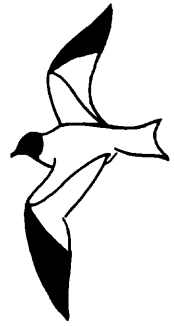


# WESTERN BIRDS



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## **THE TIMBERLINE SPARROW, *SPIZELLA (BREWERI) TAVERNERI*, IN ALASKA, WITH NOTES ON BREEDING HABITAT AND VOCALIZATIONS**

TERRY J. DOYLE, Tetlin National Wildlife Refuge, P. O. Box 779, Tok, Alaska 99780

The Timberline Sparrow was originally described as a full species, *Spizella taverneri*, by Swarth and Brooks (1925), who distinguished it from Brewer's Sparrow, *Spizella breweri*, by its darker color, heavier streaking, and larger average size but smaller, slenderer, darker bill. Subsequently, ornithologists have classified the Timberline Sparrow as a subspecies of Brewer's, though Sibley and Monroe (1990) ranked it as a full species again, on the basis of unpublished differences in vocalizations and ecology.

The published breeding range of *taverneri* extends from southwestern Yukon Territory, northwestern and central British Columbia, and west-central Alberta to southeastern British Columbia and southwestern Alberta (AOU 1957), where it approaches the north end of the range of nominate *breweri*. The winter range is poorly known, with most U.S. specimens taken during migration, in Arizona (Monson and Phillips 1981), New Mexico (Grinnell 1932), Texas (Oberholser 1974), and Washington (Jewett et al. 1953). Only one winter specimen has been reported, from California (Rea 1967), suggesting a winter range south of the U.S.

On 22 June 1992, Jeffrey J. Bouton of the National Park Service found a singing male Timberline Sparrow in the Nutzotin Mountains of Alaska, 100 km northwest of the species' closest known location in Yukon (Clarke 1945, Pamela H. Sinclair in litt.). Over the following four years I studied the occurrence and status of this species in Alaska. I characterized its habitat, recorded songs, and collected specimens (University of Alaska Museum, Fairbanks) to document its occurrence and to help shed light on the relationship between *taverneri* and nominate *breweri*.

### STUDY AREA

I searched a 15-km<sup>2</sup> area near Gold Hill from 1993 to 1995 and an 8-km<sup>2</sup> area in the Upper Cheslina drainage from 1994 to 1996 (Figure 1). In addition,

## THE TIMBERLINE SPARROW IN ALASKA

an independent group visited Gold Hill in 1996. Gold Hill is in the Nutzotin Mountains 10 km northeast of Chisana, Alaska (62° 06' N, 141° 54' W). The Upper Cheslina drainage is in the Mentasta Mountains 80 km northwest of Gold Hill (62° 39' N, 142° 44' W). The Mentasta and Nutzotin mountains are part of the Alaska Range, which extends east to the White River in Yukon (Orth 1971); the Kluane Range continues east of the White River.

Habitats within the Gold Hill and Upper Cheslina areas are similar (Figure 2) and may be described with Kessel's (1979) nomenclature. Unvegetated scree slopes of rugged mountain peaks, elevation 2300–2600 m, descend to rolling foothills of alpine and subalpine vegetation. Mats of dwarf shrubs, <0.4 m high, in the alpine zone give way to subalpine habitat at approximately 1500 m in the Gold Hill area and 1300 m in the Upper Cheslina. The alpine zone descends much lower on north-facing slopes. Subalpine vegetation on south-facing slopes is composed of patchy open and closed thickets of medium willows (*Salix* spp.) and alders (*Alnus crispa*), 1.2–2.4 m high, with Dwarf Birch (*Betula nana*) a common component of the understory. Thickets of low shrubs, 0.4–1.1 m high, dominate the subalpine zone of north-facing slopes. Dwarf spruce (*Picea* spp.) woodlands, <5.0 m high and <20% canopy cover, occur at elevations below the subalpine zone, along with closed thickets of tall willow and alder, 2.5–4.9 m high.

## RESULTS

### Status in Alaska

Timberline Sparrows were observed in the Gold Hill area each year from 1992 to 1996. Observations included an adult feeding a recently fledged juvenile in 1993 (Figure 3), birds gathering food in 1996, and up to six singing males within 8 km<sup>2</sup> in 1994 (Table 1). A singing male was in the Upper Cheslina drainage in 1994 but not in 1995 or 1996. Elsewhere, a singing male at sea level in southeast Alaska at Hyder, 3–5 June 1996, is the only Alaska record away from the breeding ground.

All but one of the Alaska observations have been during the breeding season, from mid-June to mid-July. A reconnaissance of the Gold Hill area 3–5 June 1995 failed to disclose a single Timberline Sparrow even though all of the regular breeding birds of the area were present (Upland Sandpiper, *Bartramia longicauda*; Say's Phoebe, *Sayornis saya*; Horned Lark, *Eremophila alpestris*; Townsend's Solitaire, *Myadestes townsendi*; American Pipit, *Anthus rubescens*; Orange-crowned Warbler, *Vermivora celata*; Wilson's Warbler, *Wilsonia pusilla*; American Tree Sparrow, *Spizella arborea*; Savannah Sparrow, *Passerculus sandwichensis*; White-crowned Sparrow, *Zonotrichia leucophrys*; Smith's Longspur, *Calcarius pictus*). A later trip, 25–26 June 1995, revealed three Timberline Sparrows in locations where they had been present in prior years. The earliest that Swarth (1936) found the sparrows in the Atlin region of British Columbia was 29 May, and recent arrivals near Whitehorse, Yukon, have been from 29 to 31 May (Cameron D. Eckert, Pamela H. Sinclair in litt.). The observation at Hyder in early June suggests that the birds are still migrating at that time. It is not surprising that the Timberline Sparrow arrives relatively

THE TIMBERLINE SPARROW IN ALASKA

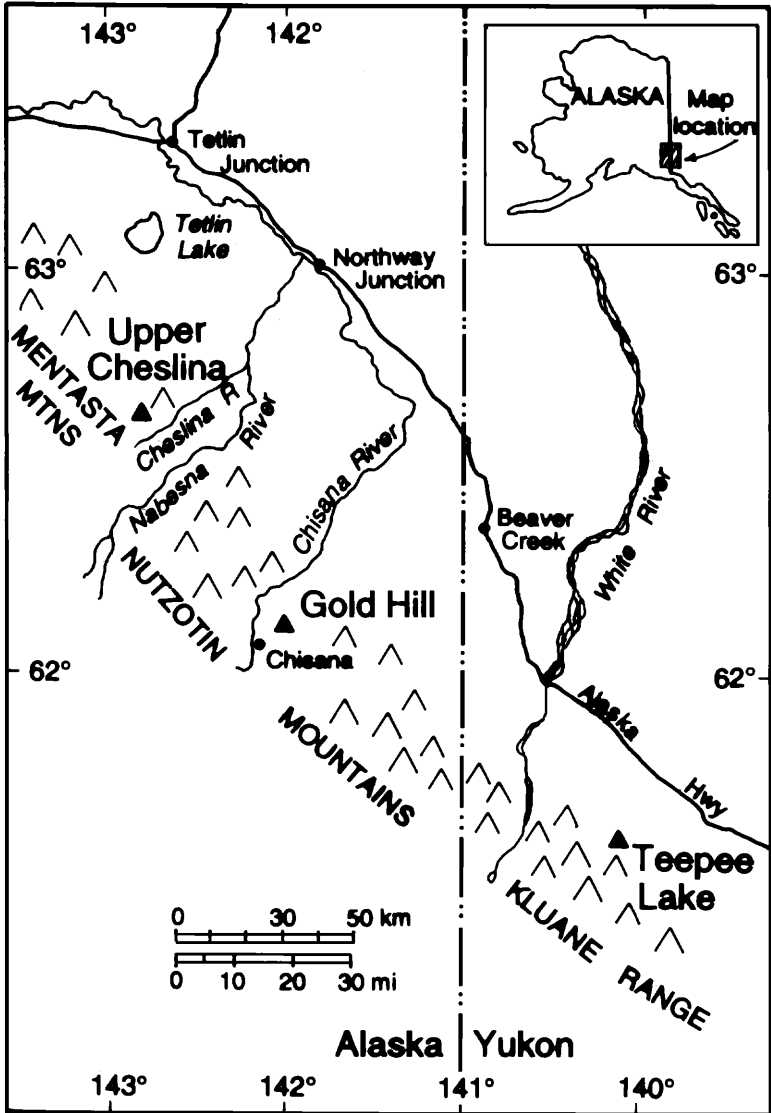


Figure 1. Locations of Timberline Sparrow records in Alaska and adjacent Yukon Territory are denoted by solid triangles.

late in the Gold Hill area, given that the known breeding range in Alaska is farther north than that in Yukon and British Columbia.

Despite the sparrows' late arrival on the breeding ground, their singing seemed to diminish by early July. The latest that they were found singing was

## THE TIMBERLINE SPARROW IN ALASKA



Figure 2. Breeding Timberline Sparrows in Alaska were found on south-facing slopes at the transition of the alpine and shrubby subalpine zones. The habitat in which they were found almost exclusively was thickets of shrubby willows 1.0–1.2 m high with a Dwarf Birch understory 0.4–0.5 m high. This habitat did not occur on north-facing slopes within the area studied, as seen on the right side of this canyon.

*Photo by Terry J. Doyle*

4 July. Three were seen but not heard singing in the Gold Hill area from 2 to 17 July, and the singing male in the Upper Cheslina drainage was not heard three weeks later, on 15 or 16 July.

Departure dates are unknown, but Swarth (1936) found Timberline Sparrows on the breeding grounds near Atlin, British Columbia, until early September.

### Habitat

I found breeding Timberline Sparrows in Alaska to be restricted to a narrow band at the transition between the subalpine and alpine zones, vegetated with low to medium thickets of willows (Figure 2). Average canopy height ranged from 1.0 to 1.2 m, canopy cover from <25% to 50%. *Salix glauca* was the dominant willow; *S. planifolia* and *S. brachycarpa* were less common. Dwarf Birch was the primary component of the next tallest shrub layer, with *Vaccinium uliginosum* and *Potentilla fruticosa* as subdominants. Average canopy height of this layer was 0.4–0.5 m, and canopy cover was <25%–75%. Ground cover included *Rhododendron lapponicum*, *Salix reticulata*, *Poa* sp., *Carex* sp., *Mertensia* sp., and trace amounts of ferns, mosses, and lichens.

## THE TIMBERLINE SPARROW IN ALASKA



Figure 3. This adult Timberline Sparrow was feeding a recently fledged juvenile at Gold Hill on 17 July 1993, providing the first documented record for Alaska.

*Photo by David W. Sonneborn*

All Timberline Sparrows were found on rather steep (30–40°) south- to southeast-facing slopes at 1460 to 1525 m in the Gold Hill area and at 1325 m in the Upper Cheslina. Below this elevation shrubs are taller and canopies more closed; above, the vegetation quickly changes to mats of dwarf shrubs. Timberline Sparrows were found in contiguous bands of willow thickets rather than in small patches of willows. Some individual Timberline Sparrows appeared to prefer the micro relief in ravines, which has also been observed in Yukon (Cameron D. Eckert pers. comm.). No Timberline Sparrows were found on north-facing slopes, which lack the medium-height thickets of willows.

The habitat in which Timberline Sparrows occurred was quite predictable. I flew over the Gold Hill area in 1994 in a fixed-wing aircraft and identified potential Timberline Sparrow habitat on the basis of the prior year's field work. All potential Timberline Sparrow habitat, within the 15 km<sup>2</sup> surveyed on the ground, had singing males in 1994. No Timberline Sparrows were found outside the identified habitat. In 1995 I identified potential Timberline Sparrow habitat from a fixed-wing aircraft over a 4600-km<sup>2</sup> area in the Mentasta and Nutzotin mountains from northwest of the Upper Cheslina drainage to the Yukon border. Approximately 61 linear kilometers of potential habitat were identified, the majority between Gold Hill and the Canadian border. Several areas more extensive than those investigated in this study were identified, as were several small patches <1 km long. Nearly all identified habitat was on steep south-facing slopes, consistent with that found at Gold Hill and the Upper Cheslina.

THE TIMBERLINE SPARROW IN ALASKA

**Table 1** Dates, locations, and observers of Timberline Sparrow sightings in Alaska.

Date	Location	Observations	Observers
22 June 1992	Gold Hill	One singing male	Jeffrey J. Bouton
17 July 1993	Gold Hill	Adult feeding a recently fledged juvenile	T. J. Doyle, Philip D. Martin, David W. Sonneborn
18–19 June 1994	Gold Hill	Six singing males	T. J. Doyle
24 June 1994 <sup>a</sup>	Upper Cheslina	One Singing male	T. J. Doyle, Ryan C. Means
25–26 June 1995 <sup>b</sup>	Gold Hill	Three singing males	T. J. Doyle, Gary H. Rosenberg
3–5 June 1996	Hyder	One singing male	T. J. Doyle
2–4 July 1996	Gold Hill	Four birds, two singing males and two gathering food	Cari E., Kevin H., and Robert E. Gill, Colleen M. Handel, Lisa J. Oakley, Theodore G. Tobish, Margaret M. Vacca

<sup>a</sup>No birds were found in the Upper Cheslina 15–16 July 1994, 27–29 June 1995, or 26 June 1996.

<sup>b</sup>No birds were found in the Gold Hill Area 3–5 June 1995.

The migrant bird in Hyder was found in scattered shrubs and Sitka Spruce (*Picea sitchensis*), up to 2 m tall, along a gravel causeway adjacent to a saltgrass meadow.

Plumage and Morphometric Comparison

Specimens collected (UAM 6669, 6670, and 6939) for this study agree with *taverneri* and differ from nominate *breweri* in being slightly larger with a more slender bill that is much darker (Figure 4). Measurements of the three Alaska specimens of *taverneri* (all males) were weight 11.8–13.7 g, wing chord 64–66.5 mm, and tail length 56–64.6 mm, in comparison to weight 9.8–11.5 g, wing chord 60.6–64.5 mm, and tail length 58.5–67.0 mm for the 10 male *S. b. breweri* reported by Swarth and Brooks (1925). The plumage of *taverneri* is darker overall with wide dark brown dorsal streaks on a dark gray ground color, in contrast to lighter and narrower brown streaks on a sandy brown ground color in *breweri* (Figure 5); in many plumage characteristics such as its coarser dorsal streaking, fairly well defined grayish nape, suggestion of a median line through the crown, and fairly distinct superciliary, *taverneri* is intermediate between *breweri* and the Clay-colored Sparrow (*S. pallida*).

Song

The songs of *breweri* and *taverneri* are superficially similar. Both are complex songs composed of a variety of trills at different pitches and tempos. Closer examination, however, reveals differences (Figure 6). I

## THE TIMBERLINE SPARROW IN ALASKA



Figure 4. Lateral comparison of two *S. b. breweri* from Utah and Wyoming and three *S. (b.) taverneri* from Alaska (left to right, UAM 2300, 2904, 6939, 6669, and 6670), showing *taverneri* as larger with a more slender, darker bill and a fairly distinct supercilary.

Photo by Barry J. McWayne

compared four songs of an individual *taverneri* (Library of Natural Sounds 73301, Cornell University) to three songs of *breweri* from Wyoming, California, and Oregon (Peterson 1975). I identified 10 different parts in the three songs of *breweri*. They tend to be more buzzy, and parts of them (Figure 6, 1b) resemble the buzzy notes of the Clay-colored Sparrow's song from Peterson (1975). A series of descending sweet notes is the only part repeated (Figure 6, 2) and has no similar counterpart in *taverneri*. The

THE TIMBERLINE SPARROW IN ALASKA

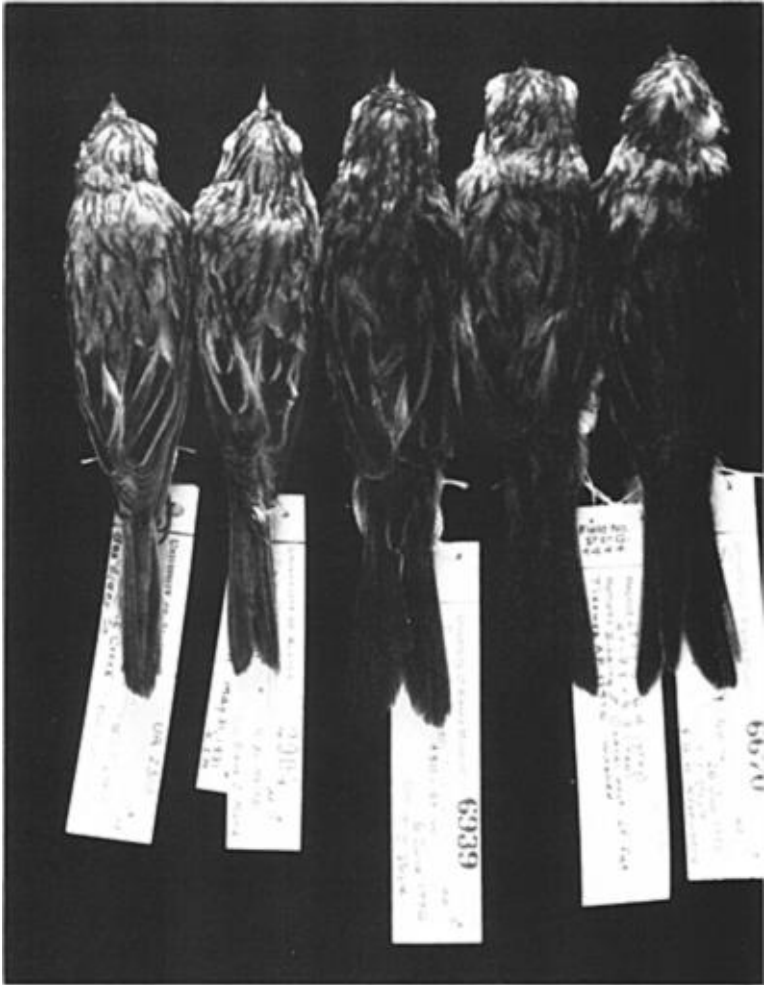


Figure 5. Dorsal comparison of two *S. b. breweri* from Utah and Wyoming and three *S. (b.) taverneri* from Alaska (left to right, UAM 2300, 2904, 6939, 6669, and 6670), showing *taverneri* as larger with coarser dorsal streaking, a fairly well defined grayish area between streaking of the head and back, and a suggestion of a median line through the crown.

Photo by Barry J. McWayne

Timberline Sparrow's song contains seven distinct segments, many of which were repeated during the same or subsequent bouts. It tends to have more trills similar to those of a junco (Figure 6, 1a), with some as high-pitched as a waxwing's call. The trills of *breweri* are of a wider frequency range (Figure



## THE TIMBERLINE SPARROW IN ALASKA

6, 1b) than those of *taverneri*, accounting for their buzziness. The most similar part of the two forms' songs is a two-toned trill that varies in pitch and tempo; that part of the *breweri* song (Figure 6, 3b) falls within the range performed by *taverneri* (Figure 6, 3a).

Playback of the *taverneri* song in the Gold Hill area produced a more aggressive response of Timberline Sparrows than did playback of the *breweri* song.

## DISCUSSION

The Timberline Sparrow appears to be an annual breeding member of the Alaska avifauna. It is locally distributed and uncommon in suitable habitat. How long it has occurred in Alaska is unknown. Given that there are records from Yukon within 45 km of Alaska, potential habitat in adjacent Alaska, and the remoteness of the area, it is most likely that Timberline Sparrows were simply overlooked until recently.

More extensive breeding habitat probably exists away from the areas investigated in this study. I suspect that the Timberline Sparrow is more widespread in Alaska with breeding populations occurring along the Nutzotin Mountains from Gold Hill to Yukon. The breeding range probably extends northwest of the Gold Hill area into the Mentasta Mountains, perhaps northwest of the Upper Cheslina drainage, where some limited habitat has been identified. Though the habitat may be more extensive than is currently known, it appears restricted to the edge between alpine and subalpine habitats, on primarily south-facing slopes. There are no immediate threats to this habitat, most of which is located on National Park Service and National Wildlife Refuge lands.

The habitat in which *taverneri* occurs in Alaska differs subtly from that in other parts of its range, but dramatically from that of nominate *breweri*. In Alaska the breeding habitat of *taverneri* is farther above timberline than in British Columbia where the bird was first discovered (Swarth 1926) and in some areas in Yukon where it is known currently. At the southern end of its range, *taverneri* is associated primarily with Dwarf Birch (Bruce W. McGillivray in litt.) rather than willows, and occurs at higher elevations (Jon C. Barlow pers. comm.). At these southern latitudes, Dwarf Birch at higher elevations is similar in structure to the willows associated with *taverneri* in Alaska (Jon C. Barlow pers. comm.). The montane habitat in which *taverneri* is found is quite different from the sagebrush steppes (*Artemisia* spp.) with which *breweri* is associated (Wiens and Rotenberry 1981).

Though superficially similar, upon close examination the songs of *taverneri* and *breweri* seem quite different and should be easily distinguishable in the field. Only a few individuals were compared during this investigation. A more thorough study of the geographic variation in song might shed light on the taxonomic status of *taverneri*. In addition, a genetic analysis of *taverneri* and nominate *breweri* may be helpful in defining their taxonomic status. Preliminary genetic work is currently being conducted (Robert M. Zink in litt.).

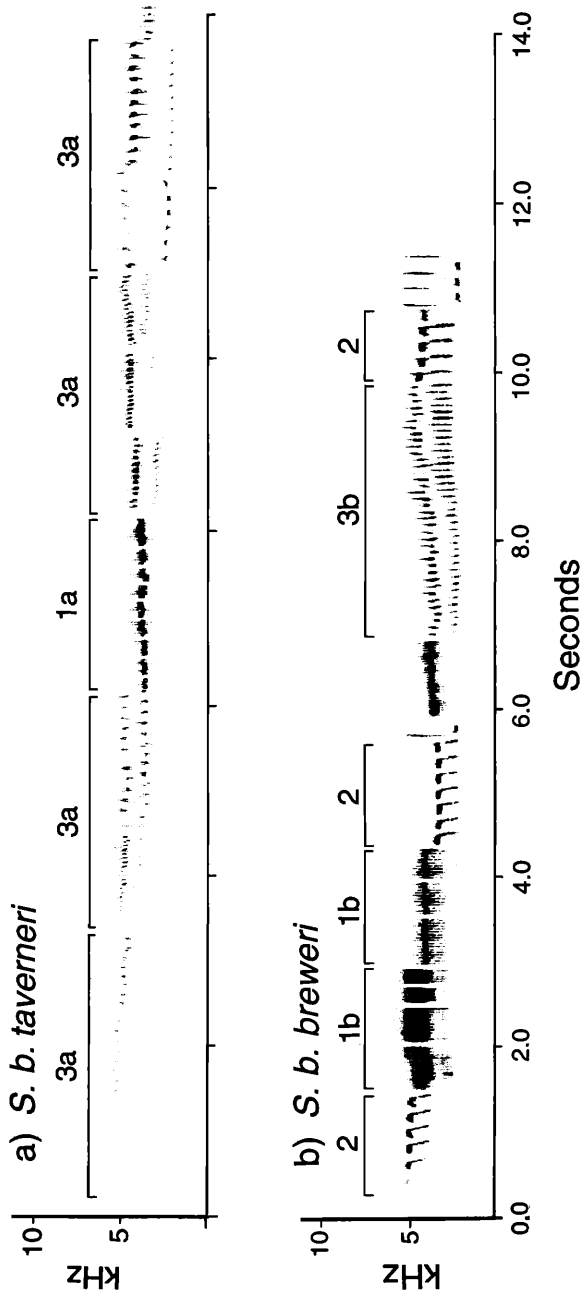


Figure 6. Sonogram of the extended song of *S. b. taverneri* from Alaska (top, Library of Natural Sounds 73301, Cornell Univ., UAM 6670) and *S. b. breweri* from Oregon (bottom, Peterson 1975). The trills of *breweri* (1b) are of a wider frequency range than those of *taverneri* (1a), accounting for their buzziness. The *breweri* song contains a series of descending sweet notes (2) for which there is no similar counterpart in the *taverneri* song. The most similar part of the song is a two-toned trill that varies in pitch and tempo; that part of the *breweri* song (3b) falls within the range performed by *taverneri* (3a).

## THE TIMBERLINE SPARROW IN ALASKA

### SUMMARY

One of the most recent additions to Alaska's breeding avifauna is the Timberline Sparrow, *Spizella (breweri) taverneri*, first discovered in 1992 in the Nutzotin Mountains, 100 km northwest of the nearest known location in the Yukon Territory. Follow-up surveys revealed the Timberline Sparrow to be uncommon and local. Up to six individuals, including an adult feeding a fledgling, were within 15 km<sup>2</sup> each year from 1992 to 1996. An additional singing male was found 80 km northwest of the Nutzotin Mountain location, and a singing male was found in migration at Hyder. Timberline Sparrows were limited to a narrow band of open thickets of low to medium shrubs at the transition of the alpine and subalpine zones, quite different from the arid lowland sagebrush habitat with which breeding *breweri* is most often associated. The habitat, although fairly limited, appears to be quite predictable. The song of *taverneri* differs from that of *breweri* in being higher pitched, having less buzzy trills, and lacking descending sweet notes.

### ACKNOWLEDGMENTS

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