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Birds of Malagos Watershed: A Comparative Sourvey

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ABSTRACT

Mindanao is considered one of the richest islands in the Philippines, due to high avifaunal biodiversity. Birds play a vital role in determining the condition of certain areas. The study is a morphological assessment of birds in Malagos watershed, Baguio District, Davao City. It sought to identify and classify the birds species; determine the distribution and compare the taxonomic listing of birds with previous avian surveys in the area. Using point count and mist netting effort, 54 species were identified belonging to 27 families. Three (3) new families were added to the list of previous studies. It included twelve Philippine endemic species, seven Mindanao endemic species, 32 resident species and four species of birds assessed as vulnerable and endangered. The area was also considered disturbed because most of the observed birds were usually found in open and cultivated areas. A comparative study of three other avian surveys showed a steady increase in the population from 1994 to 2002 but a decline in the number of avian species was observed in the present study, a negative trend which is associated with habitat destruction and anthropogenic activities.

Keywords - Birds of Malagos, Mindanao

INTRODUCTION

Mindanao is one of the major islands of the Philippine archipelago which is located in the southern part of the country. It is considered as one of the richest islands due to its high biodiversity in avifauna. The island has a record of almost 341 species of birds that consist of 147 resident species, 93 migratory, 94 endemic species, and 14 migrant and resident species (Kennedy, Gonzales, Dickinson, Miranda and Fisher, 2000). It is also the home of the majestic bird, the Philippine Eagle (*Pithecophaga jefferyi*).

Many studies utilize the presence of birds in an area because birds play a vital role in determining the condition of a certain environment. It serves as an ecological and biological indicator that can provide crucial information on the ecosystem (Crosby, 1998). However, the distribution, diversity and community structure of most bird species on small forest fragments, which are important and deemed necessary for conservation, remains poorly studied. Regular bird survey in the vicinity of the watershed or even in any area provide information such as

updated list of birds at any given point of time. This enables environmentalists or conservation groups to compare records to improve the management of wildlife in the area.

The assessment of birds at Malagos Watershed is useful to the Philippine Eagle Foundation (PEF) and Department of Environment and Natural Resources (DENR) for feedback to see if their conservation efforts worked over time as compared to past studies on bird conservation in the area. The community would then be aware of the present ecological condition of the area. It is therefore the purpose of this study to conduct an ecological assessment of birds in Malagos Watershed, Baguio District, Davao City specifically to identify and classify the species of birds; determine the distribution of bird species in the protected area; and, compare the taxonomic listing of birds with previous survey researches in the area.

MATERIALS AND METHODS

The study site covers an area of 235.32 hectares. It lies along 70 10" 40.11' North latitude and 1250 24" 36.05' East longitude which is 32 km away from Davao City proper and approximately 5 km away from Calinan proper (Fig. 1). A portion of the area was planted with bamboo and coconut species, while some parts of the area showed primary succession where vegetation like shrubs, ferns and grasses had grown. At the mid portion of the watershed, a portion being preserved by DENR (Department of Environment and Natural Resources) and DCWD (Davao City Water District) purposely for the park, are trees with an estimated height ranging from 10 – 60 ft tall. It was observed that human settlement was slowly encroaching into the area. There are 20 different organizations like schools, NGO's and School Clubs that help in the reforestation program for the watershed since 1990's. Aside from the rain, water supply within the watershed comes from the Gumalang Creek and Cugan Creek (Fig. 1b).

a) Map of Davao City

b) Malagos Site

Fig 1. Map of Malagos watershed.

Eight (8) point counts were established 200 m apart from each other. Point count 1 was bounded by a stream of water and vegetation present was mostly bamboo species, young growth trees and few species of vine. During daytime, the area was dark because of the dense vegetation. In Point Count 2, the soil was wet and soft. Vegetation like shrubs, bamboo species, rattan and young growth trees were seen. The site shows secondary succession. In Point Count 3, the area was occupied mostly by shrubs, young growth trees and few individuals of old growth trees. During the first visit around Malagos Watershed, a group of fruit bats had inhabited the area 900 m to 1000 m away, but later it was observed that fruit bats settled towards the middle portion of the watershed. In Point count 4, rattan and Romblon species, young growth trees and few old growth trees were found. The soil was wet and very soft.

The area in Point count 5 had shrubs, young growth trees, some rattan and some species of bamboo. A creek flowing from a higher elevation to the middle portion of the watershed moisten the dry leaves that covered the earth's surface and provide a habitat for insects and reptiles. Point Count 6, consisted of young growth trees, some species of shrubs and species of rattan. The small stream of water from point count 5 continues to flow into the area. It showed evidence of primary to secondary succession due to fallen trees.

Point Count 7 is filled with young growth trees and some species of ferns. Some species of bamboo had grown and a part was fully occupied by tall species of grass near the electrical tower being installed by National Power Corporation (NPC). A group of fruit bats was sighted closer to the forest edge. Point Count 8 was a few meters away from the human settlement, where growing trees and some species of vines were present. A greater part of this area was also rehabilitated and reforested by the Malagos Watershed Management.

Field Sampling and Materials

The bird survey was done using point count and mist netting methods

Point Count Method

Eight (8) point counts were posted 200 meters apart from each other which were accurately measured by a survey meter tape. Markers were then placed in every point as guides. An observer stayed at each point count within 15 to 20 minutes and counted the birds individually while the researcher also identified the bird through their unique bird call or actual sighting. A high powered binocular was used to observe the kind of species that were seen within the point count. Birds flying over the area were also included in the data and counted individually. The process was repeated at dawn, middle of the day then late in the afternoon at synchronized time and recorded on a data sheet.

Mist Netting Effort

Mist netting was used to capture birds that were shy but had flown low in the understory. The nets used were 12m x 2.8m, 36 mm mesh placed at varying distances and positioned pointing up to sky level or ground level. To put up the

nets, each end was tied and supported with straight poles planted steadily on the ground depending on the width of the net. With the aid of a digital camera, the exact appearance of the captured bird was used to get a morphologic sampling. Then the data were recorded. Extreme care was observed so as not to harm the birds in the process of being freed.

Species Identification

Bird surveys were conducted daily for two weeks in September and daily in November. Point counts started early starting from 0600 hr up to 1700 hr. Birds were identified using a pair of binoculars and a Field Guide to Philippine Birds (Kennedy, Gonzales, Dickinson, Miranda and Fisher, 2000). Nets were opened daily from 04:30 hr to 17:00 hr and at 30 minute interval the nets were checked to see captured birds. Many kinds of birds came from different areas of Davao or Mindanao to feed or build nests. To avoid repetition of recording samples, the birds were marked by cutting a small portion of the claws using a nail cutter before being released back to the environment.

RESULTS AND DISCUSSION

Species Richness and Composition

A total of 556 species of birds in the Philippines was reported by Kennedy, Gonzales, Dickinson, Miranda and Fisher (2000) and 827 species of birds were reported by Crosby (1998). The study identified 54 species using the point count and mist netting methods. Based on the Silvatrop data, 12 out of 173 (6.93%) were Philippine endemics, 7 out of 102 (6.83%) were Mindanao endemics, 2 out of 152 (1.32%) were migratory, 32 out of 385 (8.31%) were resident species, and 1 out of 15 (6.67%) was both migrant and resident known to occur in a fragmented forest.

Most of the birds under the families Nectariniidae, Estriidae, Piccidae, and Pycnonotidae were commonly found in the open areas. Rare or uncommon species of birds were also noted during the survey, namely: Rufous-lored Kingfisher (*Halcyon winchelli*), Ruddy kingfisher (*Halcycon coromanda*), Silvery kingfisher (*Alcedo argentata*), Philippine dwarf kingfisher (*Ceyx erithacus*), Hodgson's hawk-cuckoo (*Cuculus fugax*), Black-faced coucal (*Centropus melanops*), Little slaty flycatcher (*Ficedula basilanica*), Rufous paradise flycatcher (*Terpsiphone cinnamomea*), Naked-faced spiderhunter (*Arachnothera clarae*) and Streaked ground babbler (*Ptilocichla mindanensis*).

There were three vulnerable uncommon species that are considered endemics namely: Rufous-lored kingfisher (*Halcyon winchelli*), Silvery kingfisher (*Alcedo argentata*) and Little Slaty flycatcher (*Ficedula basilanica*). These rare birds are primarily dependent on the quality of the area (BIODAT, 2004) and the availability of the food item for their life processes (Lefebvre and Poulin, 1996).

Since the forest fragment was too small for all the birds inhabiting the area, the endemic species were threatened due to increased competition for the food item and area of occupancy. Unchecked hunting of birds for pet trades, conversion of forest land to agricultural or residential areas, and mismanagement of protected

areas are some of the contributing factors affecting the avian population and their survival. The most affected avian groups are the endemic species because they are very sensitive to ecological change (Danielsen, 1994 cited by Crosby 1998). From the survey, there were 4 globally threatened or vulnerable species based on the Red Data Book namely: Rufous-lored Kingfisher (*Halcyon winchelli*), Silvery kingfisher (*Alcedo argentata*) Fig. 2. Philippine dwarf kingfisher (*Ceyx melanurus*) Fig. 3 and Little slaty flycatcher (*Ficedula basilanica*) Fig. 4.

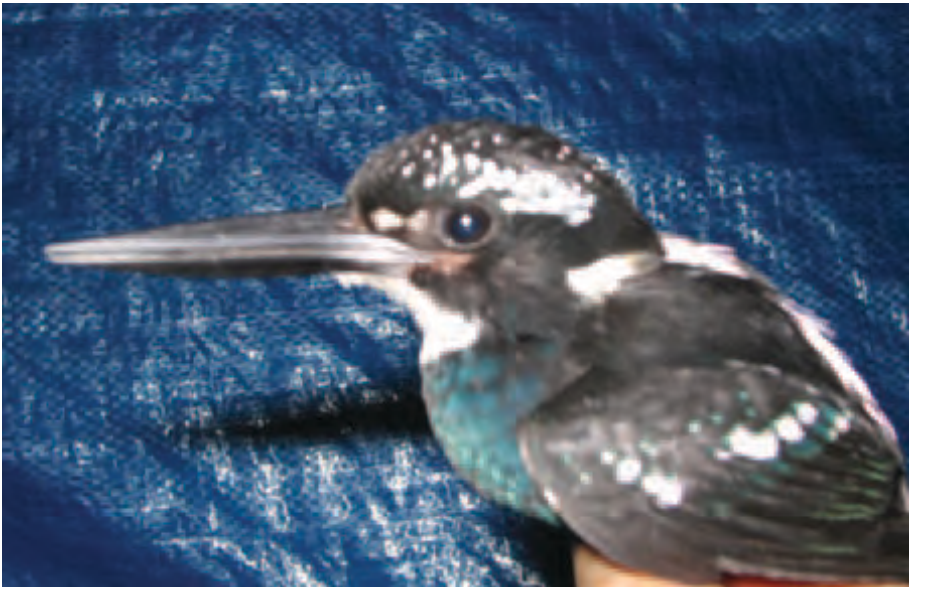

Fig. 2. Silvery Kingfisher *(Alcedo argentata)*

Fig. 3. Philippine dwarf kingfisher *(Ceyx melanurus)*

Fig. 4. Little slaty fly catcher *(Ficedula basinalica)*

Figure 4 shows the 4 ornithological surveys conducted in Malagos Watershed from 1994 – 2004.

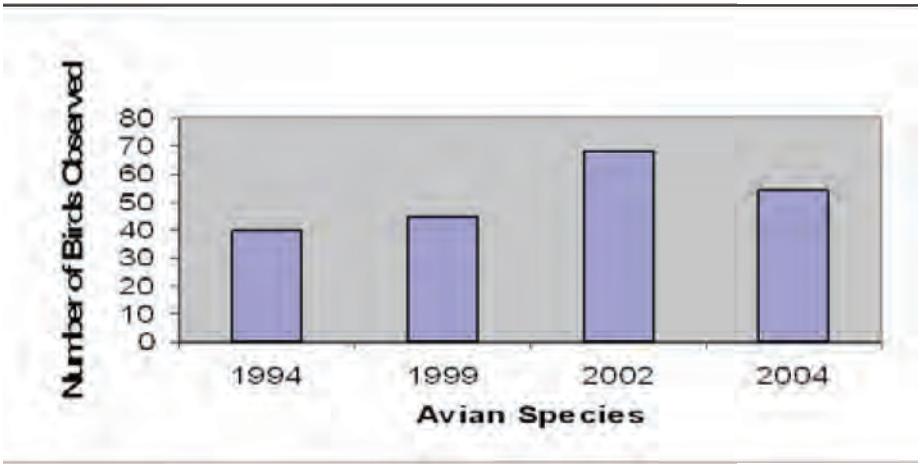

Fig. 5. Number of Avian Species in Malagos Watershed from 1994-2004.

The pioneering study of Banconguis (1994) provided an initial taxonomic listing of birds observed in the area. Forty species of birds and 20 families were accounted using the Mist Netting Effort. It was followed by Mancke in 1999, a volunteer ornithologist who only surveyed the Philippine Eagle Center (a part of the Malagos watershed) using the bird watching method and recorded 45 species of birds and 26 families.

Templado (2002) used the line transect method in all areas and recorded 68 species of birds ad 29 families. Fig. 5 shows a steady increase in population of avian species from the 1994 to 2002 of avian survey. Compared to the 2002 survey, the present survey showed a 20% decline in number of avian species.

There were 7 families of birds from the previous list of 3 surveys, namely: Apodidae (Island swiftlet, Asian-palm swiftlet, Glossy swiftlet, Philippine needletail and House swift), Oriolidae (Black-naped oriole and Philippine fairy bluebird), Picidae (Philippine pygmy woodpecker), Scolopacidae (Spotted redshank), Turnidae (Oriental magpie-robin), Coraciidae (Dollarbird) and Hirundinidae (Pacific swallow) which were not observed in the present study even when the two methods were already used.

Three families of birds which were not present in the previous studies were added to the list, namely: Raliidae (Barred rail and Plain bush-hen), Dicruridae (Spangle drongo) and Psittacidae (Colasisi). Despite the additional species, a general decrease in the number of avian species was noted. This decrease could be due to the following reasons: a) habitat destruction which leads to increase in demand of land use, b) hunting of birds for food or for selling as pets, c) some species of birds are shy and some of them are migratory (Lefebvre and Poulin, 1996), d) continuous destruction of the environment by converting the forest land into plantation, small time logging and e) insufficient food resource per species.

Continuous forest fragmentation increases the amount of forest edges, forest core decreases and vegetation composition and structural changes may cause a negative effect on the population of sensitive avian species (King, Griffin and Degraaf, 1996). Species that were mostly affected are the uncommon and endemic species due to the following reasons: a) fragments may simply be much too small for them to meet their energy requirement and b) the structure may have been altered sufficiently to reduce availability of prey or food items (Philip, Stouffer and Bierrqoard, 1995). The decrease in land area signifies overlapping of territories, increase in competition and predation of nest. When habitat is altered too fast for resident species to adapt, some species will disappear but some would favor the change (Ching 2004).

Other species present in the recent study are the following: Black bittern (*Dupetor flavicollis*), Hodgson's hawk-cuckoo (*Cuculus fugax*), Pechora pipit (*Anthus gustavi*), Rufous paradise flycatcher (*Terpsiphone cinnamomea*), Plain-throated sunbird (*Anthreptes malacensis*), Naked-face spiderhunter (*Arachnothera clarae*), Philippine leaf-warbler (*Phylloscopus olivaceus*) and Streaked ground-babbler (*Ptilocichla mindanensis*). They were listed in the study for the following reasons: a) previous researchers were not sure of their identity, b) some species were migratory like the Brown Shrike (Kennedy, Gonzales, Dickinson, Miranda and Fisher, 2000), c) they were just difficult to observe; and, d) their discovery was accidental (Ching, 2004).

CONCLUSIONS

Using point count and mist-netting methods, this study accounted for 27 families and 54 species of birds broken down as follows: 12 Philippine endemics, 7 Mindanao endemic, 2 migrants, 32 resident species and 1 both migrant and resident species. Of the 54 species, 4 are globally threatened birds namely Silvery kingfisher (*Alcedo argentata*), Rufous-lored kingfisher (*Halcyon winchelli*), Philippine dwarf-kingfisher (*Ceyx melanurus*) and Little slaty flycatcher (*Ficedula basilanica*). There were 7 families of birds which were not observed namely: Apodidae, Oriolidae, Picidae, Scolopacidae, Turnidae, Coraciidae and Hirundinidae, but 3 new families of birds were added in the list namely: Dicruridae, Rallidae and Psittacidae. Twelve species of birds were also added in the list namely: Black bittern (*Dupetor flavicollis*), Hodgson's hawk-cuckoo (*Cuculus fugax*), Pechora pipit (*Anthus gustavi*), Rufous paradise flycatcher (*Terpsiphone cinnamomea*), Plain-throated sunbird (*Anthreptes malacensis*), Naked-face spiderhunter (*Arachnothera clarae*), Philippine leaf-warbler (*Phylloscopus olivaceus*), Spangle drongo (*Dicrurus hottentottus*), Colasisi (*Loriculus philippensis*), Barred rail (*Gallirall torquatus*), Plain bush-hen (*Amaurornis olivaceus*) and Streaked ground-babbler (*Ptilocichla mindanensis*).

Comparing the previous 4 avian surveys, the 3 surveys (1994, 1999 and 2002) showed an increasing trend but in 2004 survey, the trend was reversed and a decrease of 20% compared to 2002 avian survey was noted.
Based on the avian survey, Malagos watershed is a highly disturbed area. Out of 54 species in the study, only 40 species were classified as common and 18 out of the 40 (45%) were commonly found in cultivated areas, 5 were considered as solitary and found on forest floor. Nineteen (19) endemic species were identified, 3 species of which were classified as vulnerable and the rest were considered threatened as noted in the Red Data Book (BIODAT, 2004).

The trend in the survey of the number of avian species showed a relative increase from 1994 to 2002 and a decrease of 20 % of the species in the 2004 study, a negative trend noted in the present study which is associated with habitat destruction and anthropogenic activities.

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