The Biological Diversity of Mihintale: With Special Reference to its Herpetofauna. Lyriocephalus Special issue. 2010. May.
Volume 7 Numbers 1 & 2:123-129. ISSN 13910833

AVIFAUNAL DIVERSITY IN THE MIHINTALE SANCTUARY OF SRI LANKA

I.W.C.S. Wimalasekara, and Wickramasinghe M. Sriyani.

Department of Biological Sciences, Faculty of Applied Sciences,
Rajarata University of Sri Lanka, Mihintale

ABSTRACT

Mihintale Sanctuary is an important site which is rich in biodiversity with scarce information on avifauna. This study was carried out to estimate the bird species diversity within the Mihintale sanctuary during November 2008 to May 2009. Line transect, point counts and opportunistic methods were used daily in the morning and evening to determine the species richness, abundance and diversity.

A total of 130 birds were recorded during the study that includes 111 breeding residents, 19 winter visitors, 4 endemic species and 4 proposed endemic species. Out of the 130 bird species recorded, 58 species were very common, 61 were common and 10 species belong to the rare category. Among them 01 was recorded as a very rare winter visitor and 01 species belonged to the globally threatened category respectively. Six were nationally threatened species. Species richness of the aquatic habitats, forested areas and the disturbed habitats were 93, 40 and 76 respectively. Shannon Diversity Index (H') for aquatic, forest and disturbed habitat were 3.83, 3.32 and 3.79 respectively.

Even though the avifauna observed in the Mihintale Sanctuary is low in terms of endemicity it provides habitats for large populations of native bird species. The sanctuary therefore plays an important role in conservation of birds in Sri Lanka.

Key Words: Mihintale Sanctuary, avifauna, diversity, endemic, conservation

INTRODUCTION

Sri Lanka's avifauna is one of the richest in the whole of Asia (Kotagama and Wijayasingha, 1998). About 482 bird species have been recorded including 220 breeding residents and 26 endemic species (Kotagama, et al., 2006). Sri Lanka has been identified as an Endemic Bird Area (EBA 124) in 1998 by Bird Life International (Anon, 2008).

Although several studies have been carried out previously on the avifauna of Sri Lanka, most of these studies are confined to the wet zone. Information on the dry zone avifauna is scarce. Mihintale Sanctuary is an important site located in Sri Lanka within the dry zone with scarce information on avifauna.

This study is the first detailed study on avifaunal diversity in the Mihintale Wildlife Sanctuary. The main objective of the proposed study was to determine the species richness and diversity of avifauna in the Mihintale Sanctuary.

MATERIALS AND METHODS

Mihintale Sanctuary is located in the Anuradhapura District of the North-Central Province of Sri Lanka, between 8°18'- 8°23' N and 80°27' 80°35' E containing in extant about 2,470 acres (999.6 ha). There are no proper demarcated boundaries for the sanctuary (Figure 1). The reddish brown earth is the predominant soil type which does not occur uniformly throughout the sanctuary and is interspersed with minor soil types, dependant on local conditions such as proximity to water bodies. It receives an annual rainfall between 1,000 - 1,500 mm/year from the North-east monsoon and intermonsoons (March - April and September - October). Temperature ranges between 19 °C to 35 °C. Majority of the people inhabiting the sanctuary are Sinhalese and Buddhists. The main source of livelihood of the residents is Chena cultivation (Slash and burn) (Anon, 2007).

Mihintale sanctuary comprises mainly of Undisturbed forests belong to the Dry Mixed Evergreen forest category (DMEF), Scrublands, Water-edge habitats, highly degraded tertiary forests and Vegetation in archaeological sites.

The study was conducted from 06.00 h to 08.00 h and 16.00 h to 18.30 h in the morning and evening respectively. Line transect method (200 m x 50 m) was used for sampling terrestrial habitats while point counts were used for sampling aquatic habitats (Bibby et al., 1993). Four fixed points were selected and 20-30 minutes were spent for both

point and transect counts. The opportunistic observation method was used since some bird species in the sanctuary could not be observed along the line transects or points. A pair of binoculars (Bushnell 13-1056C) was used to identify the birds at a distance. A tally counter was used to count the number of birds. Species identification and nomenclature was based on Kotagama and Fernando (1994).

RESULTS AND DISCUSSION

Mihintale Sanctuary comprises of 130 birds belonging to 47 families. This includes 111 breeding residents, 19 winter visitors, 4 endemic species and 4 species that are proposed as endemic birds to Sri Lanka. A detailed list of bird species recorded within the sanctuary is provided in Appendix I.

The habitats that are found in the Mihintale Sanctuary can be broadly divided in to forested areas, aquatic habitats and disturbed habitats. Species richness and community structure of birds vary from region to region, as well as within the region, since abiotic and biotic factors vary from habitat to habitat (Johnsingh and Joshua, 1994). Also, bird species distribution of an area may depend on the insect biomass of the area. These factors may change due to human influences, climate and the topographic conditions of the area.

The species richness of the whole sanctuary for avifauna was quite high. Out of the breeding resident species found in Sri Lanka, 48.9% were recorded within the sanctuary (Figure 2). However, the overall endemicity in the sanctuary was relatively low (15.4%) compared to protected areas in the wet zone. The wet zone rainforests provide habitats for nearly all of the country's woody endemic plants and for about three-quarters of the endemic animals (Anon, 1999). This is generally the expected result for dry zone habitats (Weerakoon and Goonatilleke, 2007). This may be due to the absence of suitable microclimatic conditions for these endemic birds. About 20% of the winter visitors were recorded during this survey.

Out of 130 bird species recorded 58 species are very common, and 61 are common. During the survey 10 rare species, 1 very rare winter visitor, *Zoothera citrina* (Orange-Headed Ground Thrush), 1 globally threatened species, *Pelecanus philippensis* (Spot billed pelican) (Plate 5, Figures 7 & 8) and 6 nationally threatened species were encountered.

Among the birds observed *Ardeola grayii* (Indian Pond Heron), *Nectarinia zeylonica* (Purple-rumped Sunbird), *Oriolus xanthornus* (Black-Hooded Oriole), *Megalaima zeylanica* (Brown-Headed Barbet), *Psittacula kramerii* (Rose-Ringed Parakeet), *Phalacrocorax niger* (Little Cormorant), *Hemiprocne coronata* (Crested Tree-Swift), *Bubulcus ibis* (Cattle Egret), and *Pycnonotus cafer* (Red-Vented Bulbul) were some of the commonest species.

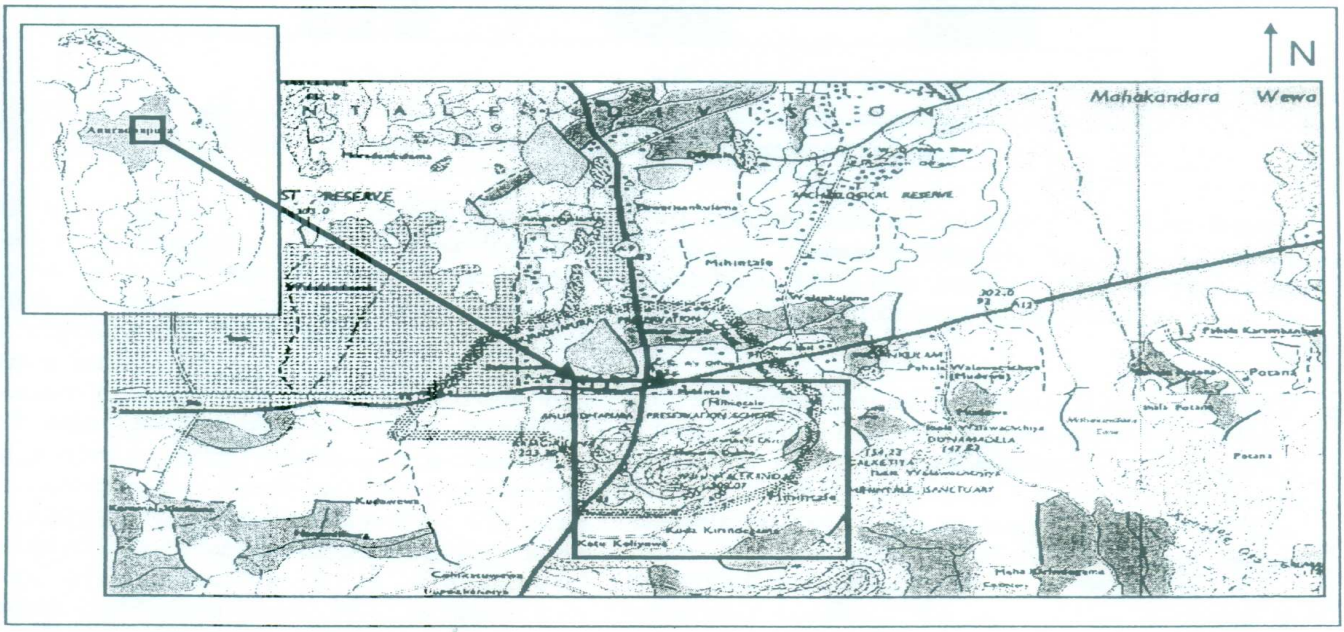
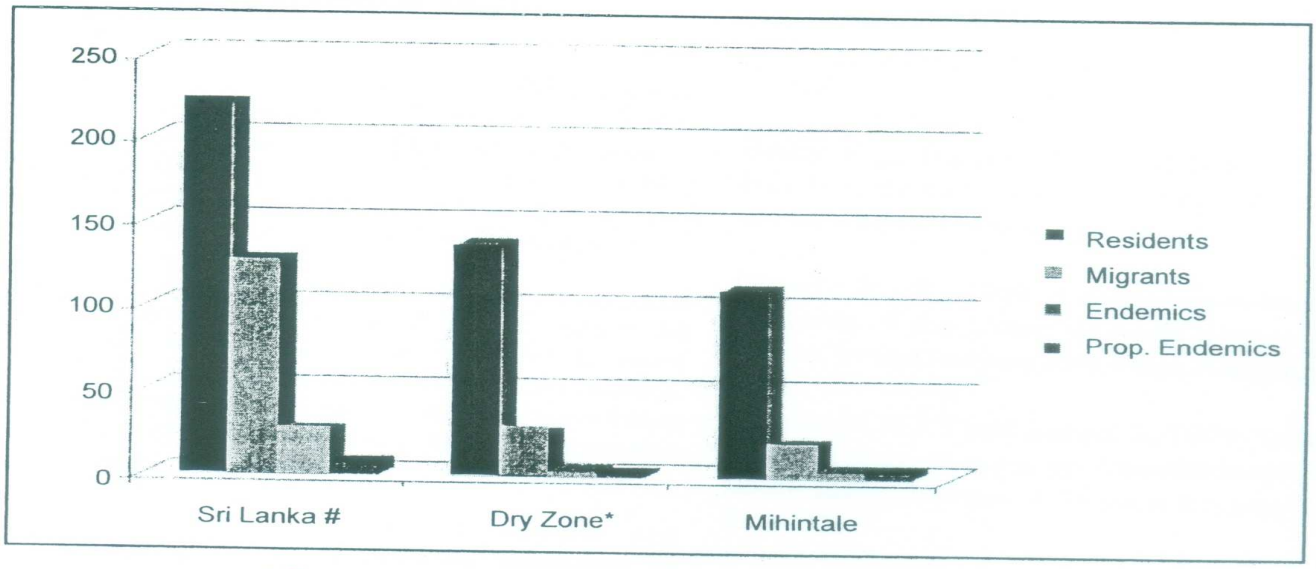


Figure 1: Map showing the study site within the Mihintale sanctuary



Kotagama, et al., 2006 * Weerakoon and Goonatilleke, 2007

Figure 2: Species richness of the sanctuary with compared to Sri Lanka and Dry zone

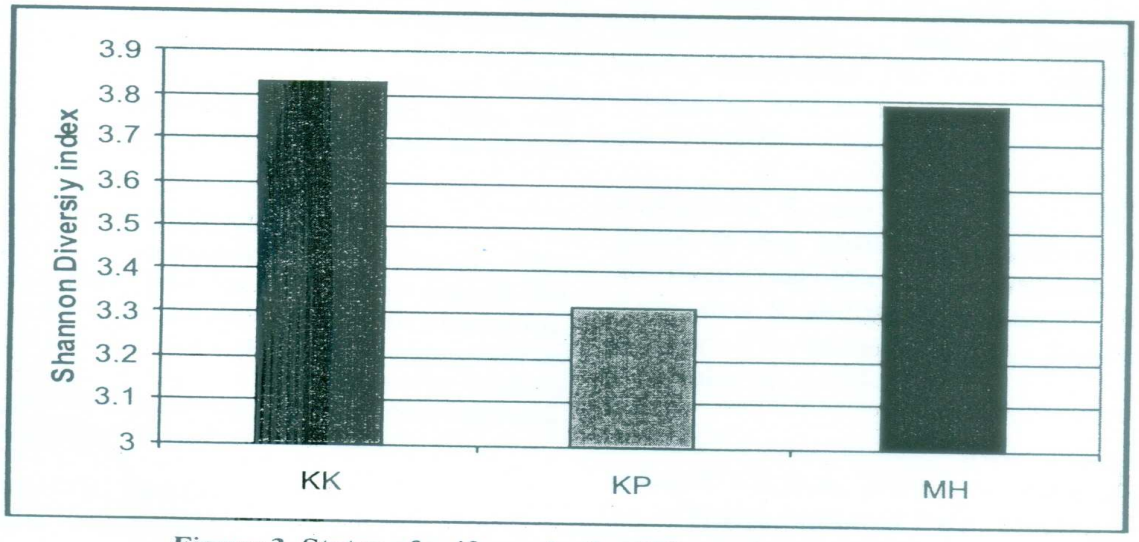


Figure 3. Status of avifauna in the different habitat types

Aquatic areas provide suitable niches and food resources for many types of birds. Therefore, the species richness near aquatic ecosystems is high compared to other forest ecosystems. Rooted aquatic vegetation in fairly shallow water bodies provides a habitat for a number of semi aquatic birds such as egrets, herons, etc. Exposed tank bed covered with grass functions as an important feeding ground for many grassland associated bird species such as prinias, bee eaters, and pipits and an important breeding ground for Lapwings. The large trees act as roosting and breeding places for a large numbers of species such as kingfishers, cormorants, egrets, herons etc. The catchment area of the tank provides habitats for many terrestrial bird species such as Spotted dove, Rose-Ringed Parakeet, Common Mynah, and the Common Tailorbird. Thus this seasonal tank plays a vital function as an important biological repository in the region.

The scattered trees in the disturbed habitat provide a large number of insect species among the foliage and other microhabitats. Flowering plants attract insects which in turn attract insectivorous birds. Daniels (1989) found an increase in bird species diversity when forests are disturbed because when disturbed it has fewer specialist species and more generalist species. So the species diversity is somewhat high in disturbed habitats. Differences in

species diversity of different habitats are clearly shown in Figure 3.

Habitat fragmentation, hunting and the excessive use of chemicals are the main threats to the bird populations within the sampling sites. Awareness programmes for the rural community about bird conservation is needed, while promoting sustainable utilization of the natural resources.

Although the sanctuary harbours large numbers of birds, a proper conservation action cannot be undertaken because Mihintale is one of the most important archaeological sites in Sri Lanka. Therefore, the area of the sanctuary is always being subjected to various activities such as excavation and mining.

Due to time limitation, the present study does not include investigations of monthly variations in avifaunal diversity. Investigations of monthly variations in avifauna should be done to get a clearer picture of avifaunal activity patterns. Birds are often useful as indicator species of the health of an eco-system. Therefore, birds can be used as focal species to gather data on the status of forest fragments and the level of isolation. This will ultimately lead to both conservation of birds and their habitats.

ACKNOWLEDGEMENTS

We thank Mr. Dharmadasa, Ms. Herath, Ms. Jayawardene, Ms. Thushari, and other friends for the co-operation and assistance given in field work. We are also grateful to all others, who supported us in various ways during this study. We also wish to acknowledge the financial assistance received from the IRQUE project to conduct this survey.

LITERATURE CITED

Anon, 1999: Biodiversity conservation in Sri Lanka: A framework for action. Ministry of Forestry and Environment. pp. 5-13.

Anon, 2007: Sampath Pathikada. Divisional Secretariat, Mihintale.

Anon, 2008: Birds of Sri Lanka. http://www.ibasrilanka.net/birds.lk/threatened.asp , 2008.

Bibby, C.J., Burgess, N.D. and Hill, D.A., 1993 Bird Census Techniques. Academic Press Limited, London. pp. 1-239.

Daniels, R.J.R., 1989: A conservation strategy for the birds of the Uttara Kannada district. M.Phil. Thesis. Indian Institute of Science, Bangalore.

Johnsingh, A.J.T and Joshua, J., 1994: Avifauna in three vegetation types on Mundanthurai Plateau, South India. Journal of Tropical Ecology. 10: pp. 323-335.

Kotagama, S.W., De Silva, R.I., Wijayasingha, A.S. and Abeygunawardena, V., 2006: Avifaunal list of Sri Lanka. In: Bambaradeniya, C.N.B. (Eds.), Fauna of Sri Lanka: Status of Taxonomy, Research and Conservation. The World Conservation Union, Colombo, Sri Lanka and Government of Sri Lanka. pp. 164-203.

Kotagama, S. and Fernando, P., 1994: A field guide to the birds of Sri Lanka. The Wildlife Heritage Trust of Sri Lanka, Sri Lanka. pp. 1-224.

Kotagama, S. and Wijayasingha, A., 1998: Sirilaka Kurullo. The Wildlife Heritage Trust of Sri Lanka, Sri Lanka. pp. 1-394.

Weerakoon, D.K., and Goonatilleke, W.L.D.P.T.S.D.A, 2007: Diversity of avifauna in the Wilpattu National Park, Siyoth. vol. 6. no. 2: pp. 11-18.