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Distributional Records for Seven Species of Mammals in Southern New Mexico

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Abstract

Geographic distributions of mammals are not static, and natural changes in distribution often are related to changes in habitat and climate. Mammalian distributions also can change with human introductions, lack of prior surveys, and misidentification of museum specimens. Here, I report on distributional records for seven species of mammals in southern New Mexico, including *Nasua narica*, *Ammospermophilus harrisii*, *Chaetodipus baileyi*, *Dipodomys merriami*, *Peromyscus truei*, *Sigmodon fulviventer*, and *Sigmodon hispidus*. For one species (*A. harrisii*), new records likely reflect a distributional shift related to recent changes in habitat, whereas others (*C. baileyi*, *D. merriami*, *P. truei*, *S. fulviventer*, and *S. hispidus*) likely represent overlooked populations because of a paucity of published surveys in the region. For *N. narica*, data include details on localities of record and reproductive data for a species previously known from the region but lacking specific details. Continued surveys and documentation of distributional limits of mammals will allow us to better evaluate how environmental changes affect biological communities and will help us to interpret new extra-limital records.

Key words: distribution, extra-limital records, mammals, New Mexico

Introduction

Distributions of mammals change through time and are not static. Changes in habitat and climate have been implicated in the purported distributional shifts for some species (e.g., *Dasypus novemcinctus*—Humphrey 1974; *Sorex cinereus*, *Microtus pennsylvanicus*, *Zapus hudsonius*, and *Mustela nivalis*—Frey 1992; *Sciurus niger*—Geluso 2004b; *Sigmodon fulviventer*—Geluso et al. 2005), whereas others represent recently discovered populations because of lack of prior surveys (e.g., *Peromyscus pectoralis*—Geluso 2004a; *Sciurus arizonensis*—Frey et al. 2008). Additionally, some changes are related to misidentification of museum specimens (e.g., *Peromyscus truei*—Cook 1986; *Leptonycteris nivalis*—Hoyt et al. 1994), and others are the result of human introductions (e.g., *Ammotragus lervia*—Dickinson and Simpson 1980; *S. niger*—Frey and Campbell 1997).

Since Findley et al. (1975) published the last comprehensive account of mammals in New Mexico,

studies continue to report new information regarding mammalian distributions in the state. Frey (2004) recently updated the taxonomy and distribution of mammals in New Mexico, which included some distributional records from southern parts of the state. Because her contribution was an annotated checklist, details of specific localities, dates of occurrence, habitat associations, and voucher specimens were not presented. In my study, I report on distributional records for seven species of mammals in southern New Mexico—*Nasua narica*, *Ammospermophilus harrisii*, *Chaetodipus baileyi*, *Dipodomys merriami*, *P. truei*, *S. fulviventer*, and *Sigmodon hispidus*. For two species (*A. harrisii* and *C. baileyi*), information is based on my research that augments distributional changes mentioned in Frey (2004) as well as provides specific details on localities of occurrence.

METHODS

Many records reported herein represent my captures or observations of individuals during brief, exploratory surveys of mammals in southern New Mexico from 1999 to 2006. I captured small mammals in Sherman live traps baited with mixed seeds. Other records represent unpublished information from museum specimens housed at the Museum of Southwestern Biology, University of New Mexico, Albuquerque (MSB) and the Gila Center for Natural History, Western New Mexico University, Silver City (WNMU). I personally visited both museums to examine voucher materials and to verify identifications of specimens. I included museum records only for those species that I had acquired data for during my field research. My voucher specimens were deposited in the United States Geological Survey, Biological Survey Collection at MSB. Additionally, I only included published references on species discussed within, although I am aware of unpublished reports on mammals from the region.

RESULTS

ORDER CARNIVORA
Family Procyonidae
Nasua narica (Linnaeus 1766)
White-nosed Coati

In New Mexico, the white-nosed coati has been confirmed from the Animas Mountains in Hidalgo County (Findley et al. 1975; Cook 1986) and Pinos Altos Mountains in Grant County (Kaufmann et al. 1976). Sightings without specific details also are reported from the Big Burro Mountains in Grant County (Kaufmann et al. 1976). In New Mexico, the known breeding range of coatis is suspected to include only the Peloncillo and Animas mountains (Kaufmann et al. 1976). On 12 December 2004, I observed a troop in Black Hawk Canyon in the Big Burro Mountains, 0.6 km E Saddle Rock Canyon, Grant County. Five individuals were observed foraging on berries in the canopy of a hackberry tree (*Celtis*) during the day. The hackberry tree was situated in a canyon surrounded by rocky slopes. Additionally, other researchers collected a juvenile in these mountains (Grant County, Big Burro Mountains, Gila National Forest, 2.4 mi W, 0.1 mi S White Signal, 32°33.277'N, 108°24.390'W [21 July 2001, female, MSB 140072]). These observations confirm records of *N. narica* in the Big Burro Mountains, provide specific localities of occurrence, and provide evidence of a breeding population in the mountain range.

ORDER RODENTIA
Family Scuiridae
Ammospermophilus harrisii
(Audubon and Bachman 1854)
Harris's Antelope Squirrel

In New Mexico, localities of record for *A. harrisii* are known only from near Redrock in Grant County and from the Peloncillo and Animas mountains in southwestern Hidalgo County (Findley et al. 1975; Cook 1986). Frey (2004) reported an observation from the Alamo Hueco Mountains in southeastern Hidalgo County, but she did not provide specific details. Here I provide the first specific localities for *A. harrisii* from southeastern Hidalgo County.

On 2 February 2003, I observed an individual on an alluvial fan on the eastern side of the Little Hatchet Mountains, Hidalgo County (T29S, R16W, SW ¼ Sec. 24, 31°46.050'N, 108°25.491'W, elev. 1429 m). At this site the substrate was gravelly, and dominant plants included honey mesquite (*Prosopis glandulosa*), prickly pear and cholla (*Opuntia*), and skunkbush sumac (*Rhus trilobata*). On 4 April 2003, I observed another individual in similar habitat about 1 km northeast of the previous sighting (T29S, R16W, NE ¼ Sec. 24, 31°46.492'N, 108°25.020'W, elev. 1400 m). On 26 April 2005, I observed an *A. harrisii* on a rocky slope in Thompson Canyon in the Big Hatchet Mountains (31°37.291'N, 108°22.623'W, elev. 1790 m). Vegetation consisted of oak (*Quercus*), mariola (*Parthenium incanum*), mountain mahogany (*Cercocarpus montanus*), littleleaf sumac (*Rhus microphylla*), tarbush (*Flourensia cernua*), and acacia (*Acacia*).

In extreme southeastern Hidalgo County, I observed many *A. harrisii* along roads on low, rolling hills, flat areas of large valleys, and smaller valley floors. All individuals were observed in arid scrublands that usually contained mesquite. Other plants observed at most sites included creosote bush (*Larrea tridentata*), jointfir (*Ephedra*), broom snakeweed (*Gutierrezia sarothrae*), and yucca (*Yucca*). Localities and dates (in parentheses) of observations were as follows: NW edge Whitewater Mountains, 31°22.474'N, 108°37.813'W, elev. 1498 m (28 August 2003); N side of Whitewater Mountains, 31°22.481'N, 108°37.129'W, elev. 1486 m (28 August 2003); Playas Valley, E of Animas Mountains, 31°30.071'N, 108°32.829'W, elev. 1385 m (28 August 2003); Playas Valley, E of Animas Mountains, 31°30.945'N, 108°31.481'W, elev. 1375 m (28 August 2003); SW side of Alamo Hueco Mountains, 31°23.607'N, 108°23.045'W, elev. 1560 m (6 September 2003); SW side of Alamo Hueco Mountains, 31°23.448'N, 108°22.413'W, elev. 1560 m (6 September 2003); SE side Alamo Hueco Mountains, 31°22.869'N, 108°18.211'W, elev. 1520 m (6 September 2003); S side of Alamo Hueco Mountains, 31°22.384'N, 108°19.010'W, elev. 1510 m (6 September 2003); S side of Alamo Hueco Mountains, 31°22.355'N, 108°19.245'W, elev. 1515 m (6 September 2003); Dog Mountains, 31°21.247'N, 108°19.602'W, elev. 1515 m (6 September 2003); Alamo Hueco Mountains, Horse Canyon, 31°24.945'N, 108°20.494'W, elev. 1685 m (6 September 2003); Alamo Hueco Mountains, Horse Canyon, 31°24.915'N, 108°20.508'W, elev. 1695 m (6 September 2003); Alamo Hueco Mountains, Horse Canyon, 31°24.236'N, 108°20.330'W, elev. 1735 m (7 September 2003); Alamo Hueco Mountains, Horse Canyon, 31°23.967'N, 108°20.789'W, elev. 1670 m (7 September 2003); Alamo Hueco Mountains, Horse Canyon, 31°23.803'N, 108°21.008'W, elev. 1660 m (7 September 2003).

My sightings represent the easternmost records of this species in the United States (Hall 1981). The nearest published record from my easternmost locality (31°22.869'N, 108°18.211'W) is 34 km to the west in the Animas Mountains (Cook 1986). These observations of *A. harrisii* may reflect a recent eastward expansion because this diurnal squirrel is easily observed while traveling along roads and because mammalian surveys have been conducted in the region in the past (see Findley et al. 1975). Mearns (1907) also did not report the species from southwestern New Mexico and southeastern Arizona. From 1977 to 1996, Brown et al. (1997) reported an increase in shrub cover associated with greater than average winter precipitation in the nearby San Simon Valley of southeastern Arizona. Moreover, Mearns (1907) discussed a large-scale population fluctuation of *A. harrisii* in the Verde Valley of Arizona in response to a year with failed seed production for mesquite. Such observations suggest that changes in habitat may have resulted in *A. harrisii* expanding its range into parts of southwestern New Mexico.

Family Heteromyidae
Chaetodipus baileyi Merriam 1894
Bailey's Pocket Mouse

In New Mexico, this large pocket mouse is known only from four published localities in extreme western Hidalgo County (Findley et al. 1975; Hayward et al. 1997). Frey (2004) also reported this species from southern Grant County but did not provide specific data on location or habitat. Reported habitats for *C. baileyi* in New Mexico include xeric, brushy hillsides in Guadalupe, Doubtful, and Clanton canyons in the Peloncillo Mountains (Findley et al. 1975) and grassy areas and areas dominated by willows at San Simon Cienaga (Hayward et al. 1997). In Arizona, *C. baileyi* has been found in similar habitats on arid slopes and flats that contain shrubs and sometimes dense grasses (Hoffmeister 1986). It usually occurs in areas with a stony substrate (Hoffmeister 1986).

On 8 April 2003, I captured two adult females and one adult male in the Big Burro Mountains, Grant County (T17S, R17W, NW ¼, Sec. 16). One female contained seven embryos, with the largest uterine swelling 6 mm in length (MSB 124225; 32°49.938'N, 108°36.565'W, elev. 1330 m). At a nearby site (32°50.012'N, 108°36.430'W, elev. 1350 m), the male had testes that measured 8 mm in length and 4 mm in width (MSB 124222); the other female was released. Each individual was captured on a dry hillside above the floodplain of the Gila River. The location was on a gravelly slope, and dominant plants included honey mesquite, catclaw acacia (*Acacia greggii*), mustard (*Descurainia*), and scattered grasses. A few rock outcrops were present on the slope, and the area was not grazed by domestic livestock. Other rodents captured in the area included *Chaetodipus intermedius*, *D. merriami*, *Dipodomys ordii*, *Reithrodontomys megalotis*, *Sigmodon ochrognathus*, and *Neotoma albigula*. In 1983, other investigators captured *C. baileyi* in the same general area (T17S, R17W, NE ¼ of NW ¼, Sec. 16; a male, MSB 56558 and female, MSB 56559). Voucher specimens also exist near Red Rock, which is located about 20 km southwest of the sites listed above for *C. baileyi* in the Big Burro Mountains (Grant County, 1 mi N Red Rock [26 June 1975, two males with testes that measured 4 mm in length, one female with no embryos, mesquite hillside, WNMU 2931-2933]; Grant County, 4 mi S Red Rock, T19S, R18W, Sec. 19 [13 September 1975, male with testes 3 mm in length and a female, mesquite grassland, WNMU 3009 and 4418]; Grant County, 1 mi N Red Rock [23 September 1978, two males, hillside of mesquite and acacia, WNMU 4183 and 4673]; Grant County, SW of Cliff, Ash Creek [13 May 1972, female, hillside with *Haplopappus*, mesquite, prickly pear, WNMU 2502]).

These captures represent the northern and easternmost records of *C. baileyi* in New Mexico. The nearest published record in the state is 65 km to the southwest in Doubtful Canyon, Peloncillo Mountains (Findley et al. 1975). Records also exist 55 km to the west in Greenlee County, Arizona (Hoffmeister 1986). It is unclear whether these records represent a recent distributional change or populations that have gone undetected. In nearby Cochise County, Arizona, Ernest and Brown (2001) reported colonization by *C. baileyi* in 1995 at a site that produced no previous captures for nearly 20 years. This change was correlated with an increase in shrub cover associated with greater than average winter precipitation (Brown et al. 1997). It is also possible that captures represent undetected populations because few mammalian surveys have been conducted in the area (Bailey 1928; Bailey 1931; Findley et al. 1975).

Dipodomys merriami Mearns 1890
Merriam's Kangaroo Rat

Merriam's kangaroo rat inhabits deserts and arid grasslands in southern New Mexico and in central parts of the state along the Pecos River and Rio Grande valleys (Findley et al. 1975). On 8 April 2003, I captured a non-reproductive, adult female (MSB 124223) on a xeric hillside above the floodplain of the Gila River in the Big Burro Mountains, Grant County (T17S, R17W, NW ¼, Sec. 16, 32°50.012'N, 108°36.430'W, elev. 1350 m). The location was on a gravelly hillside, and dominant vegetation consisted of honey mesquite, catclaw acacia, mustard, and scattered grasses. Other rodents captured included *C. baileyi*, *C. intermedius*, *D. ordii*, *R. megalotis*, *S. ochrognathus*, and *N. albigula*. I discovered four specimens previously collected by others near my capture site (Grant County, 10 mi S Cliff, Gila River [21 September 1970, male with testes that measured 10 x 6 mm, 15 March 1970, two females, mesquite grassland, WNMU 2078, 2077, 2079, respectively]; Grant County, 5 mi S Cliff, Greenwood Canyon [9 September 1972, male, mesquite/juniper mesa, WNMU 2552]).

These records extend the distribution of *D. merriami* 30 km to the northwest in the Gila River valley (Findley et al. 1975). This species likely occurs farther north and east in the region. These records most likely represent individuals from previously undocumented populations because there is a paucity of past surveys in this area (Bailey 1928; Bailey 1931; Findley et al. 1975).

Family Muridae
Peromyscus truei (Shufeldt 1885)
Piñon Mouse

The known distribution of the piñon mouse includes most of New Mexico, except the southeastern and extreme southern parts of the state (Findley et al. 1975; Cook 1986). It is most abundant in piñon-juniper woodlands (Findley et al. 1975). On 5 July 1999, I

captured two males and three females in the Guadalupe Mountains (Eddy County, Guadalupe Mountains, 1.6 mi W [by road] of Klondike Gap, near Black Lake, 32°06.677'N, 104°47.532'W, elev. 2035 m). One female contained three fetuses; the largest measured 15 mm in crown-to-rump length (MSB 123746). The males and other females were released. Individuals were captured on level terrain on soils without rocks in a savanna. Dominant vegetation at the site consisted of Colorado piñon (*Pinus edulis*), alligator juniper (*Juniperus deppeana*), and various grasses. Other rodents captured included *Perognathus flavus* (MSB 123748), *Peromyscus leucopus*, and *Chaetodipus hispidus* (MSB 123747). I also discovered a specimen previously collected from the Guadalupe Mountains in New Mexico (Eddy County, Guadalupe Mountains, T26S, R21E, Sec. 10 [26 June 1979, male with testes that measured 14 x 9 mm, ponderosa/pinyon pine forest, WNMU 3615]). Although these records represent the southernmost records of *P. truei* in New Mexico and the first records of this species in the Guadalupe Mountains of New Mexico (Findley et al. 1975), *P. truei* is known from the Guadalupe Mountains in Texas (Cornely et al. 1981). The nearest published record in New Mexico is 85 km northwest in the Sacramento Mountains, Otero County (Findley et al. 1975). Records from the Guadalupe Mountains in New Mexico represent lack of prior mammalian surveys in the region.

Sigmodon fulviventer J. A. Allen 1889
Tawny-bellied Cotton Rat

The tawny-bellied cotton rat has a disjunct distribution in New Mexico—it lives in well-developed desert grasslands in southwestern parts of the state as well as in grassy and marshy areas in central parts of the state (Mohlhenrich 1961; Findley et al. 1975; Geluso et al. 2005). On 23 April 2005, I captured two females and one male in moderately dense grasses and forbs along the border of a human-made, earthen pond near the Gila River (Grant County, 8 km NE Cliff, Lichty Ecological Center, 33°00.936'N, 108°33.205'W, elev. 1400 m). One female was pregnant and the other female was a juvenile; both individuals were released. The male had a body mass of 45.5 g (MSB 125390). Other mammals captured included *P. leucopus* and *N. albigula*. I also discovered prior unpublished individuals collected by others from along the Gila River and nearby areas (Grant County, 2 mi S Cliff [24 February 1967, three males with testes that measured 6, 5, and 8 mm in length; 19 March 1967, female one with no embryos; 12 April 1969, female; and 28 January 1967, female with no embryos; tall grasses in river bottom, WNMU 1600, 1610, 1616, 1611, 1974, 2020, respectively]; Grant County, 1.5 mi S Cliff [4 February 1967, female with no embryos, field along river, WNMU 1605]; Grant County, W side of Gila River, 2 mi S, 0.25 mi E Cliff, T16S, R17W, NE ¼ of NW ¼, Sec. 9 [5 September 1983, male with testes that measured 16 x 10 mm, riverine habitat, MSB 56656]; Grant County, Mangas Lake, 8.5 mi S, 6 mi E Cliff, T17S, R16W, NE ¼ of SE ¼, Sec. 8 [9 June 1983, a female with 11 embryos and a male, marsh, MSB 56657, 56658, respectively]).

These records extend the known distribution of *S. fulviventer* 35 km northwest into the Gila River valley from Silver City (Findley et al., 1975). As with other records of mammals in the area, I suspect captures represent individuals from previously undocumented populations because of a paucity of past mammalian surveys in this area (Bailey 1928; Bailey 1931; Mohlhenrich 1961; Findley et al. 1975).

Sigmodon hispidus Say and Ord 1825
Hispid Cotton Rat

The hispid cotton rat occurs throughout most of eastern and southern New Mexico in grasslands and disturbed areas with vegetative cover (Mohlhenrich 1961; Findley et al. 1975). On 26 June 2006, I captured four adults in foothills along the southwestern edge of the Mogollon Mountains near the confluence of Mogollon Creek and the Gila River (Grant County, 10 mi E Buckhorn, 33°02.553'N, 108°31.817'W, elev. 1410 m). Individuals were captured in an ungrazed area (225 x 75 m) containing grasses and forbs about 1.2 to 1.8 m in height. Dominant trees in the floodplain consisted of Arizona sycamores (*Platanus wrightii*), Rio Grande cottonwoods (*Populus deltoides* spp. *wislizeni*), and junipers. An adult male had testes that measured 20 x 9 mm (MSB 125023); the remaining individuals were released. Other species of rodents captured in this grassy area included *P. leucopus*, *R. megalotis*, *C. hispidus*, and *S. ochrognathus*.

I discovered other previously unreported specimens of *S. hispidus* from along the Gila River and

nearby areas south of my localities (Grant County, 10 mi S Cliff, Gila River, T17S, R17W, Sec. 9 [27 May 1984, 2 males with testes that measured 20 x 11 and 20 x 10 mm, WNMU 4578 and 4572, respectively]; Grant County, Mangas Lake, 8.5 mi S, 6 mi E Cliff, T17S, R16W, NE ¼ of SE ¼, Sec. 8 [9 June 1983, male with testes that measured 18 x 12 mm and one pregnant female with eight embryos, cattail marsh, MSB 56659 and 56660, respectively]; Grant County, Gila River, 9.2 mi S Cliff, T17S, R17W, W ½ of NW ¼, Sec. 16 [13 May 1983, male with testes that measured 14.4 x 7.9 mm and female with five embryos, MSB 56661 and 56662, respectively]; Grant County, Mangas Creek, T17S, R17W, NW ¼ of NE ¼, Sec. 2 [30 January 1983, male, riverine, MSB 56663]; Grant County, Saddle Rock, T17S, R16W, N ½ of SE ¼, Sec. 33 [8 September 1983, male, mixed shrubland, MSB 56665]; Grant County, Red Rock, T18S, R18W, NW ¼ of NE ¼, Sec. 32 [30 September 1983, male with testes 15 x 8 mm, riverine, MSB 56664]).

My northernmost record represents a 65 km northward extension of the known range for *S. hispidus* from northern Hidalgo County (Findley et al. 1975). These records possibly represent previously undocumented populations because of the paucity of prior mammalian surveys in the area (Bailey 1928; Bailey 1931; Findley et al. 1975). However, Mohlhenrich (1961) trapped at a few sites in Grant County without documenting *Sigmodon* in the late 1950s. Mohlhenrich (1961) discussed the northward expansion of the range of both *S. hispidus* and *S. fulviventer* [formerly *S. minimus*] in New Mexico. Thus, the possibility that records represent a range expansion cannot be excluded.

CONCLUSIONS

Distributional changes for mammals can occur for a number of reasons. Frey (2009) recently suggested that records representing actual recent changes in distribution should be based only on conclusive evidence. She recommended to examine whether extra-limital records represent actual distributional shifts or whether such records represent undetected populations. She proposed to examine whether other species of mammals have been documented by the same methods at or near the site of capture. If records of those background species are lacking in the vicinity, then extra-limital records should be considered as individuals from undetected populations. In contrast, if documentation of other commonly captured species is available, this is indirect evidence that records might actually reflect a recent shift in distribution. Using this framework, I suspect that five of the seven species of mammals (*C. baileyi*, *D. merriami*, *P. truei*, *S. fulviventer*, and *S. hispidus*) discussed herein represent extra-limital populations that went undetected because of few prior surveys in the immediate areas of capture. For one species (*A. harrisii*), I suspect records represent an expansion in distribution based on the number of other small mammals and other diurnal species of sciurids documented in southeastern Hidalgo County near my records (Findley et al. 1975). For *N. narica*, data presented herein augment our knowledge of this uncommon species in New Mexico in a region with limited prior observations. Continued published surveys and documentation of distributional limits of mammals will allow us to better evaluate how environmental changes affect biological communities in the future, as well as to better interpret future records of individuals captured beyond published distributional limits of species.

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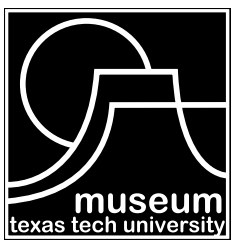

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