

## THE IMPACT OF DEFORESTATION ON BIRDS OF CEBU, PHILIPPINES, WITH NEW RECORDS FOR THAT ISLAND

BY D. S. RABOR

Cebu Island, in the central Philippines, is one of the ten large islands of the archipelago, with an area of about 4390 square kilometers. Though hilly, it reaches no great height, the maximum elevation being 1013 meters in Mt. Cabalasan in the central part.

The island was probably originally forested. Before the coming of the Spaniards, in 1521, the population probably raised only rice as a food crop. This could be grown only on favorable areas in the narrow coastal plain. Thus deforestation was limited. With the arrival of the Spaniards, and the introduction of corn, sweet potato and cassava (all native to tropical America), which could be raised more widely on lowlands and hills, deforestation continued. Within historic times Cebu has been densely populated compared with nearby islands. Before population pressure the forests disappeared. This deforestation was hastened by the wasteful method of shifting cultivation (kaingin system) practiced, in which land is cleared, planted to crops for a few seasons, then abandoned for a new clearing.

When ornithological collecting was started on Cebu in 1872, the forests were limited to patches in a few parts of the island. In 1906, when McGregor and his assistants collected on Cebu, they already had difficulty in finding forests in which to collect.

For some decades the Bureau of Forestry has been carrying on reforestation projects on Cebu, the most notable of these being in Toledo and in the hills near the water reservoir of Cebu City at Buhisan Dam. Up to 1941, the Bureau's efforts were progressing and new forests were being developed. The Second World War broke out and when it ended in 1945, nothing much was left of the government-created forests. The people had cleared most of them as well as the beginning luxuriant growths in many places in the hills and mountains of Cebu. Today, the Bureau of Forestry is again very seriously carrying on reforestation work in several parts of Cebu.

In our work from Silliman University in Cebu, begun in 1947 (see below) and in aerial survey of the island, we have been unable to find any patches of original forest, and the best bird area we found was the newly developed forest near Buhisan Dam.

### ORNITHOLOGICAL HISTORY OF CEBU

Several collectors have worked on Cebu. Among them were A. B. Meyer in 1872, J. B. Steere (First Steere Expedition) in 1874-75,

J. Murray (Challenger Expedition) in 1874, A. H. Everett in 1877, Second Steere Expedition (J. B. Steere, F. S. Bourns, E. L. Moseley, D. C. Worcester) in 1888, Menage Expedition (F. S. Bourns and D. C. Worcester) in 1892, and R. C. McGregor in 1906. Since McGregor's work on Cebu in 1906, no serious ornithological collecting has been done on this island until 1947, when my students, assistants and I started to make collections of the land vertebrates on Cebu. One objective was to find out how the land vertebrate fauna, especially the birds, have fared in the face of the excessive deforestation suffered by this island during the twentieth century. In this study, Mr. Filomeno Empeso, a Field Assistant of the Biology Department of Silliman University, has aided me very efficiently.

Collecting was carried on periodically in several places on the island. To date about 1100 bird specimens, among other land vertebrates, have been collected on Cebu. The collections are at present in various institutions, the bulk of them in the Chicago Natural History Museum (CNHM) and in Silliman University (SU), and a few in the Yale Peabody Museum (YPM).

R. C. McGregor (1909. "A Manual of Philippine Birds,") lists 154 species from Cebu, of which 123 are resident, 30 migrant, and 1 of doubtful status. D. S. Rabor (1952. Auk, 69 (3): 253-257) added two new records of resident forms, raising the total to 156.

The present paper reports 10 new bird records for Cebu, which include 6 resident and 4 migrant forms. This raises the total number of birds known from Cebu to 166, of which 131 are resident, 34 migrant, and one of doubtful status. Of the 10 new records, 8 are represented by actual capture of specimens, and two by sight records on various occasions.

Three interesting aspects of the bird life on Cebu Island are discussed below: a. the status of the 10 endemic forms; b. forest species; c. new records.

The vernacular names follow in general those in Delacour and Mayr, 1946, "Birds of the Philippines," (MacMillan Co.).

#### ENDEMIC FORMS

Ten endemic forms (see list below) have been recognized for Cebu. All presumably were forest birds. We were able to find only one of these, the Black Shama, *Copsychus cebuensis*.

The following is a list of the endemic birds with their present status:

*Phapitreron amethystina frontalis* Bourns and Worcester. Amethyst Brown Fruit Dove.—Collected by Bourns and Worcester, 1892, and not found since then. Preferred hill and mountain original forests.

*Loriculus philippensis chrysonotus* Sclater. Philippine Hanging Parakeet.—Collected by: Meyer, Steere, Everett, Steere Expedition (second), Menage Expedition, McGregor. Not found since McGregor collected it in 1906. The species prefers original forests of the lowlands and hills, but also ranges in the coconut groves and second growth. Breeding, however, takes place in original forests, at the edges of same, or in forest clearings.

This species is one of the common birds that are kept as cage pets throughout the Philippines. However, in recent years, the birds that I have seen on Cebu that were kept as cage birds, were either the Mindanao race, *L. p. apicalis*, or the Negros race, *L. p. regulus*. Both forms are very abundant in their home islands. Regular peddlers bring them in boats from Mindanao and Negros and sell them in Cebu City.

Since 1947, I have not collected, nor definitely observed, the Cebu race of the species. On several occasions, however, I heard the very characteristic musical notes of the species in the coconut groves in southern Cebu. But then, nobody can be sure of the particular race of the bird that might be singing at any one time because the songs of the various races are similar. I heard the notes of the species on Siquijor Island and thought that at last we would have the chance to collect the rare Siquijor race, *L. p. siquijorensis*. The bird was collected and to our amazement, it turned out to be *L. p. regulus* of Negros. It must have been a cage escape, one of many cage birds of this species brought over from Negros.

*Coracina striata cebuensis* Grant. Barred Graybird.—Collected by: Everett, Bourns and Worcester, McGregor. Not found since McGregor collected it in 1906. Preferred original forests of the lowlands, hills and mountains, but also ranged in the second growth.

*Coracina caerulescens alterum* Ramsay. Black Graybird.—Collected by: Everett, Bourns and Worcester, McGregor. Not found since McGregor collected it in 1906. Preferred original forests in the hills and mountains.

*Microscelis siquijorensis monticola* Bourns and Worcester. Mottled-breasted Bulbul.—Collected by: Bourns and Worcester, McGregor. Not found since McGregor collected it in 1906. Said to live in mountain forests. Its congener, *M. p. philippinus*, is still very common in the hills and mountains, among second growth patches and even in coconut groves.

*Copsychus cebuensis* Steere. Black Shama.—Collected by: Steere Expedition, Bourns and Worcester, McGregor, and Empeso. Lives in original forests, dense thickets, and dense second growth mixed with thickets. Its adaptation to second growth and thickets will help much in its survival on the island. F. Empeso collected a single specimen, a male with the testes enlarged, on July 16, 1956, in dense second growth mixed with thickets.

Its congener, *C. saularis mindanensis*, is a very common bird in second growth, bamboo groves, hedge growths in cultivated areas, and even in gardens.

*Dicaeum trigonostigma pallidus* Bourns and Worcester. Orange-breasted Flowerpecker.—Collected by: Everett, Bourns and Worcester, McGregor. Not found since McGregor collected it in 1906. Lived in original forests in the lowlands, hills and mountains, especially close to the edges, but also ranged in second growth and clearings. McGregor (1907, Phil. Journ. Sci., II A, p. 307) based on his observations of the species on Cebu in 1906, writes: "This species is the most common member of the family *Dicaeidae* in Cebu."

*Dicaeum quadricolor* Tweeddale. Four-Colored Flowerpecker.—Collected by: Everett, Bourns and Worcester, McGregor. Not found since McGregor collected it in 1906. Lived in original forests in the lowlands and hills. Its congener, *D. a. australe* (*papuense* of authors), remains very abundant all over the island.

*Zosterops everetti everetti* Tweeddale. Everett's White-eye.—Collected by: Everett, Steere Expedition, Bourns and Worcester, McGregor. Not found since McGregor collected it in 1906. Lived in lowland and hill forests and also ranged in second growth.

Its congener, *Z. everetti siquijorensis*, on Siquijor Island, is still a fairly common bird in second growth patches.

*Oriolus xanthonotus assimilis* Tweeddale. Dark-throated Oriole.—Collected by: Everett, Bourns and Worcester, McGregor. Not found since McGregor collected it in 1906. Bourns and Worcester (in McGregor, 1909, *A Manual of Philippine Birds*, p. 701) write of this species thus: "*O. assimilis* is exceedingly common in the small amount of forest left in Cebu." This observation was made in 1892.

#### FOREST SPECIES

Some forest species that we found in the course of our work on Cebu include the following:

*Ducula aenea aenea* Linnaeus. Green Imperial Pigeon.

*Kakatoe haematuropygia* Müller. Philippine Cockatoo.

*Prioniturus discurus whiteheadi* Salomonsen. Blue-headed Racket-tailed Parrot.

*Cuculus fugax pectoralis* Cabanis and Heine. Horsfield's Hawk Cuckoo.

*Ceyx lepidus margarethae* Blasius. Variable Forest Kingfisher.

*Pitta e. erythrogaster* Temminck. Red-breasted Pitta.

*Pachycephala plateni winchelli* Bourns and Worcester. White-bellied Whistler.

*Parus elegans albescens* McGregor. Elegant Titmouse.

*Sitta frontalis aenochlamys* Sharpe. Velvet-fronted Nuthatch.

However, seven other forest species previously recorded were not found by us:

*Gallus gallus gallus* Linnaeus. Red Jungle Fowl.

*Leucotreron occipitalis* Gray. Yellow-breasted Fruit Dove.

*Leucotreron l. leclancheri* Bonaparte. Black-chinned Fruit Dove.

*Ducula p. poliocephala* Gray. Pink-bellied Imperial Pigeon.

*Terpsiphone cinnamomea unirufa* Salomonsen. Rufous Paradise Flycatcher.

*Culicicapa helianthea panayensis* Sharpe. Citrine Canary Flycatcher.

*Chloropsis f. flavipennis* Tweeddale. Yellow-quilled Leafbird.

It is possible that these and the nine endemics have disappeared from the island. However, there is also the possibility that some persist in second growth we did not find.

Many of the forest species that we found were in reforested areas, and the sole endemic rediscovered was also in such a place. Possibly some of the other forest species that we did not find may actually persist in very small numbers in scattered localities. If so, their only hope of survival on the island is to colonize and adapt to the reforested areas.

## NEW BIRD RECORDS

We found several species previously unrecorded from Cebu:

*Ixobrychus sinensis astrologus* Wetmore, Chinese Least Bittern.—Basak, Cebu City: 1 female adult, September 5, 1956 (CNHM). Wing 130; culmen from frontal feathering 43.5 mm.

The bird was taken at the side of a small irrigation ditch in rice fields, when the rice plants were maturing. This species is not as commonly encountered as *I. cinnamomeus*, which is also found in the same type of haunts. The Chinese Least Bittern is more likely to be met with in Mangrove and Nipa swamps.

*Streptopelia chinensis tigrina* (Temminck and Knip), Tigrine Dove.—Tuburan, Cebu: 1 male adult, October 4, 1956 (SU). Wing 144; culmen from base 21 mm.

The Tigrine Dove is gradually extending its range in the Philippines from Palawan and Balabac (its original range in the Philippines) to Zamboanga Peninsula, Mindanao Island (Rabor, 1952. *Auk*, 69 (3), pp. 255–256) and Negros (Rabor, 1954, *Silliman Journal*, 1 (1), pp. 79–80), and now to Cebu. Although pigeons and doves are kept as cage birds in many places in the Philippines, I do not believe that the present spread of the Tigrine Dove is by this means. I am more inclined to ascribe its spread to its successful crossing and consequent colonization from one island to another, aided perhaps by the strong monsoon and typhoon winds.

*Cacomantis variolosus sepulcralis* (S. Müller), Rufous-breasted Brush Cuckoo.—Tisa, Cebu City: 1 female immature, January 30, 1956 (CNHM); Buhisan Dam, Cebu City: 1 male immature, July 23, 1956 (YPM); 1 female adult, October 22, 1956 (CNHM); 1 female immature, September 7, 1956 (CNHM). Wing ♂ 114, ♀ 119, 118; culmen from base ♂ 23.5, ♀ 23, 23.5 mm.

The Rufous-breasted Brush Cuckoo has been confused with *C. m. merulinus* in the past so that records of the latter on various islands, including Cebu, might really have included *C. v. sepulcralis*.

The immature female in the Chicago Natural History Museum collection has just completed its molt to the adult plumage, and one secondary and a few upper wing coverts are still of the juvenal plumage. The other immature female specimen in the same museum has still retained a few of the characteristic striped juvenal feathers on the throat and fore breast, otherwise the retaining part of the plumage is that of the adult.

The immature male in the Peabody Museum collection still possesses small remnant patches of the juvenal plumage both on the upperparts and underparts. The rectrices are molting to those of the adult.

All the specimens were taken in dense tree growths within or close to the reforestation project in the hills back of the city, in the areas surrounding the water reservoir.

*Halcyon coromanda bangsi* Oberholser, Ruddy Kingfisher.—Buhisan Dam, Cebu City: 1 female adult, December 12, 1955 (SU); 1 male adult, October 23, 1956 (CNHM). Wing ♂ 118, ♀ 117; culmen from base ♂ 58, ♀ 57.5 mm.

The Ruddy Kingfisher seems to be an uncommon winter visitor in the Philippines, except on Siquijor Island where 7 specimens were collected within a comparatively short time, within two remnant patches of well-logged original forest.

Three races have been identified in the Philippines: *H. c. major*, *H. c. bangsi*,

and *H. c. minor*. The first two are winter visitors in the Philippines but the last one is a breeding resident form in the Sulu Archipelago.

The two Cebu specimens are similar to the birds collected on Siquijor and Negros, which proved to be *H. c. bangsi*, after a comparative study of the various forms was made by Dr. Rand (Rand and Rabor, MS) in connection with a study of the avifauna of Siquijor Island.

At present *H. c. bangsi* has been recorded as a winter visitor on Siquijor, Negros, and Cebu.

*Monticola solitaria philippensis* (P. L. S. Müller), Blue Rock Thrush.—This winter visitor has not been collected on Cebu as specimen but I have seen it on several occasions, right in the city, on the stone walls and roofs of the old churches, even while I was a young boy living in Cebu City. Again, in March, 1954 and April, 1955, I saw the species in the vicinity of the same old stone churches.

*Gerygone sulphurea sulphurea* Wallace, Yellow-breasted Wren-warbler.—Pacna-an, Mandawe, Cebu: 1 male adult, January 31, 1954 (CNHM); Kanhabagat, Medellin, Cebu: 1 male adult, 2 female adults, July 19–21, 1954 (CNHM). Wing ♂ 50, 51.5, 51, 51.5; culmen from base ♂ 12.5, 12.5, ♀ 12.5, 12.5 mm.

The Yellow-breasted Wren-warbler, strangely enough was not collected by the earlier collectors on Cebu in spite of its being now relatively common on the island, especially in the Mangrove forest or remnant patches of it. Its song is very melodious, loud and clear and cannot be mistaken for that of any other species.

The Cebu birds do not differ from Negros and Bohol birds.

*Megalurus palustris forbesi* Bangs, Striated Canegrass Warbler.—Lico-lico, Cebu: 1 male adult, January 12, 1954 (CNHM); Canyasan, Cebu: 1 male adult, September 26, 1956 (CNHM). Wing ♂ 97.5, 101; culmen from base ♂ 23, 24 mm.

The Striated Canegrass Warbler is another species that is fairly common on Cebu, especially in the rice fields in the narrow coastal plain, and in the tall grass areas in the foothills. However, the bird is more often heard than seen, because of its habit of feeding on the ground among the dense tall grass and similar dense growths.

A favorite haunt of the bird is the dry rice fields after the harvest, where it feeds on the ground close to grazing carabaos and cattle. When disturbed it usually flies to the nearest tree, often *Nauclea orientalis* (Bangkal) or *Ceiba pentandra* (Doldol or Kapok), which trees are often planted as hedges around the rice fields. From the safety of a high bare branch close to or at the top of the tree, the bird gives its very characteristic call, a series of loud rolling, warbling notes, rather musical to hear.

The Cebu specimens do not differ from Negros and Bohol birds.

*Muscicapa narcissina narcissina* (Temminck), Narcissus Flycatcher.—Campo 3, Buhisan Dam, Cebu City: 2 male immature, November 3, 5, 1956 (CNHM). Wing ♂ 75, 77; culmen from base ♂ 13.5 14 mm.

The Narcissus Flycatcher is a rare winter visitor in the Philippines. It has been recorded so far only on Calayan, Luzon, Mindanao, and Negros. The present record on Cebu extends its winter range by one more island in the Philippines.

*Muscicapa griseisticta* (Swinhoe), Gray-spotted Flycatcher.—Tisa, Cebu City: 1 female adult, January 28, 1954 (CNHM); Bacsan, Cebu: 1 sex ?, December 10, 1954 (SU); Samboan, Cebu: 1 male adult, January 27, 1955 (SU). Wing ♂ 84, ♀ 84.5, sex ? 81.5; culmen from base ♂ 14, ♀ 12.5, sex ? 13. mm.

The Gray-spotted Flycatcher is widely distributed in the Philippines as a winter visitor, but is never found in large numbers in any one area. It is strange that it was not recorded on Cebu by the earlier collectors, considering the fact that it frequents even cultivated areas provided there are some tree growths around them.

*Padda oryzivora* (Linnaeus), Java Sparrow.—The Java Sparrow has always been a popular cage bird in Cebu and still is. Even today, several Chinese pet stores in the city always have cages just for these sparrows, oftentimes containing both the normally-colored and the albino birds. It is evident that the source of the birds that have by this time already succeeded in establishing a breeding population in the hills of Cebu, has been cage escapes. In 1922–26, as a small boy who roamed the hills of Cebu City in company with other small boys, all armed with sling shots and later, with air rifles, the Java Sparrow always attracted us whenever one was seen or a small flock observed. It was not uncommon for one or two of these birds to join the flock of the Chestnut Mannikin, *Lonchura malacca jagori*, and feed with the members. Occasionally, a flock of Java Sparrow numbering about from 6 to one dozen, was encountered, sometimes with a member or two which were albino. Somehow the species has never increased in large numbers, perhaps because of the overhunting by small boys, even up to the present.

#### ACKNOWLEDGMENTS

I am greatly indebted to the John Simon Guggenheim Memorial Foundation, Chicago Natural History Museum, Yale University, and the United Board for Christian Higher Education in Asia, for the fellowship and travel grants that have enabled me to come to the United States and pursue the studies on Philippine birds and prepare reports on them for publication, under the advice of or in collaboration with Dr. A. L. Rand, Chief Curator of Zoology of the Chicago Natural History Museum, and Dr. S. Dillon Ripley, Curator of Vertebrate Zoology of the Yale University Peabody Museum.

#### SUMMARY

Cebu Island, Philippines, was largely deforested by the early twentieth century and new forests, later developed by the government, were destroyed during the Second World War.

A recent survey of its bird life indicates that all but one of its endemic forms, as well as several other forest species, may have disappeared.

Ten forms (six resident) not previously recorded from Cebu were found.

*Silliman University, Dumaguete City, Negros Oriental, Philippines.*