

Density of Avifauna in Yesagy Township, Magway Region

Khin Nyunt Yi¹, Thant Zin², Nwet Nwet Win³

Abstract

A total of 68 bird species confined to 48 genera and distributed among 34 families and 15 orders was recorded. Of these 50 species were terrestrial birds and 18 species were aquatic birds. Among the 68 species of birds recorded in this site, 61 species of residents and seven species of migrants were included. During the study period, one Myanmar endemic bird species, namely *Turdoides gularis* (White-throated Babbler) was recorded. In the study area, terrestrial bird species such as *Columba livia* (Rock Pigeon), revealed to be the highest in monthly mean density (0.8487 inds/km²). However, some bird species such as *Motacilla citreola* (Citrine Wagtail) and *Chrysomma sinensis* (Yellow-eyed Babbler) (0.0127 inds/km²) revealed to be the lowest in monthly mean density. The present study area indicated a good habitat for birds since both terrestrial and water birds were found inhabiting in the study area, nevertheless there is still a need to preserve the habitat more environmentally friendly and also to safeguard the avifauna that thrive in it.

Keyword: Density, birds, Yesagy

Introduction

Birds are useful ecological indicators by which successful maintenance of biotic integrity can be evaluated. Birds are sensitive to environment changes, respond rapidly to change and are abundant within various landscape classes (Glennon, 2005).

The density of a species is measure of the number of birds in a standard area, and the geographic range is the area over which the species occurs. Density can vary considerably throughout the range of a species, but the average density multiplied by the size of the range give a rough estimate of the overall population of the species (Sibley, 2001). Scientists assess a bird global population size by examining both its density and its geographic range, or distribution, both of which are influenced by the suitability and distribution of different habitats.

Density is the number of units (e-g., Individual birds, pairs, groups, rests) per unit area (Ralph, 1981). Avian density information is necessary to estimate population, size and community composition. Reliable estimates of the density of birds are often crucial. They are needed for identifying important areas for species (Hill *et al.*, 2001; cited by Weller, 2009). As a result various techniques have been developed to derive density values (Kendeigh, 1944; and Emlen, 1971; cited by Franzreb, 1974).

Density values among different months as well as among different sites or habitat types are useful to compare and account the richness of species in the area.

The study area, Yesagy Township is located in the Dry Zone of Central Myanmar. The natural vegetation of study area are generally Dry Forest and Indaing Forests. Myanmar harbours 1116 species of birds among 10% of the 10928 bird species of the world. Yesagy Township has favorable habitats for variety of bird species including both terrestrials and water birds. This research aimed to determine the density of birds in Yesagy environs.

¹ PhD Candidate, Department of Zoology, University of Mandalay

² Professor and Head, Dr., Zoology Department, University of Mandalay

³ Associate Professor, Dr., Department of Zoology, Kalay University

Materials and Methods

Study Area

Yesagy is situated between 21° 30' to 21° 47' North Latitude and 95° 05' to 95° 15' East Longitude. The total area of Yesagy Township is 999.04km². Yesagy has different habitats such as mountain, ponds, paddy fields, In (Lake), mixed habitats and human settlements (Fig. 1)

Study Period

Bird surveys were conducted from June 2018 to May 2019.

Data Collection

At each sampling site, vintage data collection points were designated to cover the area of each sampling site. Each site was visited once a month. The collection of data was made using point count method (Bibby *et al.*, 2000 and Hamel *et al.*, 1996). At every point, observation was made by standing and recording all the birds seen or heard at a fixed distance (25 m radius) for 10 minutes. To minimize disturbances, 3 to 5 minutes time lapse was taken prior to observing. The minimum distance between two points was 200 m. Birds were viewed using binocular. The photos of birds were taken immediately with digital camera after sighting. At each site, species of birds and number of individuals were recorded.

Identification and Classification

Identification of birds was made followed after Smythies (2001) and Robson (2015).

Analysis of Data

The collected data were analyzed as following:

Density

The density was calculated as followed.

$$D = \frac{n}{a} = \frac{n}{K\pi W^2} \text{ (Buckland } et al., 2008)$$

D = Density

n = number of birds counted

K = number of points

W = fixed radius of the plot

a = total size of the surveyed plots

Results

During the study period, a total of 68 species belonging to 48 genera 34 families and 15 orders were recorded in the study area during June 2018 to May 2019. Of these 50 species were terrestrial birds and 18 species were aquatic birds. Among the 68 species of birds recorded in this site, 61 species of residents and seven species of migrants were included. During the study period, one Myanmar endemic bird species, namely *Turdoides gularis* (White-throated Babbler) was recorded. (Table 1).

Among the bird species recorded, *Columba livia* (Rock Pigeon) showed the highest monthly mean density (0.8487 inds/km²), followed by *Passer domesticus* (House Sparrow) (0.7851 inds/km²), *Sturnus burmanicus* (0.6365 inds/km²), *Acridotheres tristis* (0.5914 inds/km²), *Bubulcus coromandus* 0.5304 inds/km², *Pycnonotus cafer* (0.4244 inds/km²), *P. blanfordi* (0.4031 inds/km²) and *Streptopelia chinensis* 0.3819 inds/km²). However, *Chrysomma sinensis* (Yellow-eyed Babbler) and *Motacilla citreola* (Citrine Wagtail) revealed as the lowest monthly mean density (0.0127 inds/km²) (Table 1).

Table 1 Monthly density of bird species (inds/km²) in Yesagyo during June 2018 to May 2019

Sr. No.	Name of Species	Jun	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total	Mean
1	<i>Tadorna ferruginea</i>	0.10	0.10	0.10	0.10	0.10	0.25	0.25	0.10	0.10	0.10	0.10	0.10	1.53	0.1273
2	<i>Dendrocygna javanica</i>	0.25	0.15	0.10	0.15	0.10	0.25	0.25	0.25	0.20	0.20	0.15	0.20	2.29	0.1910
3	<i>Anas poecilorhyncha</i>	0.05	0.05	0.05	0.05	0.00	0.00	0.05	0.05	0.05	0.05	0.05	0.05	0.51	0.0424
4	<i>Tachybaptus ruficollis</i>	0.10	0.05	0.05	0.05	0.05	0.05	0.15	0.10	0.05	0.00	0.05	0.05	0.76	0.0637
5	<i>Anastomus oscitans</i>	0.05	0.05	0.05	0.05	0.05	0.00	0.05	0.00	0.05	0.05	0.00	0.00	0.41	0.0339
6	<i>Plegadis falcinellus</i>	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.00	0.05	0.00	0.05	0.05	0.25	0.0212
7	<i>Ardeola grayii</i>	0.05	0.05	0.05	0.05	0.05	0.05	0.10	0.10	0.05	0.05	0.10	0.05	0.76	0.0637
8	<i>A.bacchus</i>	0.10	0.10	0.05	0.05	0.05	0.05	0.05	0.05	0.10	0.20	0.31	0.15	1.27	0.1061
9	<i>Bubulcus coromandus</i>	1.02	1.02	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.25	0.25	0.25	6.37	0.5304
10	<i>Ardea cinerea</i>	0.10	0.10	0.10	0.05	0.05	0.00	0.00	0.00	0.10	0.10	0.05	0.10	0.76	0.0637
11	<i>Casmerodius albus</i>	0.05	0.05	0.05	0.05	0.10	0.00	0.00	0.00	0.05	0.05	0.05	0.05	0.51	0.0424
12	<i>Egretta garzetta</i>	0.25	0.25	0.25	0.15	0.10	0.15	0.10	0.25	0.25	0.25	0.25	0.25	2.55	0.2122
13	<i>Phalacrocorax niger</i>	0.00	0.00	0.00	0.00	0.05	0.05	0.05	0.00	0.05	0.05	0.10	0.00	0.36	0.0297
14	<i>P.carbo</i>	0.05	0.05	0.05	0.05	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.25	0.0212
15	<i>Elanus caeruleus</i>	0.00	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.10	0.05	0.05	0.05	0.36	0.0297
16	<i>Amaurionis phoenicurnus</i>	0.00	0.00	0.00	0.00	0.05	0.05	0.05	0.05	0.05	0.05	0.00	0.05	0.36	0.0297
17	<i>Vanellus cinereus</i>	0.05	0.05	0.05	0.05	0.00	0.00	0.00	0.00	0.20	0.05	0.00	0.00	0.46	0.0382
18	<i>V.indicus</i>	0.10	0.10	0.05	0.05	0.05	0.05	0.05	0.05	0.10	0.10	0.00	0.00	0.71	0.0594
19	<i>Rostratula benghalensis</i>	0.00	0.00	0.00	0.00	0.00	0.10	0.10	0.10	0.05	0.10	0.05	0.00	0.51	0.0424
20	<i>Columba livia</i>	0.51	0.51	0.51	0.51	0.51	0.51	1.02	1.02	1.53	1.02	1.27	1.27	10.18	0.8487

Table 1 Continued

Sr. No.	Name of Species	Jun	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total	Mean
21	<i>Streptopelia tranquebarica</i>	0.10	0.10	0.10	0.20	0.10	0.10	0.10	0.20	0.25	0.25	0.15	0.10	1.78	0.1485
22	<i>S.chinensis</i>	0.25	0.25	0.25	0.25	0.25	0.25	0.51	0.51	1.02	0.25	0.25	0.51	4.58	0.3819
23	<i>Centropus sinensis</i>	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.00	0.10	0.10	0.05	0.00	0.61	0.0509
24	<i>Clamator jacobinus</i>	0.00	0.05	0.05	0.00	0.05	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.20	0.0170
25	<i>Eudynamys scolopaceus</i>	0.10	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.05	0.05	0.36	0.0297
26	<i>Althene brama</i>	0.05	0.05	0.05	0.05	0.05	0.05	0.10	0.10	0.25	0.10	0.10	0.10	1.07	0.0891
27	<i>Coracias benghalensis</i>	0.15	0.10	0.15	0.10	0.05	0.05	0.05	0.10	0.25	0.15	0.25	0.10	1.53	0.1273
28	<i>Alcedo atthis</i>	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.05	0.05	0.05	0.05	0.31	0.0255
29	<i>Ceryle rudis</i>	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.00	0.05	0.05	0.05	0.05	0.31	0.0255
30	<i>Halcyon smyrnensis</i>	0.05	0.05	0.05	0.05	0.05	0.10	0.05	0.10	0.15	0.10	0.15	0.10	1.02	0.0849
31	<i>Merops orientalis</i>	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	3.06	0.2546
32	<i>M.viridis</i>	0.05	0.00	0.00	0.05	0.05	0.05	0.00	0.05	0.05	0.05	0.10	0.05	0.51	0.0424
33	<i>M.philippinus</i>	0.05	0.05	0.05	0.05	0.05	0.10	0.10	0.05	0.10	0.10	0.15	0.15	1.02	0.0849
34	<i>M.leschenaulti</i>	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.05	0.10	0.05	0.00	0.10	0.36	0.0297
35	<i>Upupa epops</i>	0.10	0.10	0.05	0.05	0.05	0.05	0.05	0.05	0.10	0.00	0.00	0.00	0.61	0.0509
36	<i>Megalaima haemacephala</i>	0.05	0.05	0.05	0.05	0.10	0.10	0.05	0.05	0.10	0.10	0.20	0.10	1.02	0.0849
37	<i>Artamus fuscus</i>	0.10	0.10	0.10	0.20	0.10	0.10	0.20	0.10	0.10	0.15	0.15	0.10	1.53	0.1273
38	<i>Dicrurus macrocercus</i>	0.20	0.20	0.10	0.10	0.10	0.10	0.10	0.10	0.20	0.10	0.10	0.10	1.53	0.1273
39	<i>D.leucophaeus</i>	0.00	0.05	0.00	0.00	0.05	0.05	0.05	0.05	0.05	0.00	0.05	0.05	0.41	0.0339
40	<i>D.annectans</i>	0.05	0.00	0.05	0.00	0.00	0.05	0.05	0.00	0.05	0.00	0.05	0.05	0.36	0.0297

Table 1 Continued

Sr. No.	Name of Species	Jun	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total	Mean
41	<i>D.aeneus</i>	0.05	0.05	0.00	0.00	0.05	0.05	0.05	0.10	0.05	0.05	0.00	0.05	0.51	0.0424
42	<i>Corvus splendens</i>	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.05	0.51	0.25	0.25	0.25	2.04	0.1697
43	<i>Lanius collurio</i>	0.05	0.05	0.05	0.00	0.00	0.00	0.05	0.05	0.10	0.05	0.05	0.05	0.51	0.0424
44	<i>L.schach</i>	0.05	0.00	0.05	0.00	0.05	0.05	0.05	0.00	0.05	0.05	0.00	0.00	0.36	0.0297
45	<i>Ploceus manyar</i>	0.05	0.05	0.05	0.05	0.05	0.05	0.10	0.10	0.51	0.51	0.25	0.25	2.04	0.1697
46	<i>P.philippinus</i>	0.00	0.10	0.10	0.00	0.00	0.10	0.10	0.10	0.31	0.31	0.20	0.20	1.53	0.1273
47	<i>P.hypoxanthus</i>	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.00	0.51	0.25	0.25	0.25	1.37	0.1146
48	<i>Lonchura punctulata</i>	0.20	0.20	0.20	0.20	0.20	0.20	0.10	0.10	0.15	0.10	0.05	0.05	1.78	0.1485
49	<i>Passer domesticus</i>	0.51	0.51	1.02	0.51	1.02	0.51	0.51	0.51	1.53	1.27	0.76	0.76	9.42	0.7851
50	<i>P.flaeolus</i>	0.15	0.10	0.15	0.10	0.25	0.25	0.15	0.10	1.02	0.51	0.31	0.20	3.31	0.2758
51	<i>P.montanus</i>	0.10	0.05	0.05	0.05	0.10	0.05	0.05	0.05	0.51	0.61	0.31	0.10	2.04	0.1697
52	<i>Motacilla alba</i>	0.00	0.00	0.00	0.00	0.00	0.25	0.15	0.10	0.15	0.00	0.00	0.00	0.66	0.0552
53	<i>M.cinerea</i>	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.10	0.00	0.00	0.00	0.20	0.0170
54	<i>M.citreola</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.05	0.00	0.00	0.00	0.15	0.0127
55	<i>Emberiza pusilla</i>	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.31	0.10	0.15	0.10	0.15	1.53	0.1273
56	<i>Acridotheres fuscus</i>	0.10	0.05	0.05	0.05	0.05	0.05	0.05	0.10	0.15	0.10	0.15	0.10	1.02	0.0849
57	<i>A.javanicus</i>	0.10	0.10	0.10	0.10	0.10	0.15	0.10	0.25	0.51	0.25	0.10	0.15	2.04	0.1697
58	<i>A.tristis</i>	0.51	0.51	0.51	0.51	0.51	0.51	0.25	0.25	1.53	0.51	0.76	0.76	7.13	0.5941
59	<i>Sturnus burmanicus</i>	1.02	1.02	0.51	0.51	0.51	0.51	0.51	0.51	0.76	0.51	0.51	0.76	7.64	0.6365
60	<i>Saxicola caprata</i>	0.15	0.10	0.15	0.10	0.15	0.10	0.15	0.10	0.25	0.15	0.05	0.05	1.53	0.1273

Table 1 Continued

Sr. No.	Name of Species	Jun	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total	Mean
61	<i>Copsychus saularis</i>	0.05	0.05	0.05	0.05	0.05	0.05	0.10	0.10	0.05	0.05	0.05	0.10	0.76	0.0637
62	<i>Pycnonotus blanfordi</i>	0.25	0.25	0.25	0.25	0.51	0.51	0.25	0.25	0.51	0.76	0.51	0.51	4.84	0.4031
63	<i>P.cafer</i>	0.51	0.51	0.25	0.25	0.25	0.25	0.25	0.25	1.02	0.51	0.51	0.51	5.09	0.4244
64	<i>Chrysomma sinensis</i>	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.05	0.05	0.00	0.00	0.15	0.0127
65	<i>Turdoides gularis</i>	0.25	0.25	0.15	0.10	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.80	0.2334
66	<i>Phylloscopus inornatus</i>	0.10	0.10	0.05	0.05	0.05	0.05	0.05	0.05	0.25	0.15	0.10	0.25	1.27	0.1061
67	<i>Orthotomus sutorius</i>	0.05	0.05	0.05	0.05	0.05	0.05	0.10	0.10	0.05	0.05	0.10	0.05	0.76	0.0637
68	<i>Cisticola juncidis</i>	0.05	0.05	0.05	0.10	0.10	0.05	0.05	0.05	0.10	0.05	0.05	0.05	0.76	0.0637
Total density		9.01	8.66	7.69	6.87	7.84	7.94	8.30	8.35	18.23	12.22	10.80	10.64	116.56	
Mean		0.13	0.13	0.11	0.10	0.12	0.12	0.12	0.12	0.27	0.18	0.16	0.16	1.71	

Discussion

In the present study during the study period from June 2018 to May 2019, a total of 68 bird species confined to 48 genera and belonging to 34 families of 15 orders were recorded in this site. Out of the total species, 50 species were terrestrial birds belonging to 33 genera, 25 families and eight orders where as 18 species of aquatic birds comprising under 15 genera, nine families and seven orders were also recorded. Among the 68 species of birds recorded in this site, 61 species of residents and seven species of migrants were included.

During the study period of June 2018 to May 2019, 36 species were found almost every month of study period and these species may be considered very common and they are dominated species in the study area.

Yin Yin Nu (2015) recorded that *Pycnonotus cafer* (Red-vented Bulbul), *Garrulax monilegar* (Lesser Necklaced Laughing thrush), *Treron Phaenicopternus* (Yellow-footed Green Pigeon) and *Hirundo rustica* (Barn Swallow) showed the highest density in Magway environs.

Ei Ei Win (2016) recorded that *Columba livia* (Rock Pigeon) showed the highest density, followed by *Acridotheres tristis* (Common Myna), *Passer montanus* (Eurasian Tree Sparrow), *Egretta garzetta* (Little Egret), *Streptopelia chinensis* (Spotted Dove), *Pycnonotus cafer* (Red-vented Bulbul), *Lonchura punctualata* (Scaly-breasted Munia) and *L.striata* (White-rumped Munia) in Banmaw environs.

Than Htike (2015) stated that *Acridotheres tristis* (Common Myna) showed the highest density, followed by *Passer montanus* (Eurasian Tree Sparrow), *Columba livia* (Rock Pigeon), *Passer domesticus* (House Sparrow) and *P. flaveolus* (Plain-backed Sparrow) in Min Son Taung Wildlife Sanctuary.

Yadanar Myo (2017) recorded that *Columba livia* (Rock Pigeon) and *Passer domesticus* (House Sparrow) showed the highest density in Pakokku environs. These species also show highest density in the present study.

Among the bird species recorded, *Columba livia* (Rock Pigeon) showed the highest monthly mean density (0.8487 inds/km²), followed by *Passer domesticus* (House Sparrow) (0.7851 inds/km²), *Sturnus burmanicus* (0.6365 inds/km²), *Acridotheres tristis* (0.5914 inds/km²), *Bubulcus coromandus* (0.5304 inds/km²), *Pycnonotus cafer* (0.4244 inds/km²), *P. blanfordi* (0.4031 inds/km²) and *Streptopelia chinensis* (0.3819 inds/km²). However, *Chrysomma sinensis* (Yellow-eyed Babbler) and *Motacilla citreola* (Citrine Wagtail) revealed as the lowest monthly mean density (0.0127 inds/km²). Based on the present findings, density of each species may be related to the availability of food, habitat condition and breeding season of the species and also in the nature of habitat compatible to each species.

On the whole, the study area is well provided with the habitat types suitable not only for terrestrial birds but also for aquatic birds to sustain their population.

Acknowledgements

I would like to express my profound gratitude to Dr Thein Win, Director General, Department of Higher Education, Ministry of Education, and Dr Kay Thi Thin, Dr Myin Zu Minn, and Dr Mi Mi Gyi, Pro-rectors, University of Mandalay for their permission to present this paper.

References

- Bibby, C.J., Burgess, N.D., Hill, D.A. and Mustoe, S.H., 2000. *Bird census technique*. Second edition. A Harcourt Science and Technology Company. London, 302 pp.
- Ei Ei Win, 2016. Species richness and diversity of bird fauna in Banmaw environs Kachin State. *PhD Disseration*, Department of Zoology, University of Mandalay.
- Franzreb, K.E., 1974. *Comparison of variable Strip transect and spot-map methods for consusing avian populations in a mixed coniferous forest*. Department of Biological Sciences, California State University, Chicago, California. pp 260-262.
- Gelnnon, M.J. and Porter, W.F., 2005. Effects of Land use Management on Biotic Intergrity: An investigation of bird communities. *Biological Conservation*, 126: 499-511.
- Robson, C., 2015. *A field guide to the birds of South-East Asia*. New Holand Publisher (UK). Ltd. London, 544 pp.
- Sibley, D.A., 2001. *The sibley guide to birdlife and behavior*. 1st Edition. Alfred A. Knopt. Inc. New York. 580 pp.
- Smythies, B.E., 2001. *The birds of Burma*. Fourth edition. National History Publication (Borneo) Kota Kinbalu, Malaysia. 565 pp.
- Than Htike, 2015. Ecological Aspects of bird fauna in Min Son Taung Wildlife Sancturay, Nahgtogyi Township. *PhD Disseration*, Department of Zoology, University of Mandalay.
- Yadanar Myo, 2017. Composition, abundance, density, habitat utilization, Feeding habit and Diversity of Birds in Pakokku Environs, Magway Region. *PhD Disseration*. Department of Zoology, University of Mandalay.
- Yin Yin Nu 2015. Diversity and abundance of birds in different habitats in Northern part of Kinmundaung Reserved Forest, Taungdwingyi Township, Magway Region. *PhD Dissertaton*, Department of Zoology, University of Mandalay.