

(*Sturnella neglecta*), western kingbird (*Tyrannus verticalis*), blue-fronted jay (*Cyanocitta stelleri frontalis*), and Say phoebe (*Sayornis sayus*).

4. Four out of five species found to feed on the butterfly are numbered among the birds whose usual food habits justly subject them to severe criticism from the farmer.

5. The Brewer blackbird (*Euphagus cyanocephalus*) was found to be the most efficient check both on account of numbers and food habits. When the comparative number of individuals of the different species of birds were considered, it was found that the Brewer blackbird took 95 percent of all the butterflies eaten by birds. In this particular outbreak, therefore, one species of bird rather than birds in general, played the greatest part in the destruction of the insect.

6. The examination of thirteen stomachs of the red-winged blackbird (*Agelaius phoeniceus*, subspecies?) showed over 93 percent of its food to be vegetable matter, thus bringing out the vast difference in food habits between this bird and the Brewer blackbird (*Euphagus cyanocephalus*), 83 percent of whose food was animal matter.

7. *Eugonia californica* in the butterfly stage, probably on account of its large size, was not eaten by any species of bird smaller than the Say phoebe. The smaller birds probably had a more intimate relation to the outbreak when the insect was in the larval and pupal stage.

8. The birds in feeding on the butterfly attacked the insect at a critical point in its life history and were therefore of more value as a check than they would have been had they fed on the larva or pupa.

9. A comparison of the food of birds taken before the plague with that of birds taken while the plague was at its height, showed that birds had varied their food habits and had taken advantage of the abundant supply of insect food in the form of butterflies. Their value as checks in this particular insect outbreak, therefore, was real.

10. The data collected shows of what value birds may be in the checking of an insect outbreak rather than their value in the prevention of an outbreak.

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FURTHER NOTES FROM SANTA CRUZ ISLAND

By ALFRED B. HOWELL and A. VAN ROSSEM

THE topography of Santa Cruz Island is more varied than that of any other of the islands comprising the Santa Barbara group, and it has a corresponding diversity of bird life. Its greatest altitude is nearly three thousand feet; for the most part it is grass land with extensive barren stretches, and canyons filled

with oak trees and scrubby growth. There is one tract, however, that appears to possess a touch of boreal at its highest part. It is composed of dense forests of the Santa Cruz pine, broken by precipitous dark gorges, with growth that strongly reminds one of northern Oregon. Here in this pine region we stayed from April 24 until May 2, 1911.

Mr. C. B. Linton during his long visit to this island in 1907 (CONDOR X, 1908, pp. 124-128) has given us such an excellent list of the birds which occur there that we deem it unnecessary to do more than record those of the sixty-six species we observed which are not in his list, and to mention facts of especial interest.

Aechmophorus occidentalis. Western Grebe. At least one seen.

Lunda cirrhata. Tufted Puffin. Rather common, and reported by the fishermen as breeding at the northern end of the island.

Larus glaucescens. Glaucous-winged Gull. A group of three seen.

Larus delawarensis. Ring-billed Gull. Not rare.

Larus philadelphia. Bonaparte Gull. Several seen.

Accipiter cooperi. Cooper Hawk. One pair in the pines acted as if it had a nest near by, but we were unable to locate it.

Buteo swainsoni. Swainson Hawk. A single bird flew over, permitting a close inspection.

Haliaeetus leucocephalus. Bald Eagle. Rather common, both adults and immature birds of last year. One pair had a nest in a pot-hole on a cliff along the shore, and another was about thirty feet up in a pine on the side of a canyon. It was occupied by one young the size of a large chicken, and the old birds were very aggressive.

Aluco pratincola. Barn Owl. One seen flying silently over camp just after dark.

Colaptes cafer collaris. Red-shafted Flicker. The flickers of Santa Cruz present an interesting problem which can be solved only by one who has the time to collect a large series of them. Unfortunately we were unable to get a shot at any but typical *collaris*. This is by far the commoner form, but others, by no means rare, certainly closely approach the Northern Flicker (*C. a. luteus*), and still others appear to be intergrades between the two.

Otocoris alpestris insularis. Island Horned Lark. Although we searched diligently no Island Horned Larks were found. We looked in suitable localities, rolling grass land, but they are evidently of local distribution, as other observers have reported them as common.

Aphelocoma insularis. Santa Cruz Jay. To us the most interesting bird on the island. Abundant in the pines. They were not as much in evidence as their cousins on the mainland, but when one did happen upon them they were as a rule unsuspecting. At this time of year they are quiet unless one of a pair is killed or a nest disturbed, and if one does not know where and when to find them they might almost escape notice. However, if one goes along with much noise, so that the jays know he is about, and then sits down at a convenient spot and remains quiet, their curiosity will get the better of them. In nine cases out of ten it is useless to watch in front because the birds will not come that way, but after several minutes, upon a surreptitious glance to the rear, a jay will be discovered sitting motionless on a pine branch a few yards away. Practically all of their nests contained young at this date. Two nests examined were placed about twenty feet up in "palo fierros", slim trees growing in small groves in the valleys; and were similar in construction to nests of the California Jay. One contained two small young and an addled egg, and the other had four young about a week old. A surprising

number of old nests were found, placed usually in the palo fierros or tall bushes, but sometimes in the pines.

Corvus corax sinuatus. Raven. Common. Two nests on the cliffs not twenty feet apart held tiny young.

Carpodacus mexicanus clementis. San Clemente House Finch. Exceedingly abundant near the shore where there were cacti and suitable caves, in the roofs of which to nest. One nest discovered held four incubated eggs, and an addled egg of the Western Flycatcher. As is not unusual with this form, great diversity of markings was encountered. Several males were taken with the usual scarlet replaced by yellow, and others in which the two colors were commingled; also one male in breeding condition marked precisely like a female except for five yellow feathers beneath the chin; and a female with a yellow rump.

Loxia curvirostra stricklandi. Mexican Crossbill. We were greatly surprised to find this bird in some numbers in the heavy timber at the top of the island, and in the short time that we were able to give to this section sixteen birds were seen. Some were in pairs and others in small companies. I believe it is highly probable that these birds are resident on the island, as the character of the country is suitable and May 1 seems rather late for them to be present if they were winter visitors only. The four individuals obtained are very large.

Zonotrichia leucophrys gambeli. Gambel Sparrow. Sparingly scattered over the brushy hillsides in pairs.

Zonotrichia coronata. Golden-crowned Sparrow. Two birds still present.

Aimophila ruficeps. Rufous-crowned Sparrow. Rather common in suitable places. One of the females of two pairs within fifty yards of camp, was incubating when shot April 26, as the absence of feathers upon her belly indicated.

Melospiza melodia graminea. Santa Barbara Song Sparrow. Two heard but none seen. They are common on other parts of the island, however.

Pipilo maculatus clementae. San Clemente Towhee. Not rare.

Hirundo erythrogastra. Barn Swallow. Abundant; frequently visiting a small spring near camp to obtain mud which they carried to the caves above the sea.

Lanius ludovicianus anthonyi. Island Shrike. Rare at this point as but two were seen, neither of which we obtained. They were remarkably wary.

Dendroica auduboni. Audubon Warbler. Several seen.

Thryomanes bewicki charienturus. San Diego Wren. Common everywhere and at this time feeding young.

Sitta canadensis. Red-breasted Nuthatch. Shared the Crossbills' range. About two dozen were seen and six taken. One bird was watched for half an hour while she was busily engaged in preparing a nesting site, so the species is resident. Those obtained average smaller than birds from the mainland and the east.

FROM FIELD AND STUDY

Tree-nests of the Point Pinos Junco and Other Notes.—The 27th of March, 1910, like many of the days that preceded it, was rainy. Mr. Henry W. Carriger and I, however, had previously decided on an outing, and although the inclement weather delayed, it did not deter us from starting for our destination in northern San Mateo County. This we reached in the early afternoon. To be exact it was the very locality described at length by Carriger and Pemberton in THE CONDOR as being the site of a Siskin colony.

Our first nest, one of the Point Pinos Junco (*Junco hyemalis pinosus*), was a strange depart-