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SAVANNAH SPARROWS NESTING IN ALPINE HABITAT IN WYOMING

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Abstract.—Three Savannah Sparrow (*Passerculus sandwichensis*) nests were found in alpine willow habitat at 3150 m elevation in the Beartooth Mountains of northern Wyoming, USA during July 1988. These are the first documented alpine nests for this species south of Canada. The nesting conditions are described and discussed in terms of a recent colonization of alpine habitat by a small, expanding population of Savannah Sparrows. We note that a population of Lincoln's Sparrows (*Melospiza lincolnii*) found at this site in 1963 and 1964 is no longer present. Possibly the extinction of Lincoln's Sparrows and the colonization by Savannah Sparrows are causally related.

INDIVIDUOS DE *PASSERCULUS SANDWICHENSIS* ANIDANDO EN HABITAT DE SAUCE ALPINO EN WYOMING

Sinopsis.—Tres nidos de *Passerculus sandwichensis* fueron encontrados a 3150 m. de altura en las Montañas Beartooth al norte de Wyoming, en hábitat clasificado como sauce alpino. Estos son los primeros nidos documentados para este tipo de gorrión en hábitat alpino al sur de Canada. Las condiciones de anidamiento se describen y se discuten en términos de la colonización reciente y expansión poblacional por parte de esta especie hacia el hábitat alpino. Notamos que una población de *Melospiza lincolnii* encontrada en la misma localidad en 1963 y 1964 ya no esta presente en el área. Posiblemente la extinción del Gorrión de Lincoln, y la colonización por parte de *P. sandwichensis* esten relacionadas.

Savannah Sparrows (*Passerculus sandwichensis*) nest in a variety of "open-field" habitats throughout North America, including arctic and subarctic tundra (Bent 1968). However, this species is rarely reported breeding in alpine tundra habitats, the few available records being from northern British Columbia (Weeden 1960) and the Yukon (Rand 1946). Breeding distribution of this species in mountainous terrain south of the Canadian border includes high mountain meadows, but not sites above treeline (Bailey and Niedrach 1965, Burleigh 1972, Grinnell and Miller 1944, Hayward 1952, Hendricks and Norment 1986, Johnson 1966, Pattie and Verbeek 1966). We report on Savannah Sparrows nesting in alpine habitat in northern Wyoming, and consider their occurrence as a recent colonization event.

Our observations were made in the Beartooth Mountains near Beartooth Pass, Park County, Wyoming at about 3150 m elevation. This site has been used for previous studies of alpine birds (Hendricks 1987a, 1987b; Hendricks and Norment 1986; Pattie and Verbeek 1966; Verbeek

1967, 1970). Such studies make the study site valuable for detecting historical changes in composition and structure of the alpine bird community. The physiography and vegetation of the site are described in Johnson and Billings (1962) and Pattie and Verbeek (1966).

We found three Savannah Sparrow nests at our Beartooth Pass study site during the summer of 1988. All nests were placed on the ground under small (15 cm) overhanging patches of dwarf willow (*Salix* sp.). Nest 1 was found on 4 Jul. and contained five eggs. Nest 2 was found on 16 Jul., and nest 3 was located 17 Jul.; these nests contained five and four nestlings, respectively. Three eggs of nest 1 hatched on 15 Jul., a fourth egg hatched on the 16th, the final egg never hatched, but contained a well-developed embryo. Two nestlings fledged from nest 1 on 26 Jul., 11 d after hatching; the other two nestlings died 1 and 8 d after hatching, and were removed, presumably by a parent bird, from the nest within 24 h after death. All nestlings from nests 2 and 3 fledged, on 24 Jul. and 21–22 Jul., respectively.

The nestlings from nest 2 weighed 5.5–9.2 g on the day the nest was found (16 Jul.). This would be day 3 after hatch day, assuming an 11-day nestling period as indicated by events at nest 1 and observations of nestling periods and weights in Newfoundland (Threlfall and Cannings 1979). The range in nestling weights at nest 2 suggests that hatching was asynchronous in this brood, as was the case with the brood of nest 1. Such disparity of nestling weights was not evident in the larger (older) nestlings of nest 3 (10.0–12.9 g on 17 Jul.) approximately day 5–6 after hatch day (Threlfall and Cannings 1979).

We believe that three additional Savannah Sparrow pairs nested in the same locality, but were unable to find their nests. On numerous occasions we saw singing males and pairs carrying food to areas removed from our known nests. We estimated the breeding density of Savannah Sparrows to be six pairs in an area roughly 500 × 200 m, or 0.6 pairs ha^{-1} in the wet and moist meadow habitat types defined by Pattie and Verbeek (1966).

The occurrence of a small alpine breeding population of Savannah Sparrows at the Beartooth Pass site is particularly interesting with regard to previous observations on the alpine avifauna of the Beartooth Mountains. Pattie and Verbeek (1966) considered the Savannah Sparrow to be a rare visitor to the alpine at Beartooth Pass, and reported only three observations in three different years (1961, 1963, 1964), all in late summer. Hendricks and Norment (1986) failed to detect nesting Savannah Sparrows in the alpine (including Beartooth Pass) during the period spanning 1980–1984. In the summer of 1987 we noted 2–3 singing male Savannah Sparrows in the willow bottom habitat (moist and wet meadow habitat types) at Beartooth Pass but found no nests. In 1988 there were probably six nesting pairs at the same site, as described above, and this many pairs were again present in 1989. Thus, the Savannah Sparrows at Beartooth Pass appear to represent a small expanding population that has recently colonized (recolonized?) the alpine willow habitat. Source populations from which the colonizing birds may have originated are

present in several subalpine meadows within 6 km of the pass site, especially wet meadows near several lakes SW of the pass.

Interestingly, a small population of Lincoln's Sparrows (*Melospiza lincolnii*) reported by Pattie and Verbeek (1966) in 1963 and 1964 was no longer present in the willow bottom habitat in 1983, 1984, and 1987–1989 where Savannah Sparrows now occur. It is unknown whether or not the colonization of the willow habitat by the Savannah Sparrows is causally correlated to the extinction of the Lincoln's Sparrows from the same habitat. Nevertheless, our preliminary observations indicate the dynamic nature, whatever the cause, of alpine bird community composition in this little-studied biome.

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