969, and SNP-WACC records, mammal files). There was an observation south of Rincon Peak in 1942 (Natural and Cultural Resources Management Plan and Environmental Assessment, June 1978). The last known record for the RMD is the ram's horn found on Tanque Verde Ridge by Bob Galati in 1957 (SNP Natural History collection files). There is also an intriguing record of a horn collected in the park by Hal Coss on January 1, 1976 (SNP Natural History collection files), but there is no location information, and the horn has been lost; Hal did not recall ever collecting a horn in the park when Don Swann asked him about it on December 21, 2007.

Comments

In 1969, the park formally considered reintroducing Bighorn Sheep (SNP-WACC records, Memo to Superintendent from NPS biologist Charles Hansen, May 8, 1969). Discussion about reintroducing them has also occurred in the years since, but no action has been taken. Impediments in the past may have included the AGFD's resistance to supporting a reintroduction in an unhunted area, but Coss (1969) believed, and many biologists believe now, that urban development has encroached upon the habitat in the Rincons to such a degree as to make successful reintroduction highly unlikely. As of this writing, bighorns appeared to be extirpated from the Santa Catalina Mountains, where a large herd once thrived (Friederici 1997).

Mountain (Bighorn) Sheep (*Ovis canadensis*).



Location for Mountain (Bighorn) Sheep.

Undocumented Species

Several species of smaller mammals, including shrews, bats, and rodents, may occur in the park but have never been documented (Swann and Powell 2006; R. Sidner, personal communication). These species include the following bats that are likely to occur: California Leaf-nosed Bat (*Macrotus californicus*), Western Mastiff Bat (*Eumops perotis*), Little Brown Bat (*Myotis occultus*), and Western Yellow Bat (*Lasiurus xanthinus*). In species accounts for shrews and rodents, we discuss other potential species for the Rincons, and also include longer discussions regarding Mesquite and White-footed Mice, below. In addition, Jaguarundis are so often reported that it seems important to discuss this species. The following accounts provide background on some of these species, but they are not meant to be comprehensive.

Mesquite Mouse

Peromyscus merriami

No records for the RMD exist for this species, which occurs in riparian woodland areas and is very difficult to distinguish from the Cactus Mouse, *Peromyscus eremicus*. Kingsley (2006) surveyed Pima County for this species, and captured it in Tanque Verde Creek immediately northeast of the park. Because this species has been found nearby, it should be considered a potential species for the park and crews should survey for it in the future. The species is not federally listed but is considered sensitive, and more research on it is generally needed.

White-Footed Mouse

Peromyscus leucopis

The only known record of this species in the Rincons, reported in Duncan (1990), is not credible, as no specimen was collected and Doug Duncan reported in 2005 (Don Swann, personal communication) that he did not believe he would have been confident of his identification at that time. We are not aware of any specimens of this species from the park. This species occurs in woodland and forest areas and is very difficult to distinguish from the Deer Mouse, *Peromyscus merriami*, which is also quite rare or absent from the Rincons. We suspect that both species do indeed occur and are more common than the inventory or past studies suggest. There is a great need for more field study with genetics testing in order to better understand the distribution, abundance, habitat requirements, and field characteristics of this genus.

Jaguarundi

Felis yagouaroundi

Jaguarundis have never been documented in Arizona (Brown and Lopez Gonzalez 1999). Even though this species probably does not occur in the park, there have been periodic reports of observations of this species. For example, in his "Wildlife Notes on the Sahuaro National Monument" (SNP-WACC records) in March 1939, A. A. Nichols reported:

> What can be nothing else than a jaguarundi was reported by Fred Gallagher, foreman in SP Camp 11. This animal was seen in the Monument in February. Mr. Gallagher is well acquainted with young mountain lions, as he spent considerable time with 2 that I raised. Also I have had him in the field with me and found him an exceptional accurate and matter-of-fact observer. Since he was unacquainted with the fact that there was such a species, his description was not made to fit some animal he desired it to be, as is often the case with persons who are more interested than accurate. This is the second record for the Monument. The first was given to me some time ago by Drs. Scott and McGinnies who both had an excellent chance the see the animal as it stood along the trail for several minutes at less than 50 feet distance from them.

Without evidence, such as a specimen or clear photograph, we must consider these reports as wishful thinking, especially given the resemblance of this species to the feral or domestic cat.

Kit Fox

Vulpes macrotis

Kit Foxes occur in desert valleys in southern Arizona, including the Tucson Mountain District of Saguaro National Park. We are not aware of any evidence of historic or current presence of this species in the Rincon Mountain District. In notes on mammals in the park (SNP-WACC mammal records), reference is made to a report by Lowell White in 1961, which mentions that the last record for this species was in the 1950s. However,

this could refer to the Tucson Mountain District, where Kit Foxes are currently rare, and probably declining (Swann and Powell 2006). If this species were to occur in the Rincons, it would most likely be along the southern edge of the park, in the Rincon Valley. Kit Foxes are easily confused with the Common Gray Fox by visitors who expect to see this species in the desert. However, Kit Foxes are smaller, with a black-tipped tail instead of a black line that runs along the top of the entire tail.

Long-Tailed Weasel

Mustela frenata

Hoffmeister (1986) considered the Rincon Mountains to be within the range of this species, with historic specimens from the Chiricahua Mountains and other Sky Island ranges. Weasels were listed as present in the park in the park's annual wildlife report of 1962, perhaps erroneously; we are not aware of any sightings in the park. This species is very elusive and difficult to sample for, however, and may occur at higher elevations in the park.

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