

Savannah Sparrow *Passerculus sandwichensis*

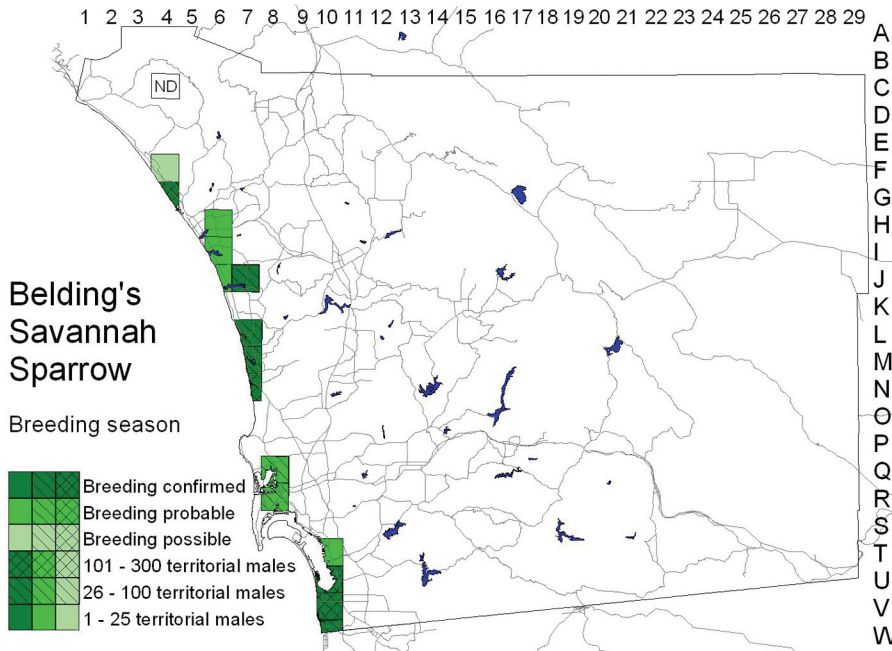
Belding's Sparrow, the nonmigratory subspecies of the Savannah Sparrow endemic to the coast of southern California and northern Baja California, is narrowly restricted to coastal marshes dominated by pickleweed. Recognized as endangered by the California Department of Fish and Game, Belding's Sparrow has been censused statewide five times, most recently in 2001. These results suggest that the bird is holding its own, with a county population of 1105 pairs, but many threats to its habitat persist. Three other subspecies of the Savannah Sparrow, breeding to the north, come to San Diego County as winter visitors only. These subspecies are locally common in open grassy or weedy areas throughout the county and invade the Belding's Sparrow's habitat. Small numbers of yet another subspecies, the Large-billed Sparrow, breeding around the head



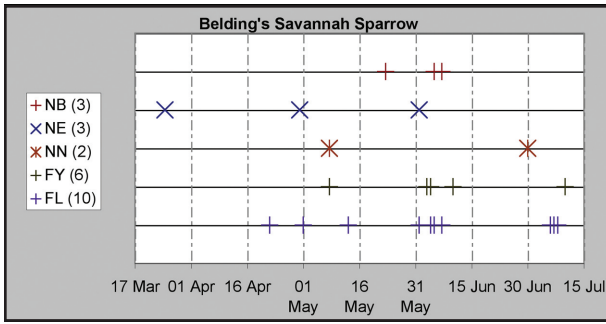
Photo by Anthony Mercieca

of the Gulf of California, visit the coast in fall and winter.

Breeding distribution: Thanks to the work of Richard Zembal and Barbara Massey, the distribution of Belding's



Sparrow in California is known exhaustively. Field work for the atlas did not reveal any sites beyond the ones they have surveyed. The most recent census is that for 2001 (Zembal and Hoffman 2002). It recorded one territory at the Aliso Creek mouth (F4), 172 at the Santa Margarita River estuary (G4), 6 at Buena Vista Lagoon (H6), 22 at Agua Hedionda Lagoon (I6), 66 at Batiquitos Lagoon (J6/J7), 75 at San Elijo Lagoon (L7), 40 at the San Dieguito River lagoon (M7), 129 at Los Peñasquitos Lagoon (N7), 38 at Kendall-Frost Reserve, Mission Bay (Q8), 4 at the FAA island in Mission Bay (Q8), 26 at the San Diego River flood-control channel (R8), 7 at the Paradise Creek marsh, National City (T10), 93



at the Sweetwater River marsh, Chula Vista (U10), 9 at the marsh on the south site of F Street (Lagoon Drive), Chula Vista (U10), 26 at the South Bay Marine Biology Study Area (U10/V10), 102 in the south San Diego Bay salt works (U10/V10), and 289 in the Tijuana River estuary (V10/W10).

Nesting: Belding's Sparrow places its nest in dense marsh vegetation, on or near the ground, concealed from above. Pickleweed, shore grass, and saltwort are recorded as nest plants (Collier and Powell 1998). Nesting success is higher where the marsh plants are denser and taller (Powell and Collier 1998). With 221 sets taken from 1887 to 1952, Belding's Sparrow was one of the species whose eggs were most avidly sought by the early collectors. The breeding activity we observed from 1997 to 2001 was entirely consistent with the dates of the collected sets, 15 March–2 July.

Migration: Belding's Sparrow is sedentary; Collier and Powell (1998) did not find population exchange even between the F Street and Sweetwater marshes, separated by only a quarter mile. Habitat fragmentation is thus a serious concern for this subspecies.

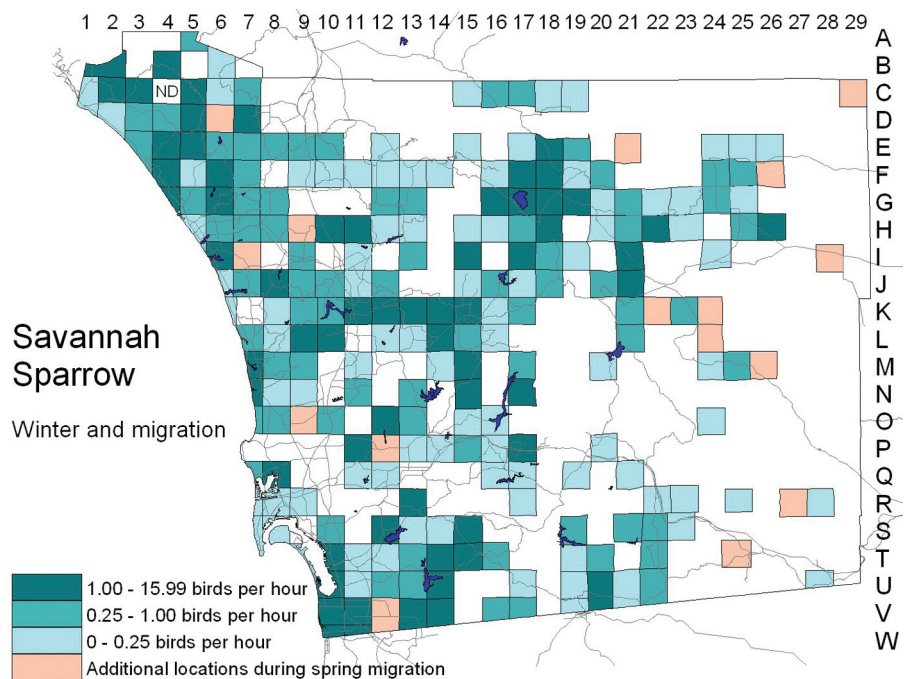
The northern subspecies of the Savannah Sparrow occur in San Diego County mainly from mid or late August to late April. By the first week of May they are rare; the latest was one 0.3 mile north of Indian Hill (R28) 6 May 1998 (J. O. Zimmer). The Large-billed Sparrow's season is shifted earlier. Its current seasonal status is still encompassed by the dates of older specimens, 8 August (1914, National City, T10, SDNHM 34223) to 23 February (1930, Silver Strand, T9, SDNHM 34215).

Winter: In winter the subspecies that come from the north spread widely over San Diego County in grassland (whether it retains any native plants or not), pastures, farmland, weedy open areas, and salt marshes. These visitors are common along the coast and in the inland valleys, with up to 285 in the San

Dieguito River valley east of Lake Hodges (K11) 29 December 2001 (E. C. Hall) and 255 at Sweetwater Reservoir (S12) 18 December 1999 (P. Famolaro). The beds of reservoirs exposed by low water offer Savannah Sparrows habitat: e.g., 60 on the dry floor of upper El Capitan Reservoir (N17) 31 January 2001 (J. R. Barth). In the mountains the Savannah Sparrow is uncommon; maximum counts are only 12, 2–3 miles north of Julian (J20) 27 December 1999 (R. T. Patton), and 10 northeast of Lake Cuyamaca (L21) 27 January 2000 (J. K. Wilson). In the desert it is common only in the Borrego Valley, in agricultural areas or halophytic scrub, where it may flock with Sage, Brewer's, and Vesper Sparrows. Numbers of Savannah Sparrows in the Anza-Borrego Desert did not swing so widely over the atlas' five years as did those of some other sparrows, but they were higher in the first two years of the period than in the three dry later ones. High counts in the desert ranged up to 56 in north Borrego Springs (F24) 20 December 1998 (R. Thériault) and 50 in Sleepy Hollow (H26) 9 February 1998 (M. L. Gabel).

The Large-billed Sparrow is strictly coastal and often mixes in the salt marshes with Belding's. But it occurs just as readily on jetties and beaches among driftwood and kelp. During the atlas period high counts were seven at the Del Mar jetty in Camp Pendleton (G4) 15 November 2001 (P. A. Ginsburg), six near Zuñiga Point on North Island (S8) 11 January 2002, six in the south San Diego Bay salt works (U10) 15 December 2001 (D. C. Seals), and nine at Imperial Beach (V10) 16 December 2000 (C. G. Edwards). Other reported locations include the San Luis Rey River mouth (H5) and the San Diego River flood-control channel (R8). The subspecies could be expected anywhere along the coast of San Diego County.

Conservation: With the elimination of at least 75% of southern California's salt marshes, the range of Belding's Sparrow contracted greatly, especially around Mission



and San Diego bays. Only 1182 hectares of salt marsh are left in San Diego County, some of it seriously degraded, and the birds fill the remaining suitable habitat to capacity. Now, fortunately, most of the Belding's Sparrow's remaining sites are designated as wildlife refuges of various kinds. But, in the delicate balance of its habitat, Belding's Sparrow still walks a tightrope. Nesting success in small, isolated marshes like that at F Street is low to none, so these sites probably act as population sinks (Powell and Collier 1998). The marshes must be flooded regularly enough to sustain the pickleweed and prevent the invasion of upland plants but not so deeply or for so long the birds are precluded from nesting. Belding's Sparrow's primary habitat is the upper marsh zone that is flooded by the tide only infrequently. The birds nest only in this zone (Powell 1993), though they range outside it to forage. Because this is the part of a marsh that is most easily filled and developed, the fraction of its habitat Belding's Sparrow has lost is even greater than the fraction of total coastal wetland lost. Currently, at Santa Margarita, Buena Vista, and Los Peñasquitos, the lagoons' mouths are often or continuously blocked from the tides. Thus the pickleweed may dry out for long periods, then be flooded for long periods by winter rain. Restoration of consistent tidal flow at Batiquitos and San Elijo allowed the numbers of Belding's there to increase (Zembal and Hoffman 2002). Blockage of lagoon mouths comes with accelerated sedimentation of the lagoons, a consequence of their watersheds being stripped of vegetative cover during development. Another factor is that tidal flow into most lagoons is constricted by the berms built for roads and train tracks. Sedimentation converts salt marsh into nonsaline uplands, as has happened on a large scale at Los Peñasquitos. Sediment and debris washing in from Tijuana threaten the Tijuana River estuary, site of San Diego County's largest Belding's Sparrow colony. Techniques for salt-marsh restoration have been established but have not yet been carried out on a scale large enough to be of significant benefit to Belding's Sparrow. Restored habitat takes over four years to reach a structure beneficial to the birds (Keer and Zedler 2002). The low numbers at several sites and the lack of dispersal between these sites raise concern for the long-term genetic viability of the population (Zembal et al. 1988). Finally, invasion of nonnative predators, disturbance by domestic dogs, and trampling of the marshes by people are continuing problems.

The career of the Large-billed Sparrow is one of the most interesting of California's birds. It is all the more mysterious because it has been viewed largely in ignorance of what has happened in the subspecies' breeding range. At the turn of the last century the Large-billed Sparrow

was common in marshes and on beaches, wharves, and even city streets along the coast of San Diego County. By the 1940s it was on the decline, and 1954 saw the last report for 23 years (Unitt 1984). After one seen in 1977 and one in 1987, the Large-billed Sparrow invaded in fall 1988 (AB 43:170, 1989) and 1989; 37 were reported on the San Diego Christmas bird count, 17 December 1988, and over 50 were around south San Diego Bay in September 1989 (C. G. Edwards, AB 44:165, 1990). Subsequently the numbers have not been so large, but the subspecies has continued to occur as a rare but annual winter visitor. Presumably the fluctuations are due to habitat changes in the Colorado delta and possibly to changes in sparrow's adaptability to them.

Even the northern subspecies of the Savannah Sparrow are not immune to habitat change. With the conversion of much farmland and grassland to urban development the habitat available to winter visitors has been reduced. The thousands recorded on San Diego Christmas bird counts in the 1960s and early 1970s, primarily in the Tijuana River valley, are no longer found.

Taxonomy: Belding's Sparrow, *P. s. beldingi* Ridgway, 1885, is recognized by its heavily black-streaked underparts and dark olive-tinged upperparts. The three subspecies occurring as winter visitors from the north are paler above and have narrow crisp brown streaks on the underparts. Not safely distinguishable from each other in the field, the three comprise *P. s. anthinus* Bonaparte, 1853, rich brown above and breeding widely in Alaska and northwestern Canada, *P. s. nevadensis* Grinnell, 1910, grayer with broad silvery-white streaks on the back, breeding in the Rocky Mountains and Great Basin, and *P. s. brooksi* Bishop, 1915, similar in color to *nevadensis* but slightly smaller, breeding in the Pacific Northwest. Restudy of 178 San Diego County specimens of the Savannah Sparrow reveals that *anthinus* and *nevadensis* are about equally common, with 35 and 32 specimens, respectively (P. A. Campbell, P. Unitt). With only four specimens *brooksi* is much scarcer, as might be expected with San Diego near the southern tip of its winter range. On the basis of existing specimens, both *anthinus* and *nevadensis* are widespread in the county with no difference in seasonal status, though the earliest fall specimen was collected only on 6 October and by spring the plumage of some individuals is so badly worn as to leave them unidentifiable. The Large-billed Sparrow, *P. s. rostratus* (Cassin, 1852), differs grossly, in its large size, brown-streaked underparts, inconspicuously streaked gray upperparts, and thick bill. It looks almost as much like a female House Finch as a Savannah Sparrow.