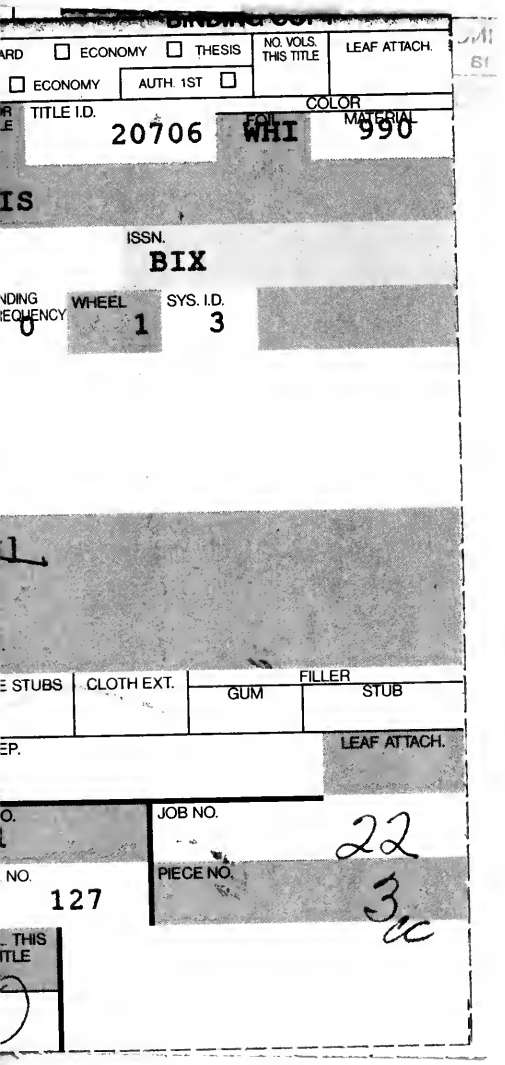
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FIELDIANA

Zoology

NEW SERIES, NO. 82

The Birds of Sibuyan Island, Romblon Province, Philippines, with Particular Reference to Elevational Distribution and Biogeographic Affinities

Steven M. Goodman

David E. Willard

Pedro C. Gonzales

November 30, 1995
Publication 1471

PUBLISHED BY FIELD MUSEUM OF NATURAL HISTORY

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Langdon, E. J. M. 1979. Yage among the Siona: Cultural patterns in visions, pp. 63-80. *In* Browman, D. L.,and R. A. Schwarz, eds., Spirits, Shamans, and Stars. Mouton Publishers, The Hague, Netherlands.

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NEW SERIES, NO. 82

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The Birds of Sibuyan Island, Romblon Province, Philippines, with Particular Reference to Elevational Distribution and Biogeographic Affinities

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Abstract

Sibuyan Island is a relatively small, isolated island measuring at its widest points 24 km north to south and 28 km east to west, rising to 2050 m above sea level, with a total land area of 233 km^2. The nearest major island masses are Luzon (to the northeast), Mindoro (to the northwest), and Panay (to the south). A considerable portion of the natural habitat, including some lowland forest, remains intact. Sibuyan is oceanic in origin and during the middle to late Pleistocene was not attached to any other island mass. Most of the small islands in the Philippines for which we have ornithological information were connected to larger island groups during the Pleistocene, making an analysis of the avifauna of Sibuyan, and its faunistic relationships to other surrounding larger islands, important in understanding patterns of dispersal across water barriers, and providing an interesting contrast to the avifaunas on Pleistocene land-bridge islands.

A total of 130 bird species have been recorded on Sibuyan: 102 known or presumed residents and 29 migrants or boreal winter visitors. Historical records combined with the results of our 1989 and 1992 field trips show 93 resident species occurring between 0 and 100 m, 24 at 325 ± 50 m, 19 at 725 ± 50 m, and 10 at 1325 ± 50 m.

Although little has been published previously on the birds of Sibuyan, the number of collections from the island is remarkable, spanning almost 100 years of ornithological exploration. Several collectors described the habitats they found on the island during their visits. This information provides a window into the extinction and colonization rates of birds as a function of time and habitat degradation. The cutting of the lowland forests for lumber or conversion into agricultural areas has had a major impact on the avifauna. Three or four species of large pigeons have likely been extirpated on Sibuyan. Five species of open country birds have colonized the island in the past few decades.

The resident bird species found on Sibuyan are closest to those on the islands of Mindanao, Luzon, Mindoro, and Panay. This group of islands has an avifauna that is very distinct from Palawan Island's.

Sibuyan is one of the last small islets in the Philippines with significant large tracts of forest. Its relative remoteness and lack of extreme human pressure on the remaining natural resources, combined with a biologically diverse environment, make it an ideal area for a reserve. The Department of Environment and Natural Resources, Manila, is currently considering a plan to place a portion of the island in the national protected area system.

Introduction

The Philippines comprise over 7,000 islands and islets, the vast majority of which have been partially or totally cleared of their lowland forests. Fewer than 10% of these islands have had avifaunal surveys, and the percentage of well-surveyed islands is even smaller. To date, virtually all of the

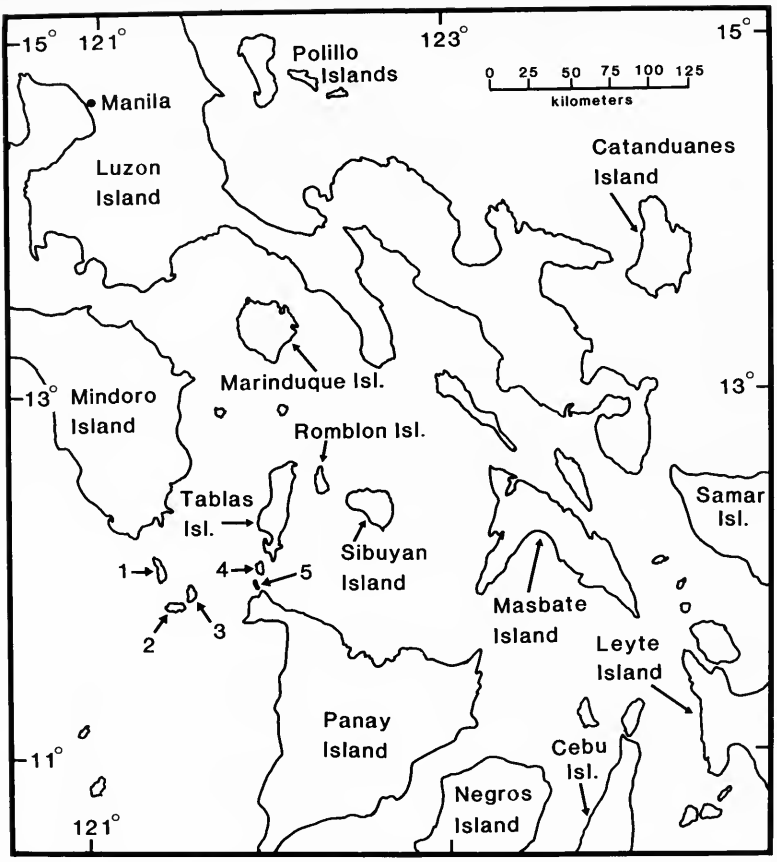

FIG. 1. Position of Sibuyan Island relative to other islands in south-central Philippines. Sibuyan is located just below center on the map. The islets between Mindoro and Panay are numbered as 1—Semirara, 2—Sibay, 3—Caluya, and between Panay and Tablas as 4—Carabao, 5—Boracay.

studies of birds occurring on smaller islands have been conducted on those connected by land bridges to much larger islands during the late Pleistocene (e.g., Catanduanes [1,823 km^2, connected to greater Luzon]—Gonzales, 1983; Marinduque [1,727 km^2, connected to greater Luzon]—duPont, 1972b; Ticao [362 km^2, connected to greater Panay–Negros]—duPont, 1972a; Dinagat [668 km^2, connected to greater Mindanao]—duPont and Rabor, 1973; and Siargao [455 km^2, connected to greater Mindanao]—duPont and Rabor, 1973). There is no published study in the Philippines of the birds found on a small island of oceanic origin and surrounded by deep water. Information on the vertebrates of isolated oceanic islands, with relatively intact forest, helps address biogeographic questions of dispersal patterns and origins of taxa colonizing across water rather than across land (e.g., Heaney et al., 1989, 1991).

In the late 1980s, Sibuyan was identified as an important site because it is oceanic in origin, is surrounded by deep water, is relatively isolated, and has considerable elevational relief. Sibuyan is separated from Romblon by a 10.5-km-wide channel that is at least 180 m deep (Fig. 1). Romblon lies 9.5 km east of Tablas, and these two islands are separated by an ocean depth of at least 55 m. The southern edge of Tablas is about 43 km north of Panay Island, the nearest large island to the south, and the small islets of Carabao and Boracay lie in between. The ocean floor depth between these islands varies: Boracay and Panay—20 m; Carabao and Panay—90 m; and Carabao and Tablas—at least 350 m (Philippine Coast Pilot, 1968; Defense Mapping Agency Hydrographic Center, 1977, 1978). Carabao and Tablas are separated by a channel less than 5 km wide.

Approximately 17,000 years ago, during the last

glacial maximum, sea level was about 120 m below the present level (Fairbanks, 1989). Thus, islands and islets currently separated by ocean depths of less than 120 m were connected, and these land bridges provided a direct means for dispersal and colonization by animals (Brown & Alcala, 1970; Heaney, 1986; Dickinson et al., 1991; Heaney et al., 1991). In contrast, Sibuyan has been separated by water from other land masses, at least since the Pleistocene.

A considerable amount of natural habitat remains on Sibuyan. In 1989 we commenced a detailed study of the birds and mammals occurring on the island, with particular reference to their elevational distribution. The inventory and the transect were completed in 1992.

Sibuyan, even though relatively small and isolated, is unique among Philippine islands in that there is a remarkable amount of information, spanning 100 years, on its birds. This historical information allows insight into the changes that have taken place in the birds of the area, particularly local extirpation and colonization related to the effects of lowland forest clearing and the subsequent formation of new habitats. The purpose of this paper is to catalog the birds of the island, providing information on their natural history, their elevational distributions, their biogeographic origins, and the effects of habitat degradation on the local avifauna.

Description of the Island

Sibuyan Island is located in the Sibuyan Sea (Fig. 1), and the closest large island masses are Luzon, about 102 km to the northeast; Mindoro, 96 km to the northwest; and Panay, 75 km to the south. The nearest small islands to Sibuyan (233 km^2 in total area), both to the west, are Romblon (130 km^2), 12.5 km away, and Tablas (828 km^2), 34 km away. Romblon Province is composed of these three islands and the smaller islets of Carabao Island, just to the south of Tablas; Cresta de Gallo Island, to the southeast of Sibuyan; Banton, Simara, and Maestre de Campo islands, north and west of the north end of Tablas; and Cobrador, Alad, and Lugbon islands, off the northwest coast of Romblon Island.

Sibuyan lies between 12°17′ and 12°30′ N and 122°26′ to 122°42′ E. It is a relatively small, kidney-shaped island, measuring at its widest points 24 km north to south and 28 km east to west (Fig. 2). The major topographical feature of the island is Mt. Guitinguitin, the summit of which is 2050 m above sea level. Along the north–south axis of the island, in about 12 km of ground distance, the elevation changes from sea level to over 2000 m. The slopes of Mt. Guitinguitin are generally steep and in some areas virtually inaccessible to humans. The name of the mountain translates from Ilonggo, the principal language spoken on Sibuyan, as "saw-tooth," which describes the series of precipitous jagged peaks that are so conspicuous from the lowlands (Fig. 3).

The climate of Sibuyan is characterized by the lack of a distinct dry season. The heaviest rains generally fall between June and November, with an average of 288.1 mm per month during this period, coinciding with the typhoon season. During this period the average number of rainy days per month is 18.3 (range, 16–21). The driest months tend to be March and April, which have 40 to 60 mm of rain per month. There is some fluctuation in the average temperature throughout the year. The extremes are in May, when the average daily maximum temperature is 32.7°C and the minimum is 25.6°C, and in January, when the average daily maximum temperature is 28.6°C and the minimum is 23.5°C. Two distinct wind patterns occur on the island: from January to May and November to December, the winds are from the northeast with the strongest average velocity of 6 kph; during the balance of the year, the winds tend to be from the southwest with the strongest average velocity of 5 to 6 kph (meteorological information from Anonymous, 1989).

The first known settlement on the island was founded in the early portion of the 17th century by religious missionaries. No group of forest-dwelling people is known to have inhabited the island, although it was reported that a group of "semiwild" peoples known as the Manguianes inhabited the mountains of the interior (Bureau of Insular Affairs, 1902). The most recent population census is from May 1990, estimated to be a little under 45,500 individuals (National Statistics Office, 1990). The 1988 human population of Magdiwang Municipality, the principal area we studied, was 9,673, representing a population density of 86 persons per km^2 (Anonymous, 1989). By May 1990 the total population of Magdiwang Municipality was 10,405, an increase of about 7%. This influx of migrants is mostly from neighboring islands, particularly Masbate, and is expected to increase over the next 5 years (A. R. Tansiongco, pers. comm.).

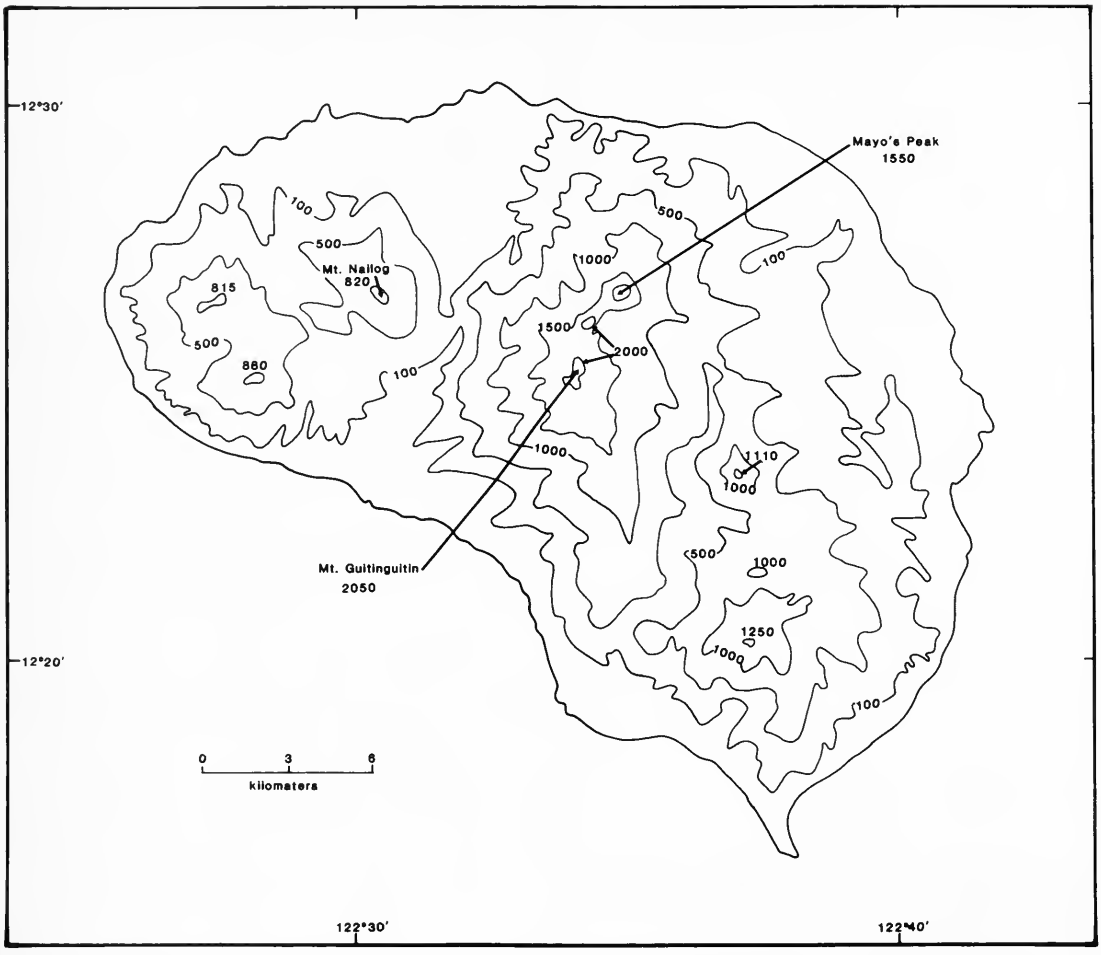

FIG. 2. Topographical map of Sibuyan Island. Note the steepness of the slopes (all figures in meters above sea level). Above 100 m, contours are based on 500-m intervals. Prominent peaks and summits are indicated.

History of Ornithological Work in Romblon Province

Museum Abbreviations Used in the Text

AMNH—American Museum of Natural History, New York.

BM(NH)—British Museum (Natural History), Tring.

CM—Carnegie Museum of Natural History, Pittsburgh.

DMNH—Delaware Museum of Natural History, Greenville.

FMNH—Field Museum of Natural History, Chicago.

MCZ—Museum of Comparative Zoology, Cambridge, Massachusetts.

MMNH—James Ford Bell Museum (formerly Minnesota Museum of Natural History), Minneapolis.

NMBE—Naturhistorisches Museum, Bern.

PNM—National Museum of the Philippines (Philippine National Museum), Manila.

SUMNH—Silliman University Museum of Natural History, Dumaguete City.

USNM—National Museum of Natural History (formerly U.S. National Museum), Washington, D.C.

Review

The first known bird collections from Romblon Province were made by the Menage Expedition

FIG. 3. View of main mountain chain from the lowlands at Agdamagan. Note the jagged peaks. Guitinguitin means "saw-tooth" in Ilonggo, the principal language of the island. Our transect trail followed the forested ridge in the right of the photo to Mayo's Peak (1550 m), the distinct peak covered with vegetation at the top of the same ridge. The upper portion of the mountain chain above 1600 m is mostly exposed rock. The summit of Mt. Guitinguitin (2040 m) is obscured by clouds but is located directly behind and to the left of Mayo's Peak. (Photograph taken by S. M. Goodman.)

between early September and late October 1892 (Bourns & Worcester, 1894). During this expedition D. C. Worcester visited the islands of Romblon, Tablas, and Sibuyan for approximately two weeks each (Worcester & Bourns, 1892, pp. 166–169). The Menage Expedition collections are housed in the MMNH, CM, and USNM (Parkes, 1989). Worcester had the following comments on the ecological conditions of two of the three islands he visited: "Romblon is an island almost entirely under cultivation, . . . [although] there is one bit of forest near the town [Romblon, Romblon]," and on Tablas, "we established ourselves in a town called Badajos. The forest was conveniently near, birds . . . were abundant" (Worcester & Bourns, 1892, pp. 166–167). Worcester did not describe the habitat he found on Sibuyan, but there is no evidence that he visited interior portions, and the majority of his records are of lowland species.

In 1904, R. C. McGregor, together with two Filipino colleagues from the Bureau of Science, Manila, collected birds on Romblon between late May and early June and on Sibuyan for the balance of June and at least the first half of July. Most of the work on Sibuyan was conducted in the vicinity of San Fernando. During this period they made a day trip to Cresta de Gallo, an islet to the southeast of Sibuyan. McGregor (1905a, pp. 6–7) commented that on Romblon "[a] large part of the old forest, even to the highest points, has been cleared off to make way for cocoanut groves. The few small patches of woods remaining cling to steep hillsides and afford little or no protection to forest-loving birds. It is not strange, therefore, that few species are known from the island." With regard to Sibuyan, McGregor (1905a, p. 7) continued, "A large part of the island is well wooded, . . . Considerable [coastal] areas have been cleared for cocoanuts, but the forests of the interior have not been disturbed." In 1905, A. Celestino and F. Rivera, collectors from the Bureau of Science, Manila, visited Tablas between 15 August and 30 September.

McGregor (1906b, p. 771) described Tablas, presumably based on information gathered by Celestino and Rivera, as having "a considerable area of undisturbed forest remaining on the slopes of the high hills and low mountains in its interior." The results of the 1904 and 1905 trips to the region were published by McGregor (1905a, 1906b). Most of the McGregor specimens were housed in the Bureau of Science, Manila, which was destroyed in 1945 during World War II. The only extant specimens from this collection had been exchanged with other institutions, namely the FMNH, CM, and USNM (Dickinson et al., 1991). During this same period McGregor published several papers on the birds of other nearby islands, including those adjacent to eastern and southeastern Mindoro—Caluya, Libagao, Maestre de Campo, Semirara, and Sibay (1905b, 1906a)—and Banton, 26 km north of Tablas (1906c).

In late March 1908 P. Bartsch, a zoologist on the M.V. *Albatross,* visited Romblon Island and collected a few birds. These specimens (at USNM) have been described by Mearns (1909). In July 1921 W. Cameron Forbes visited Romblon and obtained bird specimens that were donated to the MCZ (Bangs, 1922; Dickinson et al., 1991).

In 1928 W. Parsons, in collaboration with F. Rivera of the Philippine Bureau of Science, collected on Sibuyan near San Fernando from early July to late August, on Romblon at an undesignated area of the island in mid-August, and on Tablas near Badajos in the latter part of August. The Parson material is housed in the Muséum d'Histoire naturelle de Genève (Baud, 1976), with a few specimens at the AMNH and USNM.

In 1954 T. P. Oane and J. Ramos visited Sibuyan, Tablas, and Romblon islands during the month of May. They made an extensive collection of birds. On Tablas, they spent two weeks at the north end of the island between Mahabangbaybay and Carmen, and in the low hills toward Tambac, which at that time had a mixture of primary and secondary lowland forest (J. Ramos, pers. comm.). On Sibuyan they collected in the low hill country west of Cadjiocan and east of the base of Mt. Guitinguitin, which in 1954 was still forested. These collections were made with the use of firearms, air rifles, and local trapping techniques, and are mostly housed in the PNM.

In August and September 1971 a team of researchers from the PNM composed of P. Gonzales, R. Magana, and R. Sison traveled to Sibuyan and worked in a variety of localities on the north side of the island, including the lower slopes of Mt. Guitinguitin and lowland areas. Specimen tags from this trip bear the designation "GOMASI," an acronym formed from the first two letters of the participants' names (PNM). Also in 1971, between mid-August and early September, J. Ramos and T. Oane collected specimens in the Jao-asan area (DMNH). In the DMNH, there is a collection made in October 1971 from the Silum area, which was presumably made by Ramos and Oane.

Between mid-February and early April of the following year the GOMASI group returned to Romblon Province (DMNH, PNM). Their first stop was Tablas, between 12 and 19 February, where they worked near Badajos, slightly south along the coast (all secondary forest), north to Mahabangbaybay and Cawayan, and inland to Mt. Navitas; the latter locality at that time consisted of a small patch of primary forest. On Sibuyan they visited a number of localities on the north side between 20 February and 28 March, including Ambulong, Casing, Gaong, Katigaan, Jao-asan, and Tampayan. In 1972, Gaong, at the headwaters of the Pawala River, was still mostly virgin forest, and this habitat was more or less continuous down the river to Katigaan. Tampayan had been totally cleared for rice paddies and coconut groves, the area immediately around Casing was secondary forest, and the hills just above had relatively intact forest. At that time, the primary lowland forest on the northwestern slopes began just across from Jao-asan, on the opposite bank of the Dulangan River, and at approximately 60 m above sea level. Logging operations had already begun in areas near Jao-asan. Between 30 March and 5 April the GOMASI group visited Romblon and worked in the hills just east of Romblon town, the local watershed, which at that time had regenerating secondary forest. They also visited the Bagacay area, just west of Romblon town. They employed local trappers, firearms, air rifles, and mist nets to gather bird specimens. These collections are held by the DMNH and PNM.

In March 1972 J. T. Marshall of the U.S. Fish and Wildlife Service, USNM, visited Sibuyan for studies on nocturnal birds (Marshall, 1978). He collected a few bird specimens in the vicinity of Magdiwang that are housed in the AMNH.

Between 8 and 18 May 1972, A. Alcala, L. Alcala, P. Alviola III, J. Chua, R. B. Gonzales, A. Kintao, C. Kiskis, and C. Lumhud from Silliman University, Dumaguete City, visited Sibuyan and collected birds in the San Fernando Municipality,

specifically near Taclobo and Binaya-an. All of the areas they visited consisted of secondary forest or other disturbed habitats (C. Lumhud, pers. comm.). On the same trip, members of this group visited Tablas, between 21 May and 3 June 1972, and obtained bird specimens near Dubduban, Badajos. At the time of their visit to Dubduban the area had already been cut, and thick secondary forest had regenerated (L. Alcala, pers. comm.). On both Sibuyan and Tablas, the Silliman University group used mist nets, firearms, and air rifles to obtain specimens (A. Alcala & L. Alcala, pers. comm.).

In June 1973 a collection of birds was made on the slopes of Mt. Guitinguitin, above España, up to about 400 m. These specimens were sent to the DMNH by A. M. Nieto. In 1978 J. Ramos returned to the Jao-asan area, and all of the forest on the south side of the Dulangan River that he had visited in 1972 was logged over.

In April and May 1970, a research group from Silliman University studied the birds and mammals occurring on five small islands between the northwestern corner of Panay and the southern end of Tablas (Alcala & Alviola, 1970). Mist nets and firearms were employed in this study. The amount of original forest left on these five islands in 1970 varied from none to 20% (summarized in Table 1 of Alcala & Alviola, 1970). The material they collected, combined with the earlier records of McGregor (1905b, 1906a), is important for understanding possible dispersal routes of birds found on the larger surrounding islands (Panay and Mindoro) to the islands of Romblon Province. The 1970 and 1972 collections are housed in SUMNH.

A small collection of birds was made by Roland Müller and Uwe Goepel on Sibuyan between 21 July and 1 August 1986. They worked the area around Tampayan and along the Pawala River near Katigaan. Their bird collection is housed in NMBE.

Account of the 1989 and 1992 Expeditions

On 26 April 1989, D. Balete, S. M. Goodman, L. R. Heaney, N. R. Ingle, and A. Manamtam landed on Sibuyan. From 26 April to their departure on 1 May, Balete, Ingle, and Manamtam explored lowland areas on the north side of the island between Tampayan and the base of Mt. Guitinguitin, and together with Heaney they mist-netted bats and birds near Tampayan (Fig. 4). During this period, Goodman and a local guide conducted a reconnaissance of the north side of Mt. Guitinguitin and established a route for an elevational transect up the mountain. Goodman, with three local men, began work at two sites: camp 1 at 325 m was occupied between 2 and 11 May and camp 2 at 725 m between 20 and 27 May. These two elevations were the focal points of an elevational transect of Mt. Guitinguitin. The area worked above and below each camp was approximately ± 50 m. Plans to continue up the mountain to a third camp at 1325 m had to be abandoned because of a typhoon that hit the island. Between 28 May and 2 June Goodman worked out of the village of Agdamagan, located at the base of Mt. Guitinguitin, approximately 30 m above sea level, and at the edge of the forest up to 200 m (Fig. 4). During the 1989 field season Goodman's efforts were divided between the study of birds and mammals.

On 13 February 1992, S. M. Goodman, T. P. Gnoske, and D. E. Willard arrived on Sibuyan to complete the survey of Mt. Guitinguitin. The first three camps (two of which were occupied in 1989) were along the trail leading from Agdamagan to Mayo's Peak (Fig. 4). Elevational transect points along this trail included camp 1 at 325 m, occupied between 14 and 25 February; camp 2 at 725 m, occupied between 25 February and 3 March; and camp 3 at 1325 m, occupied between 3 March and 10 March. From the 1325-m zone we also worked the summit area of Mt. Guitinguitin (1550 m). N. R. Ingle joined the group on 2 March. From 11 to 20 March the team worked an area of lowland forest near the Lambingan Falls. This forest is continuous with that along Mayo's Peak Trail. These four camps were the focal points of the 1992 elevational transect, and the area intensively studied above and below each camp was ± 75 m. The final four days, 21 to 24 March, were spent at Tampayan. During the 1992 field season Goodman and Ingle focused on small mammals and bats, while Willard and Gnoske concentrated on birds.

On both of these trips, FMNH zoologists, in collaboration with Filipino colleagues, attempted to assess changes in the avifauna from earlier expeditions when Sibuyan was more completely forested. Air rifles, mist nets, and local hunters were employed to make the bird collections, while additional information was gathered through observation. Specimens collected on these two trips are

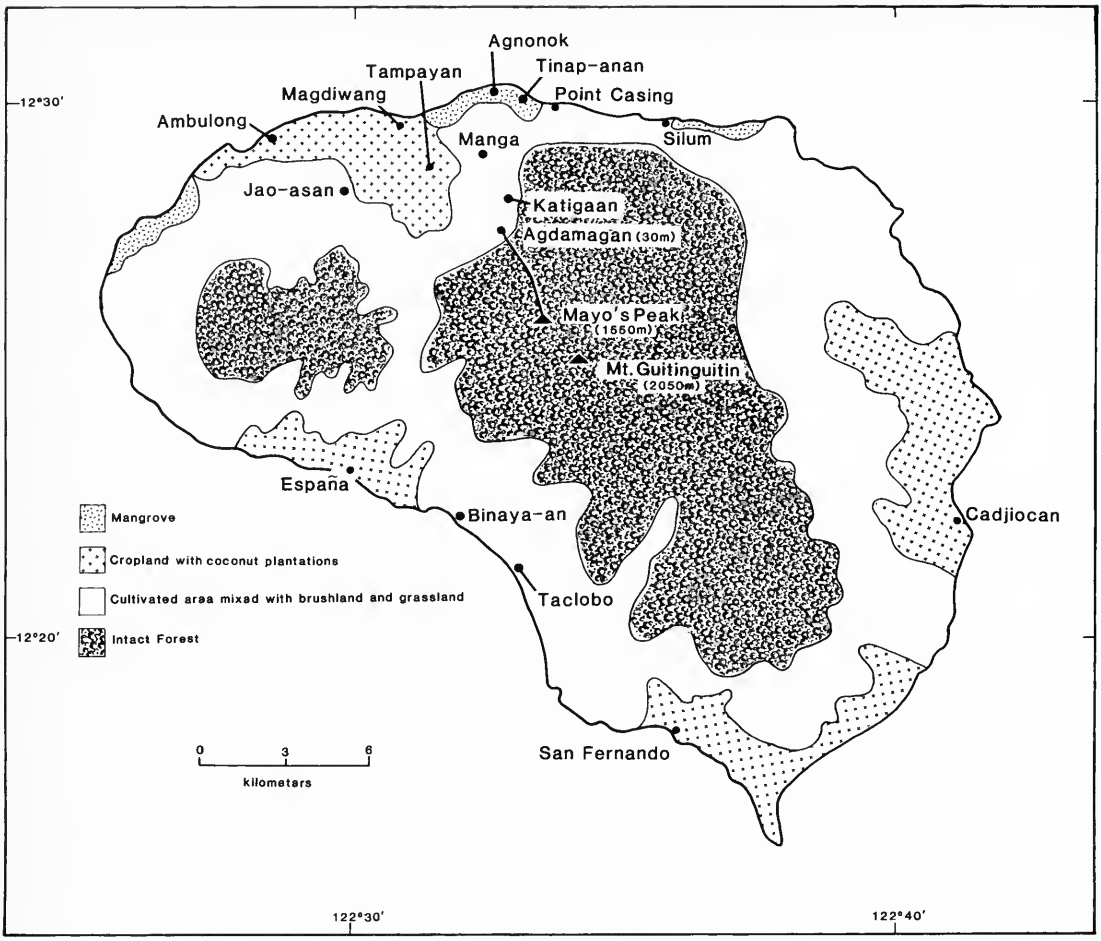

FIG. 4. Vegetational cover and locality map of Sibuyan Island. The trail from Agdamagan to Mayo's Peak is shown. The remaining lowland portion of the Kuyasian Forest is near Silum. Vegetational cover adapted from P.C.G.S. map 2518, Romblon, 1:250,000, which was based on SPOT satellite images made in 1987 by the Swedish Space Corporation and ground-truthed in 1992.

currently housed in the FMNH, and a portion will be returned to the PNM.

Vegetational and Ecological Zones

Mangroves (at Sea Level)

On the north side of the island there were extensive mangroves near Ipil, Ambulong, Agnonok, Tinap-anan, and Casing (Fig. 5). In general, these areas were not disturbed by humans except for occasional use of mangrove trees as firewood and exploitation of tidal sea animals for food. An exception was near Danao, between Silum and Cadjiocan, where an extensive area of mangrove had been diked, cut down, and converted to a fish farm.

Agricultural Lands (Sea Level to 100 m)

The vast majority of the original lowland forest on the north side of the island has been cleared and largely replaced with agricultural lands (Fig. 6). In some cases these areas have been abandoned and some forest regeneration has commenced. All of the human habitations on the north side of the island are below 80 m.

Coconut groves were abundant, mostly confined to the sandy soils along the coastal belt, generally

FIG. 5. Coastal mangroves on the north side of Sibuyan Island near Casing. (Photograph taken by S. M. Goodman.)

within 1 km of the seashore, although some plantations were found on higher ground. In recent years numerous coconut groves have been cut down, the lumber sold, and the area replanted with fruit trees, principally mango. Near Goangan, one of our collecting sites, there was a mango orchard of over 500 trees. Rice paddies were relatively common in low-lying, fertile, interior areas, generally near river or stream systems. Within the Magdiwang Municipality, an area of about 11,200 hectares in the portion of the island that we principally worked, there were 380 hectares of rice fields, almost 4,000 hectares of coconut groves, and 191 hectares of banana plantations (Anonymous, 1989).

Grassland areas (*Imperata*) covered much of the deforested areas not under agricultural production. These areas were used to graze cattle and were regularly burned to stimulate growth of new grass. In some places, such as near Agdamagan, grassy fields have partially regenerated and were mixed with secondary forest. Such habitat was regularly burned to thwart secondary forest regeneration.

Lowland Forest
(From Near Sea Level to Approximately 650 m)

Although the majority of lowland forest below 200 m has been totally cleared, there remained a flank of forest running from the northern lower slopes of Mt. Guitinguitin north toward the sea, ending near the coastal area between Point Casing and Silum (Fig. 4). This forest, known locally as the Kuyasian Forest, was continuous with the forest along Mayo's Peak Trail. The section of the Kuyasian Forest in which we worked is near the Lambingan Falls, approximately 15 m above sea level and about 0.75 km from the sea edge. Originally this forest was composed principally of dipterocarp trees. Now, the area between the waterfalls and the coast is highly degraded and mostly open with patches of secondary forest (Fig. 7). Above the falls the amount of disturbance was distinctly less. Here, at approximately 30 m above sea level, the average range of the canopy height was 20 to 25 m, and the diameter at breast height (DBH) of the canopy trees was on average 36.7

FIG. 6. Coastal plain converted to agricultural fields, predominantly rice paddy, near Tampayan (30 m). Note how the mountain chain rises precipitously out of the lowlands. (Photograph taken by S. M. Goodman.)

cm (N = 10, range 23.2–58.3 cm). The understory of the forest was composed principally of small herbaceous plants and some ferns. Pandans and epiphytes were rare. Ground palms and tree ferns were not noted. No *Ficus* was found in this immediate area, although below in the secondary forest several different species were in fruit. Many of the remaining large trees had buttressed bases. There were numerous rocky outcrops in the forest, generally along stream beds and tributaries that seasonally funnel water from the surrounding hills. The soil was essentially devoid of humus. Noticeable human modifications of this forest included extensive harvesting of rattan (*Calamus*), cut tree stumps (both old and recent), and a system of trails for rattan and lumber extraction. The average slope of the hills just above the Lambingan Falls was 30 to 40°, with extremes above the river bed of up to 70°.

There was continuous, relatively undisturbed forest between the Kuyasian Forest and our 325-m camp along Mayo's Peak Trail. At 340 m, just above our camp, the average canopy height was 10 to 30 m, with occasional trees reaching up to 40 m. The DBH of remaining canopy trees averaged 72.6 cm (N = 10, range 44–105 cm). Some of the larger trees had been selectively removed from this area, although a number of giants remained. Sections of the forest that had been partially cleared were regenerating. The understory was composed of small saplings (up to 40–60 mm in circumference), some ferns, and herbaceous vegetation. Just below the camp, at about 300 m, there were several dense patches of pandans, which were otherwise irregularly scattered in the lowland forest. Arborescent palms were moderately common. *Ficus* spp. were present (including strangler figs), several of which were in fruit in early May 1989. In the latter portion of February 1992 few forest fruits were noted. Epiphytes were uncommon; we estimated that only 10% of the large forest trees had any epiphytic growth. Vines, including rattan and a climbing bamboo, were relatively common at this elevation, particularly off the main trail in the forest. There were few rocky outcrops at this elevation, and the soil essentially lacked humus. Noticeable local human disturbances included the harvest of rattan and selective logging of hardwoods.

In a few areas the larger rivers still retained a

FIG. 7. A view of the Kuyasian Forest, just above the Lambingan Falls, at about 60 m above sea level. Note the broken canopy and degraded nature of this partially logged lowland forest. (Photograph taken by N. Ingle.)

narrow band of some native large trees and thick vegetation along their banks. This vegetation formed a distinct dispersal corridor for birds inhabiting heavily modified areas, and a few forest-dwelling species (tolerant of some disturbance) were found in this habitat. A good example of such "gallery forest" was along the banks of the Pawala River from its headwaters near Gaong, past Goangan and Tampayan, to near Magdiwang where it meets the Pato-o River.

Montane Forest
(From Approximately 650 m to 1150 m)

On the northern slopes of Mt. Guitinguitin, along the trail leading to Mayo's Peak, the transition from lowland to montane forest was gradual. Above 600 m there was little sign of logging, and at about 650 m there was a distinct drop in tree stature. At 725 m, the average canopy height was 15 m (range 10–20 m). The average DBH of canopy trees was 33.2 cm (N = 10; range, 20.7–43.0 cm). The understory of this zone consisted of ferns, occasional clumps of *Lycopodium*, small tree saplings, and some herbaceous plants. Pandans were distinctly more common than in the lower forest, and two growth forms were noted: a ground-creeping type and a climbing type (which often covered the trunks of larger trees). Arborescent palms, some reaching 4 to 8 m, and tree ferns (*Cyathea*) were present, scattered throughout the forest. *Ficus* was not noted in this zone. A few oak trees (family Fagaceae) occurred intermittently, and after the 1989 typhoon, unripe acorns were noted on the ground. Epiphyte loads on the larger trees were moderate to heavy and included ferns, a variety of monocots, and bryophytes. We estimated that 35 to 60% of the larger trees had epiphytes on the trunk or on large branches. A small species of pitcher plant (*Nepenthes*) and a gymnosperm tree (*Podocarpus*) were first noted between 600 and 650 m. Lianas were relatively common near the 725 m camp and included rattan, climbing bamboo, and other types of unidentified vines. Some of the steeper slopes around 725 m were exposed rock faces, essentially devoid of vegetation. In relatively level areas of the forest humus depth varied from 5 to 20 mm. Local human disturbance was confined to rattan exploitation.

Mossy Forest
(From Approximately 1350 m to the Summit of Mayo's Peak at 1550 m)

On the northern slopes of Mt. Guitinguitin the transition to mossy forest habitat was abrupt. From about 1150 to 1350 m Mayo's Peak Trail skirted narrow and exposed ridges. In this zone the vegetation was dominated by thick climbing bamboo and to a lesser extent low-stature montane forest (Fig. 8). At 1350 m the trail passed along a broader and less precipitous ridge, the bamboo abruptly dropped out, and the vegetational characteristics changed to mossy forest. At this ecotone there was a reduction in tree size and stature. The canopy height was between 8 and 10 m, with occasional 15-m *Podocarpus* trees, with the DBH of the canopy trees averaging 16.7 cm (N = 10; range, 10.5–28.7 cm). The understory was principally composed of a creeping *Pandanus,* small ground palms, ferns, various types of bryophytes, small scrubby trees, and the occasional tree fern. The epiphyte loads on the larger standing vegetation were heavy. All of the trees had moss, ferns, orchids, or other

FIG. 8. View of mossy forest along Mayo's Peak Trail, just above the 1325-m camp. This zone was characterized by low-stature forest trees with heavy epiphytic loads and a thick climbing bamboo. (Photograph taken by D. E. Willard.)

types of epiphytes, covering in most cases 80% of the surface area of larger trees. A large pitcher plant, *Nepenthes merrilli,* growing as a vine was relatively common. No *Ficus* was noted in this zone. Trees lacked buttressed bases, although some had support stilts. Rocky outcrops were common, particularly along the edges of gorges and in low-lying areas that acted as water channels. The ground in this zone was noticeably moister than at lower elevations and was often covered with earthworm castings. The only human-induced modification was the local exploitation of rattan.

At approximately 1415 m, along the trail going up to Mayo's Peak, the mossy forest ended abruptly and a broad expanse of "heathland" started (Fig. 9). This zone was composed of low thick vegetation, approximately 1 m tall and with occasional 2- to 3-m woody shrubs and small trees (Fig. 10). After about 200 m of ground distance and a 30-m rise in elevation the trail reentered a small patch of mossy forest, perhaps with slightly heavier epiphyte and moss loads than the forest immediately below. This patch of forest was not extensive, and after about 150 m ground distance the trail came out into another expanse of heathland at the base of a steep ridge. At the top of this ridge and just below Mayo's Peak (1550 m) there was a third patch of mossy forest. Thus, the mossy forest zone was not continuous but broken into small patches separated by heathland.

Mayo's Peak itself is an exposed rocky summit with little vegetation. The area from Mayo's Peak to the summit of Mt. Guitinguitin (2040 m) is mostly exposed rock with occasional patches of grass and a few scattered gymnosperm trees. As far as we could discern, the last patch of mossy forest on the northern approach to Mt. Guitinguitin was just below Mayo's Peak.

Other Ecotypes on the Island

While the principal focus of our work was on the northern side of Sibuyan, we visited other areas. Lowland habitats and soil types around the island were not identical. A distinct difference was noted between the density and type of lowland vegetation along the north side of the island and that of the southwest between España and Taclobo. In the north there was a relatively narrow coastal plain, particularly in the area between Point Casing and Silum, where a flank of Mt. Guitinguitin ends almost at sea level. Further, the vegetation in this area, even in degraded areas, was relatively lush. Between España and Taclobo there was a relatively broad coastal plain bisected by numerous seasonally dry river systems filled with rounded rocks and pebbles. In this region there were sandy areas along the seacoast where *Casuarina* trees were common and the vegetation was distinctly more xerophytic than in the north. The secondary forest tended to be open with little ground cover. Near Taclobo, agricultural plants included tobacco and mung beans, crops requiring dry conditions that were not found on the north side of the island.

Species Accounts

Netting

During the 1989 and 1992 trips mist nets were operated at each transect site to help locate elusive species and to attempt to quantify densities. The

FIG. 9. *Podocarpus* tree growing at the edge of an exposed ridge at 1450 m. This is the ecotone between the lower-lying mossy forest and heathland leading up to Mayo's Peak (1550 m). Note steep slopes, approximately 600 m below, covered with undisturbed montane forest. (Photograph taken by T. P. Gnoske.)

majority of mist nets used were 2.6 m high, 12 m long, and had a 36-mm mesh size. Nets were regularly checked during daylight hours, before dawn, and after dusk. Nets were left up throughout the night to capture bats and nocturnal birds. The bottom panel of each net was generally within 10 cm of or touching the ground. When possible the nets were placed in a variety of habitats in each transect zone.

Observations

In addition to collecting and mist-netting birds in the field and studying specimens taken by earlier ornithologists who visited the island, members of the 1989 and 1992 expeditions gathered observational information on birds. Field notes were kept on the species observed or heard in each transect zone, the range of elevation, and surrounding habitat(s). Altimeters and known positions on maps were used to calculate elevation. General sight observations were also made near Agdamagan, Agnonok, Casing, Magdiwang, and Tampayan. On 23 March 1992 we circumnavigated the island using the coastal road.

Weights

Because few data are available on the weights of Philippine birds, we have included summary statistics for specimens collected in 1989 and 1992. Unless otherwise stated these weights are of non-juveniles and the use of the term "combined" includes a mixture of both sexes. For sample sizes less than four the weight of each individual is presented. For larger sample sizes information is presented in order: sample size (in parentheses), the mean $\pm$ 1 standard deviation, and the range.

Systematic Order, Nomenclature, and Common Names

We have generally followed the systematic order and the scientific and English common names of Dickinson et al. (1991). Species previously unrecorded in the literature on Sibuyan are marked by an asterisk (*). For species observed on the island and not collected, the presumed subspecies has been inferred from known patterns of geographic variation; this is denoted by the use of brackets ([ ]) surrounding the subspecific name. The few

reported species for which documentation remains inadequate are also bracketed.

We have presented the local names, when known, of birds on Sibuyan in the Ilonggo. These names were obtained from hunters or people working in the forest (e.g., rattan gatherers) and are based on birds in the hand. Care was taken to corroborate names independently with various people.

Localities

The most frequently cited localities mentioned in the text are presented in Figure 4. Coordinates of additional localities in Romblon Province and in other islands near Sibuyan are presented in the appendix.

FIG. 10. Heathland at about 1500 m above sea level, just below Mayo's Peak (1550 m). The vegetation was relatively dense woody shrubs and ferns, about 1 m tall. (Photograph taken by S. M. Goodman.)

Systematic List

Family Ardeidae

Ardea purpurea manilensis
Purple Heron

The Purple Heron was recorded on Sibuyan by McGregor (1905a). We are unaware of any other record.

Butorides striatus carcinophilus
Striated Heron

LOCAL NAME—*Tindaw.*

The Striated Heron was recorded on Sibuyan by early naturalists visiting the area (Bourns & Worcester, 1894; McGregor, 1905a; Baud, 1976). Specimens of this species collected in mid-May 1954 (PNM), late February 1972 (PNM), and in March 1992 (FMNH) are referable to *carcinophilus,* which is the form presumably breeding on the island. An individual taken in mid-May 1954 (PNM) is referable to *B. s. amurensis,* a migrant to the Philippines.

In 1989 this species was found to be relatively common along slow-moving streams and in coastal mangroves. During the 1992 survey five specimens were collected. Most were snared in rice fields or in mangroves. Single female specimens taken at Tampayan on 10 March and at Tinapanan on 13 March had enlarged ovaries, including yolking eggs. A male collected on 18 March at Agnonok had testes measuring 12 × 6 mm, while another adult male taken the same day at Goangan had small testes. All five specimens had fish remains in the gizzard.

WEIGHT—Female (3) 145, 173, 189; male (2) 143, 207 g.

**Bubulcus ibis coromandus*
Cattle Egret

LOCAL NAME—*Tuyabong.*

The first records of the Cattle Egret on Sibuyan are specimens collected near Tampayan on 2 February 1972 (PNM) and at Casing on 8 March 1972 (DMNH). This species was noted on a few occasions in 1989 and 1992 in lowland areas, generally associated with grazing domestic cattle.

Egretta sacra sacra
Eastern Reef-Egret

Worcester and Bourns (1898) recorded the Eastern Reef-Egret on Sibuyan, and McGregor (1905a) noted that it was observed on Sibuyan along the beach. We are unaware of any subsequent records.

Nycticorax caledonicus manillensis
Rufous Night-Heron

Bourns and Worcester (1894) found the Rufous Night-Heron on Sibuyan. An immature bird was collected at an unspecified locality in mid-May 1954 (PNM). This species was observed along rivers during the 1971 and 1992 expeditions to the island.

**Ixobrychus sinensis*
Yellow Bittern

Until the 1992 expedition the Yellow Bittern was unknown from Sibuyan. Records include two individuals taken in rice fields near Tampayan: an adult male collected on 21 March with testes measuring 3 × 2 mm and a female taken on 23 March with a small granular ovary (FMNH). Both of these individuals had fish remains in their stomachs.

WEIGHT—Female (1) 84.8; male (1) 101.5 g.

**Ixobrychus eurhythmus*
Schrenck's Bittern

On 18 March 1992 an adult female Schrenck's Bittern was snared in mangroves near Casing (FMNH). The bird had a granular ovary measuring 12 × 8 mm. This is the only record we are aware of for Sibuyan of this migrant from mainland Asia.

WEIGHT—Female (1) 102 g.

Ixobrychus cinnamomeus
Cinnamon Bittern

LOCAL NAME—*Lapay* (used for all small bitterns).

McGregor (1905a) reported that a Cinnamon Bittern was collected on Sibuyan. More recent records include single birds obtained at an unspecified locality in mid-May 1954 (PNM), near Ambulong on 27 March 1972 (PNM), and on the lower western slope of Mt. Guitinguitin on 28 August 1971 (PNM). During the 1992 expedition we found this species in rice fields and along the seacoast. A female collected on 17 March 1992 in mangroves near Lambingan Falls had crustacean remains in its stomach.

WEIGHT—Female (1) 125; male (1) 127 g.

Family Anatidae

Dendrocygna arcuata arcuata
Wandering Whistling-Duck

LOCAL NAME—*Dakit* (used for all wild ducks).

McGregor (1905a) reported that three individuals of this species were shot on Sibuyan along a river. The specimens cannot be traced.

**Anas luzonica*
Philippine Duck

On 19 March 1972, two Philippine Ducks (PNM) were collected near Silum out of a flock of at least 200 individuals. The only other records are birds collected at Taclobo on 16 May 1972 (SUMNH) and three specimens from Casing in mid-March 1972 (DMNH).

Family Accipitridae

[*Pernis ptilorhyncus*
Oriental Honey-buzzard]

McGregor (1905a) reported that a specimen collected on Sibuyan was referable to this species. The specimen cannot be traced, and it may well be the Bourns and Worcester record of *P. celebensis* mentioned below.

Pernis celebensis steerei
Barred Honey-buzzard

A specimen collected on Sibuyan and reported by Bourns and Worcester (1894) as *P. ptilorhyncus* has been reexamined (MMNH), and it is referable to *P. celebensis steerei* (Dickinson et al., 1991). The only other confirmed record of this species is a male collected on the northeastern slopes of Mt. Guitinguitin in October 1971 (DMNH).

Elanus caeruleus hypoleucus
Black-shouldered Kite

McGregor (1905a) noted that a Black-shouldered Kite was collected on Sibuyan (specimen now at FMNH). On 12 May 1989 one individual was observed along the Pawala River, near Tampayan.

Haliastur indus intermedius
Brahminy Kite

LOCAL NAME—*Banog.*

In both 1989 and 1992 we observed Brahminy Kites in disturbed lowland areas and along the seacoast. The species had been recorded previously on the island (Bourns & Worcester, 1894; McGregor, 1905a; Baud, 1976).

Haliaeetus leucogaster
White-bellied Sea-Eagle

Both Bourns and Worcester (1894) and McGregor (1905a) reported this species on Sibuyan. On 13 March 1992 two adult White-bellied Sea-Eagles were observed flying along the seacoast near Silum.

Spilornis cheela holospilus
Crested Serpent-Eagle

Both Bourns and Worcester (1894) and McGregor (1905a) reported this species on Sibuyan. Specimens of the Crested Serpent-Eagle were collected on 15 February 1972 near Tampayan (PNM) and 27 February 1972 near Katigaan (DMNH). In late April and May 1989 this species was observed in relatively intact or undisturbed forest from the edge of the lowest-lying forest on the northern side of Mt. Guitinguitin at 250 to 850 m. During the 1992 expedition this species was noted at all four of the transect points between 30 and 1350 m.

**Accipiter soloensis*
Chinese Goshawk

On 17 March 1992 a Chinese Goshawk was netted over a stream in relatively intact lowland forest near the Lambingan Falls (FMNH). The individual was a female, molting into adult plumage, with a granular ovary (8 × 4 mm). This is the only known record on Sibuyan of this migrant from mainland Asia.

WEIGHT—Female (1) 157.5 g.

Butastur indicus
Grey-faced Buzzard

McClure (1974) reported that a Grey-faced Buzzard banded in the Ryukyu Islands, Japan, on 17 October 1966 was recovered at Cadjiocan on 14 February 1969. The only other known record on Sibuyan of this migratory species is one at Tampayan on 5 March 1972 (DMNH).

Hieraaetus kienerii formosus
Rufous-bellied Eagle

McGregor (1906b) reported that an adult male Rufous-bellied Eagle was taken on Sibuyan on 13 June 1904. On 14 February 1992 an adult was observed soaring over grassland and agricultural areas near the forest edge at Agdamagan. This species was also observed on 24 March 1992 in the Gaong Valley at about 300 to 450 m (Timmins, 1993).

[*Spizaetus philippensis*
Philippine Hawk-Eagle]

Timmins (1993, p. 90) reported this species from the Gaong Valley but provided no details.

Family Falconidae

Falco severus severus
Oriental Hobby

Bourns and Worcester (1894) reported an Oriental Hobby on Sibuyan. On 6 March 1992 an individual was observed near Mayo's Peak harassing flocks of *Collocalia* swifts.

Falco peregrinus [*ernesti*]
Peregrine Falcon

McGregor (1905a) reported that a Peregrine Falcon was taken on Sibuyan, and in a later paper

(1909) he identified the subspecies of the individual as *ernesti*. The specimen cannot be traced, and we are unaware of any subsequent records of this species on the island.

Family Megapodiidae

Megapodius cumingii pusillus
Tabon Scrubfowl

LOCAL NAME—*Tabon.*

The Tabon Scrubfowl was found on Sibuyan by Bourns and Worcester (1894) and McGregor (1905a) but not by subsequent naturalists visiting the island. In the 1950s the eggs of this species were seasonally available in the Magdiwang market (J. L. Tansiongco, pers. comm). In mid-March 1992 a bird hunter from Tampayan mentioned that about five months earlier he had shot at least two scrubfowl in the mangroves at Agnonok. He also noted that the best place to find this species was in mangroves at low tide. This is the only recent information we have about this species on Sibuyan. Presumably the combination of habitat degradation and human persecution has led to its decline.

Family Phasianidae

Coturnix chinensis lineata
Blue-breasted Quail

In early June 1904 McGregor (1905a) found adult and "very small young" Blue-breasted Quail on Sibuyan. In late April and May 1989 this species was noted in low-lying grasslands and abandoned agricultural fields near Agdamagan and Tampayan. In late March 1992 a female with a yolked egg in her oviduct and a male with slightly enlarged gonads were collected in a rice field near Tampayan (FMNH).

WEIGHT—Female (1) 45.2; male (1) 38.2 g.

Gallus gallus philippensis
Red Junglefowl

LOCAL NAME—*Elahas.*

There are several early reports of Red Junglefowl on Sibuyan (Bourns & Worcester, 1894; McGregor, 1905a). Parsons also collected a female in 1928 (Baud, 1976). A male taken in June 1973 above España at about 400 m had testes measuring 5 × 5 mm and 4 × 4 mm (DMNH). During the 1989 and 1992 visits to the island this species was heard calling in the early morning and at dusk near the 325- and 725-m camps.

Family Turnicidae

Turnix suscitator fasciata
Barred Buttonquail

LOCAL NAME—*Pogo.*

Bourns and Worcester (1894) recorded Barred Buttonquail on Sibuyan. In 1989 it was noted several times in disturbed grassland areas near Agdamagan and Tampayan, all below 100 m. Dickinson et al. (1991) noted that the subspecies occurring on Sibuyan needs to be investigated and the local form could be *nigrescens.*

Family Rallidae

Gallirallus striatus striatus
Slaty-breasted Rail

LOCAL NAME—*Tikling* (used for all rails).

A specimen (USNM) of the Slaty-breasted Rail was collected on Sibuyan in October 1892 by members of the Menage Expedition (Worcester & Bourns, 1898). Another individual was taken in May 1954 at an unspecified locality (PNM). At Agnonok, an adult female with a slightly enlarged and granular ovary was collected on 4 March 1992, and an adult male with testes measuring 6 × 3 mm was obtained on 20 March 1992 (FMNH).

WEIGHT—Female (1) 109; male (2) 107.9, 131; unsexed (1) 85.9 g.

Gallirallus torquatus torquatus
Barred Rail

McGregor (1905a) recorded the Barred Rail on Sibuyan. In 1954 nine specimens were collected (PNM; several have been transferred to other museums). Five specimens (DMNH) were taken between mid-August and early September at Jaoasan. Two were taken near the Goangan mango

plantation on 18 February 1992, including a male with testes measuring 8 × 5 mm and a female with an ovary measuring 15 × 8 mm and a 3-mm egg follicle (FMNH). This species was also found in mangroves near Tampayan.

WEIGHT—Female (1) 217; male (1) 197; unsexed (1) 246 g.

**Porzana fusca fusca*
Ruddy-breasted Crake

In late May 1989 an adult Ruddy-breasted Crake was netted at the edge of a flooded agricultural field near Tampayan (FMNH). This specimen represents the only known report of this species on Sibuyan.

WEIGHT—Unsexed (1) 57 g.

Porzana cinerea ocularis
White-browed Crake

McGregor (1905a) collected a White-browed Crake on Sibuyan. An additional four individuals were taken by Oane and Ramos in 1954 (AMNH, PNM). Single specimens were obtained near Taclobo on 13 and 18 May 1972 (SUMNH) and along the Sinobaan River on 29 February 1992 (FMNH). The latter specimen was a female with a slightly enlarged ovary with the largest ovarian follicle measuring 3 mm.

**Amaurornis olivaceus olivaceus*
Plain Bush-hen

An adult male (nonbreeding) Plain Bush-hen (PNM) was taken on 21 August 1971 near Jao-asan. This is the only known record of this species on Sibuyan.

**Amaurornis phoenicurus javanica*
White-breasted Waterhen

On 13 March 1992 a White-breasted Waterhen was collected at Agnonok (FMNH). The bird was a female with an egg follicle measuring 4 mm and a slightly thickened oviduct. This is the only record we are aware of for this species on Sibuyan.

WEIGHT—Female (1) 178 g.

Gallicrex cinerea
Watercock

McGregor (1905a, p. 10) found the Watercock to be "not uncommon" on Sibuyan and collected one individual. More recent records include three males taken between 15 August and 2 September 1971 near Jao-asan (DMNH, PNM) and one on 6 April 1972 near Magdiwang (PNM). In late March 1992 this species was commonly heard calling before dawn from rice fields near Tampayan and along the edge of the Pawala River.

Family Rostratulidae

Rostratula benghalensis benghalensis
Painted Snipe

In July 1904 McGregor (1905a) found the Painted Snipe on Sibuyan (FMNH). More recent records include males collected in May 1954 at an unspecified locality (PNM), two immature males on 13 May 1972 at Taclobo (SUMNH), an immature bird on 2 March 1992 near Tampayan (FMNH), and adults on 30 April 1989 and 2 March 1992 in rice fields near Tampayan (FMNH).

WEIGHT—Male (1) 140; unsexed (1) 190; immature (1) 83.5 g.

Family Charadriidae

**Pluvialis squatarola*
Grey Plover

There are three records of the Grey Plover, a Eurasian migrant, on Sibuyan: two females were taken on 19 March 1972 near Silum (DMNH, PNM) and one individual was observed on 13 March 1992, 1 km west of Silum.

Pluvialis dominca fulva
Lesser Golden Plover

Bourns and Worcester (1894) reported the Lesser Golder Plover from Sibuyan. More recently two males were obtained in late February 1972 near

Magdiwang (PNM). This species is a migrant and boreal winter visitor to the Philippines.

Charadrius dubius dubius
Little Ringed-Plover

McGregor (1905a) collected one Little Ringed-Plover, a boreal winter visitor to the Philippines, on Sibuyan on 10 June 1904 (FMNH), and another was taken by Parsons (Baud, 1976) near San Fernando on 4 August 1928. We are unaware of a more recent record.

Charadrius peronii
Malaysian Plover

McGregor (1905a) found the Malaysian Plover to be scarce on Sibuyan and collected one individual (specimen not traced). On 2 June 1989 this species was observed along the seacoast at low tide near Agnonok.

**Charadrius leschenaultii*
Greater Sand-Plover

On 12 May 1954 a male Greater Sand-Plover was taken on Sibuyan (PNM). This is the only known record on the island of this boreal winter visitor to the Philippines.

Family Scolopacidae

**Numenius phaeopus variegatus*
Whimbrel

Five Whimbrels were collected between 9 and 15 March 1972 near Silum (DMNH, PNM). In the latter half of March 1992 this species, a migrant and boreal winter visitor to the Philippines, was frequently noted along the seacoast between Agnonok and Silum.

Tringa glareola
Wood Sandpiper

The only known report of the Wood Sandpiper on Sibuyan is a female collected by Parsons near San Fernando on 5 August 1928 (Baud, 1976). This species is a migrant and boreal winter visitor to the Philippines.

**Actitis hypoleucos*
Common Sandpiper

The Common Sandpiper, a migrant and boreal winter visitor to the Philippines from Eurasia, was not recorded on Sibuyan by early naturalists. Records include a female taken on 12 May 1954 at an undesignated place (PNM), two females and two males between 13 and 19 August 1971 at Jao-asan (DMNH), and two females in mid-March 1972 near Silum (PNM). An individual was noted on 17 March 1992 near Casing.

**Heteroscelus brevipes*
Grey-tailed Tattler

LOCAL NAME—*Taling-ting.*

A series of Grey-tailed Tattlers was taken on Sibuyan between 23 February and 16 March 1972 (DMNH, PNM). In the latter half of February and in March 1992 this species was relatively common along the seacoast between Agnonok and Silum, and flocks of up to six individuals were frequently noted. Specimens collected included two in coastal mangroves near Tinap-anan on 15 February (FMNH) and one bird along rocky coastline near Casing Point on 15 March (FMNH). This species is a migrant and boreal winter visitor to the Philippines.

WEIGHT—Female (1) 112; male (1) 98.2; unsexed (1) 98.3 g.

Gallinago megala
Swinhoe's Snipe

LOCAL NAME—*Taling-ting.*

Bourns and Worcester (1894) reported the Swinhoe's Snipe, a migrant and boreal winter visitor from mainland Asia, on Sibuyan. An adult female was taken on 19 August 1971 near Jao-asan (PNM). More recently females with slightly enlarged ovaries were collected on 4 March and 22 March 1992 in rice fields near Agnonok and near Tampayan (FMNH). The stomachs of the latter two birds contained fragments of small insects.

WEIGHT—Female (2) 131, 160.5 g.

Family Sternidae

Sterna bergii cristata
Greater Crested-Tern

Bourns and Worcester (1894) recorded the Greater Crested-Tern on Sibuyan. On 2 June 1989 a flock of approximately 20 individuals was observed flying offshore near Magdiwang.

[*Chlidonias hybridus* ssp.
Whiskered Tern]

Bourns and Worcester (1894) list the Whiskered Tern as occurring on Sibuyan. This record was not accepted by either McGregor (1909–1910) or Dickinson et al. (1991).

Family Columbidae

Treron vernans vernans
Pink-necked Green-Pigeon

The Pink-necked Green-Pigeon was not recorded on Sibuyan by either Bourns and Worcester (1894) or McGregor (1905a). Parsons collected two females in July 1928 near San Fernando (Baud, 1976). Several were taken in August 1971 near Jao-asan and in October 1971 on the northeastern slopes of Mt. Guitinguitin at about 300 m (DMNH), and 15 individuals were obtained in late February to early March 1972 near Tampayan (PNM). In 1992 five specimens were taken near Agnonok, along the Sinobaan River, and near Tampayan, all below 30 m. It appears that either this species has colonized the island in the last 80 years or a once sparse local population has greatly expanded.

WEIGHT—Female (2) 127, 129; male (2) 126, 141; unsexed (1) 137 g.

Phapitreron leucotis nigrorum
White-eared Brown-Dove

LOCAL NAME—*Ali-mo-con.*

Bourns and Worcester (1894) recorded the White-eared Brown-Dove on Sibuyan. McGregor (1905a, p. 8) noted that it was "secured in Sibuyan where the species seems to be rare." Subsequent records include two individuals taken near San Fernando in late July and early August 1928 (Baud, 1976); two at an unspecified locality in early May 1954 (PNM); and a long series from the northeastern slope of Mt. Guitinguitin in October 1971 (DMNH), Jao-asan in August 1971 (DMNH, PNM), Tampayan in March 1972 (DMNH), and Taclobo in the first half of May 1972 (SUMNH). A female with a slightly enlarged ovary was collected on 20 August 1971 (PNM). In May and June 1989 this species was common on the northern low-lying slopes of Mt. Guitinguitin and along the trail leading to Mayo's Peak, particularly in secondary forest below 150 m, and it was uncommon in relatively undisturbed forest between 150 and 325 m. The 11 specimens collected during this period were adult, and with the exception of one individual, all were in or approaching breeding condition (FMNH).

In the second half of February and in March 1992 this species was common at 50, 325, and 750 m and distinctly less common at 1350 m. A total of 21 specimens were collected, nearly all of which were in or approaching breeding condition. Birds were found in mango plantations, in slightly to heavily disturbed lowland forest, at the edge of secondary forest, and in open agricultural areas. The stomach contents of specimens included a variety of small seeds. It seems likely that with the clearing of the lowland forest, the local population of this species has grown.

This dove is extensively hunted in lowland areas on the north side of the island. It is easily attracted by hunters imitating its call and is then shot with slings or pellet guns. One bird hunter from Tampayan mentioned that he regularly shot 15 per day and often up to 80 individuals per week. This species is still common in lowland areas, particularly in secondary forest, even in light of the extensive hunting pressure (see p. 42 for further discussion).

WEIGHT—Combined (27) 109.8 ± 8.5, 100–132 g.

Ptilinopus occipitalis occipitalis
Yellow-breasted Fruit-Dove

LOCAL NAME—*Ag-o-mo-um.*

In 1904 McGregor (1905a) collected eight Yellow-breasted Fruit-Doves on Sibuyan (two in FMNH and one in USNM). Subsequent records include a male, August 1928 near San Fernando (Baud, 1976); two males, August 1971 near Jao-asan (DMNH, PNM); three males, late February to mid-

March 1972 near Magdiwang (PNM); three individuals, including an immature bird, first half of May 1972 near Taclobo and Binaya-an (SUMNH); seven adults, June 1973 on the slopes above España at 400 m (DMNH); two adult males, with testes measuring 6 × 4 mm and 7 × 4 mm, respectively, in late July 1986 in the Pawala River Valley (NMBE); an adult male, in breeding condition, 22 May 1989 at 325 m along the trail leading to Mayo's Peak (FMNH).

In 1992 this species was noted at several sites in the lowlands and at the 30-, 325-, and 725-m transect points. Females collected at 325 m along Mayo's Peak Trail on 14 February and at 30 m at Lambingan Falls on 15 March both had enlarged ovaries with 4 × 4-mm yolking ovarian follicles (FMNH). At the latter locality, another female taken on 16 March had a shelled egg in the oviduct, and a male obtained on 14 March had testes measuring 12 × 8 mm (FMNH). All of these individuals were taken in slightly to heavily degraded lowland forest. Stomach contents included a variety of seeds.

WEIGHT—Female (3) 181, 194, 202; male (4) 225, 227, 230, 240 g.

Ptilinopus leclancheri leclancheri
Black-chinned Fruit-Dove

LOCAL NAME—*Porongan* or *Ponay.*

In July 1904 McGregor (1905a) collected the Black-chinned Fruit-Dove on Sibuyan (FMNH), and in August 1928 Parsons obtained three specimens near San Fernando (Baud, 1976). Specimens in the PNM include a male taken on 13 May 1954 at an undesignated locality and two males taken on 13 August 1971 from near Jao-asan. Seven adults were obtained on the northeastern slopes of Mt. Guitinguitin at 300 m in October 1971, none of which was in reproductive condition (DMNH). In the first part of May 1972 five specimens were taken at Taclobo and one at Binaya-an (SUMNH). Three birds, including one juvenile, were taken in late July 1986 in the Pawala River Valley (NMBE). Two individuals collected on 22 May 1989 along the trail leading to Mayo's Peak, at about 325 m, were in or approaching breeding condition (FMNH). Specimens taken in 1992 included a male taken at Agdamagan in disturbed lowland forest on 15 February with testes measuring 10 × 5 mm, and another taken in the Goangan mango plantation on 29 February with testes measuring 7 × 7 mm (FMNH). This species was also recorded at the 30- and 325-m transect points. Virtually all of our records of this species are from slightly to heavily disturbed lowland forest.

WEIGHT—Combined (5) 157.2 ± 4.2, 150–180 g.

Ducula poliocephala
Pink-bellied Imperial-Pigeon

McGregor (1905a) reported that the Pink-bellied Imperial-Pigeon was collected on Sibuyan in both thick forest in the interior and low growth near the sea. One of McGregor's specimens is in the FMNH. The only subsequent records of this species on the island are birds in the DMNH taken in August and October 1971 in lowland areas and on the lower slopes of Mt. Guitinguitin; several of these specimens were in or approaching breeding condition. The fact that this large and conspicuous pigeon was not recorded on the island between 1905 and 1971 or after 1971 is surprising. Our local guides during the 1989 and 1992 field trips were not familiar with this species, suggesting that either the Pink-bellied Imperial-Pigeon is an inter-island migrant that seasonally or irregularly visits Sibuyan or it has been locally extirpated from the island.

Ducula carola
Spotted Imperial-Pigeon

Records of the Spotted Imperial-Pigeon on Sibuyan include individuals collected by McGregor (1905a) at an unspecified locality in 1904 (two specimens in FMNH) and by Parsons near San Fernando in August 1928 (Baud, 1976). There appears to be no more recent information of this species on the island.

Ducula aenea aenea
Green Imperial-Pigeon

Both Bourns and Worcester (1894) and McGregor (1905a) recorded the Green Imperial-Pigeon on Sibuyan. The latter author noted that this "species is uncommon." We are unaware of any subsequent record.

[*Ducula bicolor*
Pied Imperial-Pigeon]

McGregor (1905a) reported that the Pied Imperial-Pigeon was familiar to inhabitants of Si-

buyan. No specimens of it are known from the island, nor has it been observed by any other ornithologist visiting the island.

Columba vitiensis griseogularis
Metallic Pigeon

McGregor (1905a) reported the Metallic Pigeon on Sibuyan. We have examined specimens he collected at unspecified places on 8 June 1904 (USNM) and on 13 July 1904 (FMNH). This species has not subsequently been recorded on the island.

Macropygia phasianella tenuirostris
Brown Cuckoo-Dove

LOCAL NAME—*Corpus.*

McGregor (1905a) collected specimens of the Brown Cuckoo-Dove on Sibuyan, one of which was on 8 June 1904 (FMNH), and Parsons obtained a male near San Fernando on 26 July 1928 (Baud, 1976). Specimens were also collected in August 1971 near Jao-asan and on the western slope of Mt. Guitinguitin (PNM) and on the slopes above España at 400 m (DMNH). More recently adult females with enlarged ovaries were taken near Tampayan on 28 May 1989 and 18 February 1992 (FMNH). In 1992 we found this species to be relatively common in secondary forest and coconut plantations on the north side of the island, particularly near Agdamagan and Tampayan. We did not record it at the 325- or 725-m transect points, but it was relatively common and frequently heard vocalizing in the early morning at 1350 m. On 7 March 1992 a male with enlarged gonads was netted at 1350 m (FMNH). Timmins (1993) found an active nest with one egg of this species in late March 1992 between 300 and 450 m along Mayo's Peak Trail "in a vertical cliff under closed canopy forest."

WEIGHT—Female (2) 165, 170.5; male (1) 161 g.

Streptopelia bitorquata dusumieri
Island Collared-Dove

LOCAL NAME—*Tokmo.*

Both Bourns and Worcester (1894) and McGregor (1905a) reported the Island Collared-Dove on Sibuyan. On 1 September 1971 a female was taken near Jao-asan that had a moderately enlarged ovary (PNM), and in March and April 1972 six specimens, including one retaining immature wing-coverts, were collected near Tampayan (PNM).

In 1992 this species was noted at a variety of lowland localities on the north side of the island, particularly near Agnonok, Magdiwang, and Tampayan. It was often observed in recently harvested rice fields. One specimen was collected in a mango plantation at Goangan on 15 February 1992 (FMNH).

WEIGHT—Unsexed (1) 152 g.

**Streptopelia chinensis tigrina*
Spotted Dove

The Spotted Dove appears to have recently invaded Sibuyan. On 29 April 1989 an adult was collected near Tampayan at the edge of a fallow field (FMNH). This is the first known record of this species on Sibuyan or in the Romblon Province. In 1992 it was noted at a variety of lowland localities on the north side of the island and was particularly common in recently harvested rice fields. An adult female collected near Tampayan on 21 March 1992 had slightly enlarged gonads and had rice in its gizzard (FMNH). In a recent compilation of the current Philippine range of this species, Luzon was the only large island near Sibuyan on which this species was known to occur (Dickinson et al., 1991). Hitherto, it has not been recorded on either Mindoro or Panay. Thus, this species may well have colonized Sibuyan from Luzon.

WEIGHT—Female (1) 125; unsexed (1) 121 g.

**Geopelia striata striata*
Zebra Dove

LOCAL NAME—*Korokokok.*

The first records of the Zebra Dove on Sibuyan were in 1971 when seven were collected at Jao-asan in mid-August and two near Silum in October (DMNH). The following year three were taken at Taclobo in mid-May (SUMNH), three at Katigaan on 6 March (DMNH), and one near Silum on 10 March 1972 (PNM). By 1989 this species was common in degraded forest and agricultural areas below 100 m. Several specimens collected between late April and May 1989 were in breeding condition (FMNH). In 1992 this species was regularly found in slightly to heavily disturbed lowland hab-

itats on the north side of the island, particularly near Agdamagan, Agnonok, Goangan, Magdiwang, and Tampayan. It was the most common dove species in agricultural areas, particularly rice fields and fruit tree plantations. Specimens collected during this period included individuals in reproductive condition and with rice in their stomachs (FMNH).

WEIGHT—Combined (7) 56.6 ± 4.4, 51.0–62.1 g.

Chalcophaps indica indica
Common Emerald-Dove

LOCAL NAME—*Banatad.*

Both Bourns and Worcester (1894) and McGregor (1905a) reported the Common Emerald-Dove on Sibuyan. On 1 August 1928 a male was taken near San Fernando (Baud, 1976). More recent records include a male and female, both nonbreeding, near Jao-asan on 15 August 1971 (DMNH, PNM), a male at Taclobo on 16 May 1972 (SUMNH), and a male at Tampayan on 29 February 1972 (PNM). In 1992 this species was noted at a variety of lowland sites, and two males with enlarged testes were netted between about 600 and 850 m (FMNH). We found it less common in disturbed habitats and never outside the forest.

WEIGHT—Male (2) 128, 142 g.

Family Psittacidae

Prioniturus discurus whiteheadi
Blue-crowned Racket-tail

LOCAL NAME—*Pikoy, tingiw.*

The Blue-crowned Racket-tail was recorded on Sibuyan by early ornithologists visiting the area (Bourns & Worcester, 1894; McGregor, 1905a). More recent records include a female with an enlarged ovary taken at Jao-asan on 30 August 1971 (PNM), and a male taken along the Pawala River near Katigaan on 22 February 1972 (PNM). Between 5 and 8 May 1989 four to five individuals frequented a fig tree (*Ficus* sp.) at about 325 m on a side trail off the main Mayo's Peak Trail. An adult male with small testes was netted at that elevation on 7 May 1989 (FMNH). This species was not recorded during the 1992 field trip to Sibuyan.

WEIGHT—Male (1) 125 g.

Tanygnathus lucionensis salvadorii
Blue-naped Parrot

LOCAL NAME—*Pikoy.*

The Blue-naped Parrot was recorded on Sibuyan by early naturalists visiting the island (Bourns and Worcester, 1894; McGregor, 1905a; Baud, 1976). Recent specimens include two collected in mid-May 1954 at an undesignated place, an adult male with small testes taken on 6 September 1971 at Jao-asan, and five individuals taken between late February and early March 1972 near Casing, Katigaan, and Tampayan (DMNH, PNM). In 1989 this species was noted only twice on the island, at about 200 m, along the trail leading to Mayo's Peak. In late March 1992 several were observed between the Gaong Valley and Agdamagan (Timmins, 1993). We follow Dickinson et al. (1991) in considering *T. l. siquijorensis* a synonym of *T. l. salvadorii.*

Loriculus philippensis bournsi
Colasisi

LOCAL NAME—*Kosi.*

The Colasisi has been recorded on Sibuyan by each ornithologist visiting the island (Bourns & Worcester, 1894; McGregor, 1905a; Baud, 1976). The subspecies *bournsi* is endemic to the island (Dickinson et al., 1991). Adult specimens collected in mid-August and in early September 1971 near Jao-asan were not in breeding condition (PNM). A single bird was taken at Taclobo on 27 May 1972 (SUMNH). It has also been recorded at about 400 m on the slopes above España (DMNH). In 1989 and 1992 this species was common below 250 m in areas with relatively intact to heavily disturbed forest near Agdamagan, Goangan, and Tampayan. It was observed up to 750 m. One informant mentioned that it is a pest to agricultural crops, particularly ripening fruits. A specimen taken near Goangan on 14 February 1992 was not in breeding condition.

WEIGHT—Male (1) 31.5 g.

Family Cuculidae

**Cuculus fugax pectoralis*
Hodgson's Hawk-Cuckoo

Two individuals collected near Jao-asan in August 1971 (PNM) and one above España at 400 m

in June 1973 (DMNH) are the only known records of the Hodgson's Hawk-Cuckoo on Sibuyan (PNM). Two of these specimens were adult males with small testes and the other was immature.

**Cacomantis variolosus sepulcralis*
Brush Cuckoo

LOCAL NAME—*Sigigid.*

A specimen of the Brush Cuckoo was taken at Jao-asan on 25 August 1971 (PNM). This is the only definite record of this species on Sibuyan. In early March 1992 a *Cacomantis* sp. was heard calling from the canopy at about 700 m.

Eudynamis scolopacea mindanensis
Common Koel

LOCAL NAME—*Bahaw.*

Ornithologists visiting Sibuyan in the late 19th and early 20th century collected Common Koels (Bourns & Worcester, 1894; McGregor, 1905a; Baud, 1976). In October 1971 four specimens, none of which was in breeding condition, were collected on the lower slopes of Mt. Guitinguitin, all below 300 m (DMNH). In 1992 this species was occasionally heard calling at dawn and dusk from lowland areas below our 725-m camp.

Centropus viridis viridis
Philippine Coucal

LOCAL NAME—*Kokok.*

The Philippine Coucal was recorded on Sibuyan by Bourns and Worcester (1894) and McGregor (1905a). More recently, specimens were collected on the western and northwestern slopes of Mt. Guitinguitin in late August and October 1971 (DMNH, PNM), near Silum in March 1972 (DMNH, PNM), and at Taclobo in mid-May 1972 (SUMNH). A fledgling was obtained on 29 August 1971 near Magdiwang (DMNH). In April and May 1989 this species was often heard vocalizing from within intact forest and thickets and along vegetated stream beds below 350 m. On 13 March 1992 an adult male with testes measuring 9 × 9 mm was collected in secondary forest near the Lambingan Falls (FMNH).

WEIGHT—Male (1) 148.5 g.

Family Tytonidae

**Tyto capensis amauronota*
Grass Owl

LOCAL NAME—*Moring.*

The first record of the Grass Owl on Sibuyan was an adult female obtained near Silum in October 1971 (DMNH). Subsequently a pair (one of which escaped) was netted on the night of 26 May 1989 over a rice field near Tampayan (FMNH). Two fledglings, barely capable of sustained flight, were taken in a grassy area near Agnonok on 17 February 1992 (FMNH). One of these birds had a subadult *Rattus* in its stomach. Local people are familiar with this bird, and we presume that it was overlooked by earlier ornithologists visiting Sibuyan rather than representing a recent colonization.

WEIGHT—Female (1) 550; fledglings (2) 460, 472 g.

Family Strigidae

Otus mantananensis romblonis
Mantanani Scops-Owl

LOCAL NAME—*Bukaw* (used for all small owls).

The first record of this species on Sibuyan was in late August 1971 when an individual was taken near Jao-asan (PNM). Four specimens were taken in October 1971 on the northeastern slopes of Mt. Guitinguitin at about 300 m (DMNH). It has subsequently been found at several other localities, generally near farmland or coconut plantations and away from tracts of undisturbed forest (Marshall, 1978). We did not observe this species during the 1989 and 1992 expeditions to the island.

[*Bubo philippensis*
Philippine Eagle-Owl]

Marshall (1978) reported the presence of a large forest owl on Sibuyan that he thought might be the Philippine Eagle-Owl. In 1992 an inhabitant from Tampayan recognized an illustration of this species and mentioned that it occurs in forested areas of the island. Until documentation is available the presence of this species remains hypothetical.

Ninox philippensis spilonota
Philippine Hawk-Owl

The Philippine Hawk-Owl was recorded on Sibuyan during the early explorations of the area by Bourns and Worcester (1894, specimen in USNM) and McGregor (1905a). Subsequent reports include a male taken on 30 August 1971 near Jao-asan, four birds collected on the northeastern slopes of Mt. Guitinguitin at about 300 m, and a male taken on 24 March 1972 at an unspecified locality (DMNH, PNM). In 1992 this species was netted at elevations from near sea level to 840 m and in a variety of habitats from disturbed lowland forest to intact montane forest. Several specimens had large insects, including beetles and orthopterans, in their stomachs. A female taken on 18 February 1992 at Goangan had a yolking egg in the ovary (FMNH).

WEIGHT—Female (3) 148, 168, 202; male (3) 169, 178, 188 g.

Family Caprimulgidae

Caprimulgus manillensis manillensis
Philippine Nightjar

LOCAL NAME—*Taktaro* (used for all nightjars).

Bourns and Worcester (1894) recorded the Philippine Nightjar on Sibuyan. Although McGregor (1905a) mentioned this species' occurrence only on Romblon Island, there is a specimen in the USNM collected by him on 1 June 1904, and "Sibuyan Is." has been pencilled in on the date tag. Neither Parsons in 1928 (Baud, 1976) nor Oane and Ramos in 1954 found this species. In September 1971 an individual was collected near Jao-asan; in October 1971 two were taken on the slopes above Silum; and in March 1972 six individuals were obtained along the Pawala River near Katigaan (DMNH, PNM). In 1989 this species was found in Magdiwang proper, and near Tampayan at the edge of an agricultural field and in a coconut plantation (FMNH). In March 1992 several specimens were collected along the seashore near mangroves and over a rocky beach, in open coconut groves, and in secondary forest. These included birds with slightly enlarged reproductive organs.

WEIGHT—Female (1) 58; male (2) 60, 68; unsexed (2) 81, 84.5 g.

Caprimulgus affinis griseatus
Savanna Nightjar

The Savanna Nightjar was recorded on Sibuyan by early naturalists who visited the area, in 1892 by Bourns and Worcester (1894, specimen in USNM), in 1904 by McGregor (1905a, specimens in FMNH and USNM), and in 1928 by Parsons (Baud, 1976). McGregor (p. 14) noted that this species was "[a]bundant along the beach on Sibuyan" and often "flushed from the shelter of low vegetation." The only post-1930 record of which we are aware is a male, with enlarged testes, shot by a local bird hunter in a mango plantation near Goangan on the night of 18 March 1992 (FMNH).

WEIGHT—Male (1) 54.5 g.

Family Apodidae

Collocalia vanikorensis amelis
Island Swiftlet

LOCAL NAME—*Salim bebateng* (used for all swifts).

McGregor (1905a, p. 15) noted that the Island Swiftlet was "very abundant in Sibuyan, where several specimens were taken" (one of which is in the FMNH). A male was collected in mid-August 1971 near Jao-asan (PNM). In April 1989 and March 1992 this species was observed foraging on the upper slopes of Mt. Guitinguitin in the vicinity of Mayo's Peak (1550 m). We follow Dickinson (1989) in placing records historically associated with *Collocalia whiteheadi* under *vanikorensis*.

Collocalia esculenta marginata
Glossy Swiftlet

The Glossy Swiftlet is the most common swift on Sibuyan. McGregor (1905a) described an active nesting colony found on 11 June 1904 in an enclosure formed by several large rocks. More recent records include individuals obtained on 20 August 1971 near Jao-asan (PNM), on 13 February 1972 near Magdiwang (PNM), and three near Taclobo in mid-May 1972 (SUMNH). On 29 April 1989 three individuals (FMNH) were netted at 150 m in a rock shelter near Gaong, one of which was a female with well-developed salivary glands and an enlarged ovary. The site was within 20 m of second-

ary lowland forest. An adult male captured near Tampayan on 29 May 1989 had small testes (FMNH).

In 1992 this species was netted over the stream at Lambingan Falls at 30 m and on exposed ridges and along a rock gorge below Mayo's Peak at about 1375 m. It was observed at a variety of localities—foraging over lowland agricultural fields; over the forest canopy at 325, 750, and 1350 m; and along the seacoast. Of 10 adult specimens collected in 1992, only a female taken on 4 March at 1325 m was in breeding condition; it had an enlarged ovary with a 3-mm yolking ovarian follicle (FMNH). Stomach contents consisted of tiny insects, many of which were dipterans.

WEIGHT—Combined (13) 6.5 ± 0.5, 6.5–7.6 g.

Collocalia troglodytes
Pygmy Swiftlet

Bourns and Worcester (1894) and McGregor (1905a) reported the Pygmy Swiftlet on Sibuyan. A male was taken near Jao-asan on 16 August 1971 (DMNH). On 12 March 1992 a male Pygmy Swiftlet was netted over a water pool below the Lambingan Falls, and four days later a female was also taken near Silum (FMNH). Neither individual was in reproductive condition.

WEIGHT—Female (1) 4.6; male (1) 5.4 g.

**Apus pacificus*
Fork-tailed Swift

Between 13 and 20 March 1992 flocks (up to 60 individuals) of the Fork-tailed Swift were noted along the seacoast between Casing Point and Silum. These are the first records on Sibuyan of this migrant from mainland Asia. No specimens were obtained, and the subspecies passing through the area remains in question.

Family Alcedinidae

Alcedo atthis bengalensis
Common Kingfisher

Bourns and Worcester (1894) noted that the Common Kingfisher, a migrant and boreal winter visitor to the Philippines, occurred on Sibuyan. One of their specimens, collected on 12 October 1892, is housed in the USNM. More recent records include a female with a small ovary taken near Jao-asan on 19 August 1971 (PNM), a female taken at Tampayan on 4 March 1972 (DMNH), a female with a slightly enlarged ovary netted over a rocky beach near mangroves at Casing Point on 18 March 1992 (FMNH), a female with a slightly enlarged ovary taken near Tampayan in a marsh near rice fields on 21 March 1992 (FMNH), and a male with small testes and with crustaceans in its stomach collected in a rice field near Tampayan on 21 March 1992 (FMNH). The 19 August specimen appears to be the earliest known autumn record of this species in the Philippines.

WEIGHT—Female (2) 25.3, 33.8; male (1) 26.6 g.

Alcedo cyanopectus cyanopectus
Indigo-banded Kingfisher

There are a few records of the Indigo-banded Kingfisher on Sibuyan. Bourns and Worcester (1894, p. 48) "found *C*[*eyx*]. *cyanipectus* [sic] along the banks of fresh water streams." McGregor (1905a) obtained a single specimen of this bird. The only other record appears to be one collected near Tampayan on 23 February 1972 (PNM). This species was not recorded during the 1989 and 1992 expeditions to the island.

Ceyx lepidus margarethae
Variable Dwarf-Kingfisher

LOCAL NAME—*Bang-kako.*

Bourns and Worcester (1894, p. 48) noted that on Sibuyan the Variable Dwarf-Kingfisher occurred "strictly [in the] woods . . . and its shy habits doubtless explain its having been so generally missed by collectors." It was also reported on the island by McGregor (1905a, specimens in FMNH and USNM) and Parsons (Baud, 1976). More recent records include an adult female not in breeding condition taken at Jao-asan on 19 August 1971, a male along the Pawala River near Katigaan on 27 February 1972 (PNM), and a male with testes less than 1 mm in the Pawala River Valley on 24 July 1986 (NMBE). In 1989 and 1992 this species was netted in disturbed lowland areas near Tampayan and Agdamagan and in relatively intact forest up to 850 m. All four individuals collected in 1992 were adult males not in reproductive condition;

one had fish remains in its stomach and another insect parts (FMNH). Birds were netted in forested areas, ranging from heavily disturbed lowland forest to pristine montane forest, both near and away from water.

WEIGHT—Combined (7) 22.1 ± 0.9, 20.5–23.0 g.

Halcyon capensis gigantea
Stork-billed Kingfisher

Bourns and Worcester (1894), McGregor (1905a), and Parsons (Baud, 1976) reported this species on Sibuyan. We are unaware of any post-1928 records of it from the island.

Halcyon coromanda major
Ruddy Kingfisher

The only report of this species on Sibuyan is that of Bourns and Worcester (1894). They collected a specimen on 8 October 1892 (USNM).

**Halcyon smyrnensis gularis*
White-throated Kingfisher

LOCAL NAME—*Patok.*

The White-throated Kingfisher was not reported on Sibuyan by any early naturalist, although recorded on Tablas by McGregor (1909–1910). The first documentation of this species on the island is three individuals taken at an undesignated place in mid-May 1954 (PNM). Ten birds, none in reproductive condition, were taken between 1971 and 1973 near Cadjiocan, above España, Jao-asan, Silum, and Tampayan (DMNH, PNM). This species was not recorded on the 1989 and 1992 expeditions to the island.

Halcyon winchelli nesydrionetes
Rufous-lored Kingfisher

The Rufous-lored Kingfisher, a forest-dwelling bird, has been consistently recorded by various ornithologists visiting the island, including Bourns and Worcester (1894), McGregor (1905a), and Parsons (Baud, 1976). The form *nesydrionetes* is endemic to the Tablas, Romblon, and Sibuyan island group (Parkes, 1966). In 1989 and 1992 it was found in heavily disturbed to intact forest areas between 30 and 725 m. The five individuals collected in 1992 all had relatively small sexual organs (FMNH). Stomach contents included insects, isopods, and a lizard.

WEIGHT—Combined (7) 63.5 ± 7.7, 52.9–73.0 g.

Halcyon chloris collaris
White-collared Kingfisher

LOCAL NAME—*Tangkali.*

The White-collared Kingfisher is one of the more common and conspicuous birds on Sibuyan and has been reported in all ornithological accounts of the local fauna. It favors lowland streams, often in moderately or heavily disturbed areas, generally below 50 m. On 29 May 1989 a nesting burrow was found in a steep bank near Agdamagan, about 150 m from the Malimig River; it contained three feathered young. In 1992 this species was common along streams and rivers in partially or totally cleared areas, in open places, usually in the vicinity of water, along the seacoast, regularly in mangroves, and even on electrical wires in Tampayan. Of the eight specimens taken in 1992 between 24 February and 21 March most had poorly developed sexual organs, but a few individuals were starting to come into reproductive condition (FMNH). Stomach contents included remains of insects, crabs, and fish.

WEIGHT—Combined (11) 58.8 ± 3.6, 54.0–66.0 g.

Family Meropidae

Merops viridis americanus
Blue-throated Bee-eater

LOCAL NAME—*Piliw* (used for all bee-eaters).

The Blue-throated Bee-eater was recorded on Sibuyan by McGregor (1905a). More recent records include four birds collected at Jao-asan in late August 1971, three on the slopes above Silum in October 1971, and one near Casing on 26 March 1972 (DMNH, PNM). In April and May 1989 this species (and/or the next) was occasionally observed flying over heavily disturbed lowland areas near Agdamagan. On 18 March 1992 two males were collected at Gaong, both of which had slightly enlarged gonads (FMNH).

WEIGHT—Males (2) 37.4, 39.7 g.

Merops philippinus philippinus
Blue-tailed Bee-eater

The Blue-tailed Bee-eater was collected on Sibuyan in 1904 (McGregor, 1905a) and near San Fernando in 1928 (Baud, 1976). We are unaware of any more recent specimen or sight records.

Family Coraciidae

Eurystomus orientalis cyanocollis
Dollarbird

LOCAL NAME—*Sayak.*

The Dollarbird was found on Sibuyan by Bourns and Worcester (1894), McGregor (1905a), and Parsons (Baud, 1976). Specimens also have been collected near Jao-asan in August 1971, on the slopes above Silum in October 1971, and near Magdiwang on 5 April 1972 (DMNH, PNM). A subadult was taken on Mt. Guitinguitin above España, at about 400 m, in June 1973 (DMNH). In late April and May 1989 an individual was regularly observed perched in a dead tree along the Pawala River at Tampayan. This species was not noted during the 1992 expedition to the island.

Family Picidae

Dendrocopos maculatus menagei
Philippine Pygmy Woodpecker

LOCAL NAME—*Patok.*

Both Bourns and Worcester (1894) and McGregor (1905a) collected the Pygmy Woodpecker on Sibuyan. In more recent years this species has been noted at several localities on the island, all of which are in relatively intact tracts of secondary or primary forest. The 1992 elevational transect of the northern side of Mt. Guitinguitin found this species at 30, 325, and 725 m and it was observed as high as 860 m. None of the three specimens taken between 16 February and 14 March 1992 was in reproductive condition; specimens from May 1989 had slightly enlarged gonads and one immature bird was also taken (FMNH). Stomach contents included insects and small larvae.

The subspecies *menagei* is endemic to Sibuyan. This species occurs on Luzon, Mindoro, and Panay (Dickinson et al., 1991), but it has not been recorded on either Romblon or Tablas.

WEIGHT—Combined (7) 24.3 ± 1.0, 23.0–25.7 g.

Family Pittidae

Pitta erythrogaster erythrogaster
Red-bellied Pitta

LOCAL NAME—*Bakwa.*

Bourns and Worcester (1894) and McGregor (1905a, specimens in USNM) collected several Red-bellied Pittas on Sibuyan. In 1989 this species was found to be relatively common in primary forest along the trail leading to Mayo's Peak from 500 to 725 m, and in 1992 along the same trail from 300 to 860 m. A female collected on 30 May 1989 at about 500 m had an enlarged ovary, while another collected at the same time had an undeveloped ovary (FMNH). The seven specimens collected between 18 and 29 February 1992 all had slightly enlarged sexual organs and appeared to be just commencing the reproductive season (FMNH). Stomach contents included remains of earthworms, insects (particularly beetles), and in one case vegetable matter. This species is captured by local hunters in snares set on the ground for monkeys.

WEIGHT—Combined (11) 59.9 ± 6.0, 51.0–68.0 g.

Pitta sordida sordida
Hooded Pitta

McGregor (1905a) collected at least two individuals on 11 June 1904 (USNM, FMNH). Subsequent records include two adults with slightly enlarged sexual organs taken in June 1973 at about 400 m on the western slopes of Mt. Guitinguitin above España (DMNH) and one individual observed on 23 March 1992 at about 300 m on the trail leading to Mayo's Peak (Timmins, 1993; Timmins, in litt.).

Family Alaudidae

Alauda gulgula wolfei
Oriental Skylark

McGregor (1905a) reported that a single example of the Oriental Skylark was collected on Sibuyan; the specimen cannot be traced. We are unaware of any other records of this species from the island.

Family Hirundinidae

Hirundo tahitica javanica
Pacific Swallow

The Pacific Swallow was found nesting in a building at San Fernando on 20 July 1904 (McGregor 1905a). Specimens have been collected on 8 July 1904 at an unspecified locality on the island (FMNH), in the first portion of August 1928 at San Fernando (Baud, 1976), and on 16 May 1972 at Taclobo (SUMNH). From late April to May 1989 and from 14 February to 25 March 1992 this species was often observed foraging over agricultural fields near Magdiwang and Tampayan and along the seashore between Agnonok and Silum. In late March 1992 at least two pairs were nesting in an abandoned house near Magdiwang.

Family Campephagidae

Lalage nigra chilensis
Pied Triller

LOCAL NAME—*Darat.*

McGregor (1905a, p. 21) reported that the Pied Triller was "fairly abundant" on Sibuyan. Specimens have been collected at numerous places around the island, mostly in disturbed habitats and all below 75 m (Baud, 1976; DMNH, FMNH, PNM, SUMNH). Fledglings, barely capable of sustained flight, were collected on 28 May 1989 near Tampayan (FMNH). Three adults taken between 19 February and 18 March 1992 had relatively small sexual organs (FMNH). Stomach contents of collected birds included fruit pulp and insects.

WEIGHT—Combined (6) 26.3 ± 1.8, 23.3–28.5 g.

Family Pycnonotidae

Pycnonotus goiavier goiavier
Yellow-vented Bulbul

LOCAL NAME—*Birao birao.*

Although both Bourns and Worcester (1894) and McGregor (1905a) found the Yellow-vented Bulbul on Romblon and Tablas, they did not mention its occurrence on Sibuyan. Further, Parsons did not obtain any material of this species during his 1928 visit (Baud, 1976). The first record of it on Sibuyan is mid-May 1954, when three individuals (PNM) were collected at an unspecified place. Four adults, not in breeding condition, were taken in mid-August 1971 near Jao-asan and in October 1971 near Silum (DMNH, PNM). Between late February and early May 1972 a series of specimens was collected near Katigaan, Silum, and Tampayan (DMNH) and near Taclobo (SUMNH; Dickinson et al., 1991). By 1989 this species was found in a variety of human-modified habitats from sea level to 50 m. In both 1989 and 1992 it was one of the most commonly netted birds in lowland disturbed areas (Table 1), particularly urban, agricultural, and secondary growth. This species apparently colonized the island sometime between 1928 and 1954. Specimens collected between late April and late May 1989 were in or approaching breeding condition, while those obtained between late February and late March 1992 showed little breeding activity (FMNH). Stomach contents included a variety of seeds, fruits, and insects.

WEIGHT—Combined (18) 29.2 ± 1.3, 27.6–32.0 g.

Family Oriolidae

Oriolus chinensis yamamurae
Black-naped Oriole

LOCAL NAME—*Kilyaw.*

The Black-naped Oriole has been regularly recorded on Sibuyan by various naturalists (Bourns & Worcester, 1894; McGregor, 1905a; Baud, 1976). In 1989 and 1992 this species was relatively common in lowland areas near Agdamagan, Magdiwang, and Tampayan, including secondary forest, mangroves, and at the edge of agricultural fields. Two feathered nestlings were found on 29 April 1989 in a nest placed about 3 m high in a tree in secondary scrub, at the edge of a cultivated field (FMNH). None of the five specimens taken between 19 February and 11 March 1992 was in breeding condition. Stomach contents consisted of a variety of fruits.

WEIGHT—Combined (6) 90.7 ± 7.1, 83–100 g.

Family Corvidae

Corvus macrorhynchos philippinus
Large- billed Crow

LOCAL NAME—*Uwak.*

At the turn of the 19th century both Bourns and Worcester (1894) and McGregor (1905a) recorded

TABLE 1. Net capture rate of resident birds on Sibuyan Island during 1989 field study.[1]

Species	Elevation (total net-days)		
	200 m (29)	325 m (49)	750 m (44)
Phapitreron leucotis	0.07 (2)	—	—
Prioniturus discurus	—	0.02 (1)	—
Caprimulgus manillensis	0.03 (1)	—	—
Collocalia esculenta	0.03 (1)	—	—
Halcyon winchelli	—	0.02 (1)	0.02 (1)
Dendrocopos maculatus	—	0.10 (5)	0.02 (1)
Pitta erythrogaster	—	—	0.07 (3)
Pycnonotus goiavier	0.28 (8)	—	—
Cyornis rufigastra	—	0.08 (4)	0.09 (4)
Hypothymis azurea	—	—	0.07 (3)
Terpsiphone cinnamomea	—	0.02 (1)	—
Pachycephala homeyeri	—	0.22 (11)	0.11 (2)
Aplonis panayensis	0.07 (2)	—	—
Nectarinia sperata	0.07 (2)	—	—
Nectarinia jugularis	0.21 (6)	—	—
Aethopyga siparaja	—	0.02 (1)	0.02 (1)
Dicaeum trigonostigma	—	0.18 (9)	0.05 (5)
Lonchura leucogastra	0.48 (14)	—	—
Lonchura malacca	0.07 (2)	—	—
Total capture rate	1.31 (38)	0.67 (33)	0.45 (20)
Total number of species	9	8	8

[1] Entry given as total number captured birds/total net-days (total number captured).

the Large-billed Crow on Sibuyan. Since then this species has been seen regularly at a variety of lowland localities, all in disturbed areas and away from original forest.

Family Turdidae

**Luscinia calliope*
Siberian Rubythroat

The Siberian Rubythroat was noted in March 1992 in forested and open heathland areas on the upper reaches of Mt. Guitinguitin, just below Mayo's Peak. Two adult females were netted on 4 and 5 March at approximately 1325 m, and neither was in reproductive condition (FMNH). The stomach of one individual included ant and beetle remains. These are the only known records for Sibuyan of this boreal winter visitor to the Philippines from mainland Asia and Japan.

WEIGHT—Female (2) 23.3, 24 g.

Copsychus saularis mindanensis
Oriental Magpie-Robin

The Oriental Magpie-Robin was recorded by early ornithologists visiting Sibuyan (Bourns & Worcester, 1894; McGregor, 1905a). There are numerous subsequent records of it, virtually all below 100 m and most in highly degraded or secondary forest (e.g., Casing, Jao-asan, Katigaan, Silum, Tampayan, and near the Lambingan Falls). Specimens collected on 30 April and 1 May 1989 at Tampayan along the river margin were in breeding condition (FMNH).

WEIGHT—Male (1) 33.5; unsexed (2) 30.5, 31.0 g.

Monticola solitarius philippensis
Blue Rock-Thrush

In 1892 Bourns and Worcester (1894) recorded the Blue Rock-Thrush on Sibuyan. In the DMNH are specimens, none in breeding condition, taken in October 1971 near Silum, in February 1972 near Casing and Katigaan, and in March 1972 at Ambulong. A nonbreeding male was netted on an open ridge below Mayo's Peak at 1350 m on 4 March 1992 (FMNH), and a bird was observed perched on rocks along the seashore between Casing and the Lambingan Falls in March 1992. The bird taken at 1350 m had small reproductive organs and seed and beetle remains in its stomach. This species is presumably a migrant to the island.

WEIGHT—Male (1) 50.2 g.

**Zoothera dauma aurea*
Scaly Ground-Thrush

Scaly Ground-Thrushes were netted on 21 February 1992 at 325 m and on 26 February 1992 at 725 m (FMNH). Both birds had relatively small reproductive organs. The only other record is one on 23 March 1992 in lowland forest on the north side of the island (Timmins, 1993). These are the only known records on Sibuyan of this boreal winter migrant from mainland Asia (Dickinson et al., 1991). The stomach of one individual contained plant matter.

WEIGHT—Female (2) 120, 142 g.

**Turdus poliocephalus* subsp.
Island Thrush

During the 1992 expedition to Sibuyan this species was found in patches of mossy forest between 1400 and 1550 m. Two adult males, both in breeding condition, were collected, one on 27 February and the other on 7 March 1992 (FMNH). During this period this species was regularly heard singing near the summit of Mayo's Peak. These are the first records of the Island Thrush on Sibuyan, where it appears to be restricted to the mossy forest zone of the higher mountaintops. No previous expedition to the island climbed to the upper portions of Mt. Guitinguitin. The two specimens match the general plumage coloration of *T. p. mayonensis* and *T. p. thomassoni* from Luzon.

WEIGHT—Male (2) 64.2, 71.5 g.

**Turdus chrysolaus chrysolaus*
Brown-headed Thrush

In 1992 the Brown-headed Thrush was relatively common above 1300 m in the mossy forest zone and open low scrubland near Mayo's Peak. The five individuals collected between 4 and 8 March all had relatively small reproductive organs (FMNH). Stomach contents included a variety of fruits. These are the first records for Sibuyan of this migrant and boreal winter visitor from Japan and the Kuriles, and the first records in the Philippines south of Luzon (Dickinson et al., 1991).

WEIGHT—Female (1) 63.2; male (3) 64.9, 71.9, 72.2 g.

**Turdus obscurus*
Eyebrowed Thrush

In early March 1992 we found the Eyebrowed Thrush in the mossy forest zone and open scrubland near Mayo's Peak. Two females were collected, one on 6 March at 1375 m and another on 5 March at 1400 m. This species, a migrant and boreal winter visitor to the Philippines from mainland Asia, was previously unknown from Sibuyan (Dickinson et al., 1991).

WEIGHT—Female (2) 60.5, 64.8 g.

Family Sylviidae

Phylloscopus borealis subspp.
Arctic Warbler

LOCAL NAME—*Titit* (used for warblers or small birds).

Both Bourns and Worcester (1894) and McGregor (1905a) reported the Arctic Warbler, a Eurasian migratory species, on Sibuyan during the boreal winter. Subsequent records include a female taken on 1 September 1971 near Jao-asan (PNM); three birds collected in October 1971 on the slopes above Silum (DMNH); a female netted in intact forest on 26 February and two males on 29 February 1992 between 610 and 810 m along the trail to Mayo's Peak (FMNH); and a female obtained in disturbed lowland forest on 16 March 1992 at 30 m above sea level near the Lambingan Falls (FMNH). All of the above specimens are referable to *P. b. kennicotti* with the exception of the 29 February individuals, which are similar to *P. b. borealis*. All individuals taken in 1992 were adults and none was in or approaching reproductive condition.

WEIGHT—Female (2) 7.8, 8.9; male (2) 7.4, 8.6 g.

**Acrocephalus orientalis*
Oriental Reed-Warbler

LOCAL NAME—*Pit-la-go* (used for several warblers or small brown birds).

The only known record on Sibuyan Island of the Oriental Reed-Warbler, a boreal winter migrant from mainland Asia, is a single individual netted on 30 April 1989 in a cultivated field at the edge of the Pawala River, Tampayan (FMNH).

WEIGHT—Unsexed (1) 35 g.

**Locustella ochotensis*
Middendorf's Warbler

Middendorf's Warbler, a boreal winter migrant to the Philippines from mainland Asia, was first recorded on Sibuyan in 1989, when one was netted on 29 May at the edge of an agricultural field near Tampayan (FMNH). In 1992 this species was found near Tampayan in rice fields and along the beach in mangroves near the Lambingan Falls. During this period an additional four specimens were collected (FMNH).

WEIGHT—Female (4) 16.3, 16.7, 17.4, 22 g.

Megalurus timoriensis tweeddalei
Tawny Grassbird

In 1904 McGregor (1905a, p. 19) recorded the Tawny Grassbird as "abundant" on Sibuyan. Subsequent records of this species include individuals collected in mid-August and early September 1971 near Jao-asan (DMNH, PNM) and on the western slope of Mt. Guitinguitin (PNM). In late March 1992 this species was found to be common in rice fields near Tampayan, where it was sympatric with *M. palustris.*

**Megalurus palustris forbesi*
Striated Grassbird

Early ornithological visitors to Sibuyan, Romblon, and Tablas did not report the Striated Grassbird. The first known records of this species on Sibuyan are individuals netted in rice fields near Tampayan on 26 May 1989 and on 19 February 1992 (FMNH). Neither individual was in reproductive condition. A nest with four eggs was found in a grass clump at the edge of a rice field near Tampayan on 23 March 1992.

WEIGHT—Male (1) 53.6 g.

Cisticola exilis semirufa
Bright-capped Cisticola

Both Bourns and Worcester (1894) and McGregor (1905a) found the Bright-capped Cisticola on Sibuyan. The latter author reported several active nests in the first portion of July 1904. Two adult males were collected near Jao-asan in mid-August 1971 (PNM). This species was noted during the 1989 and 1992 expeditions in rice fields near Tampayan and Agdamagan.

Family Muscicapidae

**Muscicapa griseisticta*
Grey-streaked Flycatcher

The Grey-streaked Flycatcher, a migrant and boreal winter visitor to the Philippines from northeastern Asia, has been recorded several times recently on Sibuyan but not by earlier workers. One individual was taken on 11 May 1954 at an unspecified locality, one in October 1971 on the slopes above Silum, and one in late February 1972 near Katigaan and Tampayan (DMNH, PNM).

Cyornis rufigastra philippinensis
Man grove Blue Flycatcher

Both Bourns and Worcester (1894) and McGregor (1905a) recorded the Mangrove Blue Flycatcher on Sibuyan, and the latter author collected one individual on 9 July 1904 (FMNH). Numerous specimens were collected in 1971 and 1972 near Binaya-an, Jao-asan, Katigaan, Silum, and Taclobo (DMNH, SUMNH). One bird in juvenile plumage was taken on 1 August 1986 in the Pawala River Valley (NMBE). In April and May 1989 it was common in forested areas between 325 and 725 m. Numerous birds taken in May 1989 were in breeding condition.

During the 1992 expedition this species was found at all elevational transect points: 30, 325, 725, and 1350 m, and occurred across the entire altitudinal range of forest types from heavily disturbed to intact lowland through montane and mossy forest. In 1989 it was one of the most frequently netted understory forest birds (Table 1). A series was collected between 16 February and 18 March 1992 from near sea level to 1350 m, and most birds were not in reproductive condition. Stomach contents included remains of various types of seeds and insects, including beetles and perhaps termites.

WEIGHT—Combined (39) 18.4 ± 1.4, 15.6–21.5 g.

[*Culicicapa helianthea panayensis* Cit rine Canary-Flycatcher]

Bourns and Worcester (1894, p. 41) reported that "*Culicicapa panayensis*" was collected on Sibuyan. Since no specimen can be traced from Sibuyan and there are no subsequent records, we consider this species hypothetical on the Sibuyan list.

Rhipidura javanica nigritorquis
Pied Fantail

LOCAL NAME—*Tagotiyot.*

Both Bourns and Worcester (1894) and McGregor (1905a) found the Pied Fantail on Sibuyan. There are numerous subsequent records of this species on the island. In 1989 and 1992 it was found to be relatively common below 50 m along vegetated stream and river margins, in mango plantations, in mangroves along the beach, and in marshes near rice fields. A few specimens taken in March 1992 were in or approaching breeding condition (FMNH).

WEIGHT—Female (2) 15.0, 16.2; male (3) 16.1, 16.9, 19.0; unsexed (2) 18.0, 18.0 g.

Hypothymis coelestis
Celestial Monarch

Bourns and Worcester (1894) collected the Celestial Monarch on Sibuyan on 10 October 1892 (CM). There is no known subsequent record of it on the island.

Hypothymis azurea azurea
Black-naped Monarch

LOCAL NAME—*Wet-wet.*

The Black-naped Monarch was reported from Sibuyan by early ornithologists, including Bourns and Worcester (1894), McGregor (1905a), and Parsons (Baud, 1976). It has subsequently been collected at several localities on the island. In 1989 this species was particularly common in undisturbed forest at 725 m on the northern slope of Mt. Guitinguitin and relatively uncommon on the same slope down to about 75 m. Several individuals taken in May 1989 were in breeding condition (FMNH).

In 1992 this species was netted at the 30-, 325-, and 725-m transect points. The sexual organs of individuals collected from 14 February to 3 March 1992 between 325 and 725 m were either small or just starting to enlarge, while those taken between 11 and 19 March at 30 m were in or approaching breeding condition. Stomach contents included insect parts, often Diptera, and in one case vegetable matter and a 3-mm seed.

WEIGHT—Combined (22) 10.9 ± 1.5, 8.4–14.5 g.

Terpsiphone cinnamomea unirufa
Rufous Paradise-Flycatcher

The Rufous Paradise-Flycatcher was recorded on Sibuyan by Bourns and Worcester (1894; specimens in USNM), McGregor (1905a; specimens in USNM), and Parsons (Baud, 1976). More recently, it has been collected on 16 August 1971 near Jao-asan (PNM), on 22 August 1971 along the western slope of Mt. Guitinguitin (PNM), in June 1973 above España at about 400 m (DMNH), on 24 and 25 July 1986 in the Pawala River Valley (NMBE), and on 5 May 1989 at 325 m along the trail leading to Mayo's Peak (FMNH). The latter specimen was a female in breeding condition. In 1992 this species was recorded between 30 and 425 m, and all seven individuals taken were adults with fully pneumatized skulls (FMNH). A pair collected at 30 m on 16 March 1992 had slightly enlarged gonads. Stomach contents included insects.

WEIGHT—Combined (8) 25.2 ± 1.34, 23.3–27.0 g.

Family Pachycephalidae

Pachycephala homeyeri winchelli
White-vented Whistler

LOCAL NAME—*Pitlago.*

Both Bourns and Worcester (1894) and McGregor (1905a) recorded the White-vented Whistler on Sibuyan, where the latter author commented that it was "somewhat scarce." In 1928 Parsons obtained three specimens in the vicinity of San Fernando (Baud, 1976). Between 1971 and 1973 this species was collected near Binaya-an, Casing, Katigaan, Jao-asan, Magdiwang, Silum, Taclobo, and on the western slopes of Mt. Guitinguitin (DMNH, PNM, SUMNH).

In 1989 this species was common in forested areas between 325 and 725 m along the trail leading toward Mayo's Peak. It was the most regularly netted bird at the 325- and 725-m transect points (Table 1). In May this species was in various stages of breeding: adults not in reproductive condition, others with well-developed sexual organs and brood patches (a female laid an egg in a holding bag), fledglings barely capable of sustained flight, and a few independent immature birds.

In 1992 this species was also the most commonly netted bird at 30, 325, 725, and 1350 m and was found as high as 1440 m. It was noted in a variety of habitats from heavily modified lowland areas, such as mango plantations and secondary forest edge, through various levels of disturbed lowland forest, montane forest, and mossy forest. At the 325- and 725-m transect points, the White-vented Whistler was one of the few bird species vocalizing in the predawn and early morning chorus. The majority of birds collected between 16 February and 17 March 1992 were adults, and a few individuals were in or approaching breeding condition. Stomach contents included insects, mostly beetles, and in a few cases plant matter and seeds.

We follow Parkes' (1989) recent revision of this species, which was in part based on material collected by the Menage Expedition in the Romblon Province.

WEIGHT—Combined (45) 24.6 ± 2.34, 21.0—31.5 g.

Family Motacillidae

Motacilla cinerea subsp.
Grey Wagtail

The Grey Wagtail, a boreal winter migrant to the Philippines, was recorded on Sibuyan by Bourns and Worcester (1894). The only known recent records are individuals taken on 1 September 1971 near Jao-asan (PNM) and on 16 March 1992 at the Lambingan Falls (FMNH).

WEIGHT—Female (1) 15.8 g.

**Anthus hodgsoni hodgsoni*
Olive Tree-Pipit

In 1992 two adults were netted just below Mayo's Peak at about 1325 m. These included a male on 5 March and a female on 8 March 1992 (FMNH). These are the only known records on Sibuyan of this Asian migrant.

WEIGHT—Female (1) 20.8; male (1) 21.6 g.

Anthus novaeseelandiae lugubris
Richard's Pipit

LOCAL NAME—*Tiwid-tiwid* (used for various pipits).

Both Bourns and Worcester (1894) and McGregor (1905a) recorded Richard's Pipit on Sibuyan. In May 1954 nine specimens were collected at an unspecified locality on Sibuyan (PNM). Some more recent records include individuals taken in mid-August 1971 near Jao-asan (DMNH, PNM), two on 18 May 1972 at Taclobo (SUMNH), and one on 22 May 1989 between Tampayan and Agdamagan (FMNH). The latter specimen was found on a nest in an agricultural field and had a highly vascularized brood patch. In 1992 this species was frequently noted in grassland areas with low vegetation and in rice fields near Agdamagan, Goangan, and Tampayan. A male collected on 13 March 1992 at Goangan had testes measuring 6 × 4 mm, and a female on 22 March 1992 had a granular ovary measuring 5 × 3 mm (both at FMNH).

WEIGHT—Female (2) 17.8, 23; male (2) 19.5, 21.7 g.

Anthus gustavi gustavi
Pechora Pipit

Bourns and Worcester (1894) collected the Pechora Pipit on Sibuyan (USNM, CM). This species is a boreal winter visitor to the Philippines from breeding grounds in mainland Asia.

Family Artamidae

Artamus leucorhynchus leucorhynchus
White-breasted Wood-Swallow

LOCAL NAME—*Git-git.*

The White-breasted Wood-Swallow was recorded on Sibuyan by Bourns and Worcester (1894), McGregor (1905a), and Parsons (Baud, 1976). In 1954 Oane and Ramos collected four individuals at an unspecified locality. More recently specimens have been taken in mid-August 1971 near Jao-

asan (DMNH, PNM), on 10 March 1972 near Silum (PNM), in mid-May 1972 near Taclobo (SUMNH), and on 22 May 1989 at Tampayan (FMNH). In May 1989 and February to March 1992 this species was noted on numerous occasions in degraded lowland areas near Agdamagan, the Lambingan Falls, Tampayan, and Silum. It often frequented dead snags and trees at the edge of rice fields or along river banks and coconut plantations. Males collected on 29 February along the Sinobaan River near Agnonok and the second half of March 1992 near Gaong and Tampayan had enlarged testes (FMNH). Stomach contents included insects, mostly beetles.

WEIGHT—Male (3) 38.9, 39.0, 39.2 g.

Family Laniidae

Lanius cristatus lucionensis
Brown Shrike

LOCAL NAME—*Talim babayas.*

Bourns and Worcester (1894) listed the Brown Shrike as occurring on Sibuyan. There are numerous subsequent records of this migrant and winter visitor to the Philippines, including specimens taken between 1971 and 1973 near Casing, Jao-asan, Magdiwang, Silum, and Tampayan (DMNH, PNM). In 1992 this species was relatively common in lowland areas below 50 m, particularly in fields and pastures with fences, rice paddies, mango plantations, and grassland areas with low scrub. One individual was netted on 5 March 1992 in the open "heath" area at about 1350 m. Of the 10 individuals collected during 1992, most had small reproductive organs (FMNH). The exception was a male collected at Tampayan on 23 March with testes measuring 9 × 4 mm. Stomach contents included insects, often beetles, and in one surprising case, seeds.

WEIGHT—Combined (8) 27.0 ± 2.7, 21.6–30.0 g.

Family Sturnidae

Aplonis panayensis panayensis
Asian Glossy Starling

LOCAL NAME—*Dalisyang.*

Bourns and Worcester (1894), McGregor (1905a), and Parsons (Baud, 1976) found the Asian Glossy Starling on Sibuyan, and specimens were collected on subsequent expeditions. In late April to May 1989 and in mid-February to late March 1992 this species was relatively common in disturbed lowland habitat between sea level and 80 m, particularly along vegetated river margins. Mixed flocks of adults and immature birds, numbering up to 30 individuals, were often seen near Magdiwang and Tampayan. Several males collected near Tampayan in late April 1989 and in late March 1992 had enlarged testes (FMNH). The stomach of one individual contained two 1-cm seeds.

WEIGHT—Combined (10) 54.6 ± 6.3, 45.0–64.5 g.

Sarcops calvus melanonotus
Coleto

LOCAL NAME—*Sal-ing.*

The Coleto was recorded on Sibuyan by the earliest naturalists who visited the island. More recently it was collected on 8 May 1954 at an unspecified locality, in August and October 1971 at Jao-asan and on the slopes above Silum, between March and February 1972 at Tampayan and Katigaan, on 28 May 1989 near Tampayan, on 17 February 1992 at Goangan (a female with a slightly enlarged ovary), and on 18 February 1992 at Tampayan (DMNH, FMNH, PNM). Coletos were heard vocalizing near Agdamagan on 14 February and 10 March 1992 and near Silum on 13 March 1992. All records are from highly disturbed areas of the island.

WEIGHT—Female (1) 109; unsexed (2) 108, 125 g.

Family Nectariniidae

Anthreptes malacensis chlorigaster
Plain- throated Sunbird

McGregor (1905a, p. 17) considered the Plain-throated Sunbird to be "abundant" on Sibuyan, "where both adults and birds of the year were taken in June and July." This species was also recorded on the island by Bourns and Worcester (1894). Parsons collected three individuals near San Fernando in July and August 1928 (Baud, 1976). There are series of this species in the DMNH

and PNM, most of which were taken near Casing, Jao-asan, Silum, and Tampayan in 1971 and 1972. In mid-May 1972 three specimens were taken near Taclobo (SUMNH). Five specimens were taken in June 1973 at about 400 m on the slopes above España (DMNH). Birds in the NMBE include two juveniles taken in late July 1986 in the Pawala River Valley.

This species was not recorded during the 1989 field trip to Sibuyan. In 1992 this species was noted once in the forest at 325 m and was particularly common in disturbed and secondary forests near the Lambingan Falls. On 12 March 1992 a pair of Plain-throated Sunbirds was noted with two fledglings (FMNH), and on 14 March a male with slightly enlarged testes was collected (FMNH). Stomach contents of collected birds included several types of seeds and a 2-cm-long caterpillar. In the latter half of March 1992 this species was observed feeding on the flowers of the *pusay sal-ing* tree, which was also frequented simultaneously by all of the island's sunbird species.

WEIGHT—Female (1) 13.3, 14.5, 16.0; male (3) 15.3, 15.4, 16.4 g.

Nectarinia sperata subsp.
Purple-throated Sunbird

LOCAL NAME—*Dato* and *tamsi.*

The Purple-throated Sunbird was found on the island by Bourns and Worcester (1894), McGregor (1905a), and Parsons (Baud, 1976). All pre-1992 specimens with accurate locality information were collected in areas below 80 m and in disturbed habitats (DMNH, FMNH, PNM, SUMNH). A male taken near Taclobo on 10 May 1972 (SUMNH) and two collected near Tampayan on 27 and 28 May 1989 (FMNH) had enlarged testes.

During the 1992 transect this species was found from near sea level up to 500 m, with one record at 725 m. This species was common in disturbed lowland areas near Agdamagan, the Lambingan Falls, and Tampayan, including open agricultural areas, mango plantations, and second-growth forest. Specimens taken at various elevations between mid-February and late March were in or approaching breeding condition. Stomach contents included flower parts, small insects, and spiders. The Sibuyan material appears intermediate between *N. s. sperata* and *N. s. trochilus.*

WEIGHT—Combined (17) 7.3 ± 0.8, 6.1–8.9 g.

Nectarinia jugularis jugularis
Olive-backed Sunbird

LOCAL NAME—*Toyamis.*

McGregor (1905a, p. 17) considered the Olive-backed Sunbird to be "abundant" on Sibuyan and mentioned that a nest with three eggs was found on 22 June 1904. This species was recorded on Sibuyan by Bourns and Worcester (1894) and Parsons (Baud, 1976). In the DMNH, FMNH, PNM, and SUMNH there are over 80 specimens taken on the island, all below 80 m, and most from areas with disturbed habitat. In May 1989 several adults were collected, all below 50 m. They varied from having enlarged sexual organs to being reproductively inactive. Immature birds were also noted during that period. In 1992 this species was recorded only around 30 m, near the Lambingan Falls, where it was abundant. Individuals collected at this locality in mid-March ranged from immature birds with 0 to 20% of the skull pneumatized to males and females with well-developed sexual organs. This species was recorded and collected at several other heavily disturbed lowland sites, including mangroves, and scrubby vegetation near agricultural fields. Stomach contents consisted of flower and plant parts, small insects, and spiders.

WEIGHT—Combined (27) 8.9 ± 0.7, 7.7–10.0 g.

Aethopyga siparaja magnifica
Crimson Sunbird

LOCAL NAME—*Polahan.*

McGregor (1905a, p. 17) considered the Crimson Sunbird "abundant" on Sibuyan (specimens in FMNH, USNM). Bourns and Worcester (1894) also reported this species. Parsons collected two males near San Fernando in late July and early August 1928 (Baud, 1976). There are a number of recent specimens in the DMNH and PNM taken near Jao-asan and on the northern and western lower slopes of Mt. Guitinguitin. Two males collected near Taclobo on 15 May 1972 had enlarged testes (SUMNH). A male molting into adult plumage was obtained on 24 July 1986 in the Pawala River Valley (NMBE).

In May 1989 this species was found in forested areas, between 325 and 725 m, along the trail leading from Agdamagan to Mayo's Peak. Specimens include a male with greatly enlarged testes on 3 May, a fledgling on 4 May, and an immature bird on 21 May (FMNH).

In 1992 this species was found in all transect

zones from 30 to 1350 m, occurring across all forested portions of the north slope of Mt. Guitinguitin. At higher elevations, above 1350 m, it was conspicuous and males were noted singing from and defending flower trees and vines from conspecifics. Stomach contents of collected individuals included spiders, fragments of tiny insects, and flower parts. Between 12 and 19 March 1992 males collected at 30 m had slightly enlarged testes; between 14 and 24 February 1992, at 325 m, a female had a slightly enlarged ovary with a 1-mm ovarian follicle, another female had an enlarged ovary (13 × 13 mm) with a yolked egg, and two males had testes measuring 4 × 3 mm and 8 × 6 mm, respectively; and between 4 and 9 March 1992, at 1350 m, two females had slightly enlarged ovaries and two males had 7 × 7–mm testes.

WEIGHT—Combined (13) 9.7 ± 0.7, 8.2–11.0 g.

Family Dicaeidae

Dicaeum aeruginosum striatissimum Striped Flowerpecker

On 7 July 1904 McGregor (1905a, p. 18) collected three Striped Flowerpeckers on Sibuyan, all "birds of the year" (one in USNM). The only other record of which we are aware is a specimen collected at an unspecified locality on 15 May 1954 (PNM).

Dicaeum trigonostigma sibuyanicum Orange-bellied Flowerpecker

Bourns and Worcester (1894) found the Orange-bellied Flowerpecker on Sibuyan and described the local form as *sibuyanicum*. In 1928 Parsons collected 16 individuals near San Fernando (Baud, 1976), and there is also a series in the PNM (some transferred to the AMNH and FMNH) taken in mid-May 1954 at an unspecified locality; 11 of these specimens are of immature birds or fledglings. A collection of 29 individuals obtained near Taclobo and Binaya-an in the first portion of May 1972 included five fledglings and a female with a "ripe egg" (SUMNH). In the DMNH there is a series taken in June 1973 at about 400 m on the lower slopes of Mt. Guitinguitin above España. In late July two juveniles and a male with enlarged testes were obtained in the Pawala River Valley (NMBE). In May 1989 this species was one of the most commonly netted birds at 325 m and distinctly less common at 725 m (Table 1). Ten specimens were taken, six of which are fledglings or immature birds.

In 1992 the Orange-bellied Flowerpecker was found at all elevations along our altitudinal transect: 30, 325, 725, and 1350 m. This species occurred in forested areas and other habitats from sea level to Mayo's Peak. Numerous collected individuals that were in or approaching breeding condition had only partially pneumatized skulls. The variation found in skull pneumatization does not appear to correlate with either plumage patterns or reproductive condition. Stomach contents included fruit fiber, small seeds, flower parts, and spiders.

This species was recently revised by Parkes (1989), who recognized three subspecies as occurring in Romblon Province (all endemic to their respective islands): *intermedium*—Romblon, *cnecolaemum*—Tablas, and *sibuyanicum*—Sibuyan.

WEIGHT—Combined (37) 8.6 ± 0.8, 7.5–10.6 g.

Dicaeum pygmaeum pygmaeum Pygmy Flowerpecker

Bourns and Worcester (1894) found the Pygmy Flowerpecker on Sibuyan (one specimen in USNM). The only more recent records are three individuals collected near San Fernando in mid-July and August 1928 (Baud, 1976) and on the slopes above Silum in October 1971 (DMNH). This species has not been recorded by any ornithological group visiting the island since 1971.

Family Zosteropidae

**Zosterops montanus* subsp. Mountain White-eye

From 7 to 9 March 1992 the Mountain White-eye, previously unknown from the Romblon Province, was observed daily in patches of mossy forest above 1450 m and below Mayo's Peak. No specimens were collected but the salient plumage characters of this species were discernible from close observations. The Mountain White-eye together with the Island Thrush form the resident bird community restricted to the top of Mt. Guitinguitin.

Family Ploceidae

**Passer montanus saturatus*
Eurasian Tree Sparrow

LOCAL NAME—*Mayang tagalog.*

The Eurasian Tree Sparrow was not reported from Sibuyan until April 1989, when it was found to be relatively common near villages and barrios on the northern side of the island. Two specimens were collected in late April 1989 in the vicinity of Tampayan (FMNH). In 1992 this species was observed in Cadjiocan, Magdiwang, Tampayan, and San Fernando.

WEIGHT—Female (1) 20.5; unsexed immature (1) 15.5 g.

Family Estrildidae

Lonchura leucogastra manueli
White-bellied Munia

LOCAL NAME—*Maya* (used for munias or small birds).

McGregor (1905a, p. 17) considered the White-bellied Munia to be "abundant" on Sibuyan (FMNH, USNM). Parsons collected a single individual near San Fernando in August 1928 (Baud, 1976). Fifteen specimens taken near Taclobo in May 1972 (SUMNH) included a female with a "ripe egg," taken on 18 May.

In late April and May 1989 the White-bellied Munia was one of the most common birds in cleared lowland areas near Agdamagan and Tampayan, particularly in the vicinity of rice fields. Sixteen specimens were collected, including one bird in immature plumage, molting into adult plumage, and adults in various stages of breeding condition from having small to well-developed sexual organs. On 28 February 1992 a single individual was netted along Mayo's Peak Trail at approximately 600 m in a partially cleared forest block (about 1,000 m^2). This spot was completely surrounded by relatively undisturbed forest. The individual was a female entering breeding condition and the stomach contained plant material and small seeds.

WEIGHT—Combined (14) 11.8 ± 1.1, 10.0–14.0 g.

Lonchura malacca jagori
Chestnut Munia

Bourns and Worcester (1894) recorded the Chestnut Munia on Sibuyan. McGregor (1905a, p. 17) considered this species, like *leucogastra,* to be "abundant." In 1954 a specimen was collected at an unidentified locality (PNM). A male with enlarged testes was taken at Taclobo on 17 May 1972 (SUMNH). In 1989 this species was found only in lowland agricultural areas below 50 m and was distinctly less common than the White-bellied Munia. Specimens collected in the vicinity of Agdamagan include an immature bird on 28 May and an adult female on 1 June with a greatly enlarged ovary and an ovarian follicle measuring 13 mm (FMNH).

In March 1992 five specimens were netted along the beach, at the edge of mangroves, and in coconut groves near the Lambingan Falls (sea level to 20 m). Two individuals were also taken in rice fields near Tampayan on 21 and 22 March 1992, one of which was a female incubating four eggs. Stomach contents included several types of small seeds.

WEIGHT—Combined (7) 11.1 ± 1.1, 10.2–12.5 g.

Analysis and Discussion

Sibuyan Avifauna

NUMBER OF SPECIES—A total of 130 bird species have been recorded on Sibuyan, of which 102 are known or presumed breeding residents. An additional five species, *Pernis ptilorhyncus, Spizaetus philippensis, Ducula bicolor, Bubo philippensis,* and *Culicicapa panayensis,* may also occur on the island, but the records of their occurrence are not adequately substantiated. Older museum records and the 1989 and 1992 results for Sibuyan yield a combined total of 98 resident species, not associated with the sea or seacoast, that have been recorded on the island (Table 2). Ninety-three of these are found below 100 m and only two are confined to upper elevations. When the list is confined to resident birds occurring in grasslands, degraded forest, or primary forest, 37 species were found within the 30-m transect zone, 24 at 325 m, 19 at 725 m, and 10 at 1325 m. This decrease in species richness with increased elevation is sig-

nificant (correlation with log-transformed data, $P = .024$, $r = 0.98$, $N = 4$).

A considerable amount of cumulative historical information is available on the birds of Sibuyan, and this information, combined with our 1989 and 1992 trips to the island, gives an excellent approximation of the past and present avifauna of the island. The birds of Sibuyan are better known than those on the vast majority of islets in the Philippines, and this information is useful for examining elevational patterns and biogeographic relationships of the resident avifauna.

ELEVATIONAL DISTRIBUTIONS—Of the 98 resident nonmarine species recorded on the island, only seven (7%) have continuous elevational distributions from near sea level to 1325 m: *Spilornis cheela, Phapitreron leucotis, Macropygia phasianella, Cyornis rufigastra, Pachycephala homeyeri, Aethopyga siparaja,* and *Dicaeum trigonostigma.* The opposite extremes include 71 species (72%) that occur only between sea level and 100 m elevation, and two species (2%), *Turdus poliocephalus* and *Zosterops montanus,* that are restricted to the 1325-m-and-above zone.

Four species occur from near sea level to 325 m (*Ptilinopus leclancheri, Centropus viridis, Terpsiphone cinnamomea,* and *Anthreptes malacensis*) and an additional six species extend farther up the mountain to 725 m (*Ptilinopus occipitalis, Loriculus philippensis, Ninox philippinus, Dendrocopos maculatus, Hypothymis azurea,* and *Nectarinia sperata*). There is a relatively small midelevational group of bird species restricted to the upper portion of the lowland and the montane forest plant communities, occurring between 325 and 725 m: *Gallus gallus, Chalcophaps indica, Pitta erythrogaster, Eudynamis scolopacea, Ceyx lepidus,* and *Halcyon winchelli.* It may be that these birds require intact forest and the degradation of the lowland forest has restricted them to slightly higher elevations.

The greatest differences in species richness along the elevational gradient are between lowland and montane forest. Of the 76 species occurring between sea level and 100 m (excluding the 17 aquatic species), 40 (53%) are found in open or heavily disturbed areas, and 37 (49%) are forest-dwelling. Four species occurring in open areas appear to have colonized the island in the past few decades, and thus, the number of species found in this ecotype is slightly inflated compared to the period before the destruction of the lowland forest. However, even with this change in the resident lowland bird fauna, the general pattern of decreasing species diversity as a function of increasing elevation is still clear.

Of the 76 genera of resident birds listed in Table 2, 31 contain species that are forest-dwelling, and seven of these genera contain more than one species. These include (number of species in parentheses) *Ptilinopus* (2), *Ducula* (3), *Ceyx* (2), *Halcyon* (2), *Pitta* (2), *Hypothymis* (2), and *Dicaeum* (3). The general pattern is for congeners to have broadly overlapping elevational ranges on the mountain. For example, all three species of *Ducula* known from the island occur between sea level and about 100 m. In four cases (*Ptilinopus, Ceyx, Halcyon,* and *Hypothymis*), pairs of species occur together in the lowland areas up to 100 or 325 m, and one of the species continues to slightly higher elevation. There appears to be no example on Sibuyan of elevational replacement by congeners.

DENSITIES OF BIRDS ALONG THE TRANSECT, BASED ON NETTING—The number of nets in operation at each site varied. In 1989 generally 10 nets were in operation, and in 1992 up to 40 nets were used. In 1989 individual nets were left up for four to five days, after which their position was changed. In 1992 nets were left up as long as 10 days, but only the birds captured during the first four days were used in calculating netting capture rates. A net left up for a 24-hour period is termed a "net-day." A few 6-m nets (other specifications the same as the 12-m nets) were used, and each of these set for a 24-hour period is considered 0.5 net-day.

In 1989 mist-netting was conducted in open country at 200 m and in forested sites at 325 and 725 m (Table 1). In total, 19 species of birds were netted. At each site approximately the same number of species was captured (range 8–9 species). The number of accrued net-days per site is insufficient to warrant detailed analysis of the results, but there appears to be a pattern of decreasing density as a function of increasing elevation. The capture rate at 200 m was 1.31 birds per net-day; at 325 m, 0.67 bird per net-day; and at 750 m, 0.45 bird per net-day (correlation of log-transformed data, $P = .19$, $r = 0.91$, $N = 3$).

During 1992 extensive mist-netting was conducted in each elevational zone. Because of differences in season and netting protocol we feel that it is inappropriate to make detailed comparisons between the two years. Twenty-one resident species and eight migrant species were netted. The capture rates in 1992, excluding migrants, were

TABLE 2. Elevational distribution of presumed resident birds on Sibuyan Island (excludes swifts, shorebirds, coastal birds, and seabirds).[1]

Species	Habitat[2]	Transects 1989 and 1992				General lowlands
		0-30 m	325 m	725 m	1325 m	0-100 m
Ardea purpurea	A					+
Butorides striatus	A	+				+
Bubulcus ibis	O					+
Nycticorax caledonicus	A	+				+
Ixobrychus sinensis	A					+
Ixobrychus cinnamomeus	A	+				+
Dendrocygna arcuata	A					+
Anas luzonica	A					+
Pernis celebensis	F					+
Elanus caeruleus	O					+
Haliastur indus	O	+				+
Haliaeetus leucogaster	A	+				+
Spilornis cheela	F	+	+	+	+	+
Hieraaetus kienerii	F					+
Falco severus	O				+	[+]
Falco peregrinus	O					[+]
Megapodius cumingii	F					+
Coturnix chinensis	O					+
Gallus gallus	F		+	+		[+]
Turnix suscitator	O					+
Gallirallus striatus	A					+
Gallirallus torquatus	A					+
Porzana fusca	A					+
Porzana cinerea	A					+
Amaurornis olivaceus	A					+
Amaurornis phoenicurus	A					+
Gallicrex cinerea	A					+
Rostratula benghalensis	A					+
Treron vernans	F	+				+
Phapitreron leucotis	F	+	+	+	+	+
Ptilinopus occipitalis	F	+	+	+		+
Ptilinopus leclancheri	F	+	+			+
Ducula poliocephala	F					+
Ducula carola	F					+
Ducula aenea	F					[+]
Columba vitiensis	F					[+]
Macropygia phasianella	F	+	[+]	[+]	+	+
Streptopelia bitorquata	O					+
Streptopelia chinensis	O					+
Geopelia striata	O					+
Chalcophaps indica	F		[+]	+		+
Prioniturus discurus	F		+			+
Tanygnathus lucionensis	F					+
Loriculus philippensis	F	+	+	+		+
Cuculus fugax	F					+
Cacomantis variolosus	F					+
Eudynamis scolopacea	F		[+]	+		+
Centropus viridis	O	+	+			+
Tyto capensis	O					+
Otus mantananensis	O					+
Ninox philippensis	F	+	+	+		+
Caprimulgus manillensis	O	+				+
Caprimulgus affinis	O					+
Alcedo cyanopectus	F					+
Ceyx lepidus	F		+	+		+
Halcyon capensis	A					[+]
Halcyon coromanda	F					[+]

TABLE 2. *Continued.*

Species	Habitat[2]	Transects 1989 and 1992				General lowlands
		0-30 m	325 m	725 m	1325 m	0-100 m
Halcyon smyrnensis	O					+
Halcyon winchelli	F	+	+	+		
Halcyon chloris	O	+				+
Merops viridis	O					+
Merops philippinus	O					[+]
Eurystomus orientalis	O					+
Dendrocopos maculatus	F	+	+	+		+
Pitta erythrogasıer	F		+	+		
Pitta sordida	F					+
Alauda gulgula	O					[+]
Hirundo tahitica	O	+				+
Lalage nigra	O	+				+
Pycnonotus goiavier	O	+				+
Oriolus chinensis	O					+
Corvus macrorhynchos	O	+				+
Copsychus saularis	O	+				+
Turdus polioephalus	F				+	
Megalurus timoriensis	O					+
Megalurus palustris	O					+
Cisticola exilis	O					+
Cyornis rufigastra	F	+	+	+	+	+
Rhipidura javanica	O	+				+
Hypothymis coelestis	F					[+]
Hypothymis azurea	F	+	+	+		+
Terpsiphone cinnamomea	F	+	+			
Pachycephala homeyeri	F	+	+	+	+	+
Anthus novaeseelandiae	O	+				+
Artamus leucorhynchus	O	+				+
Aplonis panayensis	O	+				+
Sarcops calvus	O					+
Anthreptes malacensis	F	+	+			+
Nectarinia sperata	O	+	+	+		+
Nectarinia jugularis	O	+				+
Aethopyga siparaja	F	+	+	+	+	+
Dicaeum aeruginosum	F					[+]
Dicaeum trigonostigma	F	+	+	+	+	+
Dicaeum pygmaeum	F					+
Zosterops montanus	F				+	
Passer montanus	O					+
Lonchura leucogastra	O					+
Lonchura malacca	O	+				+
Total number of species		37	24	19	10	93

[1] Brackets indicate that the elevation is inferred.

[2] Habitat definitions based mostly on information from Sibuyan Island and supplemented by duPont (1971) and Dickinson et al. (1991): A = aquatic, including rice fields; O = open or heavily disturbed areas; and F = forest or forest edge.

(accrued net-days in parentheses) 0 to 30 m, 0.28 bird per net-day (90); 325 m, 0.28 bird per net-day (151); 725 m, 0.32 bird per net-day (140); 1325 m, 0.18 bird per net-day (78); and 1525 m, 0.13 bird per net-day (36). Thus, general capture rates were more or less constant through 725 m; above this elevation the numbers declined substantially.

MIGRANTS ON SIBUYAN ISLAND—Of the 132 species recorded on Sibuyan, 29 (22%) are not known to breed on the island. This includes migrants that spend the boreal winter on the island and return in the spring to mainland Asian or Japanese breeding grounds, and those that pass through the Philippines in the autumn and spring while on migration. Of the 29 migrants recorded on the island,

TABLE 3. Changes in resident bird species on Sibuyan Island over the past 100 years.

Species	Status[1]	Proposed cause[2]
Rare, declining, or extirpated species		
Ardea purpurea	1	1
Egretta sacra	1	1
Dendrocygna arcuata	1	1
Falco peregrinus	1	1
Megapodius cumingii	1	2
Ducula carola	2	2
Ducula aenea	1	2
[*Ducula bicolor*]	1	2
Columba vitiensis	1	2
Halcyon capensis	2	1
Halcyon coromanda	3	1
Alauda gulgula	1	1
Additions		
Bubulcus ibis	7	4
Ixobrychus sinensis	4	3
Porzana fusa	5	3
Amaurornis olivaceus	6	3
Amaurornis phoenicurus	4	3
Streptopelia chinensis	5	4
Geopelia striata	7	4
Cuculus fugax	6	3
Cacomantis variolosus	7	3
Tyto capensis	5	3
Otus mantananensis	7	3
Pycnonotus goiavier	8	4
Turdus poliocephalus	4	3
Megalurus palustris	5	3/4
Zosterops montanus	4	3
Passer montanus	5	4

[1] Status codes: 1—not recorded since pre-1905; 2—not recorded since 1928; 3—not recorded since 1892; 4—first recorded 1992; 5—first recorded 1989; 6—recorded in 1971/72 only; 7—first recorded in 1971/72; 8—first recorded in 1954.

[2] Proposed cause: 1—uncommon or overlooked; 2—extirpated or erratic migrant to island; 3—increased exploration/chance; 4—recent colonization.

13 (45%) are water birds or shorebirds associated with lowland coastal or freshwater habitats, 2 (7%) are birds of prey, and 13 (44%) are passerines. Of the passerines, 5 (42%) species belong to the family Turdidae and most were found in the mossy forest zone of the mountain, in several cases in relatively high densities. Most of these migrants breed in temperate portions of Asia.

On a clear day from near Mayo's Peak it is possible to see numerous surrounding islands, e.g., the high mountains of southern Luzon, Mindoro, Panay, Marinduque, Romblon, and Tablas, and the numerous small islets scattered around the Sibuyan Sea. For migratory birds, the summit of Mt. Guitinguitin must be a prominent landmark.

CHANGES IN THE RESIDENT AVIFAUNA OF SIBUYAN ISLAND BETWEEN 1892 AND 1992—When the Menage Expedition (Bourns & Worcester, 1894) and McGregor (1905a) visited Sibuyan in 1892 and 1904, respectively, there were fewer people living on the island. The Magdiwang area population was about 1,000 at the turn of the 19th century (Bureau of Insular Affairs, 1902); it had grown to 9,600 by 1988 (Anonymous, 1989). The amount of lowland forest has also changed drastically. The Bureau of Insular Affairs (1902, p. 788) reported, "There are vast forests [on Sibuyan] of valuable woods, but no effort is made to utilize them for building or commerce." Only a small portion of those forests remains intact today.

We have no information on the conditions found during the 1928 mission to Sibuyan (Baud, 1976). When Oane and Ramos visited the island in 1954, they found considerable portions of the lowland forest on the north side gone (J. Ramos, pers. comm.). There was little to no forest between the coast and the village of Jao-asan. At that time the forest started on the south side of the Dulangan River, across from Jao-asan, and almost 3 km inland from the coast. In general, as the lowland forest was cleared, new habitats were created, e.g., *cogon* grasslands, extensive rice paddies, coconut groves, and regenerating secondary forest. On the basis of cumulative information it is clear that these human-induced perturbations have had an impact on the birds of the island, resulting in some losses and some additions to the island's avifauna (Table 3).

The Menage and McGregor 1892 and 1904 expeditions collected several species of birds that have not been recorded on the island subsequently. Most conspicuous among these were three species of pigeons: *Ducula carola* (this species was also collected by Parsons in 1928), *D. aenea,* and *Columba vitiensis.* Further, McGregor had evidence that a fourth species, *Ducula bicolor,* occurred on the island, but he was unable to document this.

Possible factors contributing to these changes are habitat degradation, erratic migratory movements between islands, and hunting pressure. On other islands, *D. carola* is recorded from lowlands to 2000 m, *D. aenea* from mangroves up to 1125 m, *D. bicolor* in lowland forest, and *Columba vitiensis* in montane forest up to 1670 m (Goodman & Gonzales, 1990; Dickinson et al., 1991). We know nothing about the former elevational range of these species on Sibuyan. On the basis of the brief descriptions in Bourns and Worcester's and

McGregor's travel itineraries, we know that they did not visit the higher slopes of Mt. Guitinguitin. They presumably hired local hunters to gather birds from a variety of localities and habitats. Given the broad elevational range of several of these pigeons elsewhere in the Philippines and the fact that intact forest remains on Sibuyan within this range, the disappearance of these birds cannot be explained simply by the destruction of the lowland forest. Further, there is no evidence that pigeon hunters have ever visited remote upland areas of the island. Large frugivorous pigeons in the Philippines are known to have elevational movements associated with the availability of fruits, often in large flocks and over considerable elevational ranges (Rabor, 1977; Miranda, 1987). It is conceivable that the pigeons that formerly occurred on Sibuyan depended seasonally on lowland fruit trees. The destruction of most of the lowland habitat, combined with locally intense human hunting pressure in the areas that pigeon flocks would have visited, may have led to their disappearance from the island.

Cumulative records of the occurrence of *Ducula poliocephala* on Sibuyan may support the notion of interisland migration for this species. McGregor (1905a) reported collecting this species on Sibuyan both in interior forest and near the sea. The only subsequent records of this vocal and sometimes conspicuous species on the island are of nine individuals taken at four different localities in late August and October 1971. The sporadic nature of these records points to erratic seasonal movements between islands. However, similar movements do not seem sufficient to explain the disappearance of the other two *Ducula* and the *Columba* pigeons from Sibuyan. The fact that early explorers found all of these species during short visits to the island and none was found after 1928, despite use of local hunters and more thorough exploration of all island habitats, indicates that these changes are real and not just a question of sampling or chance.

Other species of forest-dwelling birds such as *Megapodius cumingii* and *Tanygnathus lucionensis* have serious declined on Sibuyan. *Megapodius* was found on Sibuyan by Bourns and Worcester (1894) and McGregor (1905a) but was not positively documented thereafter by other scientists visiting the island. In other areas of its range, this species often occurs in lowland and coastal forests (Delacour & Mayr, 1946; Dickinson et al., 1991), and it is often hunted or the nests robbed of eggs (Dickinson et al., 1991; SMG, pers. obs). In the 1950s eggs of this species were seasonally available in the Magdiwang market (J. L. Tansiongco, pers. comm.). In October 1991 a bird hunter from Tampayan shot at least two *Megapodius* in the mangroves at Agnonok. Presumably, the combination of habitat change and human persecution has led to this species' rarity on the island. *Tanygnathus* was apparently more common at the turn of the 19th century than in recent years. An informant, about 50 years old and a resident of Jao-asan, mentioned that he had seen this species go from common to scarce within his lifetime.

There are some anomalous cases of species known to occur in a variety of habitats, including those still present on Sibuyan, that were recorded by early ornithological expeditions to the island but not seen subsequently. These include *Ardea purpurea, Egretta sacra, Dendrocygna arcuata, Falco peregrinus, Halcyon capensis,* and *Halcyon coromanda.* In most cases these species were documented only once on the island, and the subsequent lack of records may be best explained by migration, rarity, or simply chance.

With the conversion of much of the lowland forest through logging and agriculture, creating new habitats, a number of species that are tolerant of disturbance have colonized the island. One is *Pycnonotus goiavier,* which throughout its broad Southeast Asian range is regarded as "common in scrub, second growth, residential, and cultivated areas" (Dickinson et al., 1991, p. 284). Until 1954 it had not been recorded on Sibuyan. Since that period it has proliferated and is now one of the most common species in heavily disturbed areas below 75 m. Other examples include two species of open-country doves, possibly introduced to other Philippine islands by humans. *Geopelia striata* was first recorded on Sibuyan in 1972 and *Streptopelia chinensis* in 1989. *Passer montanus,* another species introduced into the Philippines, was first recorded on Sibuyan in 1989 at Magdiwang. In 1992 we found it in all of the large coastal villages around the island. *Bubulcus ibis* is first known from the island in 1972. Other recent additions to the Sibuyan list are simply the result of more intensive exploration of higher elevations (*Turdus poliocephalus* and *Zosterops montana*) and the discovery of species rare enough to have been missed or with secretive behavior (*Ixobrychus sinensis, Porzana fusca, Amaurornis olivaceus, A. phoenicurus,* and *Cuculus fugax*).

In summary, the avifauna of Sibuyan has undergone some clear changes in the past 100 years. In several cases the recent addition of species tol-

erant of severe natural habitat disturbance, particularly lowland forest, can be explained on the basis of the ecological changes that have taken place on the island. Yet several species that would presumably have had broad elevational ranges have disappeared from the island.

Biogeography

Comparison of the Avifaunas of Sibuyan, Tablas, and Romblon Islands—A total of 102 resident birds have been recorded on Sibuyan (233 km^2), 74 on Tablas (828 km^2), and 57 on Romblon (130 km^2) (Table 4). Thus, the number of species recorded on each island is not simply a function of total island area. Sibuyan has more relief, and consequently a wider range of habitats, than the other two islands. Moreover, the earlier degradation of natural lowland habitats on Romblon and Tablas, particularly before the post-1954 work in the area, may account for some of these differences. Finally, during the late Pleistocene, Tablas and Romblon were connected to each other, and Sibuyan was isolated from these two islands (see p. 2).

The intensity of ornithological studies conducted on each of these islands is not equivalent. Sibuyan has been the site of relatively intensive bird surveys and is certainly the best known. Despite the unevenness of data from these islands, there are obvious differences in their avifaunal composition (Table 4).

Several species, genera, and even families are known from Tablas (T) and/or Romblon (R) that have not been recorded on Sibuyan. These include *Cacatua haematuropygia* (T); *Hemiprocne comata* (T), the only member of the family Hemiprocnidae in the region; *Megalaima haemacephala* (R, T), the only member of the family Capitonidae in the area; *Coracina striata* (T); *Hypsipetes siquijorensis cinereiceps* (a subspecies endemic to R, T); and *Dicrurus hottentottus* (T).

Elanus caeruleus and *Dendrocopos maculatus,* both relatively conspicuous birds, have been recorded on Sibuyan but not on Tablas or Romblon. The latter species has an endemic subspecies on Sibuyan, *D. m. menagei,* and is the only woodpecker recorded on any of the three islands.

There is one apparent case of congener replacement. The pigeon *Treron pompadora* is known from Romblon and Tablas, while *T. vernans* is the only member of this genus recorded on Sibuyan. Both of these species occur in lowland forest, including disturbed areas (Dickinson et al., 1991).

A total of 83 resident species have been recorded on Tablas and Romblon (Table 4), of which 54 are nonpasserines and 12 are aquatic species. Of these 83 species, 25 (30%) are restricted to Tablas and 8 (10%) to Romblon. Although these two islands were connected during the Pleistocene, there are considerable differences in their known avifaunas. This may be related in part to their incomplete ornithological exploration.

A combined total of 111 resident species have been recorded on Tablas, Romblon, and Sibuyan islands (Table 4), of which 76 are nonpasserines and 19 are aquatic. Thirty (27%) of these are found only on Sibuyan, and 6 (5%) are known from either Tablas or Romblon and not Sibuyan. Sibuyan has a distinctly richer avifauna than the other two islands, and numerous species recorded on Sibuyan are not known from other localities within the province. The avifaunas occurring on Tablas and Romblon are more similar to each other than either is to that on Sibuyan.

Comparison of the Avifaunas of Small Islands off Mindoro and Between Panay and Tablas—Information is available on the birds occurring on some of the small islands off the southeastern coast of Mindoro and between Tablas and Panay (Fig. 1). During the period of low sea levels in the Pleistocene, several of these islands were connected to larger land masses (Mindoro and Panay), while others, surrounded by deep water, were not connected. These islands allow a comparison of the ability of various bird species to colonize over land and/or across water gaps.

The islands are Semirara (91 km^2), separated from Mindoro by a distance of 15 km and ocean floor depths not exceeding 85 m; Caluya (16 km^2) and Sibay (36 km^2), both of which are about midway between the northwestern peninsula of Panay and southeastern Mindoro and are separated from each other by sea depths of over 180 m and from greater Mindoro (including Semirara) and Panay by depths exceeding 200 m; Carabao (49 km^2), separated by relatively deep water (more than 350 m modern depth) and less than 7 km distance from the southern shore of Tablas; and Boracay (5 km^2), within 4 km of the peninsula extending from northwestern Panay, separated by shallow water. The modern water depth between Boracay and Carabao is approximately 90 m. All of these islands are relatively flat with little topographical relief, the highest being Carabao with the island's peak at 220 m (above figures calculated from Phil-

ippine Coast Pilot, 1968; Defense Mapping Agency Hydrographic Center, 1977, 1978). Information on the avifauna of these islands is compiled from McGregor (1905b, 1906a), Alcala and Alviola (1970), and specimens in the SUMNH (see Table 5).

Two clear groups of islands can be distinguished. Late Pleistocene land-bridge islands include Semirara, which was connected to Mindoro, and Boracay and Carabao, which were attached to each other and to Panay. Islands isolated from larger island masses include Caluya and Sibay, which were not attached to each other. Further, greater Panay (including Boracay and Carabao) was separated from greater Tablas (including Romblon) by a channel less than 5 km wide.

McGregor's (1905b, 1906a) avifaunal lists for these islands date from the turn of the 19th century, a period when the natural vegetation was presumably intact. By the time Alcala and Alviola (1970) conducted their work, the amount of intact lowland forest on each varied from a maximum of 20% on Semirara to 0% on Caluya. The bird lists compiled from these sources are presumably incomplete, particularly of the avifauna prior to human degradation. However, even given this limitation, several interesting patterns emerge about the avifaunal composition of these islands in relation to Mindoro, Panay, and Romblon Province islands.

For the four smallest islands (Boracay, Caluya, Sibay, and Carabao), the total number of birds recorded on each ranges from 31 to 34 species, while total island area varies from 5 to 49 km^2 (Table 5). Thus, irrespective of Pleistocene land connections and island size, species totals are generally similar. The birds found on these islands tend to be species that are ubiquitous in the Philippines. Semirara, the largest of the five islands, has the greatest number of species (51), most of them also broadly distributed taxa. There was not a significant relationship between island area and species diversity (correlation of log-transformed data, $P = .19$, $r = 0.70$, $N = 5$).

In a few cases, these broadly distributed species do show patterns of geographic variation associated with Pleistocene land bridges and nearest island connections. The assumption here is that phenotypic variation or similarity between populations as measured by subspecific classification (*sensu* Dickinson et al., 1991) reflects some measure of genetic exchange. For example, *Hypsipetes philippinus mindorensis* is restricted to Mindoro and Semirara, while *H. p. guimarasensis* is found only on Panay, Boracay, and Carabao. *Centropus v. viridis* occurs on Panay, Carabao, Boracay, Tablas, Romblon, Sibuyan, and many other islands in the Philippines and *C. v. mindorensis* on Mindoro and Semirara. Presumably, the Mindoro/Semirara population became isolated after invading greater Mindoro. Although this species is known from Sibay and Caluya, no specimens are available and the subspecific designation remains in question. If the subspecies is allied to *mindorensis,* then these islands presumably acted as stepping stones for the dispersal of birds from greater Panay; if referable to nominate *viridis,* then the main isolation took place between the Sibay/Caluya and Mindoro/Semirara populations. Thus, genera such as *Centropus* and *Hypsipetes* are able to disperse across water barriers on occasion, but such events appear to be relatively rare. In general, however, an analysis of the distribution of the known bird species of these islands provides no clear distinction between the avifaunas of Pleistocene land-bridge islands and isolated islands. This may reflect either incomplete information on species composition or the extirpation of some portion of the local avifauna, after the islands were cleared, and replacement by recent over-water colonizers.

Of the 62 bird species recorded from Caluya, Sibay, Semirara, Boracay, and Carabao (Table 5) all but four (6%) are known from either Tablas, Romblon, or Sibuyan islands within the Philippines (Dickinson et al., 1991). The broad overlap in species composition between these eight islands supports the idea that their current avifaunas are made up of broadly distributed taxa able to cross water gaps. The four exceptions are *Ducula bicolor, Hypsipetes philippinus, Centropus bengalensis,* and *Zosterops meyeni,* all of which are known from land-bridge islands and at least one oceanic island within the Philippines (Dickinson et al., 1991).

COMPARISON OF THE AVIFAUNAS OF ROMBLON PROVINCE WITH NEIGHBORING LARGE ISLANDS, AND POTENTIAL SOURCES OF COLONIZERS—A considerable number of landbird families are known to breed on the nearby surrounding larger islands of Luzon (L), Panay (P), and Mindoro (M) but are not known to occur on Sibuyan, Romblon, or Tablas. These are (the number of species known from each island is presented in parentheses after the island abbreviation) Podargidae—L (1), P (1); Trongonidae—L (1); Bucerotidae—L (2), P (2), M (1); Irenidae—L (1); Paridae—L (2), P (1), M (1); Sittidae—L (1), P (1); Rhabdornithidae—L (2), P (1); Timaliidae—L (5), P (2); and Fringillidae—L (2).

TABLE 4. Comparison of the resident bird faunas of Tablas, Romblon, and Sibuyan islands.

Species	Tablas	Romblon	Sibuyan	Sources[1]
Ardea purpurea manilensis	x	x	x	1, 2
Butorides striatus carcinophilus	x	x	x	1, 2, 7
Bubulcus ibis coromandus	x		x	1
Egretta s. sacra		x	x	2
Nycticorax caledonicus manillensis	x		x	1
Ixobrychus sinensis	x		x	1
Ixobrychus cinnamomeus	x		x	1, 7
Dendrocygna a. arcuata			x	
Anas luzonica	x		x	8
Pernis ptilorhynchus	[x]	[x]		12
Pernis celebensis steerei			x	11
Elanus caeruleus hypoleucus			x	
Haliastur indus intermedius	x	x	x	1
Haliaeetus leucogaster	x	x	x	1, 2, 12
Spilornis cheela holospilus	x	x	x	1, 2, 12, 14
Hieraaetus kienerii formosus	x		x	2, 10
Falco s. severus		x	x	1
Falco peregrinus [*ernesti*]			x	
Megapodius cumingii pusillus	x	x	x	1, 7, 9
Coturnix chinensis lineata			x	
Gallus gallus philippensis	x	x	x	1
Turnix suscitator fasciata			x	
Gallirallus s. striatus			x	
Gallirallus t. torquatus		x	x	1, 2
Porzana f. fusca			x	
Porzana cinerea ocularis			x	
Amaurornis o. olivaceus			x	
Amaurornis phoenicurus			x	
Gallicrex cinerea	x		x	10
Rostratula b. benghalensis			x	
Charadrius peronii		x	x	2
Treron pompadora canescens	x	x		2, 7, 10
Treron v. vernans			x	
Phapitreron leucotis nigrorum	x		x	1–4, 7–9
Ptilinopus o. occipitalis	x		x	8
Ptilinopus l. leclancheri	x	x	x	1, 2, 4, 7, 8
Ducula poliocephala			x	
Ducula carola			x	
Ducula a. aenea	x		x	1, 2
Columba vitiensis griseogularis		x	x	2, 9
Macropygia phasianella tenuirostris	x	x	x	2, 7
Streptopelia bitorquata dusumieri	x	x	x	1, 2
Streptopelia chinensis tigrina			x	
Geopelia s. striata	x		x	7, 15
Chalcophaps i. indica	x	x	x	1, 2, 8
Cacatua haematuropygia	x			1
Prioniturus discurus whiteheadi	x		x	1, 2, 9
Tanygnathus lucionensis salvadorii	x	x	x	1–3, 6, 7, 9, 15
Loriculus philippensis bournsi	x	x	x	1–3, 5–9, 14
Cuculus fugax pectoralis	x		x	3, 8
Cacomantis variolosus	x		x	9, 11
Eudynamis scolopacea mindanensis	x	x	x	1, 2, 7
Centropus v. viridis	x	x	x	1–3, 7–9, 15
Tyto capensis amauronota			x	
Otus mantananensis romblonis	x	x	x	2, 3, 7, 8
Ninox philippensis spilonota	x		x	1, 9
Caprimulgus m. manillensis		x	x	9
Caprimulgus affinis griseatus			x	
Hemiprocne comata major	x			1
Collocalia vanikorensis amelis			x	
Collocalia esculenta marginata	x		x	2, 8, 10

TABLE 4. *Continued.*

Species	Tablas	Romblon	Sibuyan	Sources[1]
Collocalia troglodytes	x	x	x	1, 2, 8
Alcedo c. cyanopectus			x	
Ceyx lepidus margarethae	x	x	x	1–3, 9, 14
Halcyon capensis gigantea	x		x	1
Halcyon coromanda major			x	
Halcyon smyrnensis gularis	x		x	1, 3, 8, 9
Halcyon winchelli nesydrionetes	x	x	x	1, 2, 8, 9, 14
Halcyon chloris collaris	x	x	x	1, 2, 6–8, 15
Merops viridis americanus	x		x	1–3, 14
Merops p. philippinus			x	
Eurystomus orientalis cyanocollis	x	x	x	1, 2, 6, 9
Megalaima haemacephala homochroa	x	x		1–3, 8, 9, 14
Dendrocopos maculatus menagei			x	
Pitta e. erythrogaster	x	x	x	1–3, 7–9
Pitta s. sordida	x	x	x	1–3, 7–9
Alauda gulgula wolfei			x	
Hirundo tahitica javanica		x	x	2, 9
Coracina striata mindorensis	x			1–3, 9, 10, 14
Lalage nigra chilensis	x	x	x	1–3, 7, 15
Pycnonotus g. goiavier	x	x	x	1–3, 7–9, 15
Hypsipetes siquijorensis cinereiceps	x	x		1–3, 7–9, 14, 15
Dicrurus hottentottus menagei	x			2, 3, 9, 14
Oriolus chinensis yamamurae	x	x	x	1–3, 6, 7, 9, 14, 15
Corvus macrorhynchos philippinus	x	x	x	1, 7, 8
Copsychus saularis mindanensis	x	x	x	1–3, 7–9, 15
Turdus poliocephalus subsp.			x	
Megalurus timoriensis tweeddalei	x	x	x	2, 7, 14
Megalurus palustris forbesi			x	
Cisticola exilis semirufa	x	x	x	1, 15
Cyornis rufigastra philippinensis	x	x	x	1–3, 7–9, 14, 15
Rhipidura javanica nigritorquis	x	x	x	1–3, 7, 15
Rhipidura cyaniceps sauli	x			1–3, 8, 10, 14, 15
Hypothymis coelestis [*rabori*]			x	
Hypothymis a. azurea	x	x	x	1, 2, 14, 15
Terpsiphone cinnamomea unirufa	x	x	x	1–3, 7–9
Pachycephala homeyeri winchelli	x		x	1, 2, 7–9, 15
Anthus novaeseelandiae lugubris	x	x	x	1, 2, 6, 14
Artamus l. leucorhynchus	x	x	x	1, 2, 7, 15
Aplonis p. panayensis	x	x	x	1–3, 6, 7, 15
Sarcops calvus melanonotus	x	x	x	1, 2, 7–9, 15
Anthreptes malacensis chlorigaster	x	x	x	1–3, 6, 7, 9, 14
Nectarinia sperata trochilus	x	x	x	1–3, 7–9, 15
Nectarinia j. jugularis	x	x	x	1, 3, 7–9, 15
Aethopyga siparaja magnifica	x		x	1–3, 8, 9, 14
Dicaeum aeruginosum striatissimum		x	x	2
Dicaeum trigonostigma ***intermedium***		x		1, 9
Dicaeum trigonostigma ***sibuyanicum***			x	
Dicaeum trigonostigma ***cnecolaemum***	x			1–3, 7–9, 15
Dicaeum p. pygmaeum		x	x	2, 3
Zosterops montanus subsp.			x	
Passer montanus saturatus			x	
Lonchura leucogastra manueli	x	x	x	1, 8
Lonchura malacca jagori	x	x	x	1, 2, 7, 8
Total number of species	74	57	102	

[1] Sources for Tablas and Romblon records: 1—Bourns and Worcester (1894), 2—McGregor (1905a), 3—Baud (1976), 4—specimen(s) in AMNH, 5—specimen(s) in BMNH, 6—specimen(s) in FMNH, 7—specimen(s) in PNM, 8—specimen(s) in SUMNH, 9—specimen(s) in USNM, 10—McGregor (1906b), 11—Dickinson et al. (1991), 12—McGregor (1909), 13—McGregor (1910), 14—specimen(s) in CM, 15—specimen(s) in DMNH. See text for documentation of Sibuyan records. Names in bold are endemic forms. Records in brackets denote that the occurrence of a species on an island has not been verified by a specimen.

TABLE 5. Distribution of breeding birds on islands between the northwestern corner of Panay and Tablas islands.[1] (Based on McGregor, 1905b, 1906a; Alcala & Alviola, 1970; specimens in SUMNH.)

Species	Caluya	Sibay	Semirara	Boracay	Carabao
Egretta sacra			−		
Bubulcus ibis			−		
Butorides striatus		−	−		
Nycticorax [*caledonicus*][2]	−				−
Ixobrychus cinnamomeus					−
Haliastur indus			−		−
Haliaeetus leucogaster		−	−		
Megapodius cumingii			−		
Coturnix chinensis					+
Gallus gallus			+		
Turnix suscitator	−		−	−	−
Gallirallus torquatus	−	−	+	−	−
Porzana cinerea					−
Gallicrex cinerea					−
Treron pompadora		−	+		
Treron vernans	−	−	−	+	+
Ptilinopus leclancheri			+		
Ducula aenea			−		
Ducula bicolor	+	−	−		
Columba vitiensis			−		
Streptopelia bitorquata	−	−	+	+	+
Geopelia striata	−	−	+	−	+
Chalcophaps indica	+	+	−	+	−
Cacatua haematuropygia				−	
Tanygnathus lucionensis	−	−	−	+	
Cacomantis sp.[3]	−	−	−		
Eudynamis scolopacea	−	−	+	−	−
Centropus viridis	−	−	+	+	+
Centropus bengalensis		−	+		
Otus mantananensis			−		
Ninox philippensis			+	+	+
Collocalia esculenta					+
Ceyx lepidus			−		
Halcyon smyrnensis	+	−	−		
Halcyon chloris	+	+	+	+	+
Merops viridis			−	+	
Megalaima haemacephala			−		+
Pitta sordida	−		−	+	
Hirundo tahitica	+	+	−	−	−
Lalage nigra	−	+	+	+	
Pycnonotus goiavier	−			+	+
Hypsipetes philippinus			+	+	+
Dicrurus hottentottus			−		
Oriolus chinensis	+	+	+	+	−
Corvus macrorhynchos	−	+	+	−	+
Copsychus saularis	+	+	+	+	
Megalurus palustris					−
Megalurus timoriensis	+	−	−	−	+
Cisticola exilis	−	−	−	+	
Cyornis rufigastra	+	+	+	+	−
Rhipidura javanica	+	+	−	+	+
Hypothymis azurea	−		+	−	
Anthus novaeseelandiae	+		−		−
Artamus leucorhynchus	+	−	−	−	+
Aplonis panayensis	−	+	−	+	+
Sarcops calvus	+	+	+	+	−
Nectarinia jugularis	+	−	−	+	
Dicaeum pygmaeum		−	−	−	
Zosterops meyeni	+				
Passer montanus					−

TABLE 5. *Continued.*

Species	Caluya	Sibay	Semirara	Boracay	Carabao
Lonchura leucogastra			–		–
Lonchura malacca	–	–	+		+
Total number of resident species	33	31	51	31	34
Total land area of each island (km²)	16	36	91	5	49
Highest point (m)	200	65	160	135	220
Pleistocene connection	none	none	Mindoro	Panay	Panay

[1] + = collected, – = observed.
[2] See Dickinson et al. (1991).
[3] The species involved is (are) not clear.

There are also numerous genera (excluding members of families mentioned above) of resident landbirds found on Luzon, Panay, and Mindoro that are conspicuously absent from the Romblon Province. These include (following the above format) *Accipiter*—L (1), M (1) [*A. soloensis,* a migrant, has been recorded on Sibuyan]; *Gallicolumba*—L (1); *Bolbopsittacus*—L (1); *Phoenicophaeus*—L (2); *Chrysocolaptes*—L (1), P (1); *Phylloscopus*—L (2) [*P. borealis,* a migrant, has been recorded on Sibuyan, Tablas, and Romblon]; and *Orthotomus*—L (3), P (1). As with the families, many of these genera are distinctly more speciose on Luzon than on Panay or Mindoro.

To assess the relationship of Sibuyan's avifauna to those of surrounding islands, we calculated two different similarity indices for the distribution of breeding birds on Sibuyan, Luzon, Mindoro, Panay, Palawan, and Mindanao. The distribution of species known to breed on Sibuyan and on these other five islands is presented in Table 6. (The full data matrix is available upon request.) The two faunal similarity indices were

$$\text{Simpson's Index} = \frac{C}{N_1}$$

and

$$\text{Jaccard's Index} = \frac{C}{N_1 + N_2 - C},$$

where N_1 = the number of species at site 1 (the smaller fauna), N_2 = the number of species at site 2, and C = the number of species common to both sites. The coefficients from these indices (Table 7) were used in a cluster algorithm ("Phylip" written by J. Felsenstein using Fitch-Margoliash method with contemporary tips).

The common result of both analyses (Fig. 11) is the separation of two distinct groups: (1) Palawan and (2) the islands of Sibuyan, Panay, Mindoro, Luzon, and Mindanao. The ordering within the latter group varies between the two indices. Jaccard's Index introduces a bias when comparing faunas with substantially different species totals, with the result that islands with comparable numbers of species show an artificial similarity. The

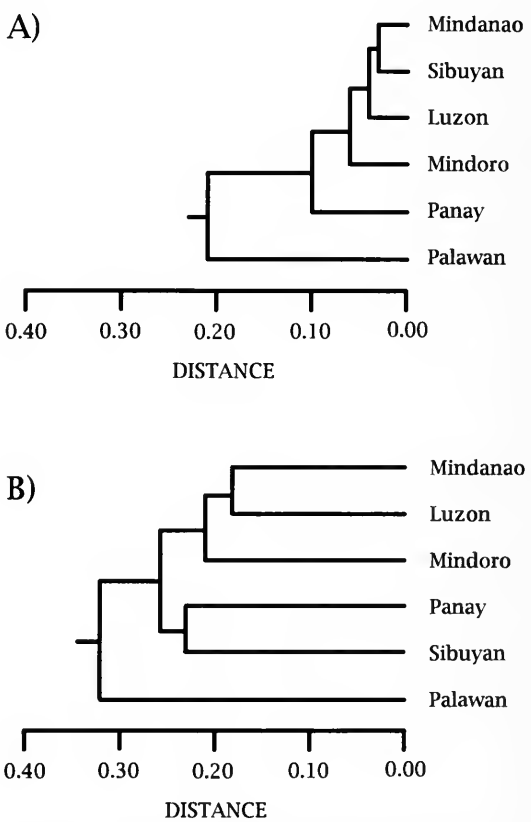

FIG. 11. Cluster analyses of faunal similarity of resident bird species found on six islands in the Philippines using Sorensen's Index (**A**), and Jaccard's Index (**B**). Data from Table 7. See text this page for definitions of indices and statistical tests.

TABLE 6. Distribution of known or presumed breeding birds of Sibuyan Island in relation to Pleistocene island groups (excludes seabirds and shorebirds).[1]

Species	Habitat[2]	Luzon	Mindoro	Panay	Mindanao	Palawan
Butorides striatus	A	x	x	x	x	x
Bubulcus ibis	O	x	x	x	x	x
Nycticorax caledonicus	A	x	x	x	x	x
Ixobrychus sinensis	A	x	x	x	x	x
Ixobrychus cinnamomeus	A	x	x	x	x	x
Dendrocygna arcuata	A	x	x	x	x	x
Anas luzonica	A	x	x	x	x	
Pernis celebensis	F	x	x		x	
Elanus caeruleus	O	x	x	x	x	
Haliastur indus	O	x	x	x	x	x
Haliaeetus leucogaster	A	x	x	x	x	x
Spilornis cheela	F	x	x	x	x	
Hieraaetus kienerii	F	x	x	x	x	x
Falco severus	O	x	x		x	x
Falco peregrinus	O	x				
Megapodius cumingii	F	x	x		x	x
Coturnix chinensis	O	x	x	x	x	x
Gallus gallus	F	x	x	x	x	x
Turnix suscitator	O	x	x	x		x
Gallirallus striatus	A	x	x	x	x	x
Gallirallus torquatus	A	x	x	x	x	
Porzana fusca	A	x	x		x	
Porzana cinerea	A	x	x	x	x	x
Amaurornis olivacea	A	x	x	x	x	
Amaurornis phoenicurus	A	x	x	x	x	x
Gallicrex cinerea	A	x	x	x	x	x
Rostratula benghalensis	A	x	x	x	x	x
Treron vernans	F	x	x	x	x	x
Phapitreron leucotis	F	x	x	x	x	
Ptilinopus occipitalis	F	x	x		x	
Ptilinopus leclancheri	F	x	x	x	x	x
Ducula poliocephala	F	x	x	x	x	
Ducula carola	F	x	x		x	
Ducula aenea	F	x	x	x	x	x
Columba vitiensis	F	x	x	x	x	x
Macropygia phasianella	F	x	x		x	x
Streptopelia bitorquata	O	x	x	x	x	x
Streptopelia chinensis	O	x			x	x
Geopelia striata	O	x	x	x	x	
Chalcophaps indica	F	x	x	x	x	x
Prioniturus discurus	F	x	x		x	
Tanygnathus lucionensis	F	x	x	x	x	x
Loriculus philippensis	F	x	x	x	x	
Cuculus fugax	F	x	x		x	x
Cacomantis variolosus	F	x	x	x	x	x
Eudynamis scolopacea	F	x	x	x	x	x
Centropus viridis	O	x	x	x	x	
Tyto capensis	O	x	x	x	x	x
Otus mantananensis	O					x
Ninox philippensis	F	x	x	x	x	
Caprimulgus manillensis	O	x	x	x	x	
Caprimulgus affinis	O	x	x		x	
Collocalia vanikorensis	—	x	x		x	x
Collocalia esculenta	—	x	x	x	x	x
Collocalia troglodytes	—	x	x	x	x	x
Alcedo cyanopectus	F	x	x	x		
Ceyx lepidus	F				x	
Halcyon capensis	A		x	x	x	
Halcyon coromanda	F	x	x		x	x
Halcyon smyrnensis	O	x	x	x	x	

TABLE 6. *Continued.*

Species	Habitat[2]	Luzon	Mindoro	Panay	Mindanao	Palawan
Halcyon winchelli	F				x	
Halcyon chloris	O	x	x	x	x	x
Merops viridis	O	x	x	x	x	
Merops philippinus	O	x	x	x	x	
Eurystomus orientalis	O	x	x	x	x	x
Dendrocopos maculatus	F	x	x	x	x	
Pitta erythrogaster	F	x	x	x	x	x
Pitta sordida	F	x	x		x	x
Alauda gulgula	O	x			x	
Hirundo tahitica	O	x	x	x	x	x
Lalage nigra	O	x	x	x	x	x
Pycnonotus goiavier	O	x	x	x	x	
Oriolus chinensis	O	x	x	x	x	x
Corvus macrorhynchos	O	x	x	x	x	x
Copsychus saularis	O	x	x	x	x	
Turdus poliocephalus	F	x	x	x	x	x
Megalurus timoriensis	O	x	x	x	x	
Megalurus palustris	O	x	x	x	x	
Cisticola exilis	O	x	x	x	x	
Cyornis rufigastra	F	x	x	x	x	x
Rhipidura javanica	O	x	x	x	x	x
Hypothymis coelestis	F	x			x	
Hypothymis azurea	F	x	x	x	x	x
Terpsiphone cinnamomea	F	x	x	x	x	
Pachycephala homeyeri	F			x	x	
Anthus novaeseelandiae	O	x	x	x	x	x
Artamus leucorhynchus	O	x	x	x	x	x
Aplonis panayensis	O	x	x	x	x	x
Sarcops calvus	O	x	x	x	x	
Anthreptes malacensis	F	x	x	x	x	x
Nectarinia sperata	O	x	x	x	x	x
Nectarinia jugularis	O	x	x	x	x	x
Aethopyga siparaja	F			x		
Dicaeum aeruginosum	F	x	x	x	x	x
Dicaeum trigonostigma	F	x	x	x	x	
Dicaeum pygmaeum	F	x	x		x	x
Zosterops montanus	F	x	x		x	x
Passer montanus	O	x	x	x	x	x
Lonchura leucogastra	O	x	x	x	x	x
Lonchura malacca	O	x	x	x	x	x
Total number aquatic habitat		15	16	15	16	11
Total number open habitat		39	36	34	37	24
Total number forest habitat		38	37	28	40	22
Total number breeding species		233	162	123	235	142
Total number in common with Sibuyan Island[3]		94	91	78	95	61

[1] Distributions based on Dickinson et al. (1991), with the exception of some Panay records that rely on Evans et al. (1993) and unpublished information of P. C. Gonzales and R. S. Kennedy.

[2] Habitat definitions based mostly on information from Sibuyan Island and supplemented by duPont (1971) and Dickinson et al. (1991): A = aquatic, including rice fields; O = open or heavily disturbed areas; and F = forest or forest edge.

[3] This figure includes swifts.

grouping of Mindanao close to Luzon, the islands with the largest number of species, and of Panay close to Sibuyan, the islands with the lowest number of species, does not necessarily reflect biogeographic affinities between these island pairs (Fig. 11B).

Because Simpson's Index is not weighted by differences in the number of species in each pairwise island comparison (Udvardy, 1969), it provides a more reasonable grouping of these islands (Fig. 11A). The faunistic similarities between these islands closely parallel the total number of species

TABLE 7. Faunal similarity indices of resident birds on several islands in the Philippines. Above the diagonal is Simpson's Index and below the diagonal is Jaccard's Index.[1]

	Sibuyan	Luzon	Mindoro	Panay	Palawan	Mindanao
Sibuyan	—	0.94	0.91	0.78	0.60	0.95
Luzon	0.39	—	0.65	0.49	0.39	0.79
Mindoro	0.52	0.61	—	0.59	0.57	0.88
Panay	0.54	0.47	0.58	—	0.57	0.85
Palawan	0.34	0.33	0.43	0.31	—	0.65
Mindanao	0.40	0.64	0.56	0.43	0.33	—

[1] See text (p. 49) for definitions of indices.

found on each that also breed on Sibuyan: Mindanao—95 species, Luzon—94 species, Mindoro—91 species, Panay—78 species, and Palawan—61 species (Table 6). With the exception of Palawan, the distances between these islands are not great, and in general they support very similar avifaunas. On the basis of this analysis, the breeding birds of Sibuyan are closest to those on Mindanao, and then Luzon. These results may be biased by several factors, including the extent of ornithological exploration and significant natural or human-induced ecological differences on these various islands. If the avifauna of Sibuyan is closely related to that of Mindanao, then one of the most direct corridors for dispersal between these two islands is across Panay. However, Panay falls some distance from the Mindanao/Sibuyan cluster. This is possibly an artifact of the amount of ornithological information available in the literature on Panay. Numerous relatively rare birds that would be expected to occur on Panay have not yet been reported there. In recent years Panay has been extensively surveyed, and once this information is published, we strongly suspect that Sibuyan and Panay will show a greater affinity in their resident bird faunas than recognized here.

COMPARISON OF THE ELEVATIONAL DISTRIBUTION OF RESIDENT BIRDS ON SIBUYAN ISLAND TO OTHER ISLANDS IN THE PHILIPPINES—Goodman and Gonzales (1990) summarized data on the elevational range of birds on four mountains in the Philippines (summit height and island area in parentheses): (1) Mt. Isarog (1966 m), Luzon (108,000 km²); (2) Mt. Malindang (2420 m), Mindanao (99,000 km²); (3) Mt. Halcon (2580 m), Mindoro (10,500 km²); and (4) Canlaon Volcano (2500 m), Negros (13,700 km²). In all cases, these mountains are considerably higher than Mayo's Peak (1550 m) on Sibuyan (233 km²). The various types of forests found

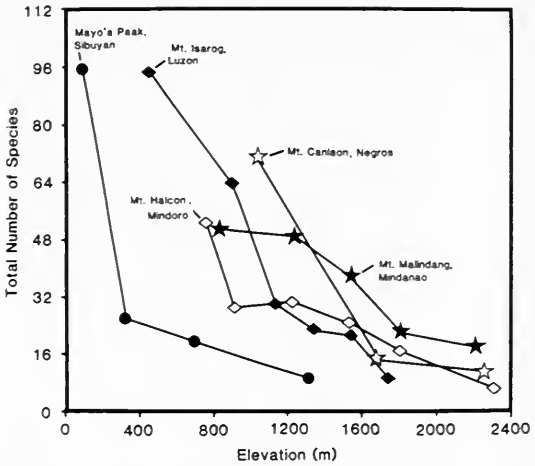

FIG. 12. Comparison of the number of bird species occurring on Sibuyan Island and other mountains in the Philippines. Data for Mt. Isarog, Luzon, are from Goodman and Gonzales (1990); for Mt. Canlaon, Negros, from Ripley and Rabor (1956); for Mt. Halcon, Mindoro, from Ripley and Rabor (1958) and Morioka and Sison (1987); and for Mt. Malindang, Mindanao, from Rand and Rabor (1960).

on these other mountains also occur on Sibuyan, where they are shifted to lower elevations. For example, on Mt. Isarog the transition from lowland to montane forest is at about 900 m and montane to mossy forest at 1550 m, while on the northern slopes of Sibuyan these transitions are at 725 m and 1350 m, respectively. The mossy forest zone on these other mountains is also elevationally broader than on Sibuyan. To facilitate comparisons we use forest type as a measure of elevational range of species rather than absolute distance above sea level.

The numbers of lowland bird species occurring on Sibuyan (between sea level and 100 m) and on Mt. Isarog (450 m and below) are nearly the same—93 and 95, respectively (Fig. 12). However, when the 17 aquatic bird species (whose habitat is not found on Mt. Isarog) on Sibuyan are excluded (Table 2), the similarity in the lowland fauna of these two areas is not as pronounced. The species diversity in montane forest on Sibuyan (19 species at 725 m) is considerably lower than on Mt. Isarog (64 species at 900 m), but similar to Mt. Malindang (22 species between 1520 and 1975 m) and Mt. Halcon (14 between 1370 and 1975 m). The mossy forest avifauna of Sibuyan (10 species at 1325 m) is similar to that of Mt. Isarog (nine species at 1750 m), Mt. Halcon (seven between 1975 and 2580 m), and Canlaon Volcano (11 species between 1975 and 2490 m), but smaller than Mt.

Malindang (18 species between 1975 and 2420 m). Between these various mossy forests there is no distinct group of bird species that makes up the local community; rather, this zone tends to be composed of regional island endemics, and the balance of species tend to have highly variable elevational ranges from island to island (Goodman & Gonzales, 1990; Christensen & Lund, 1993). The pattern of decreasing bird diversity as a function of elevation on mountains in the Philippines is relatively constant.

Conservation of Sibuyan Island

Sibuyan is one of the few places among the more than 7,000 islands in the Philippines that still has some lowland forest. There are only a handful of sites within the archipelago where a forest transect could commence near sea level, pass through mossy forest, and finish at nonvegetated peaks of high mountains. Over the course of the past 100 years there have been significant changes in the natural forest cover of the island. Modern threats to the remaining forest are related principally to logging activities, and to a much lesser extent rattan gathering.

Agriculture

The original clearing of the lowland forest on the island was for predominantly agricultural purposes. In both 1989 and 1992 little evidence of forest cutting for shifting agriculture was noted, except for a cassava patch tucked into the forest near the Lambingan Falls and a large clearing between Jao-asan and the base of Mt. Nailog being prepared for planting. In the partially cleared area along Mayo's Peak Trail, between Agdamagan and our 325-m camp, there was no sign of slash-and-burn agriculturalists moving into the area after partial clearing by loggers.

Rattan Gathering

In 1992 a number of families on Sibuyan made their living by gathering rattan in the forest, fabricating baskets and other items, and selling them in markets on Sibuyan or other islands. Raw rattan is also exported. Until 1979 the trail that now leads to Mayo's Peak ended in the bamboo zone at about 1150 m. An expedition from the University of the Philippines Mountaineering Club opened this trail in 1979 for an approach to Mayo's Peak and Mt. Guitinguitin. This trail allowed vine gatherers access to the higher slopes, and starting in about 1980 this section of the mountain was heavily exploited. Within 10 years most of the accessible rattan was collected and thereafter the local trade in rattan decreased considerably. Currently 50 to 100 people living on Sibuyan are involved in rattan gathering or trade (W. Villaneuva, pers. comm.). In March 1992 two areas were still being exploited: (1) the upper steep reaches of Mayo's Peak and the slopes leading to Mt. Guitinguitin and (2) the forest at the headwaters of the Pawala River from the area near Gaong to the hills above Silum. In the former area, rattan was gathered by no more than five individuals making day trips up the mountain and dragging the rattan back down to the lowlands (generally Agdamagan) in the late afternoon. At the latter site, groups of rattan gatherers remained in the forest for several days, and then in mass brought the rattan down to the coastal road, where it was loaded onto a motor vehicle and transported to Silum or Magdiwang. The preferred age at which rattan is harvested is approximately 10 years.

Logging

The only known remaining lowland forest on Sibuyan, below 100 m, is a northern flank of Mt. Guitinguitin that comes down toward the sea between Casing Point and the village of Silum. This area is called the Kuyasian Forest locally and is an extension of the Manabo Forest. The Kuyasian Forest is being logged at a rapid pace (Goodman & Ingle, 1993). During our study at the Lambingan Falls, within the Kuyasian Forest, between 11 and 20 March 1992, there was considerable logging activity, particularly the remaining large hardwoods.

We were informed that in early March 1992 the Atlas Mining Corporation put out an order for 80,000 cubic board feet of timbers to be delivered to their Masbate mining project by the end of the month. What proportion of these timbers were to be extracted from the Kuyasian Forest is unknown. To fill this order approximately 250 trees would have to have been felled (Ingle, 1993; cf. Goodman & Ingle, 1993). Although in March 1992 there were no legal logging concessions on Sibuyan, these activities were commonly known. Au-

thorities at the Atlas Mining Corporation claimed that all of the timber that they purchase comes from legitimate sources (Ingle, 1993).

There are other areas of Sibuyan that are being illegally exploited for timber. Portions of accessible lowland forest at higher elevations on the north side of Mt. Guitinguitin, up to 600 m, are also being logged. This is particularly true along the major trail systems such as the Agdamagan–Mayo's Peak Trail and the Jao-asan–España Trail. At the lower elevations carabaos are used to remove the logs, and on higher ground human laborers drag and carry them out. Further, timber from the lowland forest near España is shipped to Panay for building material (Ingle, 1993).

In areas that are being selectively logged, as compared to clear-cut, there is a clear reduction in the DBH of standing trees. In the Kuyasian Forest at about 40 m and just above the Lambingan Falls, the average DBH of the remaining canopy trees was 36.7 cm (N = 10, range 23.2–58.3 cm). Rotting stumps in the immediate vicinity of the site had an average DBH of 63.6 cm (N = 6, range 44–85 cm) and recently cut stumps had an average DBH of 46.0 cm (N = 5, range 38–54 cm). At 325 m, near our camp 1, the DBH of standing canopy trees was on average 72.6 cm (N = 10, range 44–105 cm), while stumps of logged trees were 83.5 cm (N = 11, range 54–146 cm). Thus it is clear that at both of these sites the larger trees have been selectively removed.

Protected Status

As a direct result of the recent zoological and botanical exploration of Sibuyan, the biological importance of the area has been brought to the attention of the Department of Environment and Natural Resources (C. Custudio, pers. comm., May 1994). Under the Integrated Protected Areas System Project II and with funding from the European Union, Sibuyan is one of 10 sites in the Philippines now being considered for inclusion in the national protected areas program.

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Appendix. Gazetteer of localities.

Locality	Island	North latitude		East longitude	
		°	(′)	(°)	(′)
Agdamagan	Sibuyan	12	28	122	32
Agdamagon	(see Agdamagan)	—	—	—	—
Agnoknok	(see Agnonok)	—	—	—	—
Agnonok	Sibuyan	12	30	122	34
Alad Island	—	12	37	122	15
Ambolong	(see Ambulong)	—	—	—	—
Ambulong	Sibuyan	12	29	122	29
Badajos	Tablas	12	34	122	08
Badajoz	(see Badajos)	—	—	—	—
Bagacay	Romblon	12	35	122	15
Banton Island	—	12	56	122	04
Binaya-an	Sibuyan	12	23	122	33
Cadjiocan	Sibuyan	12	23	122	41
Caluya Island	—	11	55	121	34
Camp 1 (325 m)	Sibuyan	12	27	122	33
Camp 2 (725 m)	Sibuyan	12	27	122	33
Camp 3 (1325 m)	Sibuyan	12	26	122	33
Camp 4 (30 m)	Sibuyan	12	29	122	35
Carabao Island	—	12	04	121	56
Carmen	Tablas	12	37	122	07
Casing	Sibuyan	12	30	122	35
Cawayan	Tablas	12	38	122	09
Cobrador Island	—	12	40	122	14
Cresta de Gallo Island	—	12	11	122	42
Danao	Sibuyan	12	29	122	38
Dubduban	Tablas	12	35	122	06
Dulangan River	Sibuyan	12	29	122	31
España	Sibuyan	12	23	122	30
Gaong	Sibuyan	12	28	122	33
Goangan	Sibuyan	12	29	122	32
Jao-asan	Sibuyan	12	28	122	30
Katigaan	Sibuyan	12	27	122	33
Kuyasian Forest	Sibuyan	12	28	122	35
Lambingan Falls	Sibuyan	12	29	122	35
Libagao Island	—	12	12	121	26
Lugbon Island	—	12	36	122	15
Maestre De Campo Island	—	12	56	121	42
Magallens	(see Magdiwang)	—	—	—	—
Magdiwang	Sibuyan	12	30	122	31
Mahabangbaybay	Tablas	12	38	122	09

Appendix. Continued.

Locality	Island	North latitude		East longitude	
		°	(′)	(°)	(′)
Malimig River	Sibuyan	12	28	122	32
Manga	(see Goangan)	—	—	—	—
Masbate Island	—	12	15	123	30
Mayo's Peak	Sibuyan	12	26	122	34
Mt. Guitinguitin	Sibuyan	12	25	122	34
Mt. Nailog	Sibuyan	12	26	122	30
Mt. Navitas	Tablas	12	31	122	04
Pato-o River	Sibuyan	12	29	122	31
Pawala River	Sibuyan	12	29	122	31
Point Casing	Sibuyan	12	30	122	35
Romblon Island	—	12	33	122	17
Romblon	Romblon	12	35	122	16
Saint Augustin	(see Badajos)	—	—	—	—
San Fernando	Sibuyan	12	18	122	36
Semirara Island	—	12	04	121	23
Sibay Island	—	11	51	121	29
Silum	Sibuyan	12	29	122	36
Sinobaan	Sibuyan	12	30	122	33
Tablas Island	—	12	24	122	02
Taclobo	Sibuyan	12	20	122	34
Tambac	Tablas	12	38	122	05
Tambaron Island	—	12	16	121	22
Tampayan	Sibuyan	12	29	122	31
Tinap-anan	Sibuyan	12	30	122	33

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