

BIRDS OF BAN-BAN, CENTRAL NEGROS,
PHILIPPINES:
THREATS AND CONSERVATION STATUS

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ABSTRACT

*The forest in Ban-ban, Ayungon, Negros Oriental, Philippines, was surveyed in March to April 1999. Some 4,956 ha of extensive mature secondary forest reported in 1991 were severely reduced to mere 1,559 ha in 1999. Five of the 18 threatened species of Negros and two near-threatened species were confirmed to be present. A significant population of the Visayan Tarictic Hornbill: *Penelopides panini* (not recorded in 1991) was discovered. Rufous-lored Kingfisher (*Halcyon winchelli*), believed locally extinct on Negros, was found to be present but rare in the area. Two species of owl, Philippine Hawk Owl *Ninox philippensis centralis* and the distinct Philippine Scops Owl *Otus megalotis nigrorum*, were netted. In 1991, six individuals of White-throated Jungle Flycatcher (*Rhinomyias albigularis*) was observed, but during this survey the team managed to see only two individuals of *Rhinomyias* species. Mining, quarrying activities, and the local development of the area have increasingly devastated and divided the forest block into smaller and smaller fragments. A number of trees were observed ringed and poisoned. An assessment of long-term conservation needs of the area is long overdue. Immediate conservation action is needed for the preservation of the forest and its wildlife inhabitants.*

Introduction

The Philippines ranks among the world's most important biological hotspots as its extraordinarily diverse habitat is seriously in need of comprehensive conservation attention (Mallari et al. 2001). Many of the country's unique species of birds are restricted to a few patches of lowland forest. Hence, the destruction of

lowland forest restricts the species to the upper limit of their known altitudinal range where they tend to exist at very reduced densities (Collar et al. 1999).

The history of Negros Island demonstrates the relationship between rapid destruction of forest and local extinction of species making the island one of the global priority areas for conservation. A total of eighteen threatened birds, out of the twenty-one species listed for West Visayas, are found on Negros Island. Three of these species are critically endangered (the Walden's Hornbill *Aceros waldeni*, the Negros Fruit Dove *Ptilinopus arcanus*, and the Negros Bleeding-heart Pigeon *Gallicolumba keayi*), while four species are considered endangered (the Negros Striped Babbler *Stachyris nigrorum*, the Flame-templed Babbler *Stachyris speciosa*, the Visayan Tarictic Hornbill *Penelopides panini panini*, and the White-throated Jungle Flycatcher *Rhinomyias albigularis* (Mallari et al. 1999).

The importance of the avifauna of Negros is further enhanced by the presence of endemic subspecies of birds. There are a total of 28 endemic subspecies listed for the West Visayas (Evans et al., 1993) of which fifteen subspecies occurring on Negros are shared with one or two other islands, and ten subspecies are restricted to Negros itself. Of these, three subspecies (*Phapitreron amythestina maculipectus*, *Otus megalotis nigrorum*, *Penelopides panini panini*, *Copsychus saularis luzionensis*) have been classified by Evans et al. (1993) as threatened.

Three significant areas of forest serve as the last strongholds of threatened species and habitat: one in the north (Mandalagan-Patag and the Mt. Canlaon range), another in the south (Mt. Talinis and the Lake Balinsasayao area), and a smaller one in the central region which is Ban-ban Forest. Of these three areas, Ban-ban has received the least attention, with only two known ornithological studies (Evans et al. 1993 and Diesmos and Pedregosa in 1996). Three of the threatened restricted-range species (Flame-templed Babbler, White-throated Jungle Flycatcher and Visayan Tarictic Hornbill) of Negros, and Panay Endemic Bird Area (Stattersfield

et al. 1998) were recently recorded in Ban-ban (Evans et al. 1993). As lowland forest is now a rare habitat in Negros, Ban-ban forest, despite its relatively small size and the degraded nature, is of crucial significance for the conservation of threatened restricted-range species. On account of the studies of Evans et al. (1993), Mallari et al. (2001) listed Ban-ban forest as an Important Bird Area (IBA). This study presents the conservation status of the forest and the endemic threatened birds of Ban-ban, Ayungon.

Conservation Overview

Ban-ban forest was logged under the concession of Philippine American Timber Company (PATIC) which ended its operation in 1979. Small-scale mining explorations followed the logging concession along with the development of roads. Designated as a Watershed Forest reserve, it is also the center of activity of the local Department of Environment and Natural Resources which is involved in improving local roads, planting commercial trees, and improving timber stands. A Community Based Forestry Management Agreement (CBFMA) works in the rehabilitation and reforestation of the areas but unfortunately utilizes exotic tree species (e.g. *Acacia mangium*, *Acacia falcata*, and *Gmelina*).

History of Ornithological Studies in Ban-ban

The extensive bird collections made on Negros in the early 19th and 20th centuries were summarized in Dickinson et al. (1991). The Cambridge-Philippines group visited Negros in 1990 (Dutson et al. 1992; Evans et al. 1993). Several threatened species were noted, including sightings of the endangered White-throated Jungle Flycatcher (*Rhinomyias albigularis*). Diesmos and Pedregosa (1996 unpublished) also conducted ethnobiological surveys of the island and reported the presence of the Visayan Tarctic Hornbill (*Penelopides panini*) and the Negros Bleeding-heart Pigeon (*Gallucolumba keayi*).

METHODOLOGY

Description of the Study Area

The forest in Ban-ban, Ayungon is located in the central portion of Negros Island in the north of Negros Oriental close to the border with Negros Occidental. Barangay Ban-ban lies at 9^o 53' 5" N, 123^o 1' 33" E, barangay Mabato lies at 9^o 51' 25" N, 123^o 2' 34" E, while Candana-ay lies at 9^o 49' 19" N, 123^o 2' 28" E. All three barangays harbor a collection of hilltop remnants of forest (sixteen forest patches) between 600 and 860 meters elevation (Fig.1). A built-up road divides the main forest area into three major blocks while the remaining patches are scattered around these forest blocks. People who commute to the other municipalities such as Bindoy and Mabinay regularly use this road. Farm-lots, plantations, and abandoned agricultural fields surround this watershed area.

Three sites within each of the three main forest blocks were selected as study sites within the watershed (Fig.1). All three sites contain remnant primary lowland forest vegetation but are characterized by disturbed regenerating secondary forest dominated by *Shorea* spp. with an average height of 20 meters (n=30, range=10-30m). In most places, the canopy is broken and the undergrowth is mostly composed of saplings of larger species of trees, herbs, ground orchids, and climbing pandans. Strangler vines and lianas are also observed. On the upper branches of large trees hang epiphytes, mostly orchids and staghorn, and bird's nest ferns. In many places the ground is covered with humus and thick layer of decaying leaves. Moss cover is almost absent and limited to areas near water.

The watershed is highly disturbed. A number of trees with an average diameter at breast height (dbh) of 167.5 cm (n=12; range: 80cm to 211 cm) were observed marked or bark-ringed. Clearings made inside the forest were planted with cassava (*Manihot esculenta*), rice (*Oryza sativa*), corn (*Zea mays*), and "gabi" (*Colocasia esculenta*). Reports of bird hunting and illegal

logging were confirmed when hunters and abandoned lumber were encountered inside the forest. Birds were also observed kept in cages in houses.

Field Research

Sampling was done from March 21 to 28, 1999 and April 8 to 15, 1999. Two-kilometer transects were established for each study site. Transects generally ran parallel with moderately used trails and built-up roads. Some transects were located inside the forest interior parallel to net locations. An average of 40 man-hours was spent gathering data at each study site. All bird species seen and heard were recorded. Information gathered included the birds' feeding habits, food items taken, habitat type, associations with other species and individuals, and participation in mixed-species flocks. Birds were identified with the use of 8 x 45 binoculars. Observation records did not include the use of sound recording equipment or the playback of calls.

Mist nets measuring 6 meters long by 4 meters high were used to catch cryptic and elusive species. Nets were set in the understory of mature secondary forest in gaps of ten to 300 meters with some distributed along ridge tops and near fruiting trees at the forest edge. The nets were set at least one meter above the ground and at most 8 meters above ground. Nets were checked regularly to minimize any adverse impact of the survey. Standard biometrical data were obtained for each bird species caught before released.

A total of 73 net-days was spent at Site 1 (Mt. Tihol), 71 net days at site 2 (Manlawa-an) and 43 net days at site 3 (Katungaw-tungawan). A net-day is measured by multiplying the number of nets operated by the number of days nets were set in operation. A single 6 x 4 meter net set from 6am to 6pm is counted as one-half net day.

RESULTS

Species Composition and Species Richness

Altogether 95 species of birds were recorded of which 48 species (50%) were non-endemic breeding residents, 41 species (43 %) were endemic to the Philippines, and twenty-four were endemic subspecies of West Visayas (Table 1). Three Negros-Panay endemic species (Visayan Tarictic Hornbill *Penelopides panini*, Visayan Writhed Hornbill *Aceros waldeni*, White-winged Cuckooshrike *Coracina ostenta*, Flame-templed Babbler *Stachyris speciosa*) were observed in the area.

Five threatened and two near-threatened species were observed, one of which, the endemic Rufous-lore Kingfisher of the subspecies *nigrorum* endemic to the West Visayas, was not reported in previous studies (Evans et al. 1993; Diesmos and Pedregosa, unpublished). Three of the threatened species recorded (White-winged Cuckoo-shrike, Visayan Tarictic Hornbill, and Flame-templed Babbler) were observed at all three sites.

Four species listed in 1991 (*Pernis ptilorhyncus*, *Hieraetus kienerii*, *Megapodius cumingii* and *Ptilinopus occipitalis*) were not encountered (Appendix 1).

Table 1. Bird species composition of Ban-ban, Ayungon. Numbers refer to the individuals reported while numbers in parenthesis refer to the percentage of individuals observed within the category.

Category	Number
Non-endemic Resident species	48 (50%)
Philippine endemic species	41 (43%)
West Visayas threatened endemic	3
Threatened species	9
Total number of species	95

Netting Results

Fifty seven (57) individuals of 18 species were netted in the study sites but this figure underestimates the number of species in the area since most of the birds observed foraged and were active at canopy level (above the nets) at all three sites. The Philippine Bulbul (*Hypsipetes philippinus guimarasensis*) was the most frequently captured bird followed by the Blue-headed Fantail (*Rhipidura cyaniceps albiventris*), Balicassiao (*Dicrurus balicassius mirabilis*), and then by the Lemon-throated Warbler (*Phylloscopus cebuensis*). The Philippine Hawk-Owl (*Ninox philippensis centralis*), White-vented Whistler (*Pachycephala homeyeri winchelli*), and the Crimson Sunbird (*Aethopyga siparaja magnifica*) were caught four times. Other species were represented by single individuals. A migrant, the Chinese Goshawk (*Accipiter soloensis*), was also caught on a ridge-top near the forest edge.

The abundance of the various species captured varied at two of the sites sampled. Eighteen (18) species were netted at all three sites of which six species were netted at both Mt. Tihol-tihol and Manlawa-an. Thirty-four (34) individuals of 13 species were netted at both Mt. Tihol-tihol while 28 individuals of 14 species were caught at Manlawa-an. Nine endemics were caught at Manlawa-an compared to seven at Mt. Tihol-tihol (7 endemic species). Three of the Philippine endemic species (*Otus megalotis nigrorum*, *Parus elegans albescens*, and *Zosterops nigrorum nigrorum*) were caught only in Manlawa-an while five individuals of Philippine Hawk Owl (*Ninox philippensis centralis*) were caught at Mt. Tihol-tihol. The Scops Owl was caught once in a net set two meters above ground in the forest interior. The most significant bird captured was the Flame-templed Babbler (*Stachyris speciosa*). A total of three individuals were caught in the understory of mature secondary forest.

It should be taken into account that all species caught were observed in all the sites visited and thus variations in the number of individuals and species caught do not reflect differences in the avifauna of the three sites.

Table 2. Bird species netted in Ban-ban, Ayungon (March-April 1999). The species marked with *is not included in the discussion.

Scientific name	Common name	Number of individuals caught
<i>Accipiter soloensis</i>	Chinese Goshawk	1
<i>Phapitreron leucotis</i>	White-eared Brown Dove	1
<i>Chalcophaps indica</i>	Emerald Dove	1
<i>Ducula poliocephala</i>	Pink-bellied Imperial Pigeon	1
<i>Ninox philippensis</i>	Philippine Hawk Owl	4
<i>Otus megalotis nigrorum</i>	Philippine Scops Owl	1
<i>Caprimulgus manillensis</i>	Philippine Nightjar	1
<i>Parus elegans</i>	Elegant Tit	1
<i>Hypsipetes philippinus</i>	Philippine Bulbul	15
<i>Dicrurus baliassius</i>	Balicassiao	6
<i>Stachyris speciosa</i>	Flame-templed Babbler	1
<i>Phylloscopus cebuensis</i>	Lemon-throated Warbler	5
<i>Orthotomus castaneiceps</i>	Philippine Tailorbird	1
<i>Rhipidura cyaniceps</i>	Blue-headed Fantail	8
<i>Pachycephala homeyeri</i>	White-vented Whistler	4
<i>Aethopyga siparaja</i>	Crimson Sunbird	4
<i>Zosterops nigrorum</i>	Golden Yellow White-eye	1
<i>Lonchura malacca*</i>	Chestnut Mannikin	1
Total number of species		18

Threatened Species

Five species in total, out of the 20 threatened forest birds listed in Negros by Dickinson et al. (1991), were recorded during the sampling. Of the threatened species observed, the White-winged Cuckooshrike (*Coracina ostenta*) was the most frequent followed by Visayan Tarictic Hornbill (*Penelopides panini*), and the Flame-templed Babbler (*Stachyris speciosa*) (Table 3). However, one of these, the Visayan Tarictic Hornbill, has not been

previously recorded in the area, indicating the difficulty in obtaining complete lists of forest birds during a relatively short visit. Comparisons of the data obtained during this survey with other surveys should take this into account.

Table 3. List of threatened forest bird species of Ban-ban, Ayungon with corresponding IUCN status. (Adapted from Collar, et al. 1999). Numbers represent individuals observed while numbers in parentheses refer to individuals netted. West Visayas endemic species are in bold. Not sighted is presented as —. X means the bird was observed in the area.

Scientific Name	Common name	IUCN 2000 Threat Category	Status	
			1991	1992
<i>Spizaetus philippensis</i>	Philippine Hawk-Eagle	Vulnerable	--	--
<i>Ducula poliocephala</i>	Pink-bellied Imperial Pigeon	Near-threatened	X	8 (1)
<i>Ducula carola</i>	Spotted Imperial Pigeon	Vulnerable	--	--
<i>Ptilinopus arcamus</i>	Negros Fruit Dove	Critically Endangered	--	--
<i>Gallicolumba keayi</i>	Negros Bleeding-Heart Pigeon	Critically Endangered	--	--
<i>Cacatua haematuropygia</i>	Philippine Cockatoo	Critically Endangered	--	--
<i>Tanygnathus lucionensis</i>	Blue-naped Parrot	Threatened	--	--
<i>Aceros waldeni</i>	Visayan Writhed Hornbill	Critically Endangered	--	H
<i>Penelopides panini</i>	Visayan Tarictic Hornbill	Endangered	--	11
<i>Todiramphus winchelli</i>	Rufous-lore'd Kingfisher	Vulnerable	--	1
<i>Stachyris nigrorum</i>	Negros Striped-Babbler	Endangered	--	--

Table 3 (cont'd)

Scientific Name	Common name	IUCN 2000 Threat Category	Status	
			1991	1992
<i>Stachyris speciosa</i>	Flame-templed Babbler	Vulnerable	X	7 (3)
<i>Mearnsia picina</i>	Philippine Needletail	Near-threatened	--	5
<i>Coracina ostenta</i>	White-winged Cuckoo-shrike	Vulnerable	X	13
<i>Rhinomyias albigularis</i>	White-throated Jungle Flycatcher	Critically Endangered	X	2
<i>Muscicapa randi</i>	Ashy-breasted Flycatcher	Vulnerable	--	--
<i>Hypothymis coelestis</i>	Celestial Monarch	Vulnerable	--	--
<i>Dicaeum haematostictum</i>	Visayan Flowerpecker	Vulnerable	--	--
<i>Erythrura viridifacies</i>	Green Parrotfinch	Vulnerable	--	--

The Rufous-lore Kingfisher (*Halcyon winchelli nigrorum*) is confined to forest habitats below 1000 meters elevation. The continuing clearance of lowland forest throughout the Philippines poses a very significant threat to this species. The bird was observed once beside a small creek in the forest interior, perched and calling from one of the lower branches of a *Shorea* sapling. It is similar to the White-collared Kingfisher except for the general bright cobalt blue coloration and its rufous hind collar.

The White-throated Jungle Flycatcher is an inhabitant of the understory (usually 2-10m from the ground, occasionally in the subcanopy) of tall, deeply shaded forest in lowland and mid-montane regions (Dickinson et al.1991; Brooks et al.1992; Kennedy et al.2001). It was observed twice in the under-story inside the forest, silently perched on a branch and occasionally flycatching. As very little lowland forest exists on Panay and Guimaras Island is already completely denuded, the remaining

lowland forest on Negros is extremely important to the survival of this species.

The Visayan Tarictic Hornbill is a bird of primary dipterocarp forest sometimes wandering into mid-montane, secondary forest, or isolated fruiting trees (Collar et al. 1999). It was observed occasionally in the area, with a total of 27 individuals, either singly or in small groups of 3-5, usually near the forest edge. Surprisingly, it was not observed during the 1990 survey (Evans et. al. 1993) but was reported in the area in 1996 (Diesmos and Pedregosa 1995). Local reports revealed the rampant hunting of this species and poaching of its young for the pet trade as well as forest destruction are a major threat to this bird.

There were reports of another species of hornbill that closely fit the description of the Walden's Hornbill (*Aceros waldeni*). Calls closely resembling those of Walden's Hornbill were also heard four times during sampling although the individual was not observed. Further observations are needed to verify whether this critically endangered species occurs here.

Although observed in great numbers in 1991, the White-winged Cuckoo-shrike was rare in the areas visited. Most encounters were at the forest edges where it was observed to participate in mixed-species flocks with the Coledo *Sarcops calvus*, the Bar-bellied Cuckoo-shrike *Coracina striata panayensis*, the Balicassiao *Dicrurus balicassius mirabilis*, and the White-bellied Woodpecker *Dryocopus javensis philippensis*.

The exquisite Flame-templed Babbler *Stachyris speciosa* was also observed to participate in mix-species feeding flocks in both the interior and edge of the forest. The flocks included the Blue-headed Fantail *Rhipidura cyaniceps*, the Velvet-fronted Nuthatch *Sitta frontalis*, the White-eyes (*Zosterops* spp.), Warblers (*Phylloscopus* spp.), the Crimson Sunbird *Aethopyga siparaja*, the Bicolored Flowerpecker *Dicaeum bicolor*, the Black-naped Monarch *Hypothymis azurea*, the White-bellied Whistler *Pachycephala homeyeri*, the Verditer Flycatcher *Eumyias panayensis*, the Citrine Canary Flycatcher *Culicicapa*

helianthea, and the Visayan Flowerpecker *Dicaeum haematostictum*. Nine (9) individuals of Flame-templed Babblers were observed and three were caught in mist nets set in the understory of forest interior.

Larger species of doves, particularly the Imperial Pigeons *Ducula poliocephala*, and the *D. aenea* were mostly targeted for hunting. About eight individuals of Pink-bellied Imperial Pigeon *Ducula poliocephala* were observed kept in cages to be sold for trade or merely for consumption. Other species of doves (Metallic Wood Pigeon *Columba vitiensis*, White-eared Brown Doves *Phapitreron leucotis*, and Amethyst Brown Doves *Phapitreron amythestina*, Fruit Pigeons) also suffered the same fate. These hunting activities pose a threat to endangered doves like the Negros Bleeding-heart Pigeon *Gallicolumba keayi* which was reported at the site in 1992 (Diesmos and Pedregosa, unpublished). The latter was not observed during the survey but there were reports of doves caught that resembled it. Interviews further revealed that this species was rarely seen and its description was familiar only to a handful of locals. The species is often confused with the Emerald Dove *Chalcophaps indica*. It appears that the Negros Bleeding-heart Pigeon is rare in the area and even throughout its range (Curio et al. 1997; Klop et al. 1999; Collar et al. 1999).

THREATS AND CONSERVATION

Much of the original forests in the West Visayas has been destroyed while Masbate and Guimaras Islands are both 100% deforested (Evans et al. 1993). As very little lowland forest is left on Panay, the importance of the remaining lowland forest in Negros becomes essential to the survival of threatened endemic species. The drastic contraction and fragmentation of Ban-ban forest from 4,956 ha in 1991 to a mere 1,559 ha in 1999 poses a grave danger to a number of threatened birds dependent on the presence of mature forest (Table 4). In the three areas sampled, a number of trees with an average diameter of 30-80 cm were observed

bark-ringed. Some of the illegally cut lumber was seen hidden among bushes or abandoned in the forest interior. If the current intensity of cutting trees and forest clearance continues unabated, the eighteen threatened species will be the first to go and with them much of the valuable watershed area.

Table 4. Habitat requirements of selected forest dependent birds observed in Ban-ban Ayungon (March-April, 1999). The observed threats are also presented.

Common Name	IUCN 2000 Threat Category	Habitat preferences and observed threats
Philippine Hawk Eagle	Vulnerable	Tall forest dependent
Pink-bellied Imperial Pigeon	?Near-threatened	Tall forest dependent, severe hunting pressure
Spotted Imperial Pigeon	Vulnerable	Tall forest dependent, severe hunting Pressure, Ecological requirements poorly understood but rarely reported
Negros Fruit Dove	Critically Endangered	Forest dependent maybe extinct - no records since collection in 1953
Negros Bleeding-heart Pigeon	Critically Endangered	Tall forest dependent, very few records, severe hunting pressure and hunting
Philippine Cockatoo	Critically Endangered	Pet trade and hunting
Blue-naped Parrot	Threatened?	Forest dependent, pet trade and hunting
Visayan Writhed Hornbill	Critically endangered	Tall forest dependent, hunting
Visayan Tarctic Hornbill	Endangered	Forest dependent, hunting
Rufous-lored Kingfisher	Vulnerable	Forest dependent, tolerates secondary forest
Negros-striped Babbler	Endangered	Forest dependent with very restricted-range
Flame-templed Babbler	Vulnerable	Forest dependent but tolerant of degraded forest

Table 4 (cont'd)

Common Name	IUCN 2000 Threat Category	Habitat preferences and observed threats
Philippine Needletail	Near-threatened	Forest dependent
White-throated Jungle Flycatcher	Critically Endangered	Tall forest dependent
Ashy breasted Flycatcher	Vulnerable	Tall forest dependent
Celestial Monarch	Vulnerable	Tall forest dependent
Visayan Flowerpecker	Vulnerable	Forest dependent but tolerant of degraded forest
Scarlet-collared Flowerpecker	Vulnerable	Forest dependent, intolerant of degraded forest
Green Parrotfinch	Vulnerable	Forest dependent and closely associated with seeding bamboo

The mining and quarrying activities observed in the area as well as the local development have increasingly devastated and continuously divided the forest block into further smaller fragments. The presence of built-up roads and trails showing continual usage and high levels of disturbance has further worsened the fragmentation of the forest. Moreover, the road and trails are also used in the transport of illegally cut timber from the forest to nearby municipalities and cities.

In view of these problems, an assessment of the conservation requirement of the area is long overdue. Without immediate intervention, protection of the forest and prevention of wildlife extinction will be a thing of the past. Much work still needs to be done and with time running out it is essential to start conservation intervention right now.

CONCLUSION

Ban-ban forest in Ayungon, Negros Oriental, Philippines stands as the last remaining significant patch of low altitude forest on Negros Island. Some 4,956 ha of extensive mature secondary

forest reported in 1991 have been severely reduced to mere 1,559 ha in 1999 (CVRP-ISF Report, AFMOI Report). This massive forest destruction in less than ten years indicates an alarming rate of global loss of forest and its endemic wildlife.

Until quite recently, Ban-ban was the only known locality to harbor a population of the endangered White-throated Jungle Flycatcher (*Rhinomyias albigularis*) on Negros. Only two individuals were observed in the area during sampling. A total of eight threatened forest species reported in Negros was not sighted including the Philippine Cockatoo *Cacatua haematuropygia*, the Negros-bleeding heart Pigeon, the Walden's Hornbill, the Celestial Monarch, the Spotted Imperial Pigeon *Ducula carola*, and the Ashy-breasted Flycatcher *Muscicapa randi*. With the rate of forest destruction and cutting of trees in the area, the prospects for survival of such species as well as that of the rest of the wildlife beyond the next few years is extremely low.

Recommendations

1. Priority Areas for Research

More research and ecological studies are needed to determine the extent of disturbance and identify detrimental factors affecting threatened species. The use of sound recording equipment is recommended in order to determine more effectively the presence of cryptic species (e.g. Ashy-breasted Flycatcher, Celestial Monarch, White-throated Jungle Flycatcher).

A patch of forest located on very steep, rocky slopes exists northeast of Ban-ban at 800 to 1000m elevation. It is recommended that studies should include this section. Studies on other vertebrate groups are also recommended,

particularly amphibians, reptiles, and mammals. Reports from the locals revealed that hunting of wild pigs and monitor lizards was quite common.

2. Habitat Rehabilitation and Reforestation Activities

Habitat rehabilitation measures should put emphasis on utilizing endemic species of trees rather than exotic trees which have been planted at both the edge and inside the forest.

Harvesting wild plants including ferns and orchids should be discouraged. The survey revealed that trees were cut just to get access to orchids and hanging ferns. Portions of the forest had been cleared for subsistence agriculture (corn, *Manihot esculenta* and *Colocasia esculenta*) and the cultivation of *Zingiber* (the flowers are harvested for making brooms). Such activities should be managed to allow maximum gain without sacrificing wildlife loss.

3. Information, Education, and Communication

Multiplier audiences (educators, corporate sectors, journalists, and the scientific community) should be the primary initiators of conservation education and awareness programs. Information on biodiversity, conservation, and the importance of species should be provided to Local Government Units (LGU) to enhance conservation awareness. Such information should also incorporate legal advocacy. Information disseminated to direct stakeholders should be in the form that is understandable to them. Thus explaining the concept of biodiversity to local people in their own language is recommended to help them fully understand the concepts. In this effort, it should be remembered that local people have their own version of explaining the importance of biodiversity.

4. Forest Protection Measures

While built-up roads and trails provide many the much-needed access between places as well as the means to transport goods and other farm produce, they ironically also facilitate the

illegal traffic of forest products. Reporting these illegal forest activities to the concerned authorities is a problem. In the first place many local people may not even be aware of what is considered an illegal forest activity and when they do, they do not know where to report these illegal activities. Moreover, most concerned offices are not easily reached and processing the report takes a long time. Massive education campaign among the local community is therefore a must. Only then can they be utilized to participate in patrolling the forests. The locals who live right in the target sites can best protect their natural resources. The *barangay tanods* and members of people's organizations should be tapped and their responsibilities delineated. NGOs working in the sites can collaborate with with the PAMB and the DENR to strengthen the capabilities of local communities in protecting their environment.

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APPENDIX 1

The table on the following pages lists all forest species found on Negros and shows bird species recorded in Ban-ban, Central Negros, Philippines.

Note that the amount of effort and time of sampling was different for the two sets of data presented.

Numbers represent individuals observed during sampling (March-April 1999), WITH THOSE IN PARENTHESES REPRESENTING INDIVIDUALS CAUGHT.

— means not sighted.

Species marked with * are migrants, while species in bold are Philippine endemic species.

1) These totals include aural records.

2) Not recognized by Dickinson *et. al*, (1991) as full species although Kennedy *et. al*, (2001) considers these as full species. The records for the Visayan Writhed Hornbill should be treated with caution as only CALLS resembling THOSE of the Writhed Hornbill WERE heard. Further studies are needed to confirm the true status of the species.

3) A new record for Negros (Curio *et. al*, 1996a) although despite the alleged occurrence in Negros, this survey found no evidence of the species presence.

(see table next page)

Scientific Name	Common Name	Cambridge-- Philippines 1991 survey	1999 survey
<i>Gorsachius melanolophus</i> *	Malayan Night Heron	-	-
<i>Pernis ptilorynchus</i> *	Oriental Honeybuzzard	21	-
<i>Pernis celebensis</i>	Barred Honeybuzzard	-	-
<i>Haliaeetus leucogaster</i>	White-bellied Sea Eagle	-	-
<i>Spilornis holospilus</i>	Crested Serpent Eagle	3	26
<i>Accipiter soloensis</i> *	Chinese Goshawk	-	6 (1)
<i>Accipiter gularis</i> *	Japanese Sparrowhawk	-	50
<i>Accipiter trivirgatus</i>	Crested Goshawk	-	6
<i>Accipiter virgatus</i>	Besra	2	7
<i>Butastur Indus</i> *	Grey-faced Buzzard	-	-
<i>Hieraaetus kienerii</i>	Rufous-bellied Eagle	1	-
<i>Spizaetus philippensis</i>	Philippine Hawk Eagle	-	-
<i>Microhierax erythrogenys</i>	Philippine Falconet	21	27
<i>Megapodius cumingii</i>	Tabon Scrubfow	R	
<i>Gallus gallus</i>	Red Junglefowl	5	7
<i>Treron pompadora</i>	Pompador Green Pigeon	-	-
<i>Treron vernans</i>	Pink-necked Green Pigeon	-	-
<i>Phapitreron amethystina</i>	Amethyst Brown Dove	-	4

Scientific Name	Common Name	Cambridge-- Philippines 1991 survey	1999 survey
<i>Phapitreron leucotis</i>	White-eared Brown Dove	17	25 (1)
<i>Ptilinopus occipitalis</i>	Yellow-breasted Fruit Dove	3	-
<i>Ptilinopus leclancheri</i>	Black-chinned Fruit Dove	-	1
<i>Ptilinopus arcanus</i>	Negros Fruit Dove	-	-
<i>Ducula poliocephala</i> ¹	Pink-bellied Imperial Pigeon	14	26
<i>Ducula aenea</i>	Green Imperial Pigeon	-	2
<i>Ducula carola</i>	Spotted Imperial Pigeon	-	-
<i>Ducula bicolor</i>	Bicolored Pigeon	-	-
<i>Columba vitiensis</i>	Metallic Wood Pigeon	-	1
<i>Macropygia phasianella</i>	Reddish Cuckoo Dove	23	35
<i>Chalcophaps indica</i>	Common Emerald Dove	9	13 (1)
<i>Gallicolumba keyi</i>	Negros Bleeding-heart	-	-
<i>Caloenas nicobarica</i>	Nicobar Pigeon	-	-
<i>Cacatua haematuropygia</i>	Philippine Cockatoo	-	-
<i>Prioniturus discurus</i>	Blue-crowned Racquet-tail Parrot	9	25
<i>Tanygnathus lucionensis</i>	Blue-crowned Parrot	-	-
<i>Loriculus philippensis</i>	Philippine Hanging Parakeet	-	1
<i>Cuculus sparveroides</i> *	Large Hawk Cuckoo	-	14

Scientific Name	Common Name	Cambridge-- Philippines 1991 survey	1999 survey
<i>Cuculus fugax</i>	Hodgson's Hawk Cuckoo	-	-
<i>Cacomantis merulinus</i>	Plaintive Cuckoo	-	-
<i>Cacomantis variolosus</i>	Brush Cuckoo	-	26
<i>Chrysococcyx russatus</i>	Gould's Bronze Cuckoo	-	-
<i>Surniculus lugubris</i>	Drongo Cuckoo	-	1
<i>Centropus viridis</i>	Philippine Coucal	3	54
<i>Eudynamis scolopacea</i>	Koel	-	6
<i>Ninox scutulata randi*</i>	Brown Hawk Owl	-	-
<i>Ninox philippensis'</i>	Philippine Hawk Owl	3	31 (4)
<i>Otus megalotis nigrorum'</i>	Philippine Scops Owl	-	5 (1)
<i>Batrachostomus septimus</i>	Philippine Frogmouth	-	5
<i>Caprimulgus manillensis*</i>	Philippine Nightjar	-	18 (1)
<i>Hemiprocne comata</i>	Lesser Tree Swift	3	-
<i>Collocalia vanikorensis</i>	Island Swiftlet	-	19
<i>Collocalia mearnsi</i>	Philippine Swiftlet	+	100
<i>Collocalia esculenta</i>	Glossy Swiftlet	+	52
<i>Collocalia troglodytes</i>	Pygmy Swiftlet	+	47
<i>Mearnsia picina</i>	Philippine Needletail	-	29

Scientific Name	Common Name	Cambridge-- Philippines 1991 survey	1999 survey
<i>Hirundapus celebensis</i>	Purple Needletail	29	-
<i>Alcedo argentatus</i>	Silvery Kingfisher	-	-
<i>Alcedo cyanopectus</i>	Indigo-banded Kingfisher	-	-
<i>Ceyx lepidus</i>	Variable Dwarf Kingfisher	-	-
<i>Halcyon winchelli</i>	Rufous-lored Kingfisher	-	1
<i>Halcyon chloris</i>	White-collared Kingfisher	-	14
<i>Actinoides lindsayi</i>	Spotted Wood Kingfisher	-	3
<i>Eurystomus orientalis</i>	Dollarbird	-	18
<i>Penelopides panini</i>	Visayan Tarictic Hornbill	-	27
<i>Aceros waldeni</i> ²	Visayan Writhed Hornbill	-	4
<i>Megalaima haemacephala</i> ¹	Coppersmith Barbet	-	6
<i>Dryocopus javensis</i>	White-bellied Woodpecker	2	39
<i>Dendrocopus maculatus</i>	Philippine Pygmy Woodpecker	18	16
<i>Chrysocolaptes lucidus</i>	Crimson-backed Woodpecker	-	11
<i>Pitta erythrogaster</i> ¹	Red-breasted Pitta	-	32
<i>Pitta sordida</i>	HOODED Pitta	-	-
<i>Coracina ostenta</i>	White-winged Cuckoo Shrike	40	22

Scientific Name	Common Name	Cambridge-- Philippines 1991 survey	1999 survey
<i>Coracina striata</i>	Bar-bellied Cuckoo-shrike	-	4
<i>Pericrocotus flammeus</i>	Scarlet Minivet	57	1
<i>Hypsipetes philippinus</i>	Philippine Bulbul	326	416 (15)
<i>Dicrurus balicassius</i>	Balicassiao	228	202 (7)
<i>Oriolus steeri</i>	Philippine Oriole	25	29
<i>Parus elegans albescens</i>	Elegant Tit	146	178 (1)
<i>Sitta frontalis</i>	Velvet-fronted Nuthatch	116	93
<i>Rhabdornis mystacallis</i>	Stripe-headed Rhabdornis	6	16
<i>Rhabdornis inornatus</i>	Stripe-breasted Rhabdornis	2	11
<i>Stachyris speciosa</i>	Flame-templed Babbler	10	9 (3)
<i>Brachypteryx montana</i>	White-browed Shortwing	22	5
<i>Copsychus lucionensis</i>	White-browed Shama	-	4
<i>Turdus poliocephalus</i>	Island Thrush	-	-
<i>Phylloscopus olivaceous</i>	Philippine Leaf Warbler	-	8
<i>Phylloscopus cebuensis</i>	Lemon-throated Warbler	80	34 (5)
<i>Phylloscopus trivirgatus</i>	Mountain Leaf Warbler	-	-
<i>Orthotomus castaneiceps</i> ¹	Philippine Tailorbird	78	79 (1)
<i>Rhinomyias albicularis</i>	White-throated Jungle-Flycatcher	6	-

Scientific Name	Common Name	Cambridge-- Philippines 1991 survey	1999 survey
<i>Muscicapa griseisticta</i> *	Grey-streaked Flycatcher	-	2
<i>Muscicapa dauurica</i> *	Asian Brown Flycatcher	-	3
<i>Muscicapa randi</i>	Ashy-breasted Flycatcher	-	3?
<i>Eumyias panayensis</i>	Verditer Flycatcher	5	9
<i>Ficedula westermanni</i>	Little Pied Flycatcher	-	-
<i>Ficedula narcissina</i> *	Narcissus Flycatcher	-	-
<i>Ficedula hyperythra</i>	Snowy-browed Flycatcher	2	2
<i>Ficedula mugimaki</i> *	Muginaki Flycatcher	-	-
<i>Cyornis rufigastra</i>	Mangrove Blue Flycatcher	1	3
<i>Culicicapa helianthea</i>	Citrine Canary Flycatcher	50	3
<i>Rhipidura cyaniceps</i>	Blue-headed Fantail	174	68 (8)
<i>Hypothymis azurea</i>	Black-naped Monarch	4	1
<i>Hypothymis coelestis</i>	Celestial Monarch	-	-
<i>Tersiphone cinnamomea</i>	Rufous Paradise-Flycatcher	-	-
<i>Pachycephala homeyeri</i>	White-vented Whistler	67	31 (4)
<i>Artamus leucorhynchus</i>	White-bellied Wood Swallow	-	27
<i>Sarcops calvus</i> '	Coletto	21	128

Scientific Name	Common Name	Cambridge-- Philippines 1991 survey	1999 survey
<i>Anthreptes malaccensis</i>	Plain-throated Sunbird	-	-
<i>Nectarinia sperata</i>	Purple-throated Sunbird	7	-
<i>Nectarinia jugularis</i>	Olive-backed Sunbird	-	-
<i>Aethopyga flagrans</i>	Crimson Sunbird	3	19
<i>Aethopyga shelleyi</i>	Lovely Sunbird	-	-
<i>Aethopyga siparaja</i>	Magnificent Sunbird	-	52 (4)
<i>Dicaeum haematostictum</i>	Visayan Flowerpecker	-	-
<i>Dicaeum retrocinctum</i> ³	Scarlet-collared Flowerpecker	-	-
<i>Dicaeum aeruginosum</i>	Striped Flowerpecker	-	-
<i>Dicaeum trigonostigma</i>	Orange-bellied Flowerpecker	27	14
<i>Dicaeum pygmaeum</i>	Pygmy Flowerpecker	2	4
<i>Dicaeum bicolor</i>	Bicolored Flowerpecker	-	-
<i>Zosterops everetti</i>	Everett's White-eye	-	-
<i>Zosterops nigrorum</i>	Golden-yellow White-eye	13	110 (1)
<i>Zosterops montanus</i>	Mountain White-eye	17	21
<i>Erythrura viridifacies</i>	Green-faced Parrotfinch	-	-
Total number of forest species		50	93
Total number of observation hours		NO DATA	NO DATA