THE LECONTE THRASHERS OF THE SAN JOAQUIN

WITH ONE ILLUSTRATION

By JOSEPH GRINNELL

In February, 1932, the writer and his companion, Mr. Ward C. Russell, found themselves on a brief trip south along the west side of the southern (upper) San Joaquin Valley, in west-central California. In attempting to trace the local distribution of certain mammals and birds in that territory, enough new facts concerning the Leconte Thrasher (*Toxostoma lecontei*) came to our attention to appear to warrant this special contribution on that species.

In coming south from Mendota, Fresno County, we first encountered the Leconte Thrasher about seven miles due east of Coalinga, in the same county, near the highway leading toward Tulare and about where "Polvadero Gap" is marked on the Coalinga sheet, U. S. G. S. Here Mr. Russell obtained a breeding male and heard or saw at least three others, the morning of February 21; they were in a tract of large-sized atriplex, or kind of salt-bush, along an arroyo. This is about where Goldman (1908, p. 205) found the species in 1907. He met with it "from near Huron west to the Arroyo Los Gatos" and collected specimens, both adults and full-grown young, "June 29 to July 1." Human activities in the oil region immediately around Coalinga, including the arroyo from Los Gatos Creek, have doubtless resulted unfavorably to the birdlife native there; at any rate, we saw no promising thrasher ground close around Coalinga. Also our own rapid reconnoissance of the immediate vicinity of Huron, southwestern Fresno County, failed to show appropriate ground for Leconte Thrashers, although there was evidence that tracts of atriplex brush formerly existed there. But there remains much good-looking Leconte Thrasher country about midway between Coalinga and Huron, and our sample was probably from a fairly extensive population of the species there. This neighborhood, then, marks the northernmost limit of the range of the species west of the Sierra Nevada (see map, fig. 21).

In our zigzagging about over the Tulare Lake basin, now dry throughout, we found no trace of this species; nor, in proceeding farther south, did we see any favorable ground for it till we approached Lost Hills, Kern County. Here, our route again cut into the piedmont belt of atriplex, good-looking for the bird in question, which probably extends with some interruptions southeast from Coalinga along the entire west side of the Tulare Lake basin. But we did not stop to test the supposition, proceeding on to McKittrick. Here, within two miles northeast of this oil-town, in western Kern County, somewhat off the highway leading towards Bakersfield, we made a three-night "dry" camp, February 22 to 24, inclusive; and we obtained there the materials upon which most of the succeeding account is based.

This locality (two miles east and northeast of McKittrick) is at about 1000 feet altitude, on ground sloping gently down northeastwardly toward Buena Vista Slough, with low hills close by to the west and south. It is in the focus of the "rain-shadow" from the coast ranges—excessively dry and of desert aspect. Despite recent rains, copious for this place, much dry-surfaced bare ground was in sight. The new green stuff was restricted to the low places along "draws" or "washes", to shady sides of hills, to spots which had been worked by burrowing rodents, and to patches beneath and close about bushes. Even though it was yet February, with unusually heavy snow mantling the mountains to the east, south and west of us, the mid-day sunshine was powerfully warming.

The most conspicuous element in the perennial vegetation about us was a species of salt-bush. Fragments saved have been identified for me by Dr. H. F. Copeland, of the Herbarium, University of California, as *Atriplex polycarpa*. Xerophilous in extreme degree, my observation of it in the San Joaquin Valley shows this species of atriplex to be most characteristic of ground fairly well-drained when it does rain, thus ground usually with a decided slope and not notably alkaline. The bushes of

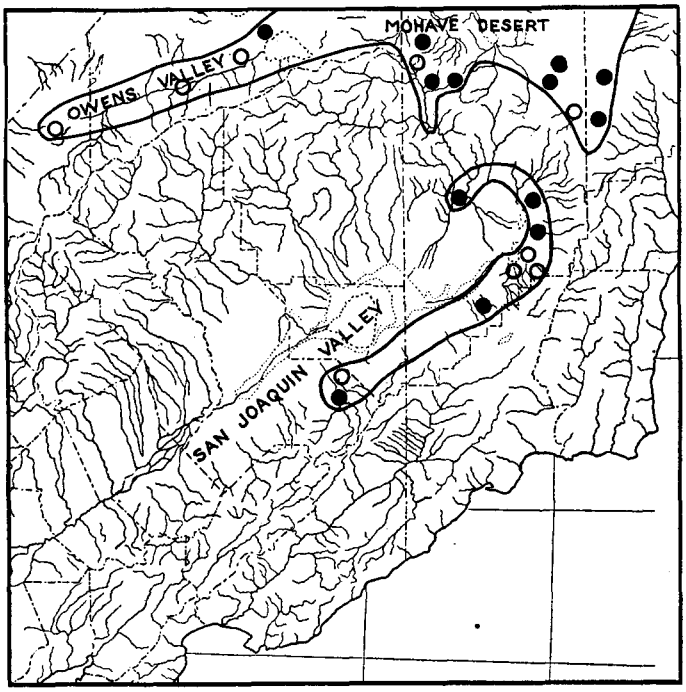

Fig. 21. STATIONS OF OCCURRENCE OF LECONTE THRASHER IN THE SAN JOAQUIN VALLEY AND ALONG THE WESTERN EDGE OF THE MOHAVE DESERT, CALIFORNIA; SOLID CIRCLES ARE STATIONS WHENCE SPECIMENS ARE AT HAND IN THE MUSEUM OF VERTEBRATE ZOOLOGY; OPEN CIRCLES ARE STATIONS OF RECORD OTHERWISE. ASSUMED GENERAL RANGE OUTLINED; BUT IT IS NOT TO BE INFERRED THAT THE SPECIES EXISTS CONTINUOUSLY OVER ALL THE INCLUDED AREA.

it grow small and far-scattered on exposed, high terrain; but in low places, in ravines and along gullies, washes, or arroyos the bushes grow eight or ten feet in diameter, and five feet or more high, and may crowd together here or there along a favorable draw to form a continuous thicket. It is the presence of this more luxuriant growth of atriplex that, together with much open ground between the scattering bushes nearby, and the general climatic conditions of high temperature and low humidity, appears to form the final requirement controlling the presence and relative numbers of the Leconte Thrashers in the San Joaquin Valley.

As we parked our truck at the side of a brush-lined gully on the evening of February 22, the first avian voice that reached our ears was that of a Leconte Thrasher. The next day, there proved to be a nest with three eggs, the birds of the pair sitting alternately, only 16 paces from the door of the tent we had set up

to work in. Other than brief snatches of song, morning and evening, and an occasional, clear, *quer-up* during the day, perhaps when the birds changed places, I heard nothing from them; I only saw them when I would go to the bush and shake it, when out would go the sitting bird on the opposite side, flying low over the ground and up the wash, partly running, and usually stopping a moment on the ground with tail held at a steep angle, before disappearing over a rise of ground. In a marvelously short time, only 15 minutes by one timing, provided I went into the tent out-of-sight, a bird would be back on the nest again. One of this pair was tailless, so the fact of about equal participation in the function of incubating as between the two sexes was easily established.

The day of February 24, beginning at dawn, was devoted by us to observation upon the thrashers. Singing of a nearby bird began at 6:10, when daylight had intensified to a point about balancing the brilliant moonlight of that dry atmosphere and when a red band had begun to glow along the eastern horizon. But this singing quickly ceased, and through the heat of the day we heard none. Perhaps earlier in the season, before incubation was generally under way, singing had been more persistent.

The first nest taken had been located by Mr. Russell the day before, a mile or so north of camp. We both approached the site, at 8:30 a. m.; a bird flushed when we were yet 30 paces from it, flying away from us low over the ground, was shot and proved to be a male. The nest bush was one of a row of large-sized atriplex bushes growing irregularly along the edges of a meandering gully in the bottom of a shallow draw. This bush was about 1250 millimeters high (to top of dense, leafy crown), with diameter a third greater. The nest rim proved to be 550 mm. beneath the crown of the bush and 670 mm. above the gently sloping ground directly beneath. The nest was not in the center of the bush, but was situated in the dense tangle of twigs about 700 mm. east of its axis, resting among the complexly branching stems which varied in slant from nearly horizontal to nearly vertical.

This nest, measured in place, showed an extreme diameter of 280 mm. and height of 190 mm. This, of course, pertained to the substructure, which consisted of straggling, dry twigs, long and varyingly slender, hardly distinguishable at the periphery from the surrounding dense leafless twiggery of the bush itself. How the bird could have managed the construction of this basal shell in such close quarters, so as to provide the proper space for the nest-proper, it was difficult for me to imagine. The inside diameter of the nest cup was 95 mm., depth from its solid rim, 60 mm. The entire inside cup was astonishingly firm, almost as if made of mud; it consisted of atriplex leaves and weathered bits of newspaper packed together so as to be of almost the firmness of pulp-board. Possibly the rains of the preceding month had had something to do with yielding this result; but even so, there was no resemblance at all to the porous, open-work, inner lining of a California Thrasher's nest—nothing for the young birds to clinch their toes and claws through. In this nest there was also a sharply distinguishable intermediate layer, of long fine grass stems and slender twigs; but none of this material reached the inner wall.

This first nest to be taken, with the male parent, contained three eggs in which incubation proved to be far advanced, so far, indeed, that I could only save one of the egg-shells intact. The second nest taken was the one at camp. It contained three eggs in each of which incubation later proved to be well along—about four days I should say. When I decided to collect this nest and appurtenances, at about 11 a. m., the bird which flushed from the bush when I shook its upper side with my foot was shot and proved to be the female. Twenty minutes later, after I had pur-

posely been away, down the wash, the other, male bird had come to the nest, was flushed, and was shot. Although, as previously stated, the two birds of this pair seemed to share about evenly in sitting upon the eggs, only the female showed the glandular-appearing condition of the ventral skin which develops at the time incubation is carried on. The male showed no trace of this; nor did the male shot with each of the three other nests taken show any incubatory patches. The male of nest number two had not a trace of tail feathers. The open follicles on the rim of the uropygium showed that the rectrices might have been lost rather recently. However that may have been, the bird was evidently attending in all respects closely to its breeding program.

This second nest was in an *Atriplex polycarpa* bush of moderately large mass, drooping over the cut bank of a gully which was extra deep at this point. The vertical height of this bank was 1850 millimeters, and it faced east. The nest was so hidden in the mass of branches drooping down over the face of this bank that its position could not be detected from any direction. There was an old nest 300 mm. from it, a little above its level, and toward the face of the bank. The occupied nest was 1 meter out from the bank, its rim 1080 mm. above the floor of the wash and about 1500 mm. below the uppermost part of the leafy crown of the containing bush. The extreme outside diameter of the twiggy substructure was 270 mm., its height, 210 mm. The inside diameter of the nest cup was 85 mm., its depth 60 mm. In general structure and materials it was quite like the first nest described—even to the incorporation of weathered newspaper along with the atriplex leaves into the hard inner wall.

The third nest found is recorded by Mr. Russell as situated in an atriplex bush growing some 20 feet apart from others on the low, sloping south side of a wash and within 6 feet of its bottom. The position of the nest in the bush was off-center, 650 mm. out from its axis and 650 mm. from the nearest outer limit of the foliage; it was 530 mm. above the ground (to rim) and 670 mm. beneath the crown of the bush. The nest rested upon and among branches which were nearly horizontal; its outside dimensions were: diameters, two ways at right angles, 340 and 260 mm.; depth 210 mm.; the inner cavity measured 95 mm. across at rim and 68 mm. deep. The twigs of the outer structure merged insensibly and intimately with the close-set surrounding twiggery of the bush proper. As with the other nests the inside of this one is firm and symmetrically moulded; the inner surface shows chiefly matted atriplex leaves, with here and there wadded bits of sheep's wool, bits of old sun-burnt cloth, fine rootlets, black hairs, and some fine gravel—the latter probably brought in on the birds' feet in wet weather. The collector hid near-by, and the bird which finally came, hesitatingly, over the ground toward the nest, uttering a low note, *pup*, at short intervals, was shot and proved to be a male. The three eggs in this nest were but slightly incubated.

The fourth nest taken contained four eggs in which incubation was well started. The sitting bird flushed when the observer had approached to within about four feet of it. He then hid and within five minutes the bird was seen returning, running quietly over the ground between and beneath the scattering bushes. It was shot and proved to be a male. This nest was in an atriplex bush of more open structure than the average, so that it was possible to see the outline of the nest from some little distance. The nest bush was one of a series closely lining a wash; it was 6 feet from the center of the bottom gully, which there had sloping, gravelly banks. The bush was on the north side of said gully, and the nest was situated in the south-facing, rather open, sunny portion of the bush—possibly of some significance when one considers

the time of the year. In this instance the nest was placed amid more nearly vertical stems of the bush; its rim was 890 millimeters above the ground and 1 meter below the extreme crown of the bush; two diameters of the gross substructure were 280 and 210 mm.; the concavity measured 100 mm. across at the rim and 55 mm. deep. In structure throughout, this nest is essentially the same as described for nests two and three; bits of wool and old rags are detectable in the lining.

Another nest, not taken, was evidently new and in final stage toward completion. Yet another nest found contained three young birds, as yet showing only natal down. A wait of three minutes brought no visible return of either parent bird. (Small young, in this instance, on February 24 meant, I think, completion of nest-building the last week of January.) The last four nests referred to, actually occupied or new, were found in a walk of approximately three miles in a semicircular course along washes. While concentrated thus for nesting along the washes where the largest atriplex bushes grew, we observed that the birds also traversed, apparently for forage purposes, the more open terrain at large, even where bushes were quite small and far-scattered.

With all these observations in mind, a topographic map in hand, and the surrounding landscape in immediate view we estimated the population of Leconte Thrashers in the favorable belt of territory lying two to six miles east of McKittrick at six (6) pairs of adult birds per square mile. If memory impressions can be given any weight at all, this is somewhat in excess of the number per square mile in parts of the Mohave and Colorado deserts where I have done field-work, even in the very favorable mesquite belt of Death Valley (see Grinnell, Proc. Calif. Acad. Sci., ser. 4, 13, 1923, p. 103).

To return to the subject of nests: Both Mr. Russell and myself found many old nests of the Leconte Thrasher. They are so durable in structure, and their envelopment in the dense branch-work of the long-lived atriplex bushes so protective, that they must last several years after the season of use. In one circuit that I made, I found by count fifteen (15) old nests in the same distance within which one pair of birds was encountered. These nests were in varying stages of disintegration, but always recognizable by even fragmentary remains from the nests of the few other birds that are known to breed in the same association. Whether more than one nest is built by a pair of thrashers in one year I do not definitely know, but if the first nesting of the season be successful (that is, the brood reared) I suspect only one. Several bushes of most favorable size and location had two nests in them; or there were four or five old nests in three or four closely adjacent bushes. Appropriateness of site had probably led the same pair or even successive pairs of birds to resort to the same restricted situation several successive years. These old nests varied in height above the ground from 375 to 600 millimeters, thus less than the average of the new, occupied nests; but this can be accounted for by their usual location off-center, amid supporting branch-work which is of more or less horizontal trend and which tends to flatten down as time passes and as the whole bush grows higher.

A consideration of these old nests helps build up the general picture already outlined of the Leconte Thrasher's special habitat requirements; namely, terrain grown sparsely to small bush-clumps, these clumps providing shelter from sun and enemies when needed, and in the loose litter about their bases sources of food to be sought in the thrasher's own peculiar method; and also, here and there, along the edges of gullies in the bottoms of draws, bushes of larger size and of dense, protecting and shading type of branching and foliage, which provide the essential type of breeding niche.

The eggs of the Leconte Thrasher preserved from the neighborhood of McKittrick measure, in millimeters, as follows. Set no. 1 (one egg out of 3): 26.9 x 19.1. Set no. 2: 27.3 x 19.3; 27.3 x 19.7; 27.6 x 19.7. Set no. 3: 28.2 x 20.2; 28.1 x 20.1; 28.2 x 20. 3. Set no. 4: 26.1 x 17.6; 25.2 x 18.5; 24.7 x 18.3; 25.4 x 18.3. Average of the 11 eggs: 26.8 x 19.2, thus decidedly smaller than eggs of the California Thrasher. Incidentally, these sets with their nests are now, respectively, numbers 2417—2420 in the egg collection of the Museum of Vertebrate Zoology.

In ground color the Leconte Thrasher eggs are close to Beryl Blue, perhaps verging toward Pale Turquoise Green—these terms as illustrated in Ridgway's "Color Standards" (1912). The three sets of 3 eggs were all dotted rather abundantly (concentration marked toward the larger ends) with varying shades and tints from Mars Brown (darkest) to Pale Purplish Vinaceous—the paler end of the series of tones probably due to the same pigment being buried to greater depths in the outer layers of the shell substance. In the set of 4 eggs, three of them are entirely immaculate; the fourth shows faintly a scattering of dots of Vinaceous-brown. As compared with a series of eggs of the California Thrasher, the Leconte Thrasher's eggs are not only smaller but they have on an average finer and decidedly sparser markings; also no egg of the 49 Californias at hand is entirely without markings, as are 3 out of the 11 Lecontes.

Now as to distributional considerations: I have reviewed all that has been published concerning the Leconte Thrasher; I have searched through the field notebooks in the Museum of Vertebrate Zoology; and I have examined the 88 specimens of the species at hand and taken into account the facts furnished by the data attached to each of these. It becomes clearly certain that the population of *Toxostoma lecontei* occupying portions of the San Joaquin Valley is completely cut off from the main range of the species, which covers the Mohave and Colorado deserts (see map, fig. 21). The barrier now operating to sequester this population would appear to be comprised in the mountains which encircle continuously the southeastern (upper) end of the San Joaquin Valley. However, it is not the factor of intervening altitude, *per se*, that operates; for the thrashers exist continuously, west from the edge of the Mohave Desert, over the Walker and Kelso passes (of altitude 5248 and 5300 feet, respectively) and down on the west side of the Sierran divide to the valley of the South Fork of the Kern River. Here the birds occur down to about 2500 feet, in the vicinity of Isabella; coextensively with them goes to about this limit westwardly a large number of other xerophilous, Lower Sonoran types of animals and plants. The terrain which they thus inhabit is dry and in summer hot, and these conditions are evidently permitted westward as far as they go by the north-south Greenhorn range of high mountains, which lie west of the Kern River opposite where it is joined by the South Fork of the Kern. The lofty Greenhorns cut off the moisture from the east-flowing air currents, and the dead-air pocket behind them doubtless has also to do with the heat accumulation in summer—despite the relatively high altitude of the South Fork Valley and the passes farther to the eastward. The Piute Mountains also cast their "rain-shadow" to the eastward, affecting similarly a portion of the main Sierran divide in the vicinity of Kelso Pass.

To the southwestward of the latitude of Isabella the Greenhorns fall away, their "rain-shadow" pinches out, and for a long interval down along the lower course of the Kern River, nearly to the low level of Bakersfield, the conditions are very different—Upper Sonoran vegetation and with every evidence of greater rainfall. It is this interval, then, wholly unsuited to the inherent requirements of the Leconte

Thrasher (because of the unfavorable nature of the flora, too low temperature and too high relative humidity), that constitutes the true sort of hiatus between the San Joaquin population of the thrashers and that of the Mohave Desert.

Since the separating belt of unfavorable conditions is narrowest in the Kern River segment of the mountains semicircling the head of the San Joaquin Valley, and in view of the fact that it is only in this segment that the thrashers at the present time exist over the divide into the San Joaquin Valley drainage, I think we can suppose most reasonably that it was along the Kern River route that the original San Joaquin stock travelled. With a general climatic "pulsation" toward the hot, dry extreme of conditions, the Upper Sonoran barrier would be weakened; there would be most likelihood at such a time that frontier breeding would extend farthest, and pioneering individuals get clear through the intervening territory until they should reach the Lower Sonoran and arid rim of the San Joaquin bed where successful and permanent establishment could quickly take place. Of course this same hypothesis could be invoked, it seems to me with good grounds, to account for the presence in the upper San Joaquin Valley of most other Lower Sonoran and xerophilous animals which we now find more or less firmly and extensively established there.

In the cases of some of the Lower Sonoran mammals of the San Joaquin Valley, we find that the isolation of their populations there at some more or less remote time has resulted in differentiation of characters to a degree easily recognizable in comparison with their relatives on the Mohave Desert. In the case of the Leconte Thrasher, I have examined closely the series of specimens available from the San Joaquin in comparison with series from the Mohave and Colorado deserts. As to general size and proportions of the birds, I can detect no differences; but as to general tone of coloration, I think there is a *tendency* shown in the San Joaquin birds toward darkness. The best evidence of this is afforded by two specimens in the personal collection of Dr. Alden H. Miller. Each is an old adult in which the annual molt is under way; one is from near Palmdale on the Mohave Desert, northern Los Angeles County, taken July 22; the other is from a point near the highway nine miles north of Grapevine, in the San Joaquin Valley, Kern County, taken August 3. Comparing only the new, unworn and unfaded feathers, the latter bird shows distinctly the darker, more leaden-hued tone of dorsal coloration. This is close to Mouse Gray (of Ridgway's "Color Standards," 1912) as compared with Drab in the other bird. The next darkest one of the whole series, however, is from Keeler, Inyo County, of date September 25.

Unfortunately, birds in perfectly fresh plumage are scarce in the available series; and sun and weather evidently plays hob with the pigments in a thrasher's feathers—the intrinsic tints are fugitive. Fading as the season advances beyond the regular molt time carries the color tones away from gray in the direction of a bleached-out, sandy tint; for example, an adult from near Buena Vista Lake, taken May 5, is of a dilute Clay Color. The very palest of the entire lot is a bird from Florence, Pinal County, Arizona, taken April 4. Yet a number of specimens from the San Joaquin Valley and from the transmontane range of the species, adults or young, season taken into account, cannot be definitely separated; the color differences that may exist are inappreciable to my eye, when I take individual variation and probably varying rate of fading into consideration. To repeat, there is only a faint average relative darkness of the San Joaquin population of thrashers—of possible significance from the bionomic viewpoint, as indicating result of its isolation there—but not sufficient for recognition nomenclaturally.

The following are the important published references to the occurrence of the Leconte Thrasher within the San Joaquin drainage basin, as bearing upon the subject matter of the foregoing account.

Fisher, N. Am. Fauna No. 7, May, 1893, p. 128 (south and west of Buena Vista Lake).
Anthony, Zoe, IV, October, 1893, p. 223 (Onyx).
Merriam, Auk, XII, January, 1895, pp. 58-59 (account of general distribution).
Goldman, Condor, X, September, 1908, p. 205 (Huron and westwardly).
Swarth, Condor, XIII, September, 1911, p. 161 (vicinity of Bakersfield and McKittrick).
Willett, Condor, XIX, July, 1917, p. 143 (vicinity of Buena Vista Lake and Maricopa, nesting).

Museum of Vertebrate Zoology, University of California, May 22, 1932.