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NEW RECORDS AND HABITAT INFORMATION FOR SOREX MERRIAMI IN NEBRASKA

Russell A. Benedict¹, Jay D. Druecker², and Hugh H. Genoways³

ABSTRACT.—We report the collection of 8 additional specimens of Sorex merriami from northwestern Nebraska; previously only 2 specimens had been collected in the state. The new specimens were captured in pitfall traps and Sherman live-traps from 1979 through 1996 in Dawes, Sheridan, and Sioux counties. These individuals were caught together with Sorex cinereus and several rodent species in a variety of grassland habitats, including disturbed roadsides dominated by native and introduced grasses and forbs, grassland openings in forests of ponderosa pine, and an open, dry grassland. Seven of the new specimens, captured in late May, early June, and December, were young-of-the-year, and 4 of these were not in reproductive condition; reproductive status of the other 3 was not assessed. One individual, captured in late May, was an old male in reproductive condition.

Key words: Sorex merriami, Nebraska, habitat use, reproduction.

Distribution of Sorex merriami is centered on the Great Basin and extends over a large portion of west central United States, from south central Arizona to northern Montana, and from western Nebraska to central California (Diersing and Hoffmeister 1977, Hall 1981). This species is poorly understood on the Great Plains and was believed to be rare in Nebraska, previously known from only 2 specimens from the northwestern corner of the state (McDaniel 1967, Freeman et al. 1993). The 1st individual was captured in 1965 on the edge of a wet meadow, 4.8 km S Rushville, Sheridan County, in the Niobrara River drainage (McDaniel 1967). The 2nd specimen was captured in 1989 in the White River drainage, 16.1 km N, 12.9 km W Harrison, Sioux County (Freeman et al. 1993). Habitat at this site was dominated by 2 species of Artemisia, Chrysothamnus sp., and several grass species. Nearby habitats included short-grass prairie and an open forest dominated by Pinus ponderosa (Freeman et al. 1993).

NEW SPECIMENS

On the night of 31 May 1979, students from Chadron State College captured a single Sorex merriami 30 km S Chadron, Dawes County (T30N, R48W, Sec. 28 NE 1/4 of NW 1/4; housed at University of Nebraska State Museum, UNSM 20921). This animal was caught in a Sherman live-trap in the Niobrara River drainage. Notes on vegetation were not taken at capture, but today this dry grassland is dominated by Andropogon scoparius, Bouteloua gracilis, B. curtispendula, Calamovilfa longifolia, Carex sp., and scattered forbs. Artemisia ludoviciana and A. frigida are present, but neither is dominant in the community. Inasmuch as land use at this site has not changed dramatically since 1979, present vegetative conditions are probably similar to those at the time of collection. This female was caught together with Microtus ochrogaster, Peromyscus maniculatus, and Perognathus fasciatus and was not in reproductive condition.

Three S. merriami (UNSM 19972-19974) were collected by a field party from Chadron State College at Metcalf Wildlife Management Area, 15 km N Hay Springs, Sheridan County (T33N, R46W, Sec. 24 SW 1/4). These animals were caught in the White River drainage in pitfall traps during the week of 7–13 June 1993. One individual was a male, 1 a female, and the other undetermined. Reproductive condition was not recorded, probably because these specimens were too decomposed. These individuals were caught on a hillside in a grassland opening surrounded by open stands of Pinus ponderosa. Vegetation at this site was dominated by native grasses, including
Andropogon scoparius, Bouteloua hirsuta, B. curtipendula, Calamovilfa longifolia, Stipa sp., and A. gerardii. Other dominant plant species included Yucca glauca, Carex sp., Ambrosia artenmisifolia, and Rhus aromatica.

Another Sorex merriami (UNSM 20927) was captured in a pitfall trap on 24 May 1994 by students from Chadron State College at Gilbert Baker Wildlife Management Area, 8.9 km N, 4 km W Harrison, Sioux County (T32N, R56W, Sec. 8 NW 1/4 of NW 1/4). This animal was captured in the White River drainage in a grassland/shrub opening surrounded by open Pinus ponderosa forests. Vegetation on this slope is dominated by Poa pratensis, Bromus tectorum, Rosa arkansana, Ambrosia psilostachya, Lepinys sp., and Yucca glauca. Scattered clumps of Artemisia frigida are present, and the shrew was captured within a large cluster of this shrub. This male was in reproductive condition, based on its enlarged testes (4 × 3 mm), and was captured together with Peromyscus maniculatus.

Finally, 3 Sorex merriami were collected by one of us (RAB) at 3 different sites in Dawes County on the night of 3–4 December 1996, 40–41 km S Chadron (UNSM 20914, 20917, 20919). The animals were caught in Sherman live-traps in the drainage of the Niobrara River.

The 1st site, where UNSM 20914 was captured (S shoulder Dunlop Road, 6.8 km W Highway 385; T29N, R49W, Sec. 34 NE 1/4), is a moderately steep embankment covered with a mix of Andropogon scoparius, Bouteloua curtipendula, B. hirsuta, Bromus inermis, Agropyron cristatum, Agropyron smithii, Panicum virgatum, Helianthus petiolaris, Ambrosia artenmisifolia, and Bromus tectorum. Three of these species (Bromus inermis, B. tectorum, and Agropyron cristatum) are introduced. Immediately adjacent to this site is a dry, open grassland, gradually sloping down to the Niobrara River <1 km to the south. This individual was a male with testes measuring 1.5 × 1 mm.

The 2nd site, where UNSM 20917 was captured (S shoulder Dunlop Road, 6 km W Highway 385; T29N, R49W, Sec. 35 NW 1/4), is 0.8 km E of the previous site, similar vegetation is located adjacent to the same open grassland, and also is a moderately steep embankment. Both sites are disturbed, roadside shoulder habitat, and grasses appear to have been planted following road construction. This female contained no embryos.

The 3rd site, where UNSM 20919 was captured (E shoulder Highway 385, 2 km S Lembke Road; T29N, R48W, Sec. 28 NW 1/4 of NW 1/4), is a less disturbed site, dominated in part by introduced grasses (Bromus inermis, B. tectorum, and Agropyron cristatum). Other dominant plants include Andropogon scoparius, Calamovilfa longifolia, Bouteloua hirsuta, B. curtipendula, Yucca glauca, Helianthus petiolaris, and Opuntia sp. Adjacent to this site are hills covered with native prairie. This individual was a female with no embryos.

The following small mammals were captured with these last 3 Sorex merriami: 22 Microtus ochrogaster, 16 Reithrodontomys megalotis, 1 R. montanus, 14 Peromyscus maniculatus, and 4 Sorex cinereus (120 traps were set at these 3 sites).

Cranial measurements were recorded from the new specimens following Diersing and Hoffmeister (1977). These values (mean [standard error; range], all in mm except where noted), together with the standard external measurements, are as follows: total length 92.62 (1.78; 87–100); length of tail vertebrae 36.12 (1.36; 30–42); length of hind foot 11.96 (0.29; 10.6–13); height of ear 6.71 (0.40; 5–8); mass in grams 3.56 (0.24; 2.7–5); breadth of maxilla 5.09 (0.05; 4.8–5.36); length of skull 15.28 (0.11; 14.64–15.68); breadth of braincase 8.10 (0.08; 7.6–8.48); breadth of upper toothrow 4.80 (0.07; 4.56–5.2); length of upper toothrow 5.96 (0.05; 5.84–6.32); length of complex toothrow 4.18 (0.04; 4.4–4.4); length of unicuspid toothrow 1.95 (0.03; 1.84–2.08); and breadth of zygomatic plate 1.26 (0.04; 1.04–1.36). Six of 8 new specimens fall within the range of measurements of 102 Sorex merriami collected throughout the western United States, reported by Diersing and Hoffmeister (1977). The remaining 2 animals, however, have measurements that fall below these ranges. One individual (UNSM 20921) falls outside the range on 4 characters. Those characters and their values (as well as the range presented in Diersing and Hoffmeister [1977]), all in mm, are as follows: breadth of maxilla 4.50 (4.91–5.62); length of skull 14.64 (14.99–16.57); breadth of braincase 7.60 (7.83–8.92); and breadth of upper toothrows 4.56 (4.65–5.21).

Despite its small size, this individual is identified as Sorex merriami using keys presented in Jones et al. (1983), Hoffmeister (1986), and Carraway (1995). One other individual reported
herein (UNSM 19973) has a hind foot measurement (10.6 mm) less than the range presented by Diersing and Hoffmeister (1977; 11–14 mm). If we compare data from the new specimens only to those shrews reported by Diersing and Hoffmeister (1977) collected on the Great Plains, the shrews presented herein extend the known size range for every measured character except length of upper toothrow.

Age of the new specimens of Sorex merriami was estimated by the amount of tooth wear (Churchfield 1990), especially the degree of wear on unicuspids and cusps of the molariform teeth. Four specimens captured in late May/early June have very little to no tooth wear (UNSM 19972–19974, 20921), indicating they are young-of-the-year. Three specimens captured in December 1996 also have light tooth wear (UNSM 20914, 20917, 20919) and were likely born in the spring of that same year. The individual captured in late May 1994 (UNSM 20927) has substantial tooth wear and was probably born in the spring of 1993. This animal is also the only new specimen reported herein that was in reproductive condition. The specimen of Sorex merriami collected by Freeman et al. (1993) is very similar to this new specimen in age and sex characteristics; it was captured in June, has enlarged testes, and also has substantial tooth wear.

None of the specimens of Sorex merriami reported here was molting. Molt in this species apparently occurs in April and then again in October and November (Jones et al. 1983).

The collection of these specimens of Sorex merriami broadens the view of the biology of this species in the Great Plains portion of its geographic range. Their capture extends the known range of the species in the state to the north and south, suggesting that it may be distributed continuously across the northwestern corner of Nebraska. The habitat in which these shrews was captured also is different from that previously described for this species on the Great Plains (McDaniel 1967, Freeman et al. 1993, Mullican 1994). Three of the shrews were captured in disturbed roadside vegetation dominated in part by introduced grasses. Four other specimens were captured in small grassland openings surrounded by open forests of ponderosa pine. The 3 previously reported specimens from the Great Plains were captured in sage/grassland habitats (Freeman et al. 1993, Mullican 1994) or along the edge of a wet meadow (McDaniel 1967). Elsewhere, Merriam’s shrews have been captured in association with ponderosa pine and other conifers in Arizona and southern Colorado (Hoffmeister 1956, 1986). In addition, this is the 1st time in Nebraska that several Merriam’s shrews have been captured in a short period of time (3 in 1 night in 1 instance), suggesting the species may be more common in the state than previously thought. Finally, this is one of the 1st reports of surface activity of this species in winter conditions. Temperatures reached a low of −6°C during the night that Sorex merriami was caught in December 1996.

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