

WINTER OCCURRENCES OF SELASPHORUS HUMMINGBIRDS IN THE SAN FRANCISCO BAY REGION

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For a 13-month period beginning in September, 1967, I conducted a study on the ecological relationships of three species of hummingbirds common in the San Francisco Bay region, the resident Anna Hummingbird, *Calypte anna*, and two closely related and morphologically similar species, the migratory Allen and Rufous Hummingbirds, *Selasphorus s. sasin* and *S. rufus*. The study was carried out in the Botanical Garden of the University of California at Berkeley, and involved trapping and color-marking individuals.

Separation of *Selasphorus* other than adult males proved to be difficult from the onset because species, age and sex determination had to be based mainly on complex plumage considerations. However, a few birds were tentatively identified as immature males, either *sasin* or *rufus*, on the basis of their aerial displays; these resembled sufficiently those of adult males as to allow species separation (Stiles, F. G. and F. I. Ortiz-Crespo, in prep.). One of these immatures, identified by its characteristic gorget patch and behavior, was first noticed on 5 October 1967; after it was observed in the garden on several dates, it was captured on 28 December 1967 and given a red plastic streamer band on its left leg. From its distinct and repeated aerial displays the bird had been tentatively identified as a young male *rufus*; this was now confirmed by measuring one of its outermost rectrices, which proved to be wider than normal for a *sasin* individual (Aldrich, E. C., 1939, Natural History of the Allen Hummingbird, *Selasphorus alleni*, unpublished thesis, University of California, Berkeley). Because the banding operation was completed after dark, the bird was not released until the morning of the following day; however, neither later on that date nor in visits on several subsequent days was this individual seen at the garden.

In the late afternoon of 30 March 1968, while conducting observations in the study area, I detected a color-marked, seemingly adult male *S. rufus* which was evidently the same bird trapped, marked and released three months before; both the color and placement of the streamer band were the same. Daily visits to the garden after 30 March enabled me to follow the bird as it moved through the vegetation. Frank A. Pitelka, who had the opportunity of seeing the bird at close range, identified it as a male Rufous Hummingbird in a late stage of prenuptial molt. The bird was observed daily until 8 April 1968; it fed periodically in the same bush where it had been rediscovered, located only a few steps away from the site of its earlier capture, and engaged in displays and in chases with other hummingbirds.

This unusual record, examined in the light of the literature on migrations of Rufous Hummingbirds, has some interesting implications. The first, of course, is that *Selasphorus* hummers may remain in central California until the early winter. This is well known to people who maintain feeders in their homes, and is documented from records of Audubon Christmas Bird Counts. A review of *Audubon Field Notes* from No. 1 (1947) to No. 23 (1969) indicates that no *Selasphorus* were detected in California counts between 1947 and 1953, but from 1954 on at least one was reported from the San Francisco Bay Area in all but two years (1956 and 1957). Significantly, many of these records were made at feeders that had been tended well into the winter. At first these records were deemed to be so unusual that they deserved separate listings; more recently, however, the compilers appear to regard these hummers as regular winter components of the Californian avifauna, and *Selasphorus* sightings are no longer emphasized.

The color-marked bird also demonstrates that Rufous Hummingbirds may be present among late migrant *Selasphorus* in the coast of central California, a possibility unsubstantiated until now. Grinnell and Wythe (*Pac. Coast Avifauna*, 19: 95, 1927) did not list records later than August for *S. rufus* in the San Francisco Bay region, pointing out that the status of this species there is poorly understood because of its confusing similarity with *S. sasin*. A further point worth noticing is that the absence of three months recorded for the color-marked specimen coincided with the period of its prenuptial molt. As Rufous Hummingbirds are reported to migrate southward late in the year, and as the first prenuptial molt is thought to occur in the winter range, the bird could have migrated southward and returned during the three-month interval. This would imply that late onset of molt and migration is not necessarily followed by a correspondingly late attainment of adult plumage and spring return, and probably also that the bird did not go far southward; unfortunately, the wintering grounds of North American hummers and their migration schedules are too poorly understood to allow for a more critical evaluation of these suggestions.

Clearly, the record also shows that hummingbirds are extremely responsive to variations in food availability. The artificially kept plant community at the Botanical Garden has flowering plants that produce nectar well into the winter, allowing protracted stay of migratory hummers. This is also the case wherever a feeder is regularly maintained, as is suggested by *Audubon Field Notes*, and is further demonstrated by other winter records of *Selasphorus* in the Botanical Garden. John Westlake (pers. comm.) collected a *Selasphorus* there on 1 January 1967, and during the course of my color-marking program, *Selasphorus* hummers other than the color-marked individual were seen there as late as 29 December 1967.

Unless museum specimens of late migrants become available, and unless a sound method of species separation is worked out, very little can be learned about species-specific patterns of migra-

tion in North American hummingbirds. Even if this is done, however, still more could be learned from large-scale banding programs, the success of which might prove to be considerable if the present account is taken as an indication.

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ECTOPARASITES FROM EIGHT TREE SPARROWS WINTERING IN SOUTHERN ONTARIO

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INTRODUCTION

Although it has been recognized that several types of ectoparasites may live on one species of bird (Ash, 1960) there are few records of more than one ectoparasite on individual birds and little attention has been given to the ecology of these parasites. The present paper will report on ectoparasites of eight individual Tree Sparrows, *Spizella arborea* (Wilson), and offer some suggestions concerning the ecological relationships of these parasites.

METHODS

In January, 1971 eight male Tree Sparrows were live-trapped near Guelph, Ontario, Canada. Shortly after capture the birds were sacrificed and examined for the presence of ectoparasites. The remiges and rectrices of each bird were removed and examined individually under a dissecting microscope for feather mites (Analgoidea). The head feathers and the body feathers were placed in separate containers of 10% KOH and allowed to partially dissolve. The resulting semi-liquid was poured through a fine bronze screen and bird lice (Mallophaga) were recovered. The ectoparasites collected in this manner were stored in 70% alcohol and later mounted in Hoyer's solution for identification. Representative specimens of all parasites collected were placed in the Canadian National Collection, Entomology Research Institute, Department of Agriculture, Ottawa, Canada.