Sorex monticolus in shrub steppe habitat in the northern Great Basin

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Sorex monticolus occurs from northern Alaska to northwestern Mexico and from the Pacific coast to the western edge of the Great Plains (Smith and Belk 1996). It is commonly found in high-elevation spruce-fir forest, alpine tundra, and mid-elevation Douglas-fir–pine forests throughout most of its range, and pinyon-juniper woodlands in the northern Great Basin (Hennings and Hoffmann 1977). We report herein the 1st record of S. monticolus in Owyhee Co., Idaho, and briefly discuss some implications of its occurrence in the shrub steppe habitat of the northern Great Basin.

While conducting small mammal surveys, we used \(3 \times 3 \times 10^7\) Sherman live-traps baited with oatmeal and millet and placed them in \(5 \times 5\) trap grids in various shrub steppe vegetation communities. We separated all traps by 15 m. On each of 2 consecutive nights (31 October and 1 November 1996) we captured 1 S. monticolus in shrub steppe habitat in different traps adjacent to one another. The capture site was at an elevation of 1792 m in Owyhee Co., Idaho, approximately 140 km south of Boise (Fig. 1). We found both shrews dead in the traps the mornings following trapping. Some patches of snow covered the ground during the survey period, and ambient temperatures during the 2 nights of trapping ranged from \(-6^\circ\) C to \(+1^\circ\) C.

Shrub steppe vegetation in the area is generally characterized by large expanses of low sagebrush (Artemisia arbuscula) surrounding patchily distributed “islands” of tall-shrub communities found in areas of greater moisture (i.e., north-facing slopes and lee sides of hills where snowpack accumulates in the winter). We captured the shrews in a trapping grid located in a tall-shrub (ca 1.5 m) island dominated by big sagebrush (Artemisia tridentata) and antelope bitterbrush (Purshia tridentata). Herbaceous understory in the area is composed of both perennial and annual grasses and a variety of post-senesced forbs dominated by species of Phlox. We located the trapping grid on a 10% slope with a north aspect, where microbiotic crust consisting of mosses and lichen carpeted the ground below the shrubs and some litter in the form of dead branches was present. Compared to the surrounding area that has been exposed to moderate grazing, livestock impact in the trapping grid is minimal. Several ephemeral springs and drainages are located ca 1.6 km from the capture site, but riparian vegetation is absent and evidence of heavy livestock usage is apparent. The nearest perennial water source with riparian vegetation is located ca 3.2 km S at Crab Creek.

Eric Yensen of Albertson College of Idaho (AC) identified the specimens, which were prepared as standard study skins and skulls and deposited in the AC Museum of Natural History (ACMN 1008 and 1009). The specimens were identified based on dentaries (Carraway 1995). The medial tines of the upper incisors of both specimens were large and located well below the upper limit of the red pigment. We confirmed the identifications by comparison to specimens of S. monticolus and S. vagrans in the ACMNH. The pelages of both S. monticolus were distinctly “dusky” as compared to specimens of S. vagrans from Owyhee Co., Idaho, in ACMNH, which were lighter and brownish. Both shrews were young females with no placental scars.
Sorex monticolus, common in Idaho, is usually considered a montane species associated with high-elevation spruce-fir forests or alpine tundra (Zeveloff 1988, Alexander 1996). The capture site of these 2 specimens is located over 100 km from spruce-fir forests. Hennings and Hoffmann (1977) also report S. monticolus as occurring in pinyon-juniper woodlands in the northern Great Basin. Ports and George (1990) suggested that shrews in the Great Basin may be very flexible in their foraging habits. Other studies have shown that besides dense ground cover, S. monticolus is weakly associated with physical or vegetation structure variables (Hawes 1977, Terry 1981, Doyle 1989, Belk et al. 1990). In addition, S. monticolus reportedly is less dependent on water and tolerates drier soils than the sympatric S. vagrans (Hennings and Hoffmann 1977). Flexibility in foraging habits, less reliance on a particular vegetation structure (i.e., high- to mid-elevation forests), and tolerance of xeric conditions may explain S. monticolus presence in shrub steppe habitat in the northern Great Basin.

Recent reports of the bushy-tailed woodrat (Neotoma cinerea) in the northern Great Basin (Grayson et al. 1996) have brought into question long-held assumptions on the distribution and habitat tolerance of alleged “montane” species. Furthermore, current static Great Basin small mammal biogeography models (i.e., “nested subset model”; Patterson and Atmar 1986) fail to adequately assess the wide range of geographical and biological variability that have produced the modern distribution of these species, especially in the northern Great Basin (Grayson et al. 1996). In the Great Basin, S. monticolus, like N. cinerea, has been considered a member of an assemblage of small mammals currently distributed on isolated mountain ranges (Brown 1971). The occurrence of S. monticolus in shrub steppe refutes this assumption and supports the call of Grayson et al. (1996) for a more dynamic view of Great Basin small mammal biogeography.
We suggest that *S. monticolus* may occur in shrub steppe habitat in the northern Great Basin more often than is currently thought and that shrews previously collected in the Owyhee Desert region may have been misidentified due to the difficulty of identifying species of the *vagrans-monticolus* complex (Hennings and Hoffmann 1977, Hall 1981, Woodward 1994).

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