

## FURTHER EXPERIMENTS IN REMOVING BIRDS FROM PLACES OF BANDING

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THE experiments to be described here owe their inspiration to work carried on by Sumner and Pierce (*CONDOR*, XXIX, 1927, p. 115) during August, 1926, at Big Bear Lake, in the San Bernardino Mountains. At that time forty-four Sierra Juncos were released at various distances from the place of capture, and although the traps were set for only seventeen days, eleven returns were secured. The number of birds involved was too small, however, to serve as anything more than an indication of what might be done in this interesting field. Accordingly, the following experiments were undertaken by the present writers with the hope of verifying these earlier observations.

With the exception of a few individuals which we shall mention specifically, all of our birds were trapped at Claremont, California. They were then removed to various points of the compass, the object being to see if any were able to find their way back, and then to calculate the percentage of returns for each species. An attempt was made to compare the percentages of returns from the several localities, which differed in their direction from Claremont. These localities we shall now consider in their chronological order, treating each species separately for each point.

A—October 21 to November 23, 1927. Birds taken from Claremont to Pomona, four miles southwest.

Gambel Sparrow (*Zonotrichia leucophrys gambelii*). Of 30 adults removed, 10 returned at various intervals during the ensuing four months. Several birds even seemed to form the "habit", and although we took them back to the same place again as soon as recaptured, two individuals came back twice, one bird three times, and one bird four times. Of 22 immature birds, on the other hand, not one returned.

Golden-crowned Sparrow (*Zonotrichia coronata*). Two birds, both adults, were taken away, but neither returned.

California Jay (*Aphelocoma californica*). We took six of these birds to Pomona, two of which came back during the following three months. One of the two came back a second time within this period.

House Finch (*Carpodacus mexicanus frontalis*). Out of 5 removed, we had one return, which was recaptured 19 days later.

San Diego Song Sparrow (*Melospiza melodia cooperi*). Although one might not imagine these furtive little birds to be capable of such strenuous flights, or of so much attachment to their chosen territory, we had two returns from 14 individuals, and one even came back three times.

The following species brought us no returns whatever for this locality: Anthony Towhee (*Pipilo crissalis senicula*), 27; San Diego Towhee (*P. maculatus megalonyx*), 1; California Thrasher (*Toxostoma redivivum*), 1.

We feel sure that in the case of the Anthony Towhee, at least, the number removed was sufficient to insure some returns if the birds had felt any inclination to come back. This is further confirmed by reports already received from the Biological Survey to the effect that three of these birds have been retaken in Pomona at no great distance from the spot where released. Moreover the records in question occurred 66, 74, and about 180 days, respectively, after the release of the birds.

B—November 11, 1927, to January 24, 1928. Birds taken from Claremont to Upland, 3.7 miles due east.

Gambel Sparrow. Of 21 adults removed, 8 returned at intervals throughout the ensuing four months, while two birds returned twice, and one three times. Of 22 immatures only one came back. This bird was recaptured three days later.

Golden-crowned Sparrow. One adult was removed, but failed to return. Four immatures were taken away, of which one came back. This one bird, however, in contrast to the others, developed the "habit" and returned from Upland five times during the two months.

California Jay. We took 8 of these birds to Upland, two of which came back during the next five weeks. One of the two, in fact, returned four times during this period.

House Finch. One bird was removed, but failed to return.

San Diego Song Sparrow. We had no returns from the 8 individuals taken to Upland.

San Diego Towhee. Of 11 birds taken away, one returned in twelve days.

Valdez Fox Sparrow (*Passerella iliaca sinuosa*). Of the 3 birds removed, one returned 55 days later.

The following brought us no returns: Anthony Towhee, 22; California Thrasher, 6; Pallid Wren-tit (*Chamaea fasciata henshawi*), 10. Once again the Anthony Towhees gave no results in spite of their numbers.

C—January 31 to February 21, 1928. Birds taken from Claremont to La Verne, 3.7 miles west.

Gambel Sparrow. Of 28 adults removed, 9 returned during the ensuing month, the last returning February 23. Two birds were recaptured twice. Of 25 immatures, only one returned, this individual being retaken 12 days later.

Golden-crowned Sparrow. Three adults were removed, of which one returned, this bird coming back to the traps three times in 27 days. Seventeen immatures were taken away, of which 9 were recaptured. Several of these formed the "habit", three returning to Claremont twice during 41 days and another bird five times.

California Jay. We took 5 of these birds to La Verne, but none was recaptured.

San Diego Song Sparrow. From 3 individuals we had one return, this bird coming back 17 days later.

San Diego Towhee. Of 7 individuals taken away, one returned after 25 days.

The following species failed to return at all: Anthony Twohee, 1; California Thrasher, 7; Pallid Wren-tit, 6.

In order that our percentages might not be affected by the northward migration, these observations were brought to a close on March 12, 1928. The most salient figures for the three localities were found to be so nearly identical as to warrant combining, and are so given in the present table.

TABLE SHOWING PERCENTAGE OF RETURNS

Species	Number of birds removed	No. returns	Percent
Gambel Sparrow			
Adults .....	79	27	34.2
Immatures .....	69	2	2.9
Golden-crowned Sparrow			
Adults .....	6	1	16.7
Immatures .....	21	10	47.6
California Jay.....	19	4	21.0
House Finch.....	6	1	16.7
San Diego Song Sparrow.....	25	3	12.0
San Diego Towhee.....	19	2	10.5
Valdez Fox Sparrow.....	3	1	33.3
Anthony Towhee.....	50	0	0
Pallid Wren-tit.....	16	0	0
California Thrasher.....	13	0	0

D—January 31 to February 25, 1928. An experiment was now made with Anthony Towhees to see if they would return over a shorter route. The distance was 2/5 of a mile, within the city limits of Claremont, but during 25 days only 5 out of 16 Towhees returned, and of these but one bird came back twice.

E—November 13 to December 4, 1927. The following birds were banded by Mr. Carl Levingston of Redlands, California, and then brought to Claremont which lies about 34 miles to the west.

Pallid Wren-tit. One individual; no further record.

San Diego Song Sparrow. Eight, with no returns yet recorded. Two, indeed, had been content to remain in Claremont, for seven days later one was trapped and the other killed by a cat.

Gambel Sparrow. Seven. One bird was actually recaptured again at Redlands by Mr. Levingston after 28 days, making our longest return flight record for the season.

F—November 11, 1927. A single Anthony Towhee was taken from Claremont to Redlands, and was recaptured by Mr. Levingston at the spot where liberated 37 days later.

G—January 12 to March 7, 1928. Twenty-seven Valley Quail (*Lophortyx californica vallicola*) were released at three points whose distances from Claremont were 2/5, 1, and 5 miles, respectively. To date none has returned.

One important fact must be remembered when considering the number of returns in these experiments—that at least 90 percent of all our birds were liberated *after dark*. This circumstance—a result of the limited time at our disposal—was most unfortunate. Without doubt the birds were often unable to find adequate shelter for the night; and although without food for the greater part of that day, were of course, obliged to wait until morning before regaining strength. For this reason it seems probable that there was a considerable mortality. It is also impossible to say how many individuals may have returned without actually re-entering the traps.

In conclusion, we wish to call attention to the strength of the attachment which adult migrants seem to have for their chosen winter resorts—in one case sufficient to cause a flight of 34 miles. Apparently the immature birds do not possess this attachment to the same degree, and for this reason we wonder just how much memory plays a part in the reactions of the older birds.

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