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Cynomys parvidens.

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Cynomys parvidens (Allen, 1905)

Utah Prairie Dog

Cynomys parvidens Allen, 1905:119. Type locality Buckskin Valley, Iron County, Utah.

CONTEXT AND CONTENT. Order Rodentia, Suborder Sciuromorpha, Family Sciuridae, Genus *Cynomys*, Subgenus *Leucocrossuromys*. See Clark *et al.* (1971) for a diagnostic key to the five living species of *Cynomys*.

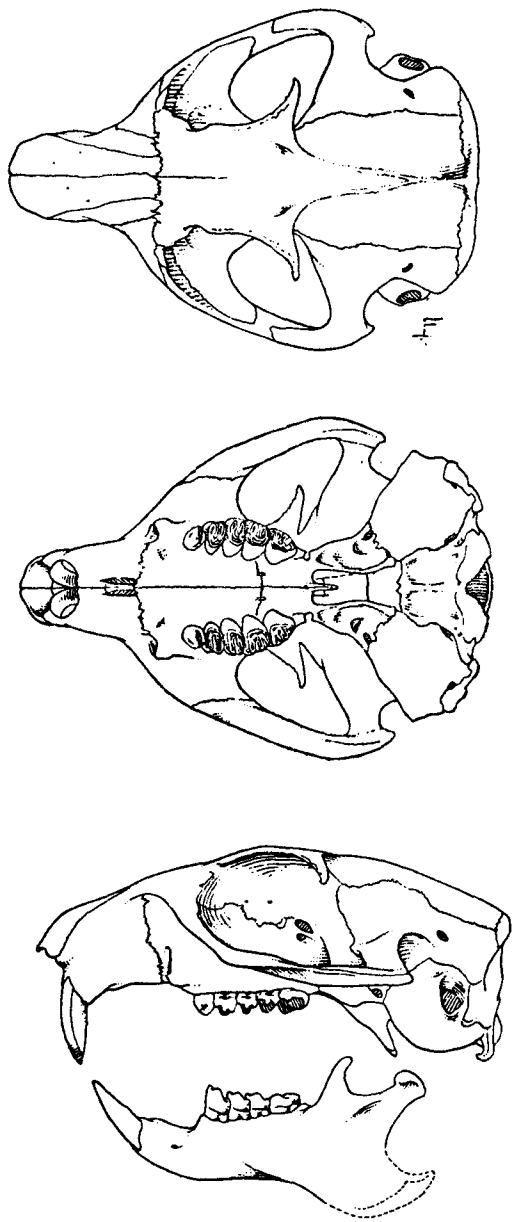

FIGURE 1. Views of skull of *Cynomys parvidens* (Univ. Kansas no. 15962, Cedar City, Utah, from Hall and Kelson, 1959:367, by permission of Ronald Press, Inc., New York). From top to bottom; dorsal, ventral, and lateral views of cranium and lateral view of dentary, all × 1.

DIAGNOSIS. In general, the Utah prairie dog is a small member of the genus. Adult males average 338 (305 to 360) mm in total length. Nothing has been reported on weights, but examination of a few museum specimens indicates weights similar to those in *C. leucurus*, with males probably averaging heavier than females. The relatively short (30 to 57 mm), white-tipped tail designates *C. parvidens* as a member of the subgenus *Leucocrossuromys* and thereby distinguishes it from species of the subgenus *Cynomys*. The dorsum, including the proximal half of the tail, is cinnamon to clay in color, readily distinguishing *C. parvidens* from the more buffy-colored *C. leucurus* and *C. g. gunnisoni*. Although some specimens of *C. gunnisoni zuniensis* resemble *C. parvidens* in dorsal color, the "zunis" are separable by their grayish-centered tails and lack of the sharply outlined black "eyebrows," which are prominent in *C. parvidens*. Durrant (1952) compared skulls of *C. parvidens* to those of *C. g. zuniensis* as: "Larger in almost every measurement taken; interorbital breadth wider; zygomatic arches relatively weaker; nasals longer and narrower posteriorly; posterior ends of nasals rounded rather than truncate; alveolar length of upper molariform series more; teeth smaller relative to size of skull."

GENERAL CHARACTERS. Although *C. parvidens* is relatively small, large individuals may be slightly larger than individuals of *C. g. zuniensis* from Utah (Durrant, 1952). Individual body hairs are multicolored. From base to tip, they are black, pale buff, cinnamon, and finally tipped with dark brown or pale buff. The cheeks are marked by a brown patch, the mouth and chin are whitish, and the underparts are cinnamon to pale buff. Ranges of adult measurements (in millimeters, modified from Hollister, 1916, and Durrant, 1952) are: total length 305 to 360, tail 30 to 60, hind foot 55 to 66, ear 12 to 16, condylobasal length 53.0 to 57.9, length of nasals 20.5 to 23.3, zygomatic breadth 38.3 to 44.7, mandibular length 40.3 to 43.7, mastoid breadth 26.7 to 29.8, and alveolar length of maxillary tooth row 14.8 to 15.5. The skull is illustrated in Figure 1. For a more detailed description of morphology, see Hollister (1916) and Durrant (1952).

DISTRIBUTION. The range of *C. parvidens* is limited to the southern half of Utah (figure 2). Local distribution began fluctuating and diminishing when control programs were initiated early in this century. Prior to control, *C. parvidens* reportedly occurred from the Pine and Buckskin valleys in Beaver and Iron counties (Allen, 1905), as far north as Nephi (Hollister, 1916; Durrant, 1952), south to Bryce Canyon National Park (Presnall, 1938), and east to the foothills of the Aquarius Plateau, where it was recorded as a dominant mammal by Tanner (1940). Hardy (1937), Long (1940), and Stanford (1931) presented additional historical details on the range of this species.

Recent information (Collier, 1974) indicates the species has at one time or another inhabited approximately 700 sections in 10 distinct areas in southern Utah. In the past 50 years there has been an estimated 87% decline in the number of sections occupied. *C. parvidens* now occurs in substantial populations in only three places: the Awapa Plateau, along the East fork of the Sevier River, and in eastern Iron County. In addition, the Grass and Sevier River valleys plus three small, widely separated mountain valleys have small populations. The Aquarius Plateau, Fremont and Paria valleys, and Salina Canyon now have only traces of activity or no prairie dogs.

Reports that prairie dogs occurred at Nephi lack voucher specimens and may be erroneous; local residents there commonly refer to the Uinta (*Spermophilus armatus*) and Townsend's ground squirrels (*S. townsendii*) as prairie dogs. The northernmost verified record is at Salina Canyon in Sevier County, 70 miles south of Nephi. Presently, the northernmost active colony is near Koosharem, Sevier County, 90 miles south of Nephi. Northward expansion is presumably checked by competition with Uinta ground squirrels and/or dense vegetation. There is evidence that *C. parvidens* once occurred through

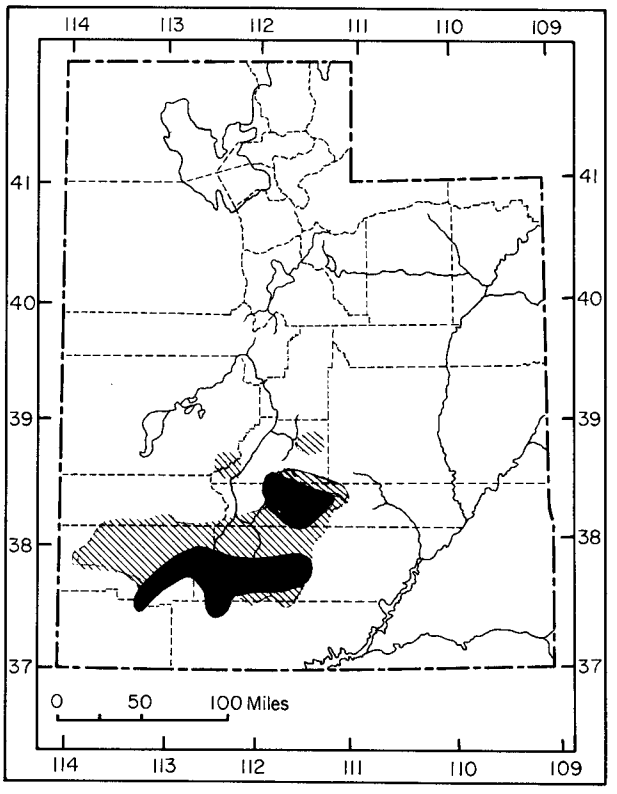

FIGURE 2. Distribution of *Cynomys parvidens*. Diagonal lines represent distribution in 1920; dark area represents distribution in 1970. The southernmost dark projection should be diagonally lined in part.

the Escalante Valley as far west as Modena, Utah, near the Nevada state line but has since been extirpated. Physical barriers and lack of suitable habitat have prevented expansion to the east and south of the present range.

The Utah prairie dog probably inhabited large segments of the Great Basin in post-pluvial times (Collier and Spillett, 1975). With drying climatic conditions, the Great Basin became unsuitable habitat forcing the species to retreat to its recent and more restricted range. This retreat probably became more rapid after shrub invasion and grass decline was accelerated by human settlement and subsequent overgrazing.

As with other species of prairie dogs, poisoning has been the single most important cause of the Utah prairie dog's decline since 1920 although disease has also been considered an important factor by some workers (Fisher *et al.*, 1969).

FOSSIL RECORD. Prairie dog bones excavated from two Fremont village sites near Cedar City, Utah, have been dated between 500 A. D. and 1300 A. D. (personal communication, G. F. Dalley). Prairie dog bones comprised less than 1% of the total number of bones identified at these sites. The Cedar City site is one of five localities at which extant populations of the Utah prairie dog are known. Clark *et al.* (1971) discussed the fossil record of the genus.

FORM AND FUNCTION. The molt pattern in *C. parvidens* has not been described in detail, but it probably consists of two renewals annually. Hollister (1916) remarked on the indistinctiveness of the molt pattern during the transition from summer to winter pelage. Of the few specimens he examined, one was still in full winter pelage on 19 May; by August or September, summer pelage was worn and some individuals already were accumulating a thick winter coat. Specimens collected after late October were in full winter pelage.

C. parvidens possesses five pairs of mammae (two pectoral, three inguinal) as found in other species of white-tailed prairie dogs (Moore, 1961). Hollister (1916) stated that white-tailed prairie dogs occasionally had 12 mammae, but did not elaborate.

Serum protein electrophoresis revealed that the serum albumins of *C. parvidens* were monomorphic throughout the distribution of the species, and identical in mobility to the monomorphic albumins of *C. leucurus* and *C. gunnisoni* (Pizzimenti and Nadler, 1972). The transferrin locus of *C. parvidens* also was monomorphic and identical in mobility to that of *C. leucurus* (Tf-5); this allele had the slowest mobility of all transferrin isozymes reported for the genus (Nadler *et al.*, 1971).

ECOLOGY. Until recently, little information was available on the ecology of the Utah prairie dog. Distribution and ecology are presently under investigation (GDC) and much of what follows stems from personal observations.

Like other species of prairie dogs, *C. parvidens* is colonial and diurnal, and feeds primarily on forbs and grasses. The burrows are similar to those of *C. leucurus* in that they consist of a mound of dirt formed by the haphazard removal of subsoil and do not represent a constructive effort as in the black-tailed species (see Smith, 1958, and King, 1955). A mound may have a single entrance or occasionally two or more entrances that may interconnect; size of the mound and number of entrances increase with the age of the burrow system. Although small mounds with single-entrance burrows are the most common, mounds of old systems may exceed 3 m (10 feet) in diameter, 0.6 m (2 feet) in height, and have 5 or more entrances. The angle of descent into the tunnel varies but, as in *C. leucurus*, usually slopes downward at about 45 degrees. No excavations of *C. parvidens* burrow systems have been reported.

Population densities of colonies are extremely variable, ranging from a mean of less than 2.5 per hectare (one per acre) to more than 74 per hectare (30 per acre). Population density appears to be influenced by condition of the habitat, as observed with other species (Koford, 1958; Longhurst, 1944). Areas with lush vegetation, provided the vegetation is not too tall, tend to support higher densities.

Reproduction occurs once annually, in the early spring. This contention is supported by the abundance of juveniles observed in the early summer, as well as laboratory observation of the reproductively quiescent state of males except during late winter and early spring. This pattern appears to be consistent throughout the genus, with the exception of *C. mexicanus* (Pizzimenti and McClenaghan, 1974). Litter size for *C. parvidens* resembles that of other members of the genus. Four captive pregnant females delivered an average of 4.8 young (range 3 to 6); all of the pups were born between 10 and 16 April. Reproduction may, however, be delayed 2 to 4 weeks at higher elevations, as also occurs in *C. gunnisoni* (Longhurst, 1944).

Poisoning programs have effectively reduced the number of colonies and individuals of *C. parvidens*, although since 1953 poisoning has been conducted solely by private individuals on private lands. In 1971, poisoning annihilated one of the few remaining large colonies (near Loa, Wayne County). In 1972, the largest colony of the species was reduced from more than 1000 animals to less than 50, apparently from poisoning (Enoch, Iron County). The total population declined from approximately 8800 animals in 1970 to 5700 in 1971, a 36% decline in one year (Collier and Spillett, 1972). Three of the five remaining localities where the species occurs in some numbers, are controlled by private individuals. *C. parvidens* was classified as an endangered species in 1968 but was dropped from the list in 1970. It was subsequently relisted as endangered because of substantial decline in numbers from 1970 to 1972 (U. S. Bureau of Sport Fisheries and Wildlife, 1973).

GENETICS. Pizziment and Nadler (1972) examined the chromosomes of *C. parvidens* from five scattered localities, and found a diploid number of 50. The autosomes are four pairs of metacentrics, a graded series of 18 submetacentric to subtelocentric pairs, and two pairs of acrocentric chromosomes; the sex chromosomes are a large submetacentric X and a small acrocentric Y. Interpretation of the sex chromosomes has been somewhat equivocal (Pizzimenti and Nadler, *op. cit.*), but is now confirmed.

REMARKS. It has been suggested that *C. parvidens*, *C. leucurus*, and *C. gunnisoni* are conspecific (Burt and Grossenheider, 1964), and that the nominal groups may represent a polytypic species. Kelson (1949) judged *C. parvidens* to be conspecific with *C. leucurus*, but did not demonstrate any evidence of intergradation. Work is in progress regarding the integrity of these species; (JJP) evidence now at hand suggests that the above-mentioned synonymizing probably is not now supportable. Most authorities do agree, however, that *C. parvidens* and *C. leucurus* are more closely related to each other than to other members of the genus.

ETYMOLOGY. The name *Cynomys* comes from the Greek words *kynos*, meaning dog, and *myos*, meaning mouse. The name *parvidens* is derived from Latin words *parvus*, and *dens*, "small teeth." The name *parvidens* is somewhat of a misnomer in that the teeth are not distinctively smaller than in other members of the genus relative to the size of the skull.

LITERATURE CITED

Allen, J. A. 1905. Mammals from Beaver County, Utah. Collected by the museum expedition of 1904. Bull. Mus. Sci., Brooklyn Inst. Arts and Sci. 1:117–122.

Burt, W. H., and R. P. Grossenheider. 1964. A field guide to the mammals. The Riverside Press, Cambridge, Massachusetts, 284 pp.

Clark, T. W., R. S. Hoffman, and C. F. Nadler. 1971. *Cynomys leucurus*. Mammalian Species 7:1–4.

Collier, G. D. 1974. The Utah prairie dog: distribution, abundance, and habitat requirements. Ph.D. dissertation, Utah State Univ.

Collier, G. D., and J. J. Spillett. 1972. Status of the Utah prairie dog. Utah Academy of Science, Arts and Letters 49:27–39.

— 1975. Factors influencing distribution of the Utah prairie dog, *Cynomys parvidens* (Sciuridae). Southwestern Nat. In press.

Durrant, S. D. 1952. Mammals of Utah. Univ. Kansas Publ., Mus. Nat. Hist., 6:1–549.

Fisher, J., N. Simmons, and J. Vincent. 1969. Wildlife in danger. Viking Press, New York, 368 pp.

Hardy, R. 1937. Extension of the ranges of prairie dogs of the genus *Cynomys* in Utah. Utah Acad. Sci., 14:197–198.

Hollister, N. 1916. A systematic account of the prairie dogs. N. Amer. Fauna, 40:1–37.

Kelson, K. R. 1949. Speciation of rodents in the Colorado River drainage of eastern Utah. Ph.D. Dissertation, Univ. Utah.

King, J. A. 1955. Social behavior, social organization and population dynamics in a black-tailed prairie dog town in the Black Hills of South Dakota. Contr. Lab. Vert. Biol., Univ. Michigan, 67:1–123.

Koford, C. B. 1958. Prairie dogs, whitefaces, and blue gramma. Wildlife Monogr., 3:1–78.

Long, W. S. 1940. Notes on the life histories of some Utah mammals. Jour. Mammal., 21:170–180.

Longhurst, W. 1944. Observations of the ecology of the Gunnison prairie dogs in Colorado. Jour. Mammal., 25:24–36.

Moore, J. C. 1961. Geographic variation in some reproductive characteristics of diurnal squirrels. Bull. Amer. Mus. Nat. Hist., 122:1–32.

Nadler, C. F., R. S. Hoffman, and J. J. Pizzimenti. 1971. Chromosomes and serum proteins of prairie dogs and a model of *Cynomys* evolution. Jour. Mammal., 52:545–555.

Pizzimenti, J. J., and C. F. Nadler. 1972. Chromosomes and serum proteins of the Utah prairie dog, *Cynomys parvidens* (Sciuridae). Southwestern Nat., 17:279–286.

Pizzimenti, J. J., and L. R. McClenaghan, Jr. 1974. Reproduction, growth and development, and behavior in the Mexican prairie dog, *Cynomys mexicanus*. Amer. Midland Nat. 92:130–145.

Presnall, C. C. 1938. Mammals of Zion-Bryce and Cedar Breaks. Bull. Zion-Bryce Mus., 2:12.

Smith, R. E. 1958. Natural history of the prairie dog in Kansas. Misc. Publ. Mus. Nat. Hist., Univ. Kansas, 16:1–36.

Stanford, J. S. 1931. Notes of small mammals of Utah. Jour. Mammal., 12:356–363.

Tanner, V. M. 1940. A biotic study of the Kaiparowits region of Utah. Great Basin Nat., 1:97–126.

U.S. Bureau of Sport Fisheries and Wildlife. 1973. Rare and endangered Fish and Wildlife of the United States. Compiled by the Committee on Rare and Endangered Wildlife Species.

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