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## GEOGRAPHIC VARIATION IN EASTERN NORTH AMERICAN SAVANNAH SPARROWS

(*Passerculus sandwichensis*)

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In attempting to identify Ohio specimens of the Savannah sparrow, the writer was confronted with the usual difficult problem familiar to investigators in this confusing group of birds. He was not long in discovering what had already been suspected, that more than one geographic race is represented rather regularly among Ohio migrants, and furthermore, that not only are there numerous examples among the transients difficult of analysis, but that the breeding stock of the state was of doubtful racial affiliation as well. It was then realized that a thorough review of the geographic variation of Savannah sparrows breeding in eastern North America would be necessary to become personally familiar with the different characters and their combinations, as well as individual variations, found in breeding populations from as many different localities as it was possible to obtain material. In connection with this study 235 breeding birds including all the known races from North America (with the exception of Pacific coast forms) have been examined, as well as numerous migrants totaling 1,087 specimens.

Peters and Griscom in their monographic work on the "Geographical Variation in the Savannah Sparrow"<sup>1</sup> divided the birds of this species breeding in Canada and the United States, east of the one hundredth meridian, into five races: *Passerculus sandwichensis nevadensis* Grinnell, *P. s. oblitus* Peters and Griscom, *P. s. labradorius* Howe, *P. s. savanna* (Wilson) and *P. s. princeps* Maynard. These authors con-

<sup>1</sup>Bull. Mus. Comp. Zool., Vol. 80, No. 13, 1938, pp. 445-481.

sidered *P. s. bradburyi* Figgins and *P. s. campestris* Taverner as synonyms of *savanna* and *nevadensis* respectively.

These conclusions were borne out completely by the material examined in the present study, with the exception of the status of certain breeding populations included under the name *P. s. savanna*, and the identification of the type specimen of *P. s. bradburyi*.

Peters and Griscom commented on certain individual variations in specimens included by them under *P. s. savanna*. They did not, however, mention any variations in this form correlated at all with geographic distribution.

The present writer examined large series of breeding birds from Nova Scotia, New England, southern Ontario, Ohio and Michigan together with scattering specimens from regions in between; also a few from southern Wisconsin and northern Illinois and found a rather considerable amount of geographic variation. Generally speaking an increase in darkness and grayishness of plumage is noticeable in progressing westward to Michigan with a progressive paling from there on. Nova Scotia and the Magdalen Islands are inhabited by a comparatively pale, brownish bird. New England and Gaspé Peninsula specimens are noticeably darker and more grayish. From there westward there is a gradual darkening of color although northeastern Ohio and Lake Nipissing, Ontario, specimens are only slightly darker than New England examples. In northwestern Ohio and Michigan, however, specimens are noticeably darker and form the transition with *Passerculus sandwichensis oblitus* which breeds from the north shore of Lake Superior (including Isle Royale) northward and north-westward. West of Ohio and Michigan, Savannah sparrows become paler again and tend to have more slender bills, thus showing an approach to the characters of *nevadensis*. It is of interest to note that relatively the same differences are observable in the juvenals as in the adults from the same regions.

Now arises the question of what to do with these variant populations which in the aggregate make up what has been called *P. s. savanna*. If the birds from Nova Scotia are compared directly with specimens from northwestern Ohio, the difference is so extremely marked that one wonders how anyone can call them the same and still recognize *nevadensis* or *labradorius* as distinct from *savanna*. Therefore, it seems desirable to recognize more than one geographic race here,

but the question is where to draw the lines between them, and having separated them, which to call *P. s. savanna* and which the undescribed form or forms.

Here we come face to face with the disconcerting fact that the breeding range of *typical P. s. savanna* has never been defined. This form was described by Wilson from a migrant female specimen, apparently now not extant,<sup>2</sup> taken at Savannah, Georgia. Since it now seems likely that any one of several subspecies might be expected to occur at Savannah, Georgia, during migration it is all the more important to know which of these Wilson had in hand when he wrote his description. Fortunately a colored plate<sup>3</sup> accompanied this description. The plate depicts a rather pale Savannah sparrow with brown markings distinctly rufescent, and in all ways definitely more like the Nova Scotia bird than any other that the writer has examined. Therefore, it seems that birds from that region should be taken as representing typical *Passerculus sandwichensis savanna*, 42 breeding specimens and numerous migrants of which have been available for study in the Cleveland Museum of Natural History's large Nova Scotia Collection. Two late summer birds from the Magdalen Islands agree rather closely with Nova Scotia specimens and are definitely referable to *P. s. savanna*. Numerous migrant specimens from the Atlantic coast region as well as scattered examples from as far west as Ohio and Mississippi also should be referred to the Nova Scotia form.

Going westward from Nova Scotia a rather abrupt change occurs in the coloration of breeding Savannah sparrows, birds from New England being distinctly darker and more grayish. In going further westward this condition is progressively intensified culminating in the rather dark birds of Michigan and northwestern Ohio.

It seems to the writer that Nova Scotia and Magdalen Island birds are distinct enough from those breeding in New England, whence a series of 10 specimens from Maine, New Hampshire, and Massachusetts have been seen, to be separated from them subspecifically. The writer was also at first inclined to consider the northwestern Ohio and Michigan population a distinct race from the New England birds. However, in view of the fact that whereas the Nova Scotia series is at the

<sup>2</sup>Hellmayr. Field Mus. Nat. Hist. Zool. Ser., Vol. 13, Pt. 11, 1938, p. 486.

<sup>3</sup>Wilson. Amer. Orn., Vol. 3, 1811, p. 55 (pl. 22, fig. 3).

extreme end of a progressive chain of character variation (from pale brown to dark gray), the northwestern Ohio and Michigan series present characters that are intermediate between the medium gray New England series and that from Fort Churchill, Manitoba, the type locality of the blackish *P. s. oblitus*. In view of these facts it seems better to recognize only two subspecies instead of three, one in Nova Scotia and vicinity already shown to be typical *P. s. savanna* and one from New England west to the Great Plains with average characters probably presented by breeding populations in northeastern Ohio, northern Pennsylvania and western New York.

Before giving it a name, however, it is of course necessary to consider the applicability of *Passerculus sandwichensis bradburyi*, the name given by Figgins<sup>4</sup> to migrant Savannah sparrows taken at James Island, South Carolina. Mr. Alfred M. Bailey, of the Colorado Museum of Natural History, very kindly loaned the type of *bradburyi* together with ten other specimens from James Island used by Figgins in the description of this race. The type of *bradburyi* is one of only two specimens of the entire series *not* referable to the pale brownish Nova Scotia race that is now known to be typical *P. s. savanna*. The type and one other specimen are much darker and apparently referable to *labradorius*, which name stands by right of priority. Therefore, the medium gray southeastern Savannah sparrow definitely seems to be without a name. The writer proposes to call it:

***Passerculus sandwichensis mediogriseus*, subsp. nov.**

SOUTHEASTERN SAVANNAH SPARROW

*Subspecific Characters*—Similar to *Passerculus sandwichensis savanna* but darker and more grayish (less brownish) above; streaking on underparts coarser and more blackish. Sides of head less buffy (more grayish); stripe over eye duller or more greenish yellow. Similar also to *Passerculus sandwichensis oblitus* but paler and duller (less contrastingly marked) above; streaking on underparts finer.

*Measurements*—Adult male (23 breeding specimens from northern Ohio); wing, 66.5–71.5 (average 69) mm.; tail, 45–52.5 (49.6); exposed culmen, 10–12 (11.1); height of bill at base, 6–7.5 (6.6); tarsus, 19–21 (19.5). Adult female (5 breeding specimens from northern Ohio); wing, 63.5–71.5 (average 66.3) mm.; tail, 42–51.5 (46.3); exposed culmen, 10.5–11.5 (11); height of bill at base, 6–7.5 (6.7); tarsus, 19–20 (19.3).

<sup>4</sup>Proc. Colorado Mus. Nat. Hist., Vol. 2, No. 1, 1918, pp. 2-3.

*Type*—Adult male, No. 29171, Cleveland Museum of Natural History; Andover, Ashtabula County, Ohio, June 22, 1931; Omar E. Mueller and John W. Aldrich, original number 1243.

*Geographic Distribution*—Breeds from the Gaspé Peninsula south (excluding Nova Scotia) to New England and New Jersey west to Minnesota and Iowa. South in winter to southeastern United States.

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The rather abrupt transition that is found in northern Ohio from typical *mediogriseus* conditions of the eastern section (Ashtabula, Carroll, Geauga, Portage, and Cuyahoga counties) to a strong infiltration of *oblitus* characters in the northwestern section (Erie, Lucas, and Paulding counties) is very likely due to the origin of the breeding populations in these two sections. There is rather conclusive evidence that the Savannah sparrow entered Ohio as a breeding bird at least in the northwestern section in comparatively recent times.<sup>5</sup> The source of immigrants into the northwestern section would naturally be from regions to the north in Michigan where one finds an approach to *oblitus* characters, while birds entering the northeastern portions of the state would most likely come in along the Lake Erie shore from the northeast through western New York and northern Pennsylvania where conditions more typical of *mediogriseus* prevail.

Specimens from northern Illinois and southern Wisconsin are slightly paler and have more slender bills than typical *mediogriseus*, but are decidedly closer to that race than to *nevadensis*.

The western limit of the range of *mediogriseus* apparently is the eastern edge of the Great Plains grassland climax in Minnesota and Iowa, while its northern limit corresponds roughly with the southern limit of the spruce-fir association from the north shore of Lake Superior through central Ontario and Quebec to the north shore of the Gulf of St. Lawrence.

A very unsatisfactory condition exists in our knowledge of the way in which *P. s. labradorius* intergrades with *P. s. oblitus* because of the paucity of material from the interior of northeastern Canada. Peters and Griscom<sup>6</sup> extend the range of *oblitus* as far east as Lake St. John, Quebec. A single breeding specimen marked merely "Ungava" in the collection of the

<sup>5</sup>Campbell. Wilson Bull., Vol. 40, 1928, pp. 223-225.

<sup>6</sup>Bull. Mus. Comp. Zool., Vol. 80, No. 13, 1938, pp. 445-481.

United States National Museum seems definitely referable to *labradorius*. The area of intergradation is undoubtedly a broad one as is the case between *mediogriseus*, *oblitus*, and *nevadensis*. But that *labradorius* extends its range farther west than the coast of Labrador and the north shore of the Gulf of St. Lawrence seems almost certain in view of the presence of the substantial number of migrant specimens of definitely *labradorius* affinities from the interior regions: James Bay, Sept. 14; Ontario (Lae Seut, Sept. 19; Agawa Bay, Sept. 12; and Pt. Pelee, Sept. 16 and 17); Michigan (Portage Lake, Sept. 2; Charity Islands, Sept. 13; Wayne County, May 6; and Huron County, May 24); as well as the Ohio localities listed beyond.

*Identification of Ohio migrants*—In light of the above outlined facts relating to the geographic variation of the Savannah sparrow in eastern North America the collection of 75 migrant specimens assembled from Ohio has been identified as follows:

*P. s. labradorius.*

Lucas	County, Waterville Township—	♀ im.	Sept. 12, 1936	Ohio State Museum
Ottawa	“ Bay Point	—	Sept. 23, 1931	Cleveland Museum of Natural History
Cuyahoga	“ Strongsville Township	♀	Oct. 5, 1935	Cleveland Museum of Natural History
Hamilton	“ Ross Lake	♂	April 14, 1880	Cincinnati Society of Natural History

*P. s. savanna.*

Lake	County, Mentor Headlands	♂	April 20, 1931	Cleveland Museum of Natural History
Delaware	“ Delaware	♂	March 30, 1932	Cleveland Museum of Natural History
Clermont	“ Union Township	♂	Oct. 25, 1936	Cleveland Museum of Natural History
Scioto	“ Buena Vista	♀	May 2, 1925	Cleveland Museum of Natural History

*P. s. mediogriseus.*

35 specimens taken in March, April and early May from all sections of Ohio.

19 specimens taken in September, October and November from all sections of Ohio.

*P. s. oblitus.*

Lucas	County, Jerusalem Township—	♂	May 10, 1936	Ohio State Museum
Lucas	“ “ “	♀	May 26, 1939	Cleveland Museum of Natural History

Ottawa	County, Bay Point		♀	May 18, 1926
				Cleveland Museum of Natural History
"	"	"	♂	May 18, 1931
				Cleveland Museum of Natural History
Lake	"	Richmond	♀	May 3, 1938
				Cleveland Museum of Natural History
"	"	"	♂	May 3, 1938
				Cleveland Museum of Natural History
Mercer	"	Grand Reservoir	♂	Oct. 19, 1911
				Ohio State Museum
Clermont	"	Union Township	—	April 1, 1934
				Ohio State Museum
"	"	"	♂	March 26, 1938
				Cleveland Museum of Natural History
"	"	"	♂	March 26, 1938
				Cleveland Museum of Natural History
"	"	"	♀	May 12, 1939
				Cleveland Museum of Natural History
"	"	"	♂	Oct. 27, 1935
				Cincinnati Society of Natural History
Pike	"	Waverly	♂	May 5, 1899
				Ohio State Museum
Scioto	"	Lucasville	♂	May 6, 1925
				Cleveland Museum of Natural History

*P. s. nevadensis.*

Clermont	County, Union Township		♂	March 19, 1936
				Cincinnati Society of Natural History
"	"	"	♂	April 14, 1936
				Cleveland Museum of Natural History
"	"	"	♂	April 10, 1938
				Cleveland Museum of Natural History

This sample of migrant birds from Ohio probably gives a fairly good picture of the proportions in which different races mingle during migration just west of the Appalachian Mountains and south of Lake Erie.

A large proportion of the specimens identified as *mediogriseus* showed definite indication of approach to *oblitus* characters as would be expected since this is the case among breeding birds in northwestern Ohio and northwestward to the south shore of Lake Superior. The majority of the migrant specimens, however, seemed fairly typical of the somewhat paler northeastern Ohio or New England type. This fact, together with the finding of four migrant specimens of *savanna* in Ohio, indicates a westward drift to the migration of eastern breeding populations, while the discovery of the three specimens of *nevadensis* in extreme southwestern Ohio (Clermont County) indicates that during migration this form may move somewhat eastward from its breeding range.

In general the northward migration of *P. s. oblitus* is later than that of *mediogriseus*, the bulk of the more northern breeding birds apparently going through Ohio in May rather than April. A few late stragglers of *oblitus* even linger as late as the last week in May as is evidenced by the capture of a perfectly typical female specimen of that form in unworn plumage and with undeveloped gonads in Lucas County on May 26.

The present study was greatly aided by the excellent revisional paper on the Savannah sparrows by Peters and Griscom mentioned above. But even with the use of that very helpful treatise, completion of the task would have been impossible without the aid of a rather large amount of comparative material courteously supplied from various collections. The writer wishes to express his thanks for the loan of this material to the United States National Museum, the United States Biological Survey, the Museum of Comparative Zoology, the Museum of Zoology at the University of Michigan, the Field Museum of Natural History, the Ohio State Museum, the Cincinnati Society of Natural History, the Colorado Museum of Natural History, and the National Museum of Canada, and the private collection of Dr. Lawrence E. Hicks. For helpful advice particularly in respect to the establishment of typical *P. s. savanna* by means of Wilson's plate the writer is indebted to Dr. Harry C. Oberholser.

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