

## DISTRIBUTION AND VARIATION OF THE UTAH POULATION OF THE GREAT BASIN POCKET MOUSE<sup>1</sup>

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The previously known range of the Great Basin Pocket Mouse (*Perognathus parvus*) in Utah was published by Durrant in 1952, pp. 241-244, and figure 41. At the time of Durrant's first publication this species was thought to be confined in the state of Utah almost exclusively to the Great Basin. The only exceptions were the small population found near Greenriver, Utah, west of the Green River, by Durrant; two specimens taken by Vernon Bailey many years ago at Laketown, Rich County, which locality, however, actually falls within the Great Basin drainage; and two collected by Svihla (1931, p. 262) near Linwood in Daggett County. Both the Green River and Linwood specimens were taken within the Colorado River drainage. Additional collecting within the past few years has added further information on the occurrence and probable relationships of this interesting species which would seem to warrant some comment at this time.

Recent collections would indicate a somewhat discontinuous range in areas outside of the Great Basin, but the writers are inclined to believe that this seeming discontinuity will disappear as additional field work is done. Since *Perognathus parvus* may live at relatively high elevations as compared to other species of pocket mice in this area, there would seem to be no continuous mountain barriers that could seriously interfere with its spread out of the Great Basin and into those portions of the Colorado Basin where it is now known to live. Up to this point, however, the species is not known to occur east of the Green and Colorado Rivers, and it may be that these streams could afford an effective barrier to the spread of these pocket mice eastward.

The slow accumulation of data relative to the distribution of *Perognathus parvus* may be due in part at least to what seems to be a definite tendency toward fluctuation in population numbers from time to time. This has been borne out by our experience in sampling mammal population in Cedar Valley which lies directly west of Utah Lake. On our first visit to that valley in 1936 we took no pocket mice of any kind. In subsequent visits up until the beginning of World War II the results were the same. When we resumed our trapping after the war years we still found no pocket mice until 1949 when, using the same kind of traps and bait in the same places at comparable seasons, we began to take more pocket mice than any other species. These high populations seem to have prevailed at least up until the close of 1952 and possibly even longer, although we have done no field work in the Cedar Valley

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area since 1953. Thus, it would appear likely that trapping in off years might not reveal the true state of distribution of this species.

From the records now available and the nature of the habitat between the collection localities it seems evident that *Perognathus parvus* is to be found in all of the counties of the state that lie west of the Green and Colorado Rivers. Our collections in Beaver and Iron Counties verify the supposition that the species extends at least to the southernmost rim of the Great Basin. Its presence in the Colorado River drainage east of the central Utah mountains and high plateaus is well indicated by our collections from Duchesne, Carbon, Emery, and Garfield Counties in addition to its discovery at Greenriver, Utah as well as other localities in the Colorado River drainage by Durrant. The probable connection of the Great Basin population with those of Rich, Summit, and Daggett Counties may be supposed by collections from Morgan, Summit, and much additional material from Rich County. A list of the precise collection localities now available in addition to those published by Durrant (*op. cit.*, 1952) is as follows:

*Utah County*: Head of Slate Canyon, east of Provo, Cedar Valley. *Tooele County*: Lookout Pass. Rush Valley, Government Creek, Mercur. *Beaver County*: Wah Wah Springs, Minersville. *Juab County*: Joy, Callao. *Boxelder County*: Lucin. *Summit County*: Echo Junction. *Iron County*: Parowan. *Garfield County*: Panguitch, Spry, 20 miles on n.w. Hite. *Sevier County*: Fish Lake, Koosharum, Paradise Valley. *Duchesne County*: Roosevelt and Myton. *Daggett County*: Linwood. *Rich County*: Woodruff. *Emery County*: Huntington. *Carbon County*: Price. *Kane County*: Pine Dunes and Navajo Wells.

In the course of our field work we have made hundreds of notations regarding the habitat preferences of *Perognathus parvus*. According to our experience the animal almost invariably inhabits benchlands and the lower slopes of mountains at elevations ranging from 4,500 to 6,500 feet. However, years ago, a specimen was taken by James Bee in the Wasatch Range east of Provo at an elevation of nearly 8,000 feet indicating that the species may inhabit higher elevations than we now realize. In his studies of the mammals of Cedar Valley, Utah County, Woodbury (MS, 1955) found *Perognathus parvus* very common in sandy flats in the valley where rabbit brush (*Chrysothamnus*) and Indian rice grass (*Oryzopsis hymenoides*) were the predominant plants. In his study of the Great Basin Desert of western Utah, Fautin (1946, p. 280) found this species only in the sagebrush community. By far the great majority of our specimens have been taken in sagebrush on the higher benchlands around the bases of hills and mountains. They occur commonly on rocky soils and often extend well up onto the steeper slopes where the ground is strewn with loose boulders or talus material. Frequently they are taken in situations where one would expect to find *Perognathus formosus*; i.e. on rocky slopes. At Joy, Juab County, we found *Perognathus parvus* and *Perognathus formosus* living together on rocky slopes, but *P. parvus* also lived on flats where shadscale (*Atriplex*) and rabbit brush (*Chrysothamnus*) were predominant on fine gravelly soil. In the vicinity of the Henry Mountains, Garfield County, *P. parvus* was taken around



the bases of sandstone ledges as well as in open sandy flats vegetated with blackbrush (*Coleogyne ramosissima*) and jointfir (*Ephedra*).

Our observations have led us to conclude that *Perognathus parvus* occupies a wider range of altitude and a greater variety of habitat than any other species of pocket mouse found in this area.

### Variations

Durrant in his first account (1952) recognized only two subspecies in the Utah population; namely, *Perognathus parvus olivaceus* Merriam of the Great Basin described from Kelton, Boxelder County, Utah in 1889, and *P.p. clarus* Goldman, a race supposed to occur in northeastern Utah and named from the former townsite of Cumberland, Lincoln County, Wyoming.

Later Durrant, Lee, and Hansen, (1955) recorded *Perognathus parvus trumbullensis* in samples of populations from Washington and Garfield Counties. Still later (Durrant and Lee, 1956) a new subspecies (*Perognathus parvus bullatus*) was described from the area west of the Green and Colorado Rivers and between the San Rafael and Fremont Rivers. Durrant considers *P. olivaceus amoenus* Merriam from Nephi, Utah, and *P.p. plerius* Goldman from Stansbury Island, Great Salt Lake, as synonyms of *P.p. olivaceus*. However, Miller and Kellogg (1955) retain the name of *P.p. plerius* as valid.

From the material available to the writers it seems likely that at least two or three additional subspecies of *P. parvus* will eventually be recognized from the Utah population when opportunity is afforded to make proper comparisons and analyses. It is our purpose to comment upon these variations as noted to the present time as follows:

*Uinta Basin, Duchesne County.* In all three body measurements this series averages smaller than either *olivaceus* or *clarus*. The skulls average distinctly longer (27.1 vs. 24.8) than in *clarus* and slightly longer than in *olivaceus*. The interparietals in the Uinta Basin series are longer and narrower than in either *olivaceus* or *clarus*. In coloration the Uinta Basin series is closer to *olivaceus* than to *clarus* since they have the darker buffy ground color and the wider lateral stripe characteristic of the former.

*Linwood, Daggett County.* Compared with a good series of topotypes of *P.p. clarus* from Cumberland, Wyoming, the Linwood series shows some signs of intergradation between *olivaceus* and *clarus*. However, in both cranial measurements and color they lie decidedly closer to *clarus* as might be expected from their continuous ranges. In coloration the Linwood series is very close to *clarus* in that it possesses the paler buffy ground color and narrow lateral stripe. However, the *clarus* topotypes have decidedly more dark hairs on the dorsum and in that respect are closer to the Laketown series.



*Laketown, Rich County.* From the more or less continuous nature of the sagebrush plains of the area it might be expected that the Laketown population would be closest to *P.p. clarus*. The relatively low divide separating the Green and Bear River drainages would not seem to afford a serious barrier to the species. However, the Laketown series is larger on the average in most measurements taken than the *clarus* topotypes. A greater skull length is owing in the main to longer nasals in the Laketown specimens (10.6 vs 9.7). Body measurements in Laketown material averaged greater, although not significantly so, than *clarus*. In coloration, there is a striking difference between the Laketown and Cumberland series. In the former the ground color is much darker, between cinnamon buff and pinkish cinnamon rather than pinkish buff. Lateral stripes on the Laketown specimens are wider and more distinct than in *clarus* topotypes. Dark hairs of the back are strikingly more prominent in the Laketown series with a tendency to form black patches on the rump and a distinct black mid-dorsal line. In matters of cranial measurements, body measurements, and ground color they seem closer to *olivaceous* than to *clarus*. They differ from *olivaceous* in the striking black hairs of the dorsum.

*Head of North Wash, Garfield County.* A striking series of specimens from the head of North Wash near the east base of the Henry Mountains seems to be representative of a distinctive population of *Perognathus parvus* inhabiting the desert plains surrounding that isolated mountain range. Comparing our series with the Great Basin *P.p. olivaceous*, we find the North Wash series has a wider carium owing to more inflated bullae, but the inter-orbital breadth is slightly less. In coloration the North Wash specimens are distinctly different from all other kinds represented in our collection. The ground color is bright cinnamon buff rather than pinkish buff but the buffy stripes on the sides are indistinct. A reduction of the dark hairs on the back gives the animal a brighter and more buffy appearance in general and such dark hairs as there are are confined to a rather distinct mid-dorsal stripe which is especially evident between the ears. The subauricular white patches are larger and the tail is more buffy throughout in the North Wash series.

*Great Basin.* Series of *Perognathus parvus* from different parts of the Great Basin in Utah show some variations in body size, cranial measurements and coloration, but our series from the southern part of the basin are not large enough to permit a comparison.

#### Summary

The previously known distribution of *Perognathus parvus* in Utah principally in the northern Great Basin and the northeastern part of the state has now been extended to the southern rim of the Basin and eastward to the Green and Colorado Rivers. It now has been verified that the species occurs in all of the coun-



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