THE AVIFAUNA OF THE SOLOMA REGION IN HUEHUETENANGO, GUATEMALA

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The department of Huehuetenango lies in the northwestern corner of Guatemala. To the north and west it is bounded by Chiapas, México, to the south by the departments of San Marcos and Quezaltenango, to the east by the department of El Quiché, and to the southeast by the department of Totonicapán. The department is largely mountainous and has a total area of 7500 square kilometers. The region is one of the more densely populated areas of Guatemala, having a population of 205,110 inhabitants according to the 1950 census (Recinos, 1954). The principal mountain range is the Sierra de los Cuchumatanes. Vast regions of this range reach elevations in excess of 9500 feet.

A review of the ornithological literature of Guatemala reveals that certain areas have been visited by many ornithologists and that other areas have been neglected. One such neglected area is the department of Huehuetenango, particularly the Sierra de los Cuchumatanes. Collectors in Guatemala have usually moved about the country a great deal and have seldom stayed at one location for more than one season of the year. This paper is a report on the avifauna of a restricted locality in the Sierra de los Cuchumatanes which was studied throughout the year. It is intended to supplement our knowledge of the distribution, taxonomy, and ecology of the birds in the highlands of northern Guatemala.

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THE COLLECTING AREA

The altitude of San Pedro Soloma, the locality where I established my headquarters, is 7300 feet. The township covers a considerable territory and is composed of one pueblo, 12 aldeas (Indian villages), and numerous caseríos (small groups of houses; Indian hamlets). The limits of the township are: Santa Eulalia to the north; Chijul, in the department of El Quiché, to the east; San Juan Ixcoy to the south; and San Rafael la Independencia to the west.

Surrounding the town of Soloma are several mountains of 9000 feet or more. These mountains all have well established names and all were investigated for birds. The principal mountains where birds were collected were Sajcaguá, Pajaltac, Ixtichacán, Cantel, Chival, and Chumajté. Although most of my collecting was done in the temperate zone between 6000 and 9600 feet, on several occasions I visited areas as low as 4200 feet and as high as 11,500 feet.

The town of San Pedro Soloma is the center of the Indian population where the Chuj language is spoken. The population of the town is about 8000 Indians and about 800 Ladinos. The latter, a people of mixed blood, are the Spanish speaking people in the community.

Because of agricultural practices it was difficult to find areas that were not subject to human disturbance. I did not visit a single collecting locality that was not also used

by the natives for farming or for wood cutting. I often found myself in an area inhabited by birds, but collecting specimens was out of the question because of the proximity of Indian houses or livestock.

Conservation in this area is poorly understood and little practiced. Vast regions have been deforested and have not been replanted. Some slopes cleared for corn growing are incredibly steep. In these areas erosion is bad and the crop almost nonexistent. Nevertheless, steep slopes are cleared for planting crops every year. Burning of fields throughout the dry season, in February and March principally, is a common practice.

In general the people are very poor and they exist on substandard diets. For this reason birds are hunted for meat throughout the year with slingshots. The hunting is not limited to game birds but includes even the small warblers and sparrows. This practice must contribute to the general scarcity of birds in the region. Very few species of birds can be called abundant or common.

When I arrived at Soloma in February, 1958, the general appearance of the land was brown and dry. The nights were very cold and frost was not unusual. The temperature rose to a pleasant 60 degrees Fahrenheit in the daytime. The weather became gradually warmer through the spring months. However, in the warmest month of the year, July, nighttime temperatures were often in the 50-degree range and the daytime temperatures seldom became as high as 80 degrees. Higher in the mountains the temperatures were lower for both nights and days.

No records of rainfall are available for the area in which I worked. Any records for such an area unless taken at a great variety of elevations would be misleading. In the dry season, from November to May, rains are not infrequent and occur about once a week. The rainy season begins in May and ends in October. There is not an abrupt transition between the two seasons. Rather, the weekly rains lead gradually into semi-weekly rains and finally into daily rains. During May and June, the rains are largely confined to the afternoons. By July rain falls every afternoon and continues to fall throughout the night. The heaviest rains come in August and continue until mid-October, when a gentle decrease in the rain is apparent. By November the rains are once again on a weekly basis and the dry season has begun.

The character of the land changes greatly with the coming of the rainy season. Fields that formerly were brown and which had been burned to get rid of the weeds now begin to appear green. Pastures which were heavily overgrazed and which were brown also become covered with a lush green growth.

HABITATS

The temperate zone in the vicinity of Soloma can be divided into six habitats: cloud forest, oak forest, scrub oak thickets, oak-pine forest, pine forest, and cultivated land including pasture. The distribution of these habitats is more dependent on soil type, rainfall, and slope of the land than on altitude. Griscom (1932:65) indicated that the life-zones in the mountains of Guatemala are too slightly developed to permit formal separation or description. Thus, on a steep slope at 8500 feet, pine forest grows where there is a rapid run-off of any rainfall, or where the soil is poor. On a gentle slope at the same altitude, oak forest may thrive.

Pine makes an appearance whenever rainfall is locally reduced or wherever the soil is poor. Scrub oak appears in cultivated fields that have been abandoned. Oak is found on good soil with abundant rainfall. Cloud forest is restricted to a high elevation and demands abundant rainfall. Cultivated land is found chiefly below 8000 feet except for pastures which have been cleared above that level.

The cloud forest crowns the higher ridges. In the Soloma region it occurs chiefly

between 8700 and 9600 feet. The cypresses and oaks are often five feet or more in diameter, and many are as high as 150 feet. The forest is usually above or in the clouds during the rainy season. Even in the dry season a moderate amount of rain falls in the cloud forest and the habitat is never dry. The tree trunks are covered with moss and there is little undergrowth except in places where trees have been cut. There is not much cloud forest left in the high country of Huehuetenango, as the natives cut the trees or clear the land almost continually for pasture. In the Soloma region there are only two remnants of this forest, both of them at some distance from town.

Mature oak forest is found in widely scattered areas from 4200 to 9000 feet. At 9000 feet and higher, rainfall increases, cypresses invade the oaks, and the habitat becomes cloud forest. In most places, pines invade the oaks. The oak forest is not as dense as the cloud forest. In areas where sheep graze there is no understory. In many places the oaks are being cut and open areas, covered with shrubs, appear in the forest. According to the natives, the oak forest near Soloma is all second growth.

Scrub oak thickets are found up to 8800 feet in abandoned fields and in places where oak forest or pine forest has been cut. These thickets seldom attain a height greater than 10 to 15 feet, since in most places the trees are cut for fire wood. The scrub oak habitat shifts gradually from one area to another as fields are abandoned and later reclaimed for agricultural uses.

The oak-pine forest occurs in two widely separated areas near Soloma. The largest stand is found between 5300 and 6300 feet. Another stand occurs between 7800 and 8900 feet. The forest at the lower elevation is much dryer than that of the higher elevation. The lower stand is rather open, the trees being far apart and the understory slight. At the higher elevation the trees are very close together and it is difficult to walk through the area except by following trails.

There are very few stands of pine forest near Soloma. The lowest stand I visited was at 4200 feet, the highest at 9000 feet. Most of the pine forest is second growth and the trees are seldom taller than 75 feet. There is little understory, as pine needles cover the ground to a depth of several inches. Only in places where trees have been cut are there any shrubs.

The land under 8000 feet is cultivated extensively. Above 8000 feet are large areas which once were forest, but which have been converted to pasture. Below 8000 feet the land is used for corn, wheat, and pasture. Several creeks run through the cultivated land and many shrubs grow along the creek banks. These shrubs provide a suitable habitat for migrating birds and for several nesting forms.

SPECIES ACCOUNTS

Unless otherwise noted, the specimens listed and the sight observations are my own and refer to the San Pedro Soloma region and to the nearby town of Santa Eulalia. Field work was done in this area from mid-February to mid-October, 1958. I have followed the nomenclature of the Distributional Check-List of the Birds of Mexico (Pacific Coast Avifauna, 1950, 1957) except for the genus *Contopus* where I have followed the fifth edition of the American Ornithologists' Union Check-list of North American Birds (1957). Common names are taken from Emmet R. Blake's Birds of Mexico (1953).

Coragyps atratus. Black Vulture. This was the common vulture in every town I visited. It far outnumbered *Cathartes aura.* I recorded this species as high as 11,500 feet in the vicinity of Chancol, above Chiantla. In Soloma the birds often sat on the ground in the market place eating garbage.

Cathartes aura. Turkey Vulture. This species was usually seen, either singly or in pairs, away from town. The local name *viuda* relates to the solitary habits of this species. These birds were usually observed as they flew over cultivated areas and were often seen with *Coragyps atratus* away from town. Subspecific identification remains in doubt in the absence of a specimen.

Buteo jamaicensis costaricensis. Red-tailed Hawk. This species was occasionally seen between 5800 and 9200 feet. Two immature birds were seen August 2. A male in breeding condition was taken on March 3, at 9000 feet, on the edge of the cloud forest. The wing measured 385 mm.; the tail, 205 mm. I did not see any melanistic birds in the Cuchumatanes.

Falco sparverius sparverius. Sparrow Hawk. My earliest record for this species in the fall was September 15; the latest spring record was March 24. Sparrow Hawks were seen as high as 9500 feet, usually on cultivated land or on pastures. A male was collected on February 18 at 7200 feet.

Penelopina nigra nigra. Black Chachalaca. During March, April, and May, these birds were frequently heard in the cloud forest from 9000 to 9600 feet. The birds were secretive and wary. On two occasions males were seen perched in trees about 25 feet from the ground. A female was taken in an oak forest at 8400 feet on May 7. The ovary was slightly enlarged; there was no brood patch. The black barring on the tail of my specimen is somewhat narrower than in any specimens of *P. n. nigra* in the collection at the Chicago Natural History Museum. The measurements are: wing, 252 mm.; tail, 283.

Oreophasis derbianus. Horned Guan. I observed one bird on the edge of the cloud forest at 9000 feet, on February 24, and caught a glimpse of one on March 17 at the same locality. The species was not common although it was well known to the natives. The birds were exceptionally wary and no specimens were collected.

Dendrortyx leucophrys leucophrys. Buffy-crowned Wood-partridge. These birds were calling from dense oak forest and cloud forest during every month of my stay in Soloma. They seemed to be quite common in the area. I recorded them from 5200 to 9500 feet. Although often heard, they were seen on only two occasions. A female, taken March 3, was with a second bird but had no brood patch. The ovary was slightly enlarged. A female, taken May 7, had a distinct brood patch. Both tails measured 135 mm.; the wings, 155 and 149 mm.

My two specimens have the "sooty gray" auriculars ascribed to *D. l. nicaraguae*, described from Jalapa, Nicaragua, but, after an examination of the series of *D. leucophrys* in the Chicago Natural History Museum, I agree with Hellmayr and Conover (1942:227) that *nicaraguae* is not a valid race. None of the alleged characters of *nicaraguae* held among 17 adults (four from Guatemala, eight from Honduras, five from Nicaragua) which I examined. I, therefore, refer my specimens to the nominate race.

Dactylortyx thoracicus chiapensis. Singing Quail. I heard this species singing in dense oak thickets in April and May. The crop of a female collected at 8500 feet in dense oaks on April 17 contained isopods, millepedes, snails, seeds, and two small grasshoppers. There was no brood patch. A downy young, molting into the juvenal plumage, was taken on July 30, at 7700 feet, in a corn field bordering an oak thicket.

Charadrius vociferus. Killdeer. In February and March I saw flocks of eight to ten birds near town in pastures where sheep were grazing.

Bartramia longicauda. Upland Plover. I collected an immature female on September 7, at 9600 feet, by a fire at night. As many as 30 Upland Plovers were taken by the natives on the night of September 7 with the aid of small fires. This species is probably a common transient in Guatemala, but in the past very few specimens have been taken in the country. I neither saw nor heard this species in the daytime.

Actitis macularia. Spotted Sandpiper. On February 15 a pair of these birds was located at a small marshy area near Soloma. One of the pair, a female, was collected February 18. The other bird stayed in the area until May 10. On August 9 a single bird was seen in the same location. It remained in the area until I left Soloma in October.

Columba fasciata. Band-tailed Pigeon. A flock of 30 to 40 birds was seen regularly at a small salt flat on the edge of Soloma. The birds drank the salty water at this location but were not observed eating salt.

Coccyzus erythropthalmus. Black-billed Cuckoo. An immature male was taken by a fire at night on September 7 at 9600 feet. This species was not recorded in the daytime, but many were killed by the natives at night with the aid of small fires. I saw about 15 to 20 killed on the night of September 7.

Geococcyx velox affinis. Lesser Road-runner. This species was found from 6000 to 8800 feet in scrub oak thickets and on rocky hillsides. A female with a slightly enlarged ovary was taken March 24. The crop contained 4 lizards and 14 grasshoppers. An immature male was collected June 16.

Aegolius ridgwayi. Unspotted Saw-whet Owl. I collected a male on July 18 in Soloma. The bird was roosting in the attic of a thatched hut where corn was stored. Briggs (1954:179) pointed out that this species is divided into three races although there are few specimens available for taxonomic study. My specimen is an adult male (the skull appeared to be fully ossified) in the postnuptial molt (body feathers, heavy on throat and breast, plus wing and tail). However, it is in the unspotted "immature" plumage. My specimen can be referred to the race *A. r. tacanensis* on the basis of the close proximity of Soloma to Volcán Tacaná, the type locality of this race. It would, however, be desirable to have more material at hand to determine the validity of the three races which have been described.

Caprimulgus vociferus chiapensis. Whip-poor-will. I heard these birds calling in the oak forest at 7000 to 9000 feet, from February to May 4 and from September until I left the area in October, but I did not hear them during the summer months. A female was collected from a nest on April 3. The two creamy white, unmarked eggs, which were near hatching, were in a slight depression on the floor of an oak forest on a steep hillside at 8100 feet.

Streptoprocne zonaris. White-collared Swift. Several of these birds were seen flying about a large waterfall at 6800 feet in April, August, and September. No specimens were secured.

Colibri thalassinus. Green Violet-ear. This species was not found in Soloma as a permanent resident, and Wagner (1945:166) believed the species to be partly migratory in the northern part of its range. The species was first recorded at Soloma on August 2 and was confined to scrub oak thickets between 6800 and 8600 feet. In August and September, when it was nesting, it was very common. I collected six males, all in breeding condition, between August 2 and October 8.

Hylocharis leucotis leucotis. White-eared Hummingbird. This was the common hummingbird in the Soloma region all year around. I found it from 5800 to 9500 feet in scrub oak thickets, in pine forests, and along the edges of the oak and cloud forests. From February to the end of July it was usually seen in small flocks. Nesting occurred in August and September when the corn was six to eight feet high. Nests were placed on corn leaves close to the stalk. Adults taken in August had enlarged gonads. Several nests were found in September, all in corn fields, and one female was captured by hand on her nest. Males of this species seemed to be aware of the location of the nest, as, on several occasions, they were observed singing from within a foot of the nest. However, this species was so common in corn fields that pair relationships were difficult to work out. No male was ever seen on the nest. Four males and two females were collected.

Lampornis amethystinus salvini. Amethyst-throated Hummingbird. This species was restricted to the cloud forest and humid oaks above 8600 feet. I found it as high as 9800 feet. An adult male and an adult female taken in March and April were not in breeding condition. Although not common in the Soloma region, this species was present throughout the entire year.

Lamprolaima rhami rhami. Garnet-throated Hummingbird. From February to the end of July this species did not inhabit the Soloma region. From July 28 to mid-October the species was common in oak forest, oak-pine forest, and cloud forest from 8100 to 9700 feet. During these months courtship displays were frequently seen. Two males were collected at Soloma and one female at Santa Eulalia.

Eugenes fulgens viridiceps. Magnificent Hummingbird. This species was seen from the latter part of July until I left the area in October. It was not common in any habitat but preferred humid oak forest and cloud forest above 8500 feet. Courtship displays were observed in August. A male collected on July 31, at 8900 feet in an oak forest, was in breeding condition.

Atthis ellioti ellioti. Wine-throated Hummingbird. This species was common after July 29 in scrub oak thickets from 7000 to 8700 feet. It was very pugnacious and was often seen chasing larger hummingbirds from feeding areas. A nest with two young was found August 12 in a scrub oak thicket. The nest was in a slender oak, four feet from the ground, near the end of a branch. A male taken July 29 shows only a few flecks of red on the throat. A male taken July 30 has a solid red throat but lacks the streamers on the gorget. Males taken in the latter half of August were in full breeding plumage. Evidently there is a prenuptial molt which involves the feathers of the chin, throat, and upper breast.

Trogon mexicanus mexicanus. Mountain Trogon. This species was seen and heard in oak forest, oak-pine forest, and cloud forest from 7800 to 9500 feet. Anthony (*in* Griscom, 1932:214) described the call note as resembling the yelping of a young puppy. I would describe it as a short *coo coo.* In quality this cooing is not at all unlike the call of the Roadrunner (*Geococcyx californianus*), and I was under

the impression for the first month that I was in the area that the call of this bird was coming from the Lesser Roadrunner (*Geococcyx velox*). Mountain Trogons were breeding in April and May. A female with a brood patch was taken in April; a juvenile was seen in May. Adults undergoing the postnuptial molt were seen in September and October. Three male specimens show an interesting variation in plumage color. One bird, taken on October 6, had just completed the postnuptial molt. The tail is black with a terminal white bar on each of the three outer rectrices. The red of the breast and belly is a brilliant scarlet. A second male, taken on March 5, was almost in breeding condition. The tail, however, is much like the adult female's tail, having white barring along the inner and outer web of the three outer tail feathers. The red of the breast and belly is not as brilliant as in the fully adult male, and several feathers on the breast are barred with black. The third male, taken on September 12, had an ossified skull, and the plumage is identical to that of the bird taken in March. The plumage of the latter two birds is sub-adult. It is probable that the bird breeds in this plumage.

Aspatha gularis. Blue-throated Motmot. I saw this species only three times during my stay in Soloma. On April 19 a bird was seen in a dense oak thicket at 4200 feet. In September a bird was seen at 8200 feet on the edge of an oak forest. A male in postnuptial molt was collected September 13, at 8600 feet, in an oak thicket.

Aulacorhynchus prasinus. Emerald Toucanet. These birds were restricted to cloud forest from 8700 to 9500 feet. The breeding season was in the spring. A male, collected May 9, had slightly enlarged gonads, and an immature bird was taken on June 24. By mid-August the postnuptial molt was completed and the birds were in fresh fall plumage. The birds were always seen in flocks, usually of eight to ten birds, even in the breeding season. My series of five adults, four males and one female, are intermediate between *A. p. prasinus* and *A. p. stenorhabdus*. The black edging of the maxillary tomia is slightly broader than that of typical *stenorhabdus*, and the embossed ridge at the base of the bill is not as broad as in typical *prasinus*. The distribution and intensity of the chestnut tipping on the tail is variable in the series of *stenorhabdus* and *prasinus* which I examined at the Chicago Natural History Museum. In my specimens this color and pattern is uniform. The yellow on the flanks and sides, which appears to be highly variable in both races, is uniform in my series.

Colaptes cafer mexicanoïdes. Red-shafted Flicker. These birds were found in oak-pine forest, oak forest, and cloud forest, from 6000 to 9200 feet. I heard flickers calling during every month of my stay in Soloma. Birds taken in February and March were not in breeding condition, and birds taken in August were undergoing the postnuptial molt. Four males were collected.

Melanerpes formicivorus lineatus. Acorn Woodpecker. This species was restricted to oak-pine forest from 5300 to 6300 feet. In this habitat the birds were frequently seen in small flocks with the Banded-backed Wren (*Campylorhynchus zonatus*). Neither species inhabited oak-pine forest at higher elevations although the higher habitat seemed identical with the lower. Two males, collected April 17, were in breeding condition. A female, taken September 10, had completed the postnuptial molt.

Sphyrapicus varius varius. Yellow-bellied Sapsucker. Two birds collected in March, above 9000 feet, in the cloud forest were undergoing a slight body molt. The two specimens, a male and a female, show no trace of red on the nape. I assign them to the nominate race on the basis of size. Male, wing 127 mm., tail 78; female, wing 129 mm., tail 76.

Dendrocopos villosus sanctorum. Hairy Woodpecker. This species was uncommon in the Soloma region. It was found in oak forest between 6800 and 8600 feet. One was seen in scrub oak at 7200 feet. A female, taken March 28, was in breeding condition. A male, collected February 19, was molting on the nape.

Lepidocolaptes affinis affinis. Spot-crowned Woodcreeper. This species ranged from 8200 to 9500 feet in cloud forest and in oak forest. One bird was taken in pine forest. Adults taken from February through April had slightly enlarged gonads. Immature birds were taken July 19, August 6, September 12, and October 4. Six males and three females were collected.

Sayornis nigricans aquatica. Black Phoebe. These birds were resident along a stream that flowed through cultivated land near Soloma. They were usually seen perching in small trees or shrubs near the stream and were wary and difficult to appproach. I assign my specimens (three males, one of them immature) to the race *aquatica* on the basis of the dark upper parts and reduced amount of white on the belly.

Nuttallornis borealis. Olive-sided Flycatcher. An adult female was taken on September 4, at 6100

feet, in open pine forest, and a second adult female was collected on September 20, at 6300 feet, in an oak-pine forest. I have no spring records for this species.

Contopus virens. Eastern Wood Pewee. Three specimens are referable to this species. The altitudinal range is from 6200 to 8800 feet. Two birds were taken in pine forest, one in April, the second in September, and one was taken in an oak forest in September.

Contopus sordidulus. Western Wood Pewee. An adult female was taken on October 2, at 8600 feet, in an apple tree which was in a pasture. I assign this specimen to the nominate race because of the brown back with a contrastingly darker crown and because of its small size: wing, 83 mm.; tail, 64 mm. A male which I collected September 8, at 8600 feet, in a scrub oak thicket is referable to the race *veliei.* The measurements are: wing, 88 mm.; tail, 65 mm.

Contopus pertinax pertinax. Greater Pewee. These birds were found in oak forest, scrub oak thickets, and in trees on cultivated land, from 5600 to 8200 feet. They were always seen singly or in pairs and usually were observed perching near the top of a tree. Four males, one of them immature, were collected.

Empidonax flaviventris. Yellow-bellied Flycatcher. One specimen, a male, was taken on August 21 by a fire at night on a 9600-foot ridge. The species did not winter in the Soloma region and I have no spring records for it.

Empidonax minimus. Least Flycatcher. On the night of August 21 I collected six specimens (two males, four females) at 9600 feet with the aid of a small fire. I did not record this species in the daytime.

Empidonax hammondii. Hammond Flycatcher. This species was common in the Soloma area when I arrived in February. I collected specimens between 7000 and 8600 feet in scrub oak thickets, oak forest, cloud forest, and shrubs bordering streams. My latest record in spring was March 27, the first fall date was September 25. Six males and two females were collected.

Empidonax wrightii. Wright Flycatcher. I collected a male at 7600 feet, on February 19, in a scrub oak thicket. This species is called *E. oberholseri* in the fifth edition of the American Ornithologists' Union Check-List.

Empidonax flavescens. Yellowish Flycatcher. On April 2 I collected a female in an oak forest at 7900 feet. The oviduct held an egg ready to be laid. On April 10 I collected a male in breeding condition in the cloud forest at 9000 feet. I assign these specimens to *E. f. dwighti* on the basis of their incomplete eye-rings. This condition is more pronounced in the male than in the female. The characters used by van Rossem (1928:359) to separate *E. f. dwighti* from *E. difficilis salvini* are: incomplete eye-ring versus complete eye-ring; general coloration of the upper parts brighter and greener; wing bars yellowish green instead of buffy. Van Rossem had ample specimens of *dwighti,* but he had only the type of *salvini* to use for comparison. In examining the specimens at the Chicago Natural History Museum, I found that the characters used by van Rossem to separate the two forms are variable within each group. They are to some extent variable in individual birds. For example, specimen no. 93804, collected by E. R. Blake in Guatemala, has a complete eye-ring on the left side and an incomplete eye-ring on the right side. The two forms might be assigned to the same species (Hellmayr, 1927:214) except that their breeding ranges overlap in Chiapas, México, and in Guatemala. It is possible that some of the specimens collected in Chiapas and in Guatemala are hybrids. Information concerning the call notes, nests, behavior, and so forth of the two forms appears to be lacking. It does not seem possible to solve the taxonomic problem presented by these birds with the material at hand.

Empidonax fulvifrons fusciceps. Buff-breasted Flycatcher. Five specimens were collected between 6950 and 8600 feet in oak forest, scrub oak thickets, pine forest, and shrubs bordering streams. The male of a pair collected on April 17 was in breeding condition. Singing was common in April and May. An immature male was collected on August 7.

Mitrephanes phaeocercus quercinus. Tufted Flycatcher. This species was not common in the Soloma region, and I doubt if it nested anywhere in the area. I saw it only in August and September, from 8200 to 9400 feet, in pine forest, oak forest, and cloud forest. Two males, one of which was immature, and a female were collected.

Notiochelidon pileata. Black-capped Swallow. This species nested from mid-May to early July in a large rock sink in cultivated land and pasture at 8700 feet. Nesting was at its peak in mid-June. Another possible nesting site was a steep road-cut at the edge of town where birds were seen entering

and leaving holes in May and June. About 15 pairs nested in the rock sink. The nests were placed in crevices in the rocks about 20 to 35 feet above the floor of the sink. Mud and small twigs were used in building the nests, and at least one nest had feathers in the lining. Both parents fed the young in the nest and both carried away fecal sacs. Often both birds arrived at the nest with food at the same time. One pair made 36 trips to the nest in one hour. About every half hour the entire flock assembled at the sink, and, after perching for a few minutes, the birds swirled up together in a flock and left the nesting area. In this respect their behavior seemed to be similar to that of the Cliff Swallow (*Petrochelidon pyrrhonata*). Black-capped Swallows often sang when perched. A few perched on dead twigs sticking out of the face of the rock wall, but many birds clung, swift-like, against the face of the rock. Most of the foraging was done within 200 yards of the sink, in pastures and in cultivated fields near houses. By the first of September the birds deserted the nesting area and were seen only occasionally over fields and pastures. I collected two specimens: a male, taken June 19, in breeding condition; a female, collected February 22, not in breeding condition.

Tachycineta thalassina. Violet-green Swallow. I saw small flocks flying over pastures and cultivated areas between 6800 and 8800 feet from February to March 22 and from September 10 until I left the area in October. No specimens were taken.

Corvus corax sinuatus. Common Raven. This species was common above 8000 feet and was often seen in small flocks near Paquix at 11,500 feet. I recorded it as low as 4200 feet near Soloma. Throughout the year the natives complained that ravens fed on young chickens and turkeys. On March 10 I found a nest with two eggs on a rock ledge at 8700 feet. On March 24 there were two young in the nest. On April 5 the young were about ready to leave the nest, and I collected the adult female. The bird was in good plumage, showing little wear on either the wings or tail. The specimen is referable to the race *sinuatus* on the basis of its small bill, but it is much larger than would be expected from the southern edge of the range for this race. The measurements are: wing, 443 mm.; tail, 252 mm. The measurements of the largest of 14 adult female *principalis* listed by Ridgway (1904:259) are: wing, 440.5 mm.; tail, 246.5 mm.

Cyanolyca cucullata guatemalae. Azure-hooded Jay. I found two birds in a humid oak forest at 4800 feet on April 19. A female with a distinct brood patch was collected. The birds were wary and the density of the underbrush made approach difficult. Both birds uttered a nasal one-note call. The second bird, presumably a male, was not heard after the female was collected.

Cyanolyca pumilo pumilo. Black-throated Jay. This species was found in cloud forest and oak forest above 7900 feet. A male, taken on April 10, was in breeding condition. A female with a brood patch was taken on April 2. An immature female was collected July 28. Adults collected in May and October were molting.

Aphelocoma unicolor unicolor. Unicolored Jay. I saw this species principally in the cloud forest above 9000 feet. However, on February 28, I found a nest among oaks and pines at 8200 feet. The nest was in a slender oak about 40 feet from the ground; in it were three unmarked, pale blue eggs. By September the birds had completed the postnuptial molt. Three males and one female were collected.

Cyanocitta stelleri ridgwayi. Steller Jay. This, the common jay of the high country, was found in every habitat from 5800 to 11,000 feet, but it was not common in the cloud forest and the dense oak forest. In February and March these jays were usually in small flocks of eight to ten birds, but by April pairs had formed. On April 12, two nests were found in an oak-pine forest; one, with two eggs, at 8400 feet about 20 feet from the ground in an oak, the other, with one egg, at 6400 feet in an oak about 15 feet up. The eggs were bluish, slightly speckled with brown. By June the birds, once again in small flocks, were very destructive to the growing corn. The natives considered them pests. The birds continued to flock as long as I was in the area. Birds taken in August were in the postnuptial molt. There was no evidence of fall nesting in this species. Seven males and one female were collected.

Psaltriparus melanotis melanotis. Black-eared Bushtit. These birds inhabited scrub oak thickets and shrubs bordering streams from 5800 to 8600 feet. They were occasionally found in open oak-pine forest or oak forest at the same elevations. The birds went about in small flocks even during the breeding season. Nesting was at its peak in April and May. A nest, found April 12 in a scrub oak thicket at 8100 feet, contained three newly hatched, naked young and one immaculate white egg. The nest was lined with feathers. Four juveniles were collected May 4 as they left a nest at 8200 feet in a scrub

oak thicket. There was no evidence of fall nesting in this species. Adults were molting in July. Male and female juveniles resemble the adult male in having black masks and brown eyes. Adult females lack the black mask and have yellow eyes. Four males and seven females were collected.

Certhia familiaris pernigra. Brown Creeper. This species was not common in the Soloma region, but in nearby Santa Eulalia it was abundant in a pine forest at 8000 feet. Specimens were taken in pine forest, oak-pine forest, and oak forest between 5800 and 8800 feet. Adults were molting in August and were in fresh fall plumage in September. Immature birds were taken in July, August, and October. Five males and three females were collected.

Cinclus mexicanus anthonyi. Dipper. This species was resident along mountain streams between 4900 and 7000 feet. Near Soloma there was no suitable habitat above 7000 feet. Adults were in breeding condition in March, and an immature bird was collected on June 18. Four males and one female were collected.

Campylorhynchus zonatus vulcanius. Banded-backed Wren. This species was common in pine forest and in oak-pine forest from 5300 to 6300 feet, but it was not found in identical habitat at higher elevations. The birds invariably went about in flocks, even during the breeding season. A pair of wrens taken April 17 was in breeding condition. An immature female was collected on September 15. An adult female, collected September 15, was in fresh fall plumage.

Troglodytes musculus intermedius. Southern House Wren. These wrens were often heard in town, both in Soloma and in Santa Eulalia. They were also found on cultivated areas on the edges of town. In dense vegetation at higher elevations, they were replaced by *T. rufociliatus.* Singing was most intense from February to the end of July, but I often heard this species in the fall. Two males were collected.

Troglodytes rufociliatus rufociliatus. Rufous-browed Wren. This species was restricted to the cloud forest and the oak forest from 7400 to 9100 feet. It is a ground-inhabiting form seldom seen more than five feet from the ground, although Blake (1953:407–408) and Griscom (1932:294–295) both referred to the birds' preference for living in epiphytes above the ground. Adults taken in March and April had slightly enlarged gonads. Singing was often heard in these two months. One male is abnormal in having white on the sides of the neck and on part of the crown. Five males and one female were collected.

Henicorhina leucophrys capitalis. Gray-breasted Wood-Wren. This species was found in humid oak forest and in cloud forest above 8000 feet. It was extremely secretive and difficult to collect. A pair was taken in the cloud forest on March 24. The male was singing, but the birds were not in breeding condition. An adult female, collected September 13 in a humid oak forest, was undergoing the postnuptial molt.

Melanotis hypoleucus. Blue and White Mockingbird. These birds were found in scrub oak thickets and on shrubby hillsides from 6700 to 8100 feet. Singing was most intense in March, April, and May, but scattered bits of song were heard throughout the summer. A female, taken March 27, had a brood patch. A juvenal female, dark below with a few white feathers on the lower belly, was collected July 30. A bird taken October 9 was undergoing the postnuptial molt. One male and four females were collected.

Turdus rufitorques. Rufous-collared Robin. This was a resident species between 5200 and 10,500 feet, but it was more abundant above 7000 feet. It was found on the edges of town, in cloud forest, oak forest, oak-pine forest, and scrub oak thickets, and on grassy fields. Birds taken in March were in breeding condition. Nests: April 9, in a scrub oak thicket, female building a nest in a small oak, about six feet from the ground; April 30, on a stump in a deserted field, about seven feet from the ground, two eggs; August 19, on the edge of an oak forest, about 18 feet up in a large oak, two young; September 10, about 12 feet up in an oak tree in a pasture, three young. Singing was not heard in the latter part of June or in July, but it was resumed in August and September. By the end of September, flocks of ten to 15 birds were commonly seen flying about the area or feeding in pastures. I collected four adult males, three adult females, one juvenal male, and one juvenal female.

Turdus plebejus differens. Mountain Robin. Mountain Robins were not common in the Soloma region. They were found in cloud forest and in oak forest above 8600 feet. Two females, taken March 24 and 26, respectively, had brood patches; a male, taken March 26, was singing and had enlarged testes. One male and four females were collected.

Turdus infuscatus. Black Robin. These robins were found in the cloud forest and in oak forest

above 8600 feet. Specimens were taken as high as 9500 feet. A female, collected April 28, had a brood patch. Males taken in July had enlarged testes.

My series of five specimens, four males and one female, reveals some interesting color variations. Two males are solid black. One breeding male is essentially black but has patches of brownish female-like chest, flank, and side feathers on the right side. Another breeding male is olive-gray above, olive-brown below, paler on the belly, with a lightly streaked throat. All of these specimens have yellow feet and bills. The breeding female is brown, darker above than below, with a lightly streaked throat. The legs are yellow, the bill black.

Catharus occidentalis alticola. Russet Nightingale-Thrush. The beautiful song of this species was heard daily from March to July. Specimens were collected from 6800 to 9500 feet in oak forest, cloud forest, and in scrub oak thickets. Males taken from March to July had enlarged testes. A nest with two eggs was found on April 17 about five feet from the ground in a shrub on the edge of an oak forest. The eggs were light blue, splotched with lavender. Two adult females taken April 17 and 21, respectively, were not in breeding condition. The birds were undergoing the postnuptial molt in September. A juvenal male was collected on August 2 in an oak forest. Although somewhat mottled below, this specimen is unmarked on the crown and back. Fall singing was not common. Ten males and three females were collected.

Myadestes obscurus oberholseri. Brown-backed Solitaire. This was a common species in oak forest, cloud forest, oak-pine forest, and pine forest from 4800 to 9400 feet. A female taken February 28 had a brood patch. Males taken from February through April had enlarged testes. A nest with two eggs was found on April 15 in an oak-pine forest at 8800 feet. The nest was on the ground at the base of a large rock. It was lined with pine needles and the outer layers were of mosses and lichens. The last date for spring singing was May 27. Fall singing started August 30. An adult male, collected August 15, was undergoing an extensive body molt. My series of seven males and one female is referable to the race *oberholseri*, as they are somewhat darker than individuals representing the nominate race.

Sialia sialis guatemalae. Common Bluebird. Bluebirds were common from 6500 to 8500 feet in corn fields, pastures, and near farm houses. They were seen daily in small flocks from July to October. Birds taken in March were in breeding condition. By the end of May, young were out of the nest. There was no sign of fall breeding. Four males and two females were collected.

Bombycilla cedrorum. Cedar Waxwing. In February and May flocks of 30 to 50 Cedar Waxwings were seen on the edges of oak forest and oak-pine forest, and in fruit trees in pastures and cultivated land between 6000 and 8100 feet. This species was not recorded in the fall. A female was collected on February 18, at 7000 feet, from a flock of 25 birds on the edge of an oak forest.

Ptilogonys cinereus molybdophanes. Gray Silky Flycatcher. This species was seen in small flocks in oak forest and in oak-pine forest from 7500 to 8600 feet. On two occasions these birds were seen in trees on the edge of Soloma, and once I saw them in a large tree on the edge of Santa Eulalia. The species was common in March and April, but I have only a few scattered sight records from June to October. Three males and three females, collected in March and April, had slightly enlarged gonads. I do not think that this species nested near Soloma.

Vireo huttoni vulcani. Hutton Vireo. Specimens were collected between 8000 and 9300 feet in oak forest and scrub oak thickets. A female, collected April 29, had a slightly enlarged ovary. Immature birds were taken in August, September, and October. Six males and two females were collected.

Vireo solitarius solitarius. Solitary Vireo. On March 25 a female was collected in shrubs bordering a stream at 7700 feet. The bird was molting on the crown and throat. On September 25 and on October 8, two birds were taken at 7100 and 7700 feet, respectively, in oak forest.

Vireo gilvus swainsonii. Warbling Vireo. A female, collected March 7 at 6900 feet in an oak forest, is referable to the race *swainsonii* on the basis of its dull coloration, small bill, and size. Measurements are: wing, 68 mm.; tail, 50 mm.

Vireo flavoviridis flavoviridis. Yellow-green Vireo. I collected a male on the night of September 16 by a small fire on a 9600 foot ridge. This species is a lowland form and was not breeding in the Soloma region.

Diglossa baritula montana. Cinnamon-bellied Flower-piercer. This species was not common in the Soloma region until the latter part of July. I collected specimens between 6600 and 8800 feet in oak forest, cak-pine forest, and corn fields. Adults taken in March and April did not have enlarged

gonads. Nesting coincided with the maturing of the corn in the fall. When the corn reached a height of six to eight feet in August, males sang a great deal in the corn fields. Courtship, pairing, and nesting activity continued through August, September, and October. Adult birds taken in October had enlarged gonads. One immature bird was collected in October. There was no evidence of spring nesting for this species.

One male, collected February 28, was in essentially a female-like plumage but was molting into the adult male plumage. A fully adult male, taken March 29, was undergoing body molt and molt of the primaries. A non-molting male, taken October 8, was in breeding condition but had retained the female-like primaries, secondaries, and rectrices of the immature plumage. Five males and four females were collected.

Mniotilta varia. Black-and-White Warbler. Several of these birds were seen in oak forest and oak-pine forest between 5900 and 8400 feet in September and October. I did not see this species in the spring. A male was collected on September 29, at 8400 feet, in an oak forest.

Vermivora superciliosa superciliosa. Crescent-chested Warbler. This was a common species between 7000 and 9500 feet in scrub oak thickets, oak-pine forest, oak forest, and cloud forest. Much singing was heard in March, April, and May. Specimens collected at that time had enlarged gonads. A female taken March 27 had a brood patch. On June 16 adults were seen feeding young out of the nest. The postnuptial molt was just ending in September, indicating that there was no fall nesting. Singing was not heard in the fall. Eight males and six females were collected.

Dendroica coronata. Myrtle Warbler. On February 25 a female was taken at 7000 feet in shrubs bordering a stream. On March 31, a female was collected at 8600 feet in a scrub oak thicket. I am unable on the basis of size to assign these specimens to either *hooveri* or the nominate race. I have found no color differences to separate females in winter plumage of these two races. The measurements are: wings, 70, 71 mm.; tails, 53, 55 mm.

Dendroica audubøni memorabilis. Audubon Warbler. These birds were rather uncommon but were seen occasionally from February to March 18. There were no fall records. One male was taken at 8500 feet in an oak-pine forest on February 21. A second male was taken in oaks on March 8 at 8000 feet. The subspecific identification is based largely on size: wings, 80 mm. (both specimens); tails, 61, 59 mm.

Dendroica townsendi. Townsend Warbler. This was one of the most common birds in the Soloma region from September through April. I found the species in oak forest, scrub oak thickets, cloud forest, oak-pine forest, and pine forest. The earliest fall record was September 8, the last spring record, April 8. They were usually found between 6200 and 9600 feet. Twenty-one males and eight females were collected.

Dendroica occidentalis. Hermit Warbler. These warblers were found in oak-pine forest, oak forest, and pine forest from 5300 to 8400 feet. I have records for this species only from the months of September and October. Three males and two females were collected.

Dendroica fusca. Blackburnian Warbler. A male was collected on April 29 at 9300 feet in an oak forest. I have no other records for this species.

Seiurus noveboracensis notabilis. Northern Waterthrush. A male was collected on May 16, at 8600 feet, next to a stream.

Oporornis formosus. Kentucky Warbler. An immature female was collected on September 16 by a small fire at night on a 9600-foot ridge. I did not record this species in the daytime.

Oporornis tolmiei. MacGillivray Warbler. Specimens were collected between 6600 and 8600 feet in oak forest and in shrubs bordering streams. The earliest record in fall was September 30, the latest record in spring was April 14.

Of eight specimens, four males and four females, seven are referable to the race *monticola* and one tends toward the nominate race on the basis of the difference between wing and tail (Phillips, 1947:297). The measurements of the latter bird are: wing, 59 mm.; tail, 52 mm.

Wilsonia pusilla. Pileolated Warbler. This species was common in oak forest, oak-pine forest, cloud forest, and deserted fields between 5900 and 9600 feet. The earliest record in fall for this species was September 4, the latest spring record was May 9.

Thirteen of my specimens (five males, two females, four immature males, two immature females) are referable to the brightly colored race *pileolata.* Eight specimens (two males, one female, one immature male, four immature females) are referable to the nominate race. Five were collected in the fall (two by a fire at night), one in spring, and two in mid-February.

Wilsonia canadensis. Canada Warbler. Three females were collected at night by a fire on a 9600-foot ridge on September 16. I did not record this species in the daytime.

Cardellina rubrifrons. Red-faced Warbler. An immature male was collected in an oak-pine forest at 5300 feet on September 15. The bird was in a mixed flock of *Dendroica occidentalis* and *Wilsonia pusilla*.

Myioborus miniatus intermedius. Slate-throated Redstart. This species was recorded from 4800 to 9400 feet in humid oak forest and in dense thickets. Birds taken in March and April had enlarged gonads. Singing was frequently heard in those two months. An immature bird was taken on October 2. Adults were undergoing the postnuptial molt in the latter half of August. There was no evidence of fall nesting.

My specimens (seven males) are referable to the race *intermedius* on the basis of their relatively bright orange underparts. The tail length is not long enough for *hellmayri* of western Guatemala.

Ergaticus versicolor. Pink-headed Warbler. This warbler was common between 7100 and 9400 feet in oak forest, oak-pine forest, pine forest, cloud forest, and scrub oak thickets. Singing was most fervent in March, April, and May. Birds collected at that time were in breeding condition. A brown juvenile was taken May 9. The juvenal plumage is rapidly lost, as immature birds taken in July and August have only a trace of brown on the belly and flanks. Immature birds taken in September and October could be distinguished from the adults only by their incompletely ossified skulls. Eight males, six females, three immature males, four immature females, and one juvenal male were collected.

Basileuterus belli scitulus. Golden-browed Warbler. Specimens were collected from 7000 to 9400 feet in oak forest, oak-pine forest, and cloud forest. Birds taken in March and April had enlarged gonads. Adults were molting in July. Immature birds were taken in July, August, and September. There was no evidence of fall nesting. Six males and four females were collected.

Basileuterus rufifrons salvini. Rufous-capped Warbler. An immature male was collected on August 14 at 6700 feet in a scrub oak thicket. I refer this specimen to the race *salvini* on the basis of the solid yellow underparts.

Cassidix mexicanus. Boat-tailed Grackle. This species was common in town and on cultivated land on the edge of town. In February there were small flocks of 15 to 20 birds. On March 5 one was seen building a nest in a tall tree in town. Nesting continued through July 3. The first juveniles were seen April 14. By August 1 the birds were molting. There was no fall nesting. No specimens were obtained.

Icterus galbula. Baltimore Oriole. A male was collected on February 24, at 8000 feet, in a small woodlot near a house. The species was seen in open oak forest from 4800 to 8500 feet until April 19. An adult female was collected on October 8. This was my only record for this species in the fall.

Icterus chrysater chrysater. Yellow-backed Oriole. On July 28 I collected an adult female at 7700 feet on the edge of an oak forest. The bird was undergoing the postnuptial molt. I have no evidence that this species was nesting in the Soloma area. It is essentially a bird of the subtropical zone and the individual collected was the only member of this species seen in the high country.

Sturnella magna. Common Meadowlark. I saw and heard this species on the grassy plains near Paquix in February and in June. The altitude was 11,500 feet. No specimens were secured.

Tanagra musica elegantissima. Blue-headed Euphonia. This species is found principally in the subtropical zone of Guatemala, but occasionally it wanders into the high country. An immature female was taken at 8500 feet in a scrub oak thicket on July 28. An adult female, molting, was collected at 8700 feet on September 19 on the edge of the cloud forest. It was with an adult male.

Piranga rubra rubra. Summer Tanager. I collected an adult female on September 30, at 8600 feet, in oaks bordering a cleared field. The specimen is referable to the nominate race on the basis of its small size: wing, 88 mm.; tail, 72 mm.

Chlorospingus ophthalmicus dwighti. Common Bush-Tanager. Specimens were collected from 7900 to 9300 feet in the cloud forest and in humid oak forest. Females with brood patches were taken in the latter half of March. Males taken in the latter part of June were undergoing the postnuptial molt. By the end of July both males and females were in fresh fall plumage. In late summer and in fall the birds were always seen in small flocks of four or five birds, possibly family groups.

Griscom (1932:385) referred specimens from Barillas and San Mateo (both in the Department of Huehuetenango) to the race *postocularis*. Hellmayr (1936:399) referred these same specimens to the race *dwighti* on the basis of head color and pattern. My specimens (eight males and three females)

are referable to *dwighti* in that throughout the series the pileum is slate gray bordered laterally with black. In *postocularis* the entire pileum is sooty drab.

Spinus atriceps. Black-capped Siskin. Flocks of this rare species, which apparently did not nest in the vicinity of Soloma, were seen on several occasions in high open pasture land in July, August, September, and October and were extremely difficult to approach. One non-molting male was taken from a flock of 40 to 50 birds on July 28 at 8400 feet. The crop contained grass seed. The flight of this species was undulating and the call notes were similar to those of *S. tristis*.

Guiraca caerulea interfusa. Blue Grosbeak. An adult female was collected on April 11 at 7500 feet in a corn field. The bird was not molting.

Passerina cyanea. Indigo Bunting. Two specimens were taken, an adult male in brown winter plumage in scrub oak at 7600 feet, on February 19, and a female in an oak thicket, at 6900 feet, on March 7.

Atlapetes gutturalis griseipectus. Yellow-throated Brush-Finch. This species, which was much more secretive than *A. brunnei-nucha*, apparently was restricted to scrub oak thickets between 7500 and 8800 feet. I saw it only on six occasions and collected a male on September 11. The bird was undergoing an extensive postnuptial molt.

Atlapetes brunnei-nucha. Chestnut-capped Brush-Finch. This species was found between 7600 and 9300 feet in the underbrush of oak forest and cloud forest. One specimen was collected in pine forest and one in a scrub oak thicket, but the birds were not common in these habitats. Birds taken in March and April were in breeding condition. A nest with two well-incubated eggs was found on March 28. The nest was 18 inches from the ground in a shrub on the edge of an oak forest. The eggs were white and unmarked. There was no sign of fall nesting. Adults were in fresh fall plumage by mid-September. Five males and three females were collected.

Pipilo erythrophthalmus repetens. Red-eyed Towhee. This species lived between 6800 and 9700 feet in scrub oak thickets, pastures, and cornfields. It was very common above 8000 feet. In the non-nesting season it was often seen in small flocks with *Junco alticola* and *Zonotrichia capensis*. Birds taken in March, April, and May were in breeding condition. During these months they were often heard singing. Adults were molting in July, August, and September. There was no evidence of fall nesting, and singing stopped by mid-September. Nine males and four females were collected.

Aimophila rufescens gigas. Rusty Sparrow. These birds were not common in the Soloma region and were very secretive. Three specimens were taken between 6700 and 7800 feet on rocky slopes well covered with shrubs. Two adult females, taken March 6 and May 26, respectively, showed no signs of breeding. A male taken July 26 was just starting the postnuptial molt.

Junco alticola. Guatemala Junco. Juncos were found between 6800 and 9300 feet in short grass pastures, rocky hillsides, and in corn fields. A bird was seen building a nest on the ground in a grassy pasture on March 17. A second nest, with its complete clutch of two, white, unmarked eggs, was collected on March 26. The eggs had been incubated for four or five days. The second nest was also in a pasture on the ground at the base of a tall clump of grass. Singing was common from March through August. Both adults and young were molting in September and October.

The species *J. alticola* is closely related to *J. phaeonotus*. Hellmayr (1938:554) considered *alticola* to be a race of *phaeonotus*. I, however, consider it to be a full species on the basis of the back color which is brown in *alticola* but which is rusty or chestnut in every race of *phaeonotus*. The bill of *alticola* is dark above and yellow below and the iris is yellow. Six males and two females were collected.

Zonotrichia capensis septentrionalis. Rufous-collared Sparrow. This species was common between 6800 and 9200 feet in cultivated land, on grassy pastures, and in town. There were two distinct nesting seasons; the principal one in fall, when corn fields were the preferred habitat, and a lesser one in spring when the species frequented pastures and shrubbery in town. On June 16 a nest, containing three young, was found at the base of a tall clump of grass in a pasture near town. On June 19 a nest with two young was found in a similar location. An immature male, streaked below, was taken June 20. Spring nesting stopped by mid-July. Singing increased again and fall nesting started in mid-August. Three two-egg clutches and one three-egg clutch were collected on August 19, September 10, 22, and 29, respectively. One juvenile was taken September 24; one immature, streaked below, was taken on October 1. Nests were all on or near the ground, well hidden in tall grass or in shrubs in corn fields. The highest nest was four feet from the ground. The fall nesting season seemed to be of more importance to the species, as many more individuals nested in the fall than in the spring. Ten males and five females were collected.

Melospiza lincolnii lincolnii. Lincoln Sparrow. Three specimens were taken between 6600 and 8600 feet, respectively, in scrub oak, in a corn field, and in shrubs bordering a stream. The earliest record was March 6, the latest, April 9. None of the birds were molting. The species was not recorded in the fall.

DISCUSSION AND SUMMARY

Four hundred and fifty specimens were collected near San Pedro Soloma, Guatemala. An analysis of the number of nesting species found in the six basic habitats of this region reveals that the oak forest, with 28 breeding forms, contained more species than any other habitat. The pine forest was the poorest habitat for birds, having only nine nesting forms. Although the cloud forest was very restricted in size, it contained 26 nesting species. The cultivated land, which covered more ground than all the other habitats combined, contained 19 nesting forms. The scrub oak thickets had 18 breeding species and the oak-pine forest 17.

The mountain mass formed by the Sierra de los Cuchumatanes presents a barrier to migration. The range extends in an east-west direction and has an elevation in excess of 12,000 feet. To the east and the west there are lowlands which swarm with migrants in both the spring and fall. In the Soloma region migration in both spring and fall was unimpressive and disappointing. It was evident that most species avoid crossing the Cuchumatanes.

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