

THE SONG SPARROWS OF THE VIRGIN RIVER VALLEY, UTAH

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Study of a series of Song Sparrows (*Melospiza melodia*), recently collected in Washington County, Utah, has brought to light one more case of racial differentiation in this exceedingly variable species. Correlated with this differentiation is a significant ecological separation of populations of Song Sparrows in southwestern Utah. The specimens of the series are easily separable into two distinct groups. Those taken from stream-side thickets from 4200 to 6800 feet in the Pine Valley Mountains are dark, heavily streaked and apparently typical of *M. m. fallax*, whereas others collected at swamps 25 miles away at 2800 feet along the Virgin River near Saint George are of a conspicuously lighter brown color and also lack the black streaks on the feathers of the dorsum which are so characteristic of *fallax*. These features suggest an approach to the race *saltonis*, yet the Virgin River Valley birds are darker than those of *saltonis*.

While the Song Sparrows of the Virgin River Valley are thus intermediate in certain respects between *fallax* and *saltonis*, several circumstances argue against the view that they constitute an intergrading population. Although the Virgin River series exhibits the wide range of individual variation characteristic of Song Sparrows as a whole, there is, nevertheless, closer agreement among individuals of the group in their color characters than there is in comparable series of many other races. In addition, they exhibit a small range of variation in wing length. These features suggest a racial stock of relatively uniform genetic constitution, which view is strengthened when one considers the wide range of variation in *saltonis-fallax* intergrades, where the ranges of these two races adjoin. For instance, five breeding and two fall-taken adults from Cochise and Santa Cruz counties, Arizona, which we have examined (also reported by Swarth, Proc. Calif. Acad. Sci., ser. 4, 18, 1929:329) vary in wing length from below average for *saltonis* to a value extremely high for *fallax*. One breeding female in contrast to the others has conspicuous black dorsal streaks. The dorsal ground color of one specimen is grayish. Another has a back typical of *saltonis*. The rest have an intensification of the bright reddish-brown of *saltonis*, rather than the subdued chestnut color of the Virgin River birds. The lack of resemblance of the Virgin River series to these highly variable intergrades might be taken as evidence that the Virgin River Valley birds are not themselves intergrades.

The uniformity of the Virgin River population may be explained in part by its being more or less isolated from surrounding races. Between it and *saltonis* to the south lies a great desert country with infrequent oases. Even though the Virgin River is a tributary of the Colorado River, there is, for the most part, an absence of suitable Song Sparrow habitat, especially in regions below Boulder Dam where the Colorado River cuts through narrow gorges and has little or no stream-side vegetation along its course. The Virgin River population is in closer geographic proximity to *fallax* but is separated from that form to some extent by prevailing desert conditions and by lack of suitable habitat. There is seemingly an ecological separation, in addition, between the two races.

Indications are that the Virgin River Song Sparrows occur only in the vicinity of cattail swamps with standing water and with bushy thickets such as mesquite or rose in the immediate dry-land surroundings. Both the thickets and the cattails are frequented by the Song Sparrows, the latter being resorted to especially for greater protection. The breeding specimens from Zion Canyon, from south of Saint George, and from Pahrnagat Valley were taken in such a habitat. Bird associates are Marsh Wrens, Yellow-throats, Yellow Warblers, and Red-winged Blackbirds. Extensive field work

along the Beaver Dam Wash, the lower Santa Clara Creek, and the Virgin River has failed to reveal Song Sparrows in stream-side thickets. The swamps where these birds do occur are few in number and widely scattered. If the swamps are of any extent at all, Song Sparrows are numerous in them, but the total racial population can not be great. This spotty distribution of suitable swampy habitat not only makes for isolation from *fallax* but also makes for discontinuous distribution of the colonies within the general range of the race. The Virgin River Song Sparrows exist in an area characterized by "Lower Sonoran" conditions as shown by the presence of such indicator species as the catclaw (*Acacia greggi*), mesquite (*Prosopis glandulosa*), screwbean (*Strombocarpa odorata*), desert willow (*Chilopsis linearis*), creosote bush (*Covillea tridentata*), and bur-sage (*Franseria dumosa*) in the general region.

In contrast to the ecological situation of the lowland population, the nearest examples of *fallax* were taken at the Danish Ranch, 4200 feet, five miles northwest of Leeds, and near the hamlet of Pine Valley, 6800 feet, some 17 and 23 miles away. At both these collecting stations the Song Sparrows were taken from dense stream-side thickets of willows and hawbush along streams running through wet meadows. Also occupying the thickets were Lazuli Buntings and Yellow Warblers. Occasionally, Brewer Blackbirds and Red-wings come to the thickets, although these latter species are found, for the most part, associated with the wet meadows of grasses and sedges. The Song Sparrows under these conditions are more widely spaced and less concentrated than in the lowlands. Probably the Song Sparrows of the *fallax* group are relatively tolerant as to habitats frequented, for farther north in Utah they exist also near swampy areas.

The general environmental situation occupied by *fallax* in Washington County, Utah, can be summed up by saying that they occur in "Great Basin" or "Upper Sonoran" type of country characterized by sage brush of various species (*Artemisia*), rabbit brush (*Chrysothamnus*), shadscale (*Atriplex confertifolia*) and other shrubs of the northern desert shrub association. Another characteristic vegetative feature of the region is the juniper-piñon pine association. Although the Song Sparrows do not associate directly with any of these vegetative types, the presence of these forms indicates a different ecological situation where *fallax* occurs as compared with the lowland Virgin River Valley situation.

Yet another consideration bearing on the status of the Virgin River Valley population is the indication of a definite, fairly extensive breeding range.

In view of the uniformity of characters of the Virgin River population, its distinct color and size characteristics, and its ecological and spatial isolation from *fallax* and *saltonis*, respectively, we regard it as representing a distinct race.

Melospiza melodia virginis, new subspecies. Virgin River Song Sparrow.

Type.—Adult male, no. 6534, Univ. Utah Mus. Zool.; taken near junction of Virgin and Santa Clara rivers, 3 mi. S Saint George, 2800 feet, Washington County, Utah, May 16, 1940; collected by William H. Behle, orig. no. 2091.

Subspecific characters.—Differs from *M. m. fallax* in having the centers of shaft streaks of the scapulars and interscapulars and breast spots brown rather than black. Crown not streaked with black. Dorsal ground color light brown rather than gray. Closer in general color tone to *saltonis* but differs in having breast spots, back and crown darker, more of a chestnut brown rather than the bright reddish brown of the southern race. In comparing series rather than individuals, the sides of the head and neck of the new race show a grayer appearance than *saltonis*, the mass effect being due largely to the whiter superciliary stripe of *saltonis*. Sexual dimorphism is similar to that of *saltonis* in that females have darker streaks than males. As to wing length, *virginis* is intermediate between *saltonis* and *fallax*.

Extreme and average measurements of M. m. virginis.—Eleven males, wing 64.2-68.0 (66.1), tail 66.7-72.3 (69.3), bill from nostril 7.9-8.8 (8.4), tarsus 20.8-22.7 (21.2) mm. Nine females, wing 62.0-67.4 (64.0), tail 65.4-73.3 (67.7), bill from nostril 7.9-9.0 (8.4), tarsus 20.1-21.9 (20.8) mm. Type, male, wing 65.4, tail 69.5, bill from nostril 8.8, tarsus 22.0 mm.

Extreme and average measurements of M. m. fallax.—Twenty males, wing 65.3-72.2 (69.0), tail 65.5-77.1 (70.0), bill from nostril 7.5-9.5 (8.4), tarsus 20.9-23.5 (22.2) mm. Nine females, wing 64.2-67.8 (66.2), tail 64.1-69.9 (67.4), bill from nostril 8.4-9.0 (8.6), tarsus 20.8-22.7 (21.5) mm.

Extreme and average measurements of M. m. saltoris.—Twenty males, wing 63.0-67.5 (65.2), tail 65.0-72.4 (68.4), bill from nostril 7.6-9.1 (8.4), tarsus 19.8-22.8 (21.3) mm. Twenty females, wing 58.7-64.0 (61.4), tail 58.3-67.4 (64.1), bill from nostril 7.6-9.5 (8.4), tarsus 19.6-21.9 (20.7) mm.

Geographic distribution.—Breeds in the valley of the Virgin River, Washington County, Utah (16 breeding specimens), including Zion Canyon (2 breeding specimens) and zonally equivalent habitat west at least to Pahrangat Valley, Lincoln County, Nevada (2 breeding specimens).

Winters south along the Colorado River from the southern tip of Clark County, Nevada, to San Bernardino County, California (13 winter specimens).

The time of departure and the completeness of the winter exodus of *virginis* from its breeding range as well as the fact of replacement in winter of the summer resident population by individuals from farther north is indicated by the fact that less than half of 20 specimens collected at the type locality in mid-September represent the breeding population. The others were *fallax* which probably wandered down into the lowlands from near-by higher areas. Also, of 30 skins collected in the vicinity in mid-December, all but two are *fallax*. The other two show an approach to *merrilli*.

Intergradation between *virginis* and *fallax* is suggested by one skin of the lot of 6 collected near the hamlet of Pine Valley, Pine Valley Mountains, which shows an approach in its coloration to the new race. The others are uniform in characters and are allocated to *fallax*. A specimen from Lehman Creek, 7500 feet, White Pine County, Nevada, has something of the general color of *virginis* but is of the size of *fallax*. Yet another skin from Greenmonster Canyon, Monitor Range, Nye County, Nevada, although badly worn, shows some of the chestnut color of *virginis* on the back.

This study has involved scrutiny of skins not only from the collections of the University of Utah and the Museum of Vertebrate Zoology but also from the Museum of Northern Arizona, the California Academy of Sciences and the collection of Ralph Ellis, Jr. To the owners or custodians of these collections we express our thanks.

Museum of Vertebrate Zoology, Berkeley, California, and Department of Biology, University of Utah, Salt Lake City, December 26, 1941.