

A SYNOPSIS OF THE SAVANNAH SPARROWS OF NORTHWESTERN MEXICO

By A. J. VAN ROSSEM

Along the Pacific coast of Baja California from the international boundary south to Magdalena Bay, on the San Benito Islands, and on the coast of northwestern Mexico from the mouth of the Colorado River south to Sinaloa, there exists a series of populations of the Savannah Sparrow (*Passerculus sandwichensis*) which are separated ecologically from those of the interior of the continent. The habitat of this group, save for two instances of insular adaptation, is rather rigidly restricted to tidal marshes, a fact long recognized and reflected in past vernacular usage of the name "Marsh Sparrow." Because of environmental limitations, distribution is not continuous and through the same circumstance the transition from one population to another tends at times to be more abrupt in one or more characters than otherwise would be the case. This abruptness is expressed in the nomenclature of only a few years ago, as witness the binomials *Passerculus beldingi*, *Passerculus rostratus*, and *Passerculus guttatus*.

Considerations which have altered the concept of closely related but distinct species are the discovery of geographically intergrading populations in some cases and breakdown of supposed specific characters through individual variation in others. There now is no valid reason to dispute the reevaluation of these initially conceived species as geographical variants of the continent-wide Savannah Sparrow, *Passerculus sandwichensis*. Such reevaluation is not novel. It has been advocated at various times in the past and if re-affirmed here it is only because of relatively recent protest (Grinnell, Condor, 41, 1939:112-119) which would urge retention of the name *rostratus* in a specific sense for the largest-billed members of the group. There admittedly is something to be said in favor of such distinction and if I disagree it is only because definite intergradation of all characters is shown to exist.

The confusion in the nomenclature of this group has been due largely to past complications surrounding *Passerculus guttatus*, the name given by Lawrence eighty years ago to an olive-gray, moderately large-billed sparrow taken in winter at San José del Cabo. This locality is outside the breeding range of any Savannah Sparrow but is one where several races are to be found in winter. For the moment it need only be mentioned that the name *guttatus* has been used at one time or another for the breeding populations of an unknown, provisional area, of San Ignacio Lagoon, of the San Benito Islands, of the mouth of the Colorado River, and even, tentatively, of the coast of southern Sonora. It was uncertainty as to the application of this name which admittedly caused Peters and Griscom (Bull. Mus. Comp. Zoöl., 80, 1938:474-477) to omit detailed consideration of the large-billed group in their recent revision of the Savannah Sparrows, although they did deal with the northernmost member, *beldingi*.

Paradoxically, there has been substantial agreement as to the number of forms to be recognized. The confusion has been largely a matter of nomenclature, the keystone to which is, as already observed, proper application of the name *guttatus*. Failure to reach accord on this point has been due to one or another of several causes, probably the most important of which have been the lack of adequate, known, breeding material by which to determine and evaluate critical morphological characters and failure to recognize the fact that some, and possibly all, races exhibit a gray manifestation or even an extreme gray phase in addition to the "normal" coloration. Additionally, it seems to have been

generally overlooked that the females of some races, most especially and particularly those of the migratory, Colorado delta race *rostratus*, average darker and grayer and possess smaller and relatively more slender bills than males. Finally, the suggestion of the existence of possibly radically different winter and summer plumages has proved to be without basis, since aside from loss of edgings through wear, the basic colors and patterns persist throughout the year.

In the following synopsis an attempt is made to outline what appears to me to be the proper arrangement of the "large-billed" group of Savannah Sparrows. At this place I wish to acknowledge the plate made for me as a personal favor by my friend George Miksch Sutton, for it illustrates far better than any words the extraordinary degree of subspeciation which has occurred among the Savannah Sparrows within the limited region under consideration.

THE BELDINGI GROUP OF RACES

The two races of the *beldingi* group occur, within the scope of this paper, from the international boundary south along the Pacific coast of Baja California to Scammon Lagoon. The group is characterized by a strong color pattern with the upper parts streaked with contrasting black, browns, and buffs and under parts prominently streaked with black or brownish black. Normally, there is a certain amount of yellowish suffusion which affects chiefly the head but which in extreme cases is apparent over most of the body plumage and may even tinge the white of the under parts. The superciliary streak is normally strongly yellow at all seasons. An extreme gray phase which results in a substantially gray, black, and white plumage occurs at times. Additionally, a certain proportion of individuals shows varying reduction of the buffy or brown elements. Aside from this individual variation, which is marked, there is little which I can associate with age or sex although first-year birds tend to average more buffy or yellowish. Spring and summer birds are darker dorsally because of attrition of the light feather edgings with consequent emphasis of the black central streaking. Structurally, this group is a connecting link, through *P. s. beldingi*, with the more typical races of the "Savannah" Sparrow to the north and, through *P. s. anulus*, with the larger-billed races to the south. Both races are essentially non-migratory, although there is a limited local dispersal during the winter.

Passerculus sandwichensis beldingi Ridgway Belding Savannah Sparrow

Passerculus beldingi Ridgway, Proc. U. S. Nat. Mus., 7, 1884 [Feb. 25, 1885]:516 (San Diego, California).

Subspecific characters.—Within the group characterized above, bill smaller both in length and depth than that of *Passerculus sandwichensis anulus* of Scammon Lagoon, and tail slightly longer than in that form. Compared with *Passerculus sandwichensis alaudinus* ["*bryanti*?"] of the San Francisco Bay area of California, bill longer and more attenuated (less conical), and upper parts with black streaking less prominent.

Geographic range.—Resident on coastal marshes from Santa Barbara County, California, south along the coast of northwestern Baja California, including the Todos Santos Islands, to Rosario (lat. 30°).

This race is dichromatic in that a gray tendency or manifestation is present in many individuals. The extreme gray phase is not dissimilar in color to the essentially gray, black, and white *P. s. nevadensis* of the Great Basin but the shorter wing and tail, longer and larger bill, and broad ventral streaking of *beldingi* serve to distinguish such rare extremes without difficulty. It follows that individual variation in color is very pronounced in *beldingi* but a sharp, contrasting pattern is always present and in this feature *beldingi*, together with *anulus*, is well set off from the other races of northwestern

Mexico. As to color trends correlated with sex, there is a tendency in Ventura and Santa Barbara counties and on the Todos Santos Islands for males to be grayer and females to be browner, but elsewhere this seems not to be true. Geographical trends within the race are to be seen in a notable tendency toward the smaller bill of *alaudinus* in the northern part of the range and an increase in bill size combined with shorter tail which reflects an approach to *anulus* southward. As a matter of fact, most specimens from Baja California south of latitude 31° are so variously intermediate between *beldingi* and *anulus* that any name applied to them must be more or less arbitrary.

Specimens examined.—California, 94. Baja California, 35 (Ensenada, 1; Todos Santos Islands, 20; Colnett, 4; Mouth of San Telmo River, 1; San Quintín, 7; Socorro, 1; Rosario, 1).

Passerculus sandwichensis anulus Huey

Scammon Savannah Sparrow

Passerculus rostratus anulus Huey, Trans. San Diego Soc. Nat. Hist., 6, no. 10, Aug. 30, 1930: 204 (Scammon Lagoon, Lower California).

Subspecific characters.—Similar to *Passerculus sandwichensis beldingi* and not certainly distinguishable in color, although averaging lighter dorsally. Bill distinctly larger and longer, and tail shorter.

Geographic range.—Resident at Scammon Lagoon and the adjacent Santo Domingo Landing on the Pacific coast of central Baja California.

In the series at hand, which includes both breeding and winter specimens, the coloration is less variable than in *beldingi* and also averages a little lighter due to a reduction of black, central streaking dorsally. This distinction is minor, however, and discernible only in series. Males tend to have the dorsal pattern less sharp and more diffused than do females. This tendency is significant chiefly because of the approach it constitutes to the more decided sexual dichromatism found in some members of the *rostratus* complex. An extreme gray phase is represented by a single specimen, a female (no. 18495 San Diego Nat. Hist. Mus.) taken at Santo Domingo Landing, December 7, 1941, by L. M. Huey. This extreme manifestation is probably rare in *anulus* since the gray influence is not nearly so noticeable in series as in *beldingi*.

This race is a critical one since in bill size it is the link which connects the *beldingi* group with the *guttatus* group to the south. Seemingly it is resident, for no specimens which can be identified with it have been taken anywhere outside of the breeding area.

Specimens examined.—Baja California, 28 (Scammon Lagoon, 22; Santo Domingo Landing, 6).

THE GUTTATUS GROUP OF RACES

The *guttatus* group of two races occurs in the southern part of the peninsula from Pond and San Ignacio lagoons south to Magdalena Bay. It is distinct from *beldingi* and *anulus* in the notably diffused and blended character of the dorsal plumage with much less contrast between feather centers and edgings, even in fresh fall plumage. The color tone dorsally is prevailingly olive, darker, grayer, and more diffused northwardly, and lighter, greener, and more contrasted in pattern southwardly. The superciliary streak is normally yellow at all seasons, although perhaps less strongly so than in *beldingi* and *anulus*. No extreme gray phase has been observed to date, although there is some individual variation in the relative degrees of gray, olive, or greenish olive present. In general size, members of the *guttatus* group are somewhat larger than those of the *beldingi* group. This is particularly true of the bill. However, through the northern member of the group (*guttatus*) there is complete structural intergradation with *anulus*, and to the south (through *magdalenae*) there is similar intergradation with the *rostratus* group. Both races are migratory only to the extent that some individuals occur southward to the Cape region in winter.

LEGEND

SAVANNAH SPARROWS OF NORTHWESTERN MEXICO

1. *Passerculus sandwichensis beldingi*.
Male, fall, San Diego, California, November 17, 1920. No. H-1165 Dickey Coll.
2. *Passerculus sandwichensis anulus*.
Male, fall, Santo Domingo Landing, Baja California, December 7, 1941. No. 18494 San Diego Nat. Hist. Mus.
3. *Passerculus sandwichensis anulus*.
Female, fall, gray, Santo Domingo Landing, Baja California, December 7, 1941. No. 18495 San Diego Nat. Hist. Mus.
4. *Passerculus sandwichensis guttatus*.
Male, spring, San Ignacio Lagoon, Baja California, March 26, 1927. No. 11345 San Diego Nat. Hist. Mus.
5. *Passerculus sandwichensis guttatus*.
Female, fall, Todos Santos, Baja California, September 17, 1924. No. 45156 Mus. Vert. Zool.
6. *Passerculus sandwichensis magdalenae*.
Male, spring, San Jorge, Baja California, April 23, 1931. No. 59974 Mus. Vert. Zool.
7. *Passerculus sandwichensis magdalenae*.
Female, fall, Todos Santos, Baja California, October 18, 1928. No. 55481 Mus. Vert. Zool.
8. *Passerculus sandwichensis sanctorum*.
Male, "fall," brown, San Benito Islands, Baja California, April 1, 1938. No. 19221 Los Angeles Mus.
9. *Passerculus sandwichensis sanctorum*.
Female, spring, gray, San Benito Islands, Baja California, February 19, 1930. No. 29972 Dickey Coll.
10. *Passerculus sandwichensis rostratus*.
Male, fall, red, San Diego, California, September 28, 1914. No. 9420 Dickey Coll.
11. *Passerculus sandwichensis rostratus*.
Female, spring, mouth of Colorado River, Sonora, April 23, 1925. No. 15210 Dickey Coll.
12. *Passerculus sandwichensis rostratus*.
Female, extreme gray, Angel de la Guarda Island, Baja California, January 6, 1932. No. 50312 Dickey Coll.
13. *Passerculus sandwichensis atratus*.
Male, spring, Tobari Bay, Sonora, May 1, 1930. No. 30308 Dickey Coll.
14. *Passerculus sandwichensis atratus*.
Male, fall, Todos Santos, Baja California, September 17, 1924. No. 45154 Mus. Vert. Zool.

All figures approximately three-fourths natural size.



SAVANNAH SPARROWS OF NORTHWESTERN MEXICO

Passerculus sandwichensis guttatus Lawrence

Abreojos Savannah Sparrow

Passerculus guttatus Lawrence, Ann. Lyc. Nat. Hist. New York, 8, nos. 15-17, May, 1867:473 (San José [del Cabo], Lower California).

Ammodramus halophilus McGregor, Auk, 15, July, 1898:265 (Abreojos Point [= Pond Lagoon], Lower California).

Subspecific characters.—Compared with *Passerculus sandwichensis anulus* of Scammon Lagoon, bill averages decidedly larger, tail longer, and dorsal coloration distinctly dull, olivaceous gray with the pattern relatively inconspicuous and diffused instead of contrasted. Compared with *Passerculus sandwichensis magdaleneae* of Magdalena Bay [*postea*], size averages smaller in all dimensions except for the slightly longer bill; coloration darker and more grayish (less greenish) olive, and dorsal pattern less conspicuously contrasted.

Geographic range.—Pond and San Ignacio lagoons on the Pacific coast of Baja California. Winters occasionally south to the Cape region.

The transition from *anulus* to *guttatus* is abrupt in coloration; indeed one's first impression when series of both races are observed is that distinct species are represented. However, individual extremes are to be found which completely bridge these differences; and this circumstance, combined with the marked overlap of all measurements, would seem sufficient to nullify any claim to specific distinctness.

The splendid breeding series of *guttatus* in the San Diego Natural History Museum, collected in March and April, has been the most critical of series examined in the present study. While most of the specimens exhibit wear, a few are still in only slightly abraded plumage and one or two show so little wear that the feathers of the limited anterior body molt of spring are scarcely discernible among the annual plumage. The neutral character of the dorsal coloration, that is to say, the relative absence of contrast between the dark olive feather centers and olive gray edgings, makes the differences between fresh and worn specimens of *guttatus* less than in any other race of the Savannah Sparrow.

The type of *Passerculus rostratus* has been sent to me through the courtesy of the United States National Museum. It is old number 17291, new number 26651 of that institution, taken at San José [del Cabo] in December [no date], 1859, by John Xantus. It is marked "♂" but this is certainly a mistake. No male sparrow measured by me in the present study has a wing measurement so short as the type save for a single *beldingi*. On the other hand, the wing length lies within the range of variation found in females of five out of the seven races here considered. Other measurements would seem to place the type beyond question as a female of the population of Pond and San Ignacio lagoons; in fact, taken in their entirety, these measurements can scarcely be associated otherwise. Additionally, the plumage is normal for the more grayish olive birds of that locality although this last factor would not in itself be conclusive in view of the observed color and pattern extremes of *rostratus* and of the San Benito Island race, *sanctorum*. Measurements, therefore, of adequate series of breeding birds have been the important and deciding factor. Brewster (Bull. Mus. Comp. Zool., 41, 1902:138-142), of course, correctly diagnosed the situation as long ago as 1902, and it is only to be regretted that other people, including myself, have found occasion to differ.

It seems evident that very few individuals of *guttatus* reach the Cape region in winter, for less than a dozen birds which are said to resemble closely the type of *guttatus* have been reported. At this time there are at hand three birds, in addition to the type, which can confidently be identified as *guttatus*. These are no. 18459, San Diego Natural History Museum, taken at San Jorge on November 22, 1941, by L. M. Huey; no. 45153, Museum of Vertebrate Zoology, taken at Todos Santos on September 8, 1924, by Chester

Lamb; no. 45156, Museum of Vertebrate Zoology, taken at the same locality by the same collector on September 21, 1924.

Specimens examined.—Baja California, 43 (San Ignacio Lagoon, 26; Pond Lagoon, 13; San Jorge, 1; Todos Santos, 2; San José del Cabo, 1, the type).

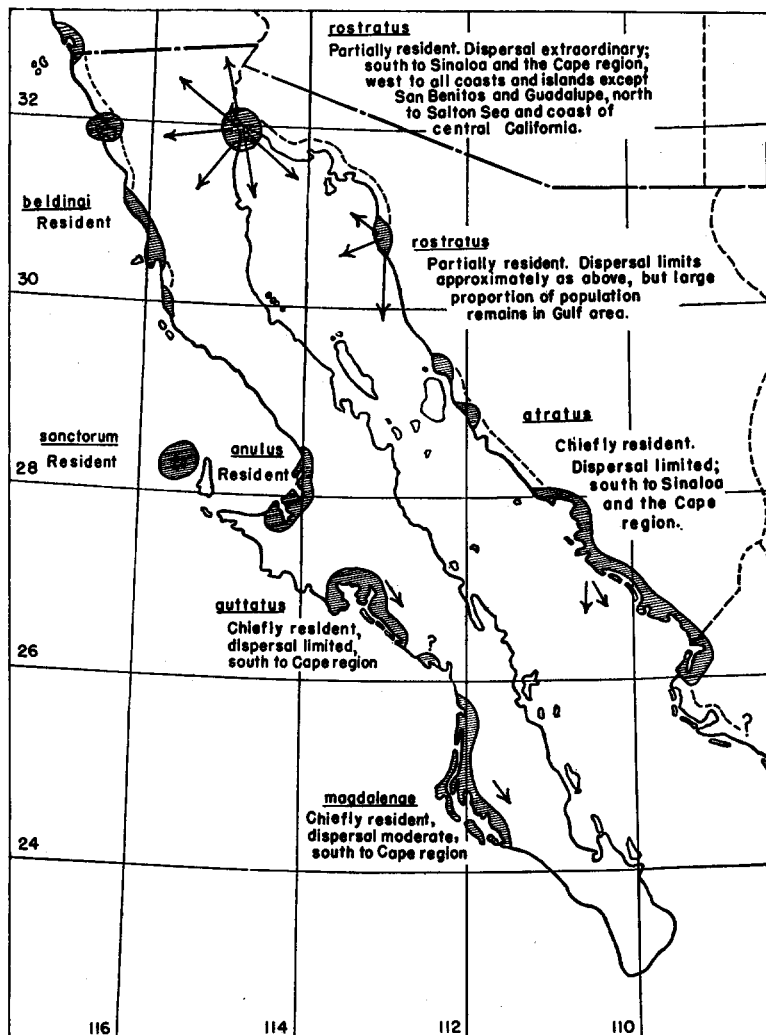


Fig. 20. Distribution of the races of Savannah Sparrow in northwestern Mexico. Shaded areas indicate breeding ranges; arrows show direction of dispersal in non-breeding season.

Passerculus sandwichensis magdalense new subspecies
Magdalena Savannah Sparrow

Type.—Adult male, nearing breeding condition, no. 29887, Dickey Collection; North Estero, Magdalena Bay, Baja California, March 4, 1930; collected by A. J. van Rossem.

Subspecific characters.—Coloration most nearly similar to that of *Passerculus sandwichensis guttatus* but lighter and more greenish (less grayish) olive; dorsal markings more prominent (less diffused) due to the lighter edgings. Size averages larger in all dimensions save for the bill which is slightly shorter and thicker at base; culmen outline more convex.

Geographic range.—Tidal marshes of Magdalena Bay and estuaries. Occurs, apparently in some numbers, south to the Cape region in winter.

This race is the culmination of the strongly yellow-browed, peninsular Savannah Sparrows with relatively slender bills which average less (usually much less) than 7.0 millimeters in depth at base. It forms a good connecting link between the smaller-billed, more northern *guttatus* and the larger-billed *rostratus* group of the continental mainland and the San Benito Islands in that it possesses the essential coloration of the former combined with the general large size of the latter.

To judge from the label names on the material examined at this time, it is safe to say that by far the greater number of specimens which have in the past been identified as "*halophilus*" when taken in winter in the Cape region are really *magdalenae*. I assume that *magdalenae* is for the most part resident, although the only winter date for that locality in the present material is January 28. Ten fall and winter specimens have been examined from localities south of the breeding area with dates ranging from September 11 at Todos Santos to January 20 at San José del Cabo.

Specimens examined.—Baja California, 30 (Magdalena Bay [San Jorge, 13; North Estero, 3; Santa Margarita Island, 3; "Magdalena Bay," 1]; Todos Santos, 9; San José del Cabo, 1).

THE ROSTRATUS GROUP OF RACES

The *rostratus* group occurs on the coast of northwestern Mexico from the mouth of the Colorado River south to Sinaloa, and on the San Benito Islands off the west coast of Baja California. It is characterized by a large, gross bill which averages over (usually well over) 7.0 millimeters in depth at base and with culmen outline varying from straight to strongly convex. The supraloral streak is normally only faintly yellow or yellow may be absent at any season. Coloration is extremely variable; dorsally it is prevailing grayish, grayish brown, pinkish to pale rufescent brown, chestnut brown, or fuscous brown with moderately variegated dorsum in distinction to the bright, contrasting colors and pattern of *beldingi* and *anulus*, or to the diffused olive or greenish olive tones of *guttatus* and *magdalenae*. Ventral streaking varies in width but usually corresponds with the upper parts in color. This group is difficult to define other than as above, for in pale and dark as well as in red and gray extremes there is a wider variation than in any of the foregoing groups. It is equally varied in migratory habits; one is resident, the movements of another are imperfectly known but probably are limited, while the third has an extraordinary radial dispersal or migration for hundreds of miles north, west, and south from the breeding area. The three races are as follows.

Passerculus sandwichensis sanctorum Ridgway

San Benito Savannah Sparrow

Passerculus sanctorum "Coues" Ridgway, Proc. U. S. Nat. Mus., 5, April 3, 1883:538 (Island of San Benito, Pacific coast of Lower California).

Subspecific characters.—Bill large, stout, and deep at base as in *Passerculus sandwichensis rostratus* and *Passerculus sandwichensis atratus*, but culmen outline normally straight or nearly so rather than convex. Tarsi slightly shorter than in those races, but notably stout and, together with the feet, horn color or plumbeous brown rather than flesh color or light brown, a distinction which persists in most dried specimens. Wing slightly shorter and tail decidedly so, the latter relatively as well as actually. Dorsal pattern moderately variegated or contrasted as in *rostratus* and *atratus*, but differs in the presence of a more or less extensive intermixture of light gray or grayish white edgings in the interscapular area. Brown phase with tones tending to chestnut rather than pinkish. Ventral streaking relatively narrow as in *rostratus* but black, or nearly so, instead of brown.

Geographic range.—Resident on the San Benito Islands off the west coast of Baja California.

There has been considerable misapprehension about *sanctorum*, both as to distinguishing characters and migratory habits (see Oberholser, Ohio Jour. Sci., 19, 1919: 344-354). The chief cause of error concerning migration is that darker and grayer ex-

amples of the migratory *rostratus* often resemble *sanctorum* in general appearance, and it is such birds which have so often been identified as belonging to the island race. I have examined many which have been so determined in local and other collections and have yet to find one which has all, or even the majority of the distinctive characters of *sanctorum*. Under the circumstances, the population from the San Benito Islands must be assumed to be strictly resident until proven otherwise.

Both grayish and brownish manifestations are present but no extreme phase has been noted. The gray tendency is overwhelmingly dominant in the ratio of slightly better than three to one in the eighty specimens, including juveniles, examined at this time. It is appropriate to mention that age is not a consideration, for the two types are as obvious in the juvenal plumage as in mature birds. Neither does there seem to be a color trend correlated with sex as there is in *rostratus*.

The habitat of *sanctorum* is very unlike that of any of the other races here considered except for the colony of *beldingi* on the Todos Santos Islands. In the utter absence of marsh growth on these rocky, semi-desert islands the birds have adapted themselves to a setting in which one might reasonably expect the absent Black-throated Sparrow, but one which it is difficult to envision as an environment suitable for a populous colony of Savannah Sparrows. A further adjustment is reflected in the very early breeding season which commences, in common with other land birds of the San Benito Islands, in the latter part of February or even, possibly, in January, for fully plumaged post-juveniles are to be found as early as April 1. Such adaptability makes all the more perplexing the total absence of breeding colonies of this species on numerous other and seemingly much more suitable islands and its absence also from the entire Gulf coast of the peninsula.

The obviously close relationship of *sanctorum*, *rostratus*, and *atratus* can easily lead to the speculation that the colony on the San Benito Islands is a remnant population. At any rate, it is obvious that the three are more closely interrelated than are any of them to the present-day occupants of the intervening peninsula.

Specimens examined.—San Benito Islands, 80 (West island, 69; East island, 11).

Passerculus sandwichensis rostratus (Cassin)

Large-billed Savannah Sparrow

Emberiza rostrata Cassin, Proc. Acad. Nat. Sci. Philadelphia, 6, "October" [= November 1], 1852:184 (San Diego, California).

Subspecific characters.—Differs from *Passerculus sandwichensis sanctorum* in convex rather than straight outline of culmen, longer tail, and longer, flesh-colored or light brown tarsi. Plumage coloration varied, but usually with a definite pinkish or reddish tone pervading the gray of the entire upper parts and the streaking of the under parts. From the "normal" coloration, as above, there are endless variations which reach a pale gray at one extreme and a pale rufescent or brick red at the other. There is also a wide latitude in lightness or darkness of tone. Additionally, females average darker and grayer than males and also are more prominently streaked on the dorsum. Differs from *Passerculus sandwichensis atratus* of southern Sonora in much paler (less fuscous) and more varied coloration and narrower ventral streaking.

Geographic range.—Tidal marshes from the mouth of the Colorado River south along the coast of Sonora to Puerto Lobos at latitude 29° 54'. Disperses in fall, winter, and spring south at least to northern Sinaloa and Cape San Lucas, west to most and probably all islands in the Gulf, the shores of the entire peninsula of Baja California and its Pacific coast islands except the San Benitos and Guadalupe, and north in California to the Salton Sea in the interior and to Santa Cruz County along the coast.

Sexual dichromatism as well as individual variation is more in evidence in *rostratus* than in any other Savannah Sparrow under consideration here. A decided majority of the males possess a coloration which falls variously between numbers 10 and 11 of the

accompanying plate. Most females approximate number 11, with some overlapping into "male" coloration and others tending in varying degree toward the pale gray extreme of number 12. Further, as stated above, the interscapular region is more prominently streaked in females than in males, although here, too, some individual variation is apparent. A further variation which is geographical in nature is that in the colony at Puerto Lobos wherein a darkening in the average coloration of both sexes indicates an approach to *atratus*. The males of this colony tend to approximate number 11, while the females are slightly darker.

It is birds of the type found at Puerto Lobos, from whatever geographical source, which have provided records of the so-called "San Benito Sparrow" (usually under the equally incorrect name of "*guttatus*") from localities away from those islands. Possibly because of the more southward location of Puerto Lobos, it appears that the chief wintering ground of this colony, or at least of birds which resemble them, is in the Gulf. By this I do not mean that widespread dispersal does not take place, for it certainly does and probably reaches quite to the periphery of "typical" *rostratus*. A breakdown of the fall, winter, and early spring specimens in the Dickey Collection gives the proportions listed below. It is not possible to be exact, and several have been assigned arbitrarily. Further, the ratio for southern California does not reflect actual conditions because of the intentional emphasis on the collecting of gray birds. The other areas represent "run-of-the-mill" collecting.

	Reddish	Grayish
Gulf coasts and islands	38 specimens	33 specimens
Pacific coast and islands of Baja California	22	8
Coast and islands of southern California	53	21
Salton Sea, interior southern California	2	0

The route by which the Large-billed Savannah Sparrow reaches the Pacific coast is still problematical. An eight hundred mile, southward journey around Cape San Lucas as a preliminary before proceeding north for an equal or greater distance hardly seems likely. On the other hand the few records from the lower Colorado River in California and Arizona and at Salton Sea are the only instances of occurrence, anywhere, away from the maritime littoral.

Specimens examined.—Southern California, approximately 250; Sonora, 53 (Montague Island and adjacent shore, 16; Punta Peñascosa, 7; Puerto Lobos, 13; Puerto Libertad, 5; Tepopa Bay, 5; Patos Island, 1; Tiburón Island, 2; Kino Bay, 2; Pelicano Island, 1; San José de Guaymas, 1); Sinaloa, 2 (Isla de los Burros, 2); Baja California, 54 (Angel de la Guarda Island, 10; Angeles Bay, 1; San Lorenzo Island, 1; San Francisco Island, 1; San José Island, 5; La Paz, 1; Todos Santos, 12; Magdalena Bay, 3; Natividad Island, 10; Port San Bartolomé, 7; Cedros Island, 2; San Ignacio Lagoon, 1).

Passerculus sandwichensis atratus van Rossem

Sonora Savannah Sparrow

Passerculus sandwichensis atratus van Rossem, Trans. San Diego Soc. Nat. Hist., 6, no. 14, Nov. 28, 1930:218 (Tóbari Bay, Sonora, Mexico).

Subspecific characters.—Similar in size and proportions to *Passerculus sandwichensis rostratus* but averages slightly larger in all dimensions. Coloration grayer and much darker, the central streaking on dorsal feathers fuscous black; ventral streaking wider, and black rather than brown, reddish, or gray.

Geographic range.—Tidal marshes of the coast of central and southern Sonora at least to the Sonora-Sinaloa boundary. Winter range imperfectly known, although some individuals occur at various points in the breeding range at that season. Found also, perhaps only irregularly, in the Cape region of Baja California.

Specimens from the northern part of the range show marked approach to *rostratus*; in fact, the paler extremes, and particularly the females, from Tepopa and Kino bays

Table 1

Extreme and Average Measurements of Males in Millimeters											
Wing	Tail		Culmen		Depth		Tarsus		Middle toe		
Twenty-five <i>beldingi</i> from San Diego County, California											
64.0 (66.5)	69.0	46.0 (48.3)	51.0	11.3 (11.8)	12.5	5.6 (5.9)	6.5	19.5 (20.5)	21.3	15.0 (15.7)	16.6
Twenty-five <i>beldingi</i> from northern Baja California											
62.5 (65.6)	67.5	44.0 (46.2)	48.0	11.7 (12.1)	12.8	5.8 (6.2)	6.7	19.8 (20.7)	21.6	14.9 (15.6)	16.4
Sixteen <i>anulus</i> from Scammon Lagoon											
64.5 (66.7)	68.0	44.0 (45.7)	48.0	11.8 (12.4)	12.9	6.1 (6.3)	6.7	20.0 (21.1)	21.8	15.8 (16.1)	16.4
Twenty-seven <i>guttatus</i> from Pond and San Ignacio lagoons											
66.0 (68.2)	70.5	45.5 (49.9)	53.5	12.5 (13.2)	13.9	6.2 (6.6)	7.0	20.4 (21.4)	22.0	15.5 (16.3)	17.0
Sixteen <i>magdaleneae</i> from Magdalena Bay											
66.5 (69.1)	70.5	48.5 (51.4)	53.5	12.2 (13.0)	13.8	6.4 (6.9)	7.5	21.8 (22.2)	22.8	16.4 (17.0)	17.7
Twenty-five <i>sanctorum</i> from the San Benito Islands											
66.5 (68.8)	71.0	46.5 (49.2)	52.0	13.1 (13.7)	14.7	7.0 (7.4)	7.8	20.5 (21.5)	22.1	16.0 (17.0)	17.7
Ten <i>rostratus</i> from the Colorado River delta											
69.5 (70.7)	73.5	49.5 (51.4)	55.0	13.0 (13.6)	14.2	6.8 (7.5)	8.1	21.9 (22.3)	23.1	16.0 (16.9)	18.0
Ten <i>rostratus</i> from the coast of northern Sonora											
66.0 (69.3)	71.5	49.0 (51.5)	54.0	12.8 (13.4)	14.1	7.2 (7.6)	8.2	21.3 (22.1)	22.6	16.3 (16.9)	17.5
Seventeen <i>atratus</i> from the coast of southern Sonora											
67.0 (70.0)	72.0	50.0 (52.8)	56.5	13.3 (13.8)	14.4	7.2 (7.6)	8.2	21.3 (22.0)	23.0	16.0 (16.9)	17.6
Measurements of Females in Millimeters											
Wing	Tail		Culmen		Depth		Tarsus		Middle toe		
Eighteen <i>beldingi</i> from San Diego County											
58.5 (61.7)	64.5	41.0 (43.9)	45.0	11.2 (11.6)	12.1	5.3 (5.6)	5.9	19.0 (19.6)	20.5	14.5 (15.2)	16.2
Nine <i>beldingi</i> from northern Baja California											
58.5 (61.2)	63.0	41.0 (43.4)	46.0	11.0 (11.5)	12.0	5.3 (5.8)	6.2	18.6 (19.4)	20.2	14.0 (15.0)	16.1
Twelve <i>anulus</i> from Scammon Lagoon and Santo Domingo Landing											
60.0 (62.3)	64.0	40.5 (44.0)	46.0	11.4 (12.1)	12.8	5.5 (6.0)	6.7	19.4 (20.5)	21.3	15.1 (15.9)	16.8
Twelve <i>guttatus</i> from Pond and San Ignacio lagoons											
62.0 (63.9)	65.5	45.0 (47.0)	48.0	12.6 (12.9)	13.2	5.9 (6.2)	6.5	19.5 (20.6)	21.2	15.0 (15.5)	16.0
Type of <i>guttatus</i>											
63.0		47.5		12.9		6.1		21.1		15.2	
Four <i>magdaleneae</i> from Magdalena Bay											
64.5 (65.5)	67.0	48.5 (49.0)	49.5	12.3 (12.6)	13.0	6.3 (6.4)	6.7	21.0 (21.5)	22.0	16.0 (16.5)	17.0
Twenty-two <i>sanctorum</i> from the San Benito Islands											
62.5 (64.2)	66.5	43.5 (45.6)	47.0	12.8 (13.4)	14.0	6.6 (7.1)	7.8	19.6 (20.6)	21.9	16.0 (16.5)	17.1
Seven <i>rostratus</i> from the Colorado River delta											
62.5 (66.3)	68.5	47.5 (48.8)	52.0	12.3 (13.0)	13.8	7.0 (7.2)	7.7	21.2 (21.4)	22.0	16.0 (16.3)	16.6
Eleven <i>rostratus</i> from the coast of northern Sonora											
63.5 (64.7)	66.5	46.5 (48.0)	49.0	12.8 (13.1)	13.6	6.7 (7.0)	7.2	19.6 (20.7)	21.6	15.6 (16.3)	17.0
Seven <i>atratus</i> from the coast of southern Sonora											
65.0 (66.2)	67.0	48.0 (50.0)	51.5	13.1 (13.4)	14.0	6.8 (7.2)	7.4	20.3 (21.1)	21.7	15.6 (16.1)	17.0

are not very much darker than *rostratus* from Puerto Lobos. There seems to be relatively little individual variation in *atratus*, in fact the series, aside from the extreme northern examples is surprisingly uniform in appearance. There is, however, the same marked sex difference seen in *rostratus* in the character of the interscapular streaking, the pattern of which is much more sharply defined and less diffused in females than in males.

The migrations or dispersals of *atratus* and their extent are at present imperfectly known. No winter specimens which possess characters of *atratus* in satisfactorily positive degree have been examined from localities outside the breeding range except for two individuals, birds of the year, taken at Todos Santos in the Cape region of Baja California on September 17 and 19, 1924, by Chester Lamb. These are now numbers 45154 and 45155, respectively, in the Museum of Vertebrate Zoology. Other specimens at hand

(all in the Dickey Collection) are one from Kino Bay, December 27, 1931, three from Patos Island, February 18, 1946, and one from Isla de los Burros, northern Sinaloa, March 12, 1946. This last locality, however, is probably within the breeding range. I also observed a few at Guaymas at various dates in February, 1946, where they appeared to be vastly outnumbered by wintering *rostratus*. At La Colorado at the mouth of the Fuerte River in northern Sinaloa, *atratus* appeared to outnumber *rostratus* so far as I could estimate visually, on March 15, 1946. Unfortunately, circumstances prevented collecting on both occasions. At this time it seems likely that *atratus*, in some measure at least, and perhaps for the most part, remains within the breeding range throughout the year.

Specimens examined.—Sonora, 39 (Tepopa Bay, 3; Patos Island, 3; Kino Bay, 11; Guaymas, 1; Viejo Yaqui Lagoon, 3; Tóbari Bay, 13; Agiabampo, 5). Sinaloa, 1 (Isla de los Burros, 1); Baja California, 2 (Todos Santos, 2).

MEASUREMENTS

The measurements in the accompanying table were taken from birds known, or with good reason believed, to have been on their nesting grounds. In the resident *beldingi*, *anulus*, and *sanctorum*, season has not been considered important although early spring birds have been used for the most part. Measurements of the migratory races *guttatus*, *magdalenae*, *rostratus*, and *atratus* are almost exclusively those of breeding birds collected at the beginning of the nesting season before any great amount of abrasion had occurred. An exception is the inclusion of some winter *rostratus* from the breeding area of that race at the mouth of the Colorado River because actual breeding birds were too few in number to provide reasonably accurate figures. Bill length has been taken from the tip to the edge of the skin covering the culmen near its base. Depth of bill has been taken from the edge of the skin on the mandibular ramus to the edge of the skin across the culmen.

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