

NOTES ON DISTRIBUTION, HABITAT AND ABUNDANCE OF SOME MAMMALS OF ZACATECAS, MEXICO

INTRODUCTION

This paper describes the distribution and natural history of some mammals collected in the State of Zacatecas, Mexico, during trips from 1950 through 1964.

Baker *et al.*, (1967, 1968), Genoways and Jones (1968) and Matson and Patten (1975) are the only papers dealing solely with mammals of the State of Zacatecas. Other articles including references to Zacatecan mammals are cited under the appropriate species.

METHODS

Most mammals were taken by setting traps in what appeared to be good habitat or by hunting. However, during January and February 1964 small mammals were systematically trapped with Museum Special snap traps and mouse-sized Havahart live traps. The traps were set in three parallel lines, live and snap traps in different plots, in an attempt to estimate populations. The resulting numbers have been converted to #/100 trap nights (tn) for this paper. All specimens have been deposited in the California Academy of Sciences.

DESCRIPTION OF STUDY AREAS

The larger collections were made at four localities: Laguna Valderrama, 8 miles south of Moyahua, 20 miles south of Concepción del Oro, and 8 miles south of Chalchihuites.

Laguna Valderrama is a shallow basin, about 4×10 miles, 40 miles west of Fresnillo, elevation 7800 ft.: it was entirely short grass prairie in 1952 but was partially cultivated for wheat during 1964. The basin was surrounded by oak-savannah and, farther out, by mixed woodland composed primarily of *Quercus cordifolia*, *Pinus chihuahuana* and *Juniperus deppeana*. The dominant grasses were *Bouteloua gracilis*, *B. hirsuta*, *B. curtipendula*, *Muhlenbergia* sp. and *Andropogon* sp. Cattle grazing was moderate to light.

The area eight miles south of Moyahua is on a mountain slope along the Juchipila-Guadalajara road, elevation 5600 ft. In 1964, the area was disturbed woodland, an arid fasciation of tropical deciduous forest, dominated by *Acacia cymbispina*, *Tecoma stans*, *Bursera multijuga*, *Juniperus deppeana*, and *Ipomoea arborescens*. Large *Pachycereus* sp. and *Agave mayoensis* were common; tall grasses and adjacent bajada, elevation 6000 ft. In 1964 the vegetation was shrub desert.

The locality 20 miles south of Concepción del Oro included both desert flat and adjacent bajada, elevation 6000 ft. In 1964 the vegetation was shrub desert, severely grazed by goats. Dominant shrubs were *Larrea divaricata*, *Fleurensia cernua* and *Jatropha spathulata*; dominant succulents were *Agave lechuguilla*, *Opuntia leptocaulis*, *O. rufida*, and *Euphorbia antisiphilitica*.

The area 8 miles south of Chalchihuites, in the Sierra de Chalchihuites, is on a southwest facing mountainside, 8200 to 8600 ft elevation. The area is oak-pine woodland; the trees were primarily *Quercus durifolia*, *Q. radiata*, *Q. arizonica*, *Juniperus deppeana*, *Pinus cembroides*, *P. chihuahuana*, *Arbutus glandulosa*, and *A. xalapensis*. Tree saplings and *Arctostaphylos pungens* formed the understory. There was moderate grazing pressure from cattle in 1964.

More detailed descriptions can be found in Webster (1964a, 1964b). Other areas where specimens were collected are briefly described under the species account.

SPECIES ACCOUNTS

Choeronycteris mexicana Tschudi, 1844

The first Zacatecan record of this species are 2 specimens, a male and a female, collected by G. S. Jones, 8 mi S Moyahua on 28 January 1961. These specimens (Villa-R, 1966) were collected in a cave high on the west face of an escarpment overlooking the Río Jochipila. Twenty to 30 individuals were roosting in well-illuminated spots near the mouth of the cave. They were alert, rotating their heads to observe any change in our position, and eluded efforts to capture them by hand. No other bats were present. Matson and Patten (1975) reported this species from a number of other localities in the state.

Myotis californicus (Audubon and Bachman, 1842)

Two specimens were collected during 1964, one on 26 June in the desert 20 mi S. Concepción del Oro, and one on 18 June in the pines, 8 mi S. Chalchihuites. This species has previously been reported from 8 mi S Majoma (Genoways and Jones, 1968), San Juan Capistrano (Dalquest, 1953) and 21 km SW Camacho, 16 km NW Yahualica, 9.6 km SW Jalpa, Santa Rosa and 12.9 km NW Nochistlán by Matson and Patten (1975).

Myotis velifer (J. A. Allen, 1890)

During July 1964 a nursery colony of about 200 *M. velifer* was discovered under a concrete standpipe at Laguna Valderrama. During the evening of 18 July, a number of *Rana montezumae* were observed eating immature individuals of *M. velifer* which were swimming in a pond beneath a nearby windmill. Some of the bats were seen swimming in the water and emerging safely. It appeared that the bats had been knocked into the water by the rotating windmill. There was a wind of about 15 miles per hour that night; two evenings previous there was very little wind and no bats were observed in the water. Published records from Zacatecas are 6 mi E Monte Escobedo (Genoways and Jones, 1968) and Tabasco (Villa-R, 1966).

Pipistrellus hesperus (H. Allen, 1864)

P. hesperus was collected in pine-oak woodland 8 mi S Chalchihuites. This species was previously reported from 1.6 km N Santa Rosa by Baker, Webb and Dalby (1967) from Hda. San Juan Capistrano, 3 mi N Moyahua by Findley and Traut (1970), and Santa Rosa and 6.4 km S Jalpa by Matson and Patten (1975).

Eptesicus fuscus (Palisot deBeauvois, 1796)

This species was shot in juniper and pine-oak woodland at Laguna Valderrama and in oak woodland 3 mi NW Teul de Ortega. Matson and Patten (1975) collected this species in similar habitat 16 km NW Yahualica. Genoways and Jones (1968) collected *E. fuscus* in a grassy clearing in pine-oak forest 3 mi NW Monte Escobedo, and Villa-R (1966) reported an additional record from Fresnillo.

Lasiurus borealis (Muller, 1776)

A female was shot on 6 July 1961, in the tropical deciduous forest 8 mi S Moyahua. This is apparently the first record for *L. borealis* from the State. Watkins, Jones and Genoways (1972) recorded this species 2 mi ESE Plan de Barranca, Jalisco, which is about 70 mi east.

Plecotus townsendi Cooper, 1837

Four specimens of *P. townsendi* were collected from a rocky shaft in the prairie at Laguna Valderrama in July 1964. The shaft is the remains of a drainage tunnel used to drain the lake a century ago (Sr. Anhelm Mier, personal communication). Handley (1959) reported this species 13 mi W Valparaiso.

Sylvilagus auduboni (Baird, 1858)

Sylvilagus auduboni was collected 10 mi N Sombrerete during 1954 and in the desert 22 mi SW Concepción del Oro in 1964. Nelson (1909) reported this species from Berriozabal and Cañitas. Our record extends the known range of this species to western and northern Zacatecas.

Lepus californicus Gray 1837

A specimen was collected 6 mi SW Sombrerete in 1952. *Lepus californicus* has previously been reported from Valparaíso, Cañitas, Calera, and Berriozabal (Nelson 1909).

Eutamias bulleri (J. A. Allen, 1889)

Eutamias bulleri was collected in the oak-pine woodland 8 mi S Chalchihuites. Allen (1889) listed it from Sierra de Valparaíso and Howell (1929) from Sierra Madre.

Spermophilus spilosoma Bennett, 1833

Spermophilus spilosoma was collected 3 mi SW Sombrerete in overgrazed cactus-acacia grassland and on the prairie at Laguna Valderrama where its burrows were in the grazed pastures. This species has previously been reported from Berriozabal and Cañitas (Howell, 1938).

Spermophilus variegatus (Erxleben, 1777)

During January 1964, four individuals were collected near their burrows in stone walls in and around a small village 8 mi S Moyahua. A female collected on 29 January contained 3 embryos. Another female was collected on a rocky hillside in cactus-acacia scrub 3 mi SW Sombrerete on 19 July 1950. This species was observed frequently in the western part of the state in grassland, lower pine-oak, and tropical deciduous areas, always on rocky hillsides. Howell (1938) reported *S. variegatus* from Berriozabal.

Sciurus nayaritensis J. A. Allen, 1890

Several specimens were collected at Laguna Valderrama and several were observed 8 mi S Chalchihuites in the oak-pine woodland. This species is common in the pine-oak community of Zacatecas. Allen (1889) reported *S. nayaritensis* from Sierra Valparaíso and there is a further record from Plateado (Hall and Kelson, 1959).

Thomomys umbrinus (Richardson, 1829)

T. umbrinus was collected on a wooded ridge 8 mi S Chalchihuites, in the short grass prairie and in the juniper woodland at Laguna Valderrama and in the desert 20 mi S Concepción del Oro. In the oak-pine woodland *T. umbrinus* appeared to be restricted to the ridges. Previous records include Sierra de Valparaíso, Berriozabal, and Sierra Moroni, near Plateado (Nelson and Goldman, 1934).

Perognathus flavus Baird, 1855

P. flavus was collected in the grazed grasslands at Laguna Valderrama. The snap trap grid yielded 2.5/100 tn and the live trap grid 4.6/100 tn. It was seen active in morning and afternoon; one was observed emerging from a burrow, presumably occupied by hibernating *Spermophilus spilosoma*. Baker (1954) listed this species from Valparaíso and 8 mi SE Ciudad de Zacatecas, noting that it prefers sandy, rocky soil in desert situations; and Osgood (1900) recorded it from Berriozabal.

Perognathus hispidus Baird, 1858

Specimens were collected in sparse juniper woodland 10 mi NW Sombrerete. Osgood (1900) recorded *P. hispidus* from Valparaíso.

Perognathus nelsoni Merriam, 1894

One *Perognathus nelsoni* was collected among lechuguilla, on a rocky slope at the edge of the desert flat 20 mi SW Concepción del Oro at a rate of 0.6/100 tn. Another was collected 7 mi N Jalpa at the edge of a gully in sparse grass and shrubs in acacia-mesquite grassland, a tropical deciduous forest ecotone. The only published record for Zacatecas is from Hda. San Juan Capistrano (Osgood, 1900).

Dipodomys merriami Mearns, 1890

D. merriami was an abundant member of the creosote desert community 22 mi SW Concepción del Oro. It was taken at a rate of 5/100 tn in the snap trap grid on the rocky slope and 8.3/100 tn in live traps in the desert flat. Five were collected 8 mi W Fresnillo, 6700 ft, in cactus-acacia grassland. Lidicker (1960) records *D. merriami* from a number of localities in the deserts and arid grasslands of eastern Zacatecas.

Dipodomys phillipsii Baker, 1841

Seven specimens of *D. phillipsii* were collected in the overgrazed portions of the grassland at Laguna Valderrama. A female collected on 9 February 1964 was lactating. Genoways and Jones (1971) listed a number of localities for this species including Laguna Valderrama.

Liomys irroratus (Gray, 1868)

Liomys irroratus was collected in the tropical deciduous forest 8 mi S Moyahua. Snap traps set along a rock wall which led from the woodland into a grassy field yielded 2.5/100 tn; live traps set along the stone wall in the grassy oldfield yielded 6.1/100 tn. This species was also collected on a low mound at the edge of the woodland and grassy clearing. There were a number of burrows in the mound. Three were collected 4 mi NW Chalchihuites along a barbed wire-stone fence in acacia grassland. Genoways (1973) listed many localities in central and southern Zacatecas including the above specimens and their respective localities.

Reithrodontomys fulvescens J. A. Allen, 1894

Two *R. fulvescens* were collected 8 mi S Moyahua, both from modified bird's nests about four feet above the ground. Hooper (1952) recorded it from Berriozabal and Valparaíso; our records, therefore, are the first from southern Zacatecas.

Reithrodontomys megalotis (Baird, 1858)

Two specimens of *R. megalotis* were collected in the desert 22 mi SW Concepción del Oro, 6500 ft, two in the oak-pine woodland 8 mi S Chalchihuites, 8600 ft, and six in the grassland and juniper woodland at Laguna Valderrama. Both the snap trap and live trap grids in grassland at Laguna Valderrama yielded 2.5/100 tn. Previous records were 3 mi N Lulu and 8 mi W, 1 mi N Sombrerete (Hooper, 1952) and Sierra de Valparaíso (Merriam, 1901).

Peromyscus boylii (Baird, 1855)

Peromyscus boylii was taken at a rate of 12.5/100 tn in a snap trap grid set on the crest of a ridge 8 mi S Chalchihuites. Five were trapped in the grassland at Laguna Valderrama, several in the juniper woodland at Laguna Valderrama and two along a rock wall 4 mi NW Chalchihuites, 7000 ft, in acacia grassland. Osgood (1909) listed *P. boylii* from Plateado and Sierra Madre.

Peromyscus difficilis (J. A. Allen, 1891)

Peromyscus difficilis was captured at a rate of 3.8/100 tn in snap traps in pine oak forest at the bottom of a valley 8 mi S Chalchihuites and 1.4/100 tn in live traps set nearby. Previous records are Sierra de Valparaíso (Allen, 1891) and Plateado (Osgood, 1909).

Peromyscus eremicus (Baird, 1858)

This species was collected in the desert, 22 mi SW Concepción del Oro and in the cactus-acacia grassland, 8 mi W Fresnillo. Osgood (1904) reported it from Cañitas.

Peromyscus maniculatus (Wagner, 1845)

Two specimens of *P. maniculatus* were collected in the snap trap grid ($\approx 1.6/100$ tn) on a rocky slope in the desert 22 mi SW Concepción del Oro. At Laguna Valderrama $3.75/100$ tn were caught in the snap trap grid and $10.6/100$ tn in the live trap grid. A female collected in the snap trap plot on 6 February 1964 contained four embryos. Two individuals were collected along a stone wall in acacia-grassland 4 mi NW Chalchihuites, 7000 ft; some were also collected 10 mi N Sombrerete. Previous records are Plateado, Berrioabazal, Cañitas, Sierra de Valparaíso and Zacatecas (Osgood, 1909).

Peromyscus melanophrys (Coues, 1874)

Peromyscus melanophrys was taken at a rate of $1.3/100$ tn in snap traps set along a stone wall in tropical deciduous woodland, 8 mi S Moyahua. Also three were collected in the cactus-acacia grassland 8 mi W Fresnillo, and one in the desert 22 mi SW Concepción del Oro. Baker, Webb and Dably (1967) reported this species from 1.6 km N Santa Rosa. Baker (1952) listed it from 2 mi ESE Transcosa, and from 3 mi SW Jalpa, and Osgood (1904) Berrioabazal and Monte Escobedo.

Peromyscus pectoralis Osgood, 1904

Peromyscus pectoralis was collected 3 mi SW Sombrerete, in cactus-acacia scrub. Osgood (1909) recorded it from Monte Escobedo and Baker, Webb, and Dalby (1967) collected it 1.6 km N Santa Rosa.

Peromyscus truei (Shufeldt, 1885)

Two specimens were collected along a ridge top in the oak pine woods 8 mi S Chalchihuites. Others were collected in the grassland at Laguna Valderrama and in cactus-acacia scrub 3 mi SW Sombrerete. Hoffmeister (1951) listed Valparaíso as another Zacatecan locality.

Baiomys taylori (Thomas, 1887)

Sixteen individuals of *B. taylori* were collected 8 mi S. Moyahua near a rock wall in sparse woodland and a small grassy oldfield interspersed with shrubs and trees (*Ipomoea arborescens*, *Bursera multijuga*). The snap trap grid in the woodland yielded $16.3/100$ tn and a live trap grid in the oldfield $21.2/100$ tn. They were taken with *Peromyscus melanophrys* and *Liomys irroratus*.

Twenty-two snap traps set along a barbed wire-rock wall fence in cactus-acacia grassland 4 mi NW Chalchihuites yielded 5 *B. taylori* in association with *Liomys irroratus*, *P. maniculatus* and *P. boylii*. Specimens were also collected in juniper woodland at Laguna Valderrama. The only previously published locality for *Baiomys taylori* in Zacatecas in Valparaíso (Osgood, 1909).

Baker and Greer (1962) noted that *B. taylori* is restricted to the central grasslands in Durango; they collected it in grass along rock fences in association with a fauna similar to that 4 mi NW Chalchihuites.

Onychomys torridus (Coues, 1874)

Three specimens of *O. torridus* were collected on the rocky slope among lechuguilla and cacti 20 mi S Concepción del Oro. Two were collected in the grassland at Laguna Valderrama and one was collected in the cactus-acacia grassland, 8 mi W Fresnillo, 6700 ft. *Onychomys torridus* has previously been reported from 2 mi ESE Transcosa (Hall and Kelson, 1959) and San Juan Capistrano (Merriam, 1904). Thus our records are the first from northern Zacatecas.

Sigmodon fulviventris J. A. Allen, 1889

Seven were trapped in runways in dense grass along a barbed wire fence adjacent to a wheat field at Laguna Valderrama. This species has been recorded near Ciudad de Zacatecas (Bailey, 1902; Allen, 1889), and 13 km S Villanueva (Dalby and Lillevik, 1969), both in central Zacatecas.

Sigmodon leucotis V. Bailey, 1902

One male was collected along a stone wall which stretched across a grassy field opening in the oak-pine woodland 8 mi S Chalchihuites. Bailey (1902) described the species from Sierra de Valparaíso and Zimmerman (1970) reported it 9 mi WNW Jalpa.

Neotoma albigula Hartley, 1894.

Three *N. albigula*, an adult female and 2 immature males were collected in the desert 22 mi SW Concepción del Oro, 6500 ft. They had constructed their lodge under a large *Agave*. Three more were collected on top of a rocky ridge in the cactus-acacia grassland 6 mi W Fresnillo. Previous records include Berriozabal, 4 mi E Calabazal, and Valparaíso (Goldman, 1910) and Plateado (Goldman, 1905). The specimens from Concepción del Oro are the first recorded from northern Zacatecas.

Mus musculus Linnaeus, 1758

One was collected in a house 8 mi S. Moyahua. The species undoubtedly occurs throughout the state but this appears to be the first report of the species from Zacatecas.

Canis latrans Say, 1823

A specimen was collected at Laguna Valderrama and individuals or signs and calls were observed 8 mi S Chalchihuites, 6 mi W Fresnillo, 8 mi S Moyahua, 22 mi S Concepción del Oro, and 7 mi N Jalpa. Previously the species has only been *Canis lupus* Linnaeus, 1758

Canis lupus Linnaeus, 1758

A *C. lupus* was found dead in oak savannah 5 mi S Laguna Valderrama and another was found dead in the pine-oak forest 13 mi W Milpillas (= 65 mi W Fresnillo) during July 1954. The skulls of both were collected. A live individual was observed in the grassland-juniper ecotone 8 mi NW Sombrerete during the same month. Baker (1957) stated that small numbers persist in the state but these appear to be the first specimens recorded. Leopold (1959) does not give records but indicates the present range extending into the southwestern portion.

Urocyon cinereoargenteus (Schreber, 1775)

A lactating female was shot on 30 June 1957 in the tropical deciduous woodland 8 mi S Moyahua. Goldman (1938) reported this species from Hda. San Juan Capistrano. Our record extends the known range of this species into southern Zacatecas.

Onychomys mesoleucus (Lichtenstein, 1832)

A skull was preserved from an animal found dead at Laguna Valderrama. The only other Zacatecan record is Merriam's (1902) from Sierra de Valparaíso.

Odocoileus virginiana (Zimmermann, 1780)

Antlers were collected in the oak woodland at Laguna Valderrama and 8 mi S. Chalchihuites, and one was observed 8 mi S Chalchihuites during January 1964. Miller and Kellogg (1955) listed *O. virginiana* from Plateado.

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GWILYM S. JONES

J. DAN WEBSTER

Hanover College,
Hanover, Indiana 47243.

Present address: Department of Life
Sciences, Indiana State University,
Terre Haute, Indiana 47809.

ABSTRACT

Natural history and distributional notes on 40 species of mammals collected between 1950 and 1964 are presented. This includes apparent new state records — *Lasiurus borealis*, *Mus musculus*, and *Canis lupus* as well as range extensions within the state. The natural history notes include observations on reproduction, predation, abundance, habitat, nests, and behaviour.

RESUMEN

Se presentan notas acerca de la biología y de la distribución de 40 especies de mamíferos recolectados entre 1950 y 1964. Esto incluye lo que parecen ser nuevos registros para el Estado — *Lasiurus borealis*, *Mus musculus* y *Canis lupus* así como extensión de su distribución dentro de Zacatecas. Las notas acerca de la historia natural incluyen observaciones sobre reproducción, depredación, abundancia, habitat, nidos y comportamiento animal.

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