

brought immediate response from a score of birds. Almost at once appeared Rocky Mountain Jays, imitating the owl call perfectly, while from the hidden depths of the swamp came that angry call of the Red-naped Sapsucker which mimicks, or seems to mimick, the Red-tail's scream. White-winged Crossbills with metallic notes of alarm alighted on the topmost twigs of the spruces above, and a mixed crowd of Ruby-crowned Kinglets, in dull, juvenal dress, Red-breasted Nuthatches, Aubudon Warblers, Chickadees, and a Brown Creeper flitted and scrambled through the surrounding trees as they searched for the source of those exciting noises.

A total of 77 species was observed (or recorded from other evidence) in the seven habitats studied during the course of a week at the latter end of the breeding season. Of these, 65 species can be regarded as summer visitants, or residents, and 12 species as vagrants or migrants.

*Okanagan Landing, B. C., Canada, July 15, 1934.*

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## THE CHANGING DISTRIBUTION OF THE WESTERN MOCKINGBIRD IN CALIFORNIA

WITH TWO MAPS

By JOHN R. ARNOLD

For a number of years the impression has been gaining ground among students of bird-life that the distribution of the Western Mockingbird (*Mimus polyglottos leucopterus*) in California has been undergoing considerable change. Recently a study was undertaken for the purpose of assembling definite data that would decide whether this impression were founded on fact, and if so, whether the observed change in distribution could be correlated with any causal factor.

The writer has secured his facts from three main sources: (a) from published reports in which the mockingbird has been mentioned; (b) from unpublished notes of experienced ornithologists and oologists in various parts of the State; and (c) from the records and files in the Museum of Vertebrate Zoology and the California Academy of Sciences. The writer's own observations were made while residing in mockingbird country as well as during frequent trips to various parts of central California, with the mockingbird the special objective.

The writer wishes to express great appreciation to the members of the staff of the Museum of Vertebrate Zoology for guidance and aid in his study and to members of the Cooper Ornithological Club for the use of their notes.

In 1911 there appeared a paper under the title, "Distribution of the mockingbird in California" (Grinnell, 1911), which included a map of California showing the distribution of the mockingbird as of that date. In addition to the map were several pages citing authorities for the data upon which the map was based and discussing the status of the species prior to 1911. This discussion was chiefly concerned with the changes in the mockingbird population of southern California, that area apparently being the only one in which an especially noticeable change had occurred. Since 1911, further published reports have brought out the fact that the mockingbird had been actively spreading into regions other than the southern area. Tyler (1913) first reported a changing distribution in the San Joaquin Valley; Wilder (1923) reported an unusual occurrence in Humboldt County; Kline (1931)

reported a nesting record for Santa Cruz; and A. H. Miller (1931) published an account of a nesting colony at Richmond, Contra Costa County.

A copy of the map from Grinnell's paper reproduced here (fig. 38) shows the distribution in California at that time. The map of the distribution of the mocking-

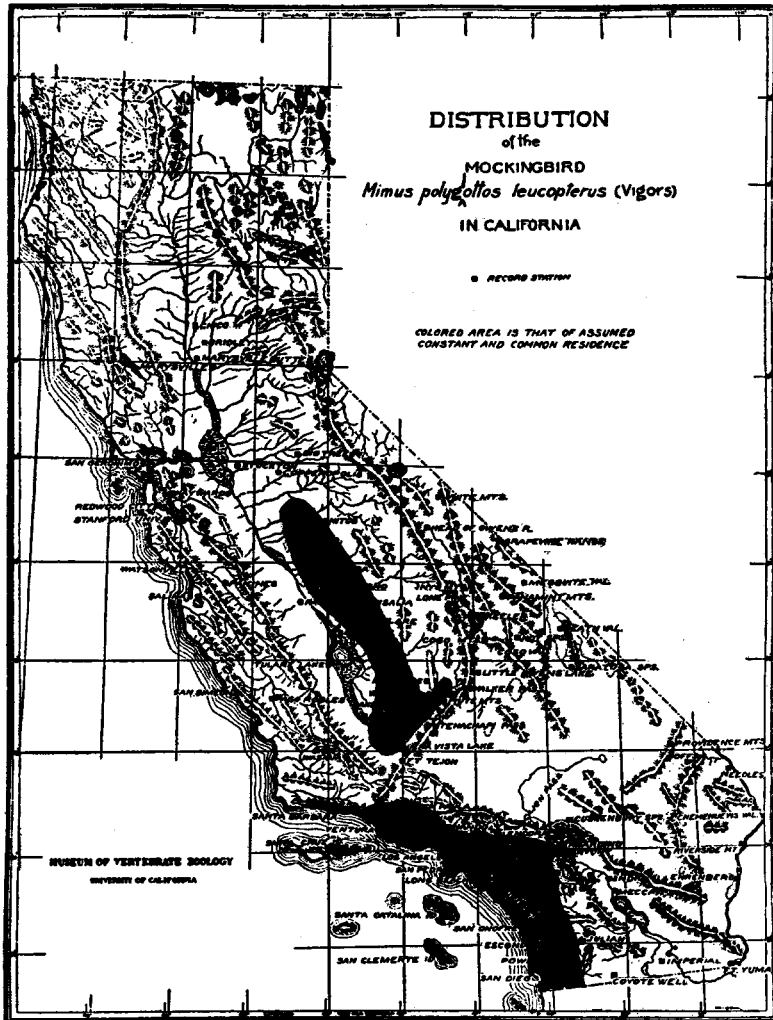


Fig. 38. Grinnell's map of Mockingbird distribution in 1911 (from *Auk*, 28, opp. p. 293).

bird in July, 1934 (fig. 39), shows the change in distribution that has occurred during the subsequent twenty-three year period. For the purpose of discussion, the areas of changing distribution may be grouped as follows: (1) the central valleys, (2) the southern California area, and (3) the coastal areas.

Throughout the great central valleys of California, the San Joaquin and the Sacramento, the mockingbird has greatly extended its range during the last decade. Whereas in 1911 the breeding area in the San Joaquin Valley was designated as

"From the vicinity of Merced south through the San Joaquin Valley to the region about Bakersfield . . ." (Grinnell, 1911, p. 294), it now extends from north-central San Joaquin County, on the north, to south of Bakersfield. In addition to the south-north expansion, the range has been extended from four to ten miles west-

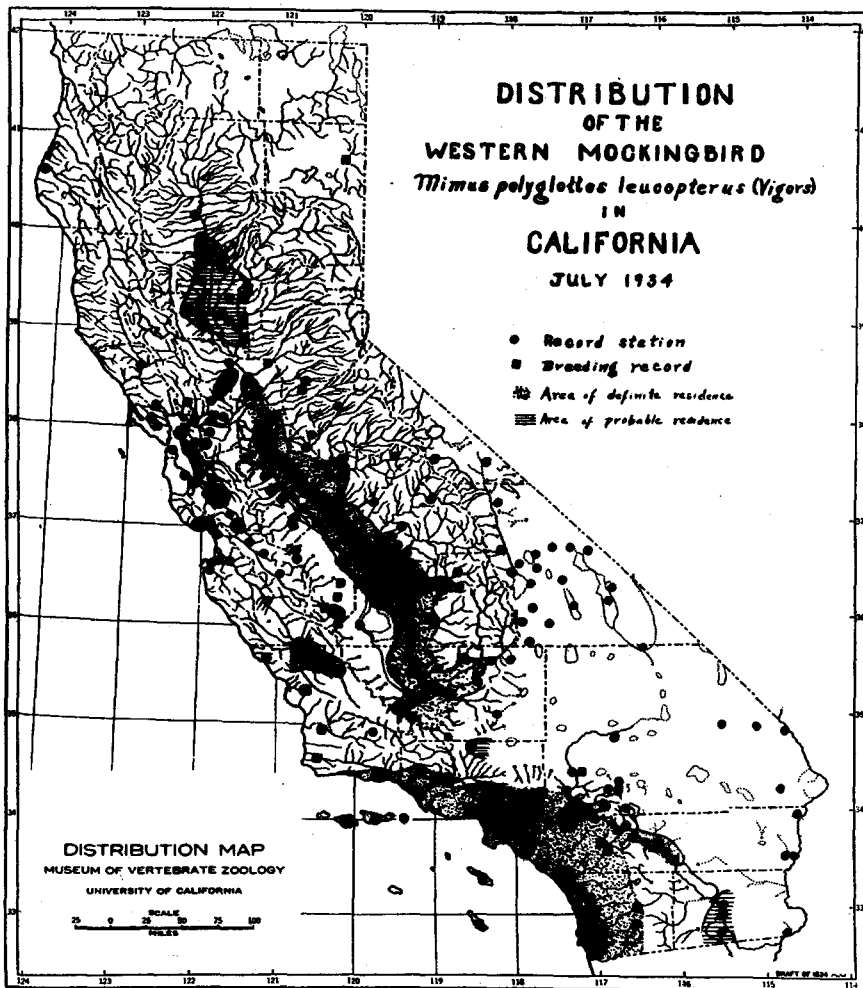


Fig. 39. Mockingbird distribution in California according to records up to July, 1934.

ward until, in general, the Kings-San Joaquin River drainage system is the western boundary. Through that strip of the San Joaquin Valley known as the "West Side," various stations of breeding residence occur. On the east side of the San Joaquin Valley, in Tulare County, the range has been extended to Three Rivers and Woodlake, while there is a breeding record from Hospital Rock, Sequoia National Park (Powell and Fry, MS, 1934). In general, the mockingbird does not nest in the blue oak belt of the foothill territory on the east side of the San Joaquin Valley. Exceptions to this are the records from east of Snelling, Merced

County, at La Grange, Stanislaus County, and in Pleasant Valley, Mariposa County (Grinnell and Storer, 1924). In the southern portion of the San Joaquin Valley, in Kern County, the mockingbird has extended its range but slightly. The bird now breeds somewhat commonly in Taft and around Buena Vista Lake (Stansell, MS, 1934); it breeds west from Wasco at least as far as Semitropic (Truesdale, MS, 1932); and it is quite common in the Edison orange district to the southeast of Bakersfield. In the Buena Vista Lake region it has been known to nest in the six foot Atriplex bushes, but in Taft it chooses the cottonwood (Stansell, MS, 1934). In other portions of Kern County its nesting sites are similar to those in the rest of the San Joaquin Valley.

This increase in the breeding range of the mockingbird in the San Joaquin Valley is doubtless due to several factors, all related. The outstanding factor in the cause for the spreading of the mockingbird in the area is the expansion of certain types of agriculture, this in itself related to water supply, and this latter dependent largely on the general climatic character of the region.

In the Sacramento Valley, the area about Sacramento seems to be an extension of the breeding territory at the north end of the San Joaquin Valley, while the area about Davis, Yolo County, in which the mockingbird was first reported nesting in 1928 (Storer, MS, 1933), seems to constitute a distinct area of residence, without connection, at the present time at least, with other areas. The Marysville area, in the northern portion of the Sacramento Valley, is marked on the map as an area of probable breeding because the writer could locate no records of breeding since those of Belding in 1890 (Belding, 1890). Sight records for nearly every month, however, point to definite residence in this region (Neff, MS, 1934).

Southern California, called by many a "mockingbird metropolis," is an area in which the mockingbird population has increased probably tenfold, according to Mr. George Willett. In this region the range of the mockingbird has not been extended on all fronts, but only in some directions. In the Santa Barbara region it may be noted that the mockingbird now breeds at Santa Maria and Lompoc. This may indicate a continuous breeding area along the immediate coastal slope from Santa Barbara to San Luis Obispo and Paso Robles, for the birds have been noted at various ranch houses between Santa Barbara and Santa Maria (Stevens, MS, 1934). However, it seems unlikely that the mockingbird will be able to establish more than a chain of breeding colonies because of the existing mountain barriers.

In Los Angeles County the area of residence for the mockingbird has increased northward, and breeding records for Antelope Valley (Stevens, MS, 1934) seem to indicate the possibility of an even greater expansion in this portion of the area. In San Bernardino County the mockingbird has spread to the base of the San Bernardino Mountains, a slight yet noticeable change. In addition, the bird has been reported (Pierce, MS, 1934) as nesting occasionally east of Victorville, a location on the Mohave Desert. Probably the greatest extension of breeding range has occurred in Riverside County, where the expansion eastward as far as Coachella Valley (Clary, MS, 1934) and Mecca (van Rossem, 1911) appears to have followed the Southern Pacific Railroad through San Gorgonio Pass. Climatic conditions, as well as the vegetation, of the series of towns are probably favorable through this pass, in which there is an arm of the Lower Sonoran life-zone. While the nests in this area are often found in native desert plants on the open desert, mockingbirds are known to drive the shrikes from olive trees and cotoneaster bushes to build their own nests (Clary, MS, 1934). The Imperial Valley, Imperial County,

seems to be another area of residence, but breeding records from this county are unknown to the writer.

Under the heading of coastal areas of changing distribution, the writer has grouped a number of small areas, some definitely coastal, others not as near the coast, but probably best discussed in this group. The northernmost coastal area is that of Richmond, Contra Costa County, in which a colony of six to twelve birds has established residence. This colony, of which the first reliable report is that of Miller (April, 1931), is exposed to the strong cold winds and frequent fogs off the bay, but the birds seem to be increasing in number. Mockingbirds have been reported from Pinole, six and one-half miles north of the Richmond location, but none seems to be present there now. Also in Contra Costa County, but separated from the Bay by the Berkeley Hills, is the colony at the town of Walnut Creek. The writer investigated this colony in July, 1934, after receiving a report of it from Mrs. E. A. Sykes of Walnut Creek. It was found that mockingbirds had been nesting in this region since 1929, and that now a colony of at least sixteen birds, and probably more, exists in this region. The conditions seem favorable for a still larger colony. At Hayward, on the southern arm of San Francisco Bay, wintering mockingbirds have been reported since 1899 (Emerson, 1899); but as far as is known to the writer the first breeding record was in 1931 (Cohen, MS, 1930). Hayward now supports a small colony of mockingbirds in the residential district, and Niles Nursery, ten miles southeast of Hayward, has two or three resident pairs (Carriger, MS, 1934).

In the San Jose-Gilroy area, mockingbirds have been reported since 1886, but the first breeding records here were in 1931 in San Jose (Pickwell, MS, 1931), and in 1928 in Gilroy (Unglish, MS, 1933). Although it is quite possible that these are not the first records, it seems certain that the mockingbird has only recently become a resident of this area. Santa Cruz is a truly coastal area in which the mockingbird has become a resident; in fact, most of the breeding records are within a mile of the shore-line. For at least fifteen years the mockingbird has been recorded as a winter visitant in Santa Cruz, but it did not nest there until about 1930 (Streator, MS, 1933; Kline, 1931). The mockingbird is not abundant in the city of Santa Cruz or at Twin Lakes, but a small colony seems firmly established. The mockingbird colonies of San Luis Obispo County are somewhat separated. The town of San Luis Obispo seems to support an isolated breeding colony, but scattered nesting records in the vicinity of Paso Robles, Shandon, the San Juan River, and in southern Monterey County indicate a larger contiguous breeding colony (Truesdale, MS, 1933).

Mockingbirds are not restricted to the mainland of California, but they also occur on islands off the coast. At the time of the 1911 report, the islands of Santa Cruz, Santa Catalina, and San Clemente were known as islands on which the mockingbird nested. Now, in addition to these islands, the island of Santa Rosa is known to have resident mockingbirds (Pemberton, 1928), and mockingbirds have been seen on Anacapa Island (Burt, 1911).

This study has shown that the mockingbird has, within a short period of years, extended its range in many parts of California. The map of the distribution in 1934, when compared with the map of the distribution in 1911, shows the places in which changes have occurred. The author realizes that it is entirely possible for mockingbirds to have occurred in some of the areas before observations from them had been reported, but this factor could not reasonably have affected all of the places involved.

## CONCLUSIONS

1. No single factor in itself will account for the changing distribution of the Western Mockingbird in California; in all areas the changing distribution is due to a combination of factors.

2. Arboreal plantings on a large scale in portions of the San Joaquin Valley, the Davis area, and in the Sacramento Valley have made those areas suitable for the support of mockingbird populations by furnishing food and appropriate nesting sites.

3. The planting of ornamental shrubbery, such as pyracantha, cotoneaster, toyon, and other berry-producers, has helped the mockingbird to establish residence in the vicinities of Santa Cruz and Walnut Creek, and probably in other localities also.

4. The seeming trend toward a drier climate in most parts of California, in particular, the dry years of 1928, 1929, and 1930, has, it is thought, been favorable to the mockingbird in those places in which the agricultural conditions have also become suitable for the bird. In other words, the mockingbird has apparently chosen to follow the orchard type of cultivation and the park-residence type of district whenever climatic conditions have favored its doing so.

5. In one locality, the Richmond area, the presence of a suitable nesting site, plus the onset of a drier period, seems to have been enough for the establishment of a colony. However, this colony is new, and its tenure is uncertain.

6. The mockingbird is a bird of somewhat roving habits in most portions of its range, and the population spreads for winter foraging. Thus on the borders of its general range individuals wander into new areas during the winter season.

7. The new breeding area on Santa Rosa Island probably is merely a case of undiscovered range, not a change in range.

8. If present dry, warm climatic conditions continue, and agriculture of the present kinds remain in status quo or further spreads, then it is to be expected that the mockingbird will continue to extend its range. Probably several of the smaller isolated colonies will link together into larger areas of residence.

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*Coalinga, California, March 18, 1935.*

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## SYSTEMATIC STATUS OF SOME NORTHWESTERN BIRDS

By H. S. SWARTH

### *TRINGA SOLITARIA*

In our standard books, wherever the Solitary Sandpiper is dealt with, there is unhesitating recognition of two subspecies, Eastern (*Tringa solitaria solitaria*) and Western (*T. s. cinnamomea*), a recognition that I do not believe is warranted by the facts. In the A. O. U. Check-list there is a most positive and definite allotment of territory to each that, too, can not be substantiated. To clear up the uncertainty that I felt from the appearance of the first several specimens of this species that I collected in the Atlin region, British Columbia, I made an effort to get more, with a resulting series of nineteen skins. There are also at hand eight more from Yukon Territory near-by, six from Forty-mile, two from White Horse.

As regards subspecific characters, Ridgway (*Birds N. and Mid. Am.*, pt. 8, 1919, p. 363) describes *cinnamomea* as follows: "Similar to *T. s. solitaria*, but larger; summer adults with upper parts much less distinctly spotted with whitish, white bars on tail averaging decidedly narrower (and blackish ones correspondingly broader), and middle pair of retrices often (usually?) wholly deep brownish gray; young with spotting on upper parts decided brownish buffy or cinnamomeous, instead of whitish." Brewster, in the original description of *Totanus solitarius cinnamomeus*, gives an additional character: "The outer primary finely mottled with ashy white along the border of its inner web for a distance of about an inch beyond the tips of the under primary coverts" (*Auk*, 7, 1890, p. 377). I have carefully checked all these features within my Atlin series and as compared with series from other parts of North America.

First, as to size. Tables of measurements that I have compiled of all available specimens would occupy too much space for presentation, and I will restrict myself to some figures showing length of wing, commonly accepted as an index to general size. In support of the statement ascribing greater size to *cinnamomea*, Ridgway (*loc. cit.*) gives the following wing measurements: *T. s. solitaria*, wing, male, 121.5-129.5 mm.; female, 126-134. *T. s. cinnamomea*, male, 124-137; female, 137-142.

Fourteen male birds from Atlin have the following wing measurements: 124.5, 126.5, 127.5, 129.0, 130.0, 130.0, 130.5, 131.5, 132.0, 132.5, 134.0, 135.0, 136.5, 139.0. Five females, 127.0, 134.0, 138.0, 138.5, 142.0. By measurement, in which category do these birds belong? If some in each, where should the dividing line be drawn? Measurements of tail, culmen and tarsus show a similar range, but the different parts do not vary uniformly in the same direction.

As to differences in markings of upper parts and tail that are ascribed to adults of the eastern and western birds, I am unable to detect them in any degree. The supposedly less intense cinnamon of the dorsal spots in the young of the eastern bird I could not satisfactorily ascertain, due to a paucity of eastern specimens, but it is