

Seasonal Occurrence and Composition of Bird Species at Paleik Lake and Its Environs, Sintkaing Township, Mandalay Region, Myanmar

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Abstract

Seasonal occurrence of bird species were observed at Paleik Lake and its environs, during June, 2017 to May, 2018. Line transect method was carried out. A total of 82 bird species confined to 62 genera and distributed 35 families under 13 orders were recorded. Among species recorded, 34 species are waterbirds and 49 species are terrestrial birds. Regarding the species composition of birds, the highest species was found in order Passeriformes 41.46% and the lowest species was found in orders Ciconiiformes, Accipitri-formes, Strigiformes, Bucerotiformes and Piciformes 1.22% each. The most seasonal occurrence of bird species was found in the cold season 70 species, 41.67% and the lowest species was found in rainy season 38 species, 22.62%. Paleik Lake is not only good supports for avifauna diversity but also attract more migratory birds as the present of favorable for bird inhabitant. Thus, there is a need to protect the natural habitats of birds for future.

Keywords: Occurrence; Avifauna; Paleik Lake

Introduction

Myanmar is mainland Southeast Asia's largest country, with a land area and is often considered to be the last frontier of global biodiversity in mainland Asia [1]. Myanmar supports one of the richest and most diverse bird communities in mainland Southeast Asia [2].

The avifauna of Myanmar includes a total of 1114 species of which six are endemic, two have been introduced by humans and ten are rare of accidental. One species listed is extirpated in Myanmar [3]. Among them, 47 bird species are globally threatened and seven are critically endangered in Myanmar. Two species are probably extinct and of which one is possibly globally endangered. White-shouldered Ibis *Pseudibis davisoni* has not been seen in Myanmar since the 1940s [4].

Seasonality plays a major role in determining the abundance and distribution of birds. Seasonality affects food and cover availability of bird population, which in turn affects breeding success and ultimately survival of the bird species [5]. Abundance of bird species is largely influenced by the spatiotemporal distribution of some key environmental resources [6].

Apart from the highest uplands in the far north of the country, the climate of Myanmar may practically be classified as tropical monsoonal, although important regional variations occur within that overall category. Throughout the year, three seasons are defined: the dry (summer) season (from March to May), the rainy season (from June to October) and the cold season (from November to February) [7].

Mandalay is located in the central zone of Myanmar. The study area Paleik Lake is situated in Sintkaing Township in Mandalay. It is a wetland and it is drained by flooded water from Myit Nge River is the division of Ayeyawady River and also fishery area. Many people are come in this area, some for fishing, and others for growing vegetable and planting paddy. Thus, there are disturbed for birds for nesting, feeding, and sheltering in it. Observation of bird species was undertaken to investigate the bird species. Thus, the objectives of this study are to identify the bird species and to record the occurrence of bird species in this area.

Materials and Methods

Study area

The study area is situated in Sintkaing Township, Mandalay Region. It is situated at 8.7 km from Mandalay. It has 2.3 km long from east to west and 2.1 km width from south to north. The water body of Paleik Lake is (96.22) hectares in rainy season and (16.35) hectares in hot season. Its lines at Latitude 21°50' 14.91" N and Longitude 96°03'12.00" E.

Data collection

The study was conducted from June 2017 to May 2018. Birds were observed and recorded using a binocular. Line transect method was used, as the study area was of open type. Birds were collected one time in per month and counted by boat and walk in the edge of lake and its environs. The field surveys were conducted in the morning (between 6:30 - 10:30 am) about 3:00 hours after the sunrise and in the evening (between 3:30 - 5:30) when the movement of birds were prominent.

Data analysis

Data were analyzed by presented in percentage (%) follow after Thrusfield [8].

$$\text{Average percentage} = \frac{\text{Total no. of individuals in each species}}{\text{Total no. of individuals in observed species}} \times 100$$

Result and Discussion

Paleik Lake is situated at 8.7 km from Mandalay on the high-way road of Yangon-Mandalay. It has 96.22 hectares in the rainy season and reduces to 16.35 hectares in hot season. Water surface was fairly extensive and at times flooding reached some rice field. There are also some small trees in the flooded area. The immediate area is used for rice cultivation and growing of vegetables such as cabbages and corn around the lake margin. This situation is suitable for birds to inhabit in these areas.

The most seasonal occurrence of bird species were found in cold season 70 species (44.30%) in 2017-2018 and followed by summer season 60 species (37.97%) in 2017 - 2018. The lowest species was found in rainy season 38 species (24.05%) in 2017 - 2018 (Table 1, 2 and Figure 1).

No	Scientific name	2017							2018					Total	% Composition
		June	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May		
1	<i>Anser anser</i>	-	-	-	-	-	-	+	+	+	-	-	-	3	0.59
2	<i>Tadorna ferruginea</i>	-	-	-	-	-	-	+	+	-	-	-	-	2	0.40
3	<i>Dendrocygninae javanica</i>	+	+	+	+	+	+	+	+	+	-	-	-	9	1.78
4	<i>Anas zonorhyncha</i>	-	-	-	-	-	+	+	+	+	-	-	-	4	0.79
5	<i>Anastomus oscitans</i>	-	-	-	-	-	+	+	+	+	-	-	-	4	0.79
6	<i>Microcarvbo niger</i>	+	+	+	+	+	+	+	+	+	+	+	-	11	2.18
7	<i>Phalaracrocorax carbo</i>	+	+	+	+	+	+	+	+	+	+	-	-	10	1.98

Seasonal Occurrence and Composition of Bird Species at Paleik Lake and Its Environs, Sintkaing Township, Mandalay Region, Myanmar

8	<i>Anhinga melanogaster</i>	-	-	-	-	-	+	+	+	+	-	-	-	4	0.79
9	<i>Threskiornis melanocephalus</i>	-	-	-	-	-	-	+	+	-	-	-	-	2	0.40
10	<i>Plegadis falcinellus</i>	-	-	-	-	+	+	+	+	+	-	-	-	5	0.99
11	<i>Ixobrychus sinensis</i>	+	+	+	+	+	+	-	-	+	+	+	+	10	1.98
12	<i>I. cinnamomeus</i>	+	+	+	+	+	-	-	-	+	+	+	+	9	1.78
13	<i>Nycticorax nycticorax</i>	+	+	+	+	+	+	+	+	+	+	+	-	11	2.18
14	<i>Ardea cinerea</i>	-	-	-	-	-	+	+	+	+	-	-	-	4	0.79
15	<i>A. purpurea</i>	-	-	-	-	-	-	+	+	-	-	-	-	2	0.40
16	<i>A. alba</i>	-	-	-	-	-	-	+	+	+	+	+	-	5	0.99
17	<i>Ardeola bacchus</i>	-	+	+	+	+	+	+	+	+	+	+	-	10	1.98
18	<i>Bubulcus ibis</i>	-	+	-	+	+	+	+	+	+	+	+	-	9	1.78
19	<i>Mesophoyx intermedia</i>	-	-	-	-	+	+	+	+	+	+	+	-	7	1.39
20	<i>Egretta falcinellus</i>	+	+	+	+	+	+	+	+	+	+	+	-	11	2.18
21	<i>Porphyrio poliocephalus</i>	+	+	+	+	+	+	+	+	+	-	-	-	9	1.78
22	<i>Gallinula chloropus</i>	-	-	-	-	-	+	+	-	-	+	+	-	4	0.79
23	<i>Fulica atra</i>	-	-	-	-	+	+	+	+	+	+	-	-	6	1.19
24	<i>Amaurornis phoenicurus</i>	-	-	-	-	-	+	+	+	+	+	+	+	7	1.39
25	<i>Himantopus himantopus</i>	-	-	-	-	-	-	-	+	+	-	-	-	2	0.40
26	<i>H. leucocephalus</i>	-	-	-	-	-	-	-	-	-	-	-	+	1	0.20
27	<i>Hydrophasianus chirurgus</i>	-	-	-	-	-	+	+	+	+	-	-	-	4	0.79
28	<i>Vanellus cinereus</i>	-	-	-	-	-	-	-	-	+	-	-	-	1	0.20
29	<i>Charadrius dubius</i>	-	-	-	-	-	-	+	+	+	-	-	-	3	0.59
30	<i>Gallinago gallinago</i>	-	-	-	-	-	-	+	+	+	-	-	-	3	0.59
31	<i>Limnodromus scolopaceus</i>	-	-	-	-	-	-	-	+	+	+	-	-	3	0.59
32	<i>Tringa nebularia</i>	-	-	-	-	-	+	+	+	+	-	-	-	4	0.79
33	<i>T. glareola</i>	-	-	-	-	-	-	+	+	+	-	-	-	3	0.59
34	<i>T. ochropus</i>	-	-	-	-	-	-	-	-	-	+	+	-	2	0.40
35	<i>Columba livia</i>	+	+	+	+	+	+	+	+	+	+	+	+	12	2.38
36	<i>Spilopelia chinensis</i>	+	+	+	+	+	+	+	+	+	+	+	+	12	2.38
37	<i>Eudynamis scolopaceus</i>	-	-	-	-	-	-	-	-	+	+	+	+	4	0.79
38	<i>Centropus sinensis</i>	+	+	+	+	+	+	+	-	+	-	-	+	9	1.78
39	<i>Cacomantis merulinus</i>	-	-	-	-	-	+	-	+	-	+	+	-	4	0.79
40	<i>Athene brama</i>	+	-	-	-	-	-	+	-	-	-	-	+	3	0.59
41	<i>Halcyon smyrnensis</i>	+	+	+	+	+	+	+	+	+	-	-	+	10	1.98
42	<i>Alcedo atthis</i>	+	+	+	+	-	-	-	-	-	-	+	+	6	1.19
43	<i>Ceryle rudis</i>	-	-	-	-	-	+	+	+	-	-	+	+	5	0.99
44	<i>Merops orientalis</i>	+	+	+	+	+	+	+	+	+	-	-	+	10	1.98
45	<i>M. philippinus</i>	-	-	-	+	+	+	+	+	+	-	-	+	7	1.39

Seasonal Occurrence and Composition of Bird Species at Paleik Lake and Its Environs, Sintkaing Township, Mandalay Region, Myanmar

46	<i>Megalaima rafflesii</i>	-	-	-	-	-	-	-	-	-	-	-	+	1	0.20
47	<i>Jynx torquilla</i>	-	-	+	-	-	-	-	-	-	-	-	-	1	0.20
48	<i>Dicrurus macrocerus</i>	+	+	+	+	+	+	+	+	+	+	+	+	12	2.38
49	<i>D. annectans</i>	-	-	-	-	-	-	-	-	+	+	+	+	3	0.59
50	<i>Corvus splendens</i>	+	+	+	+	+	+	+	+	+	+	+	+	12	2.38
51	<i>Aegithina tiphia</i>	+	-	+	-	+	-	-	+	+	-	+	+	7	1.39
52	<i>Cinnyris asiaticus</i>	-	-	-	-	-	+	+	-	+	-	-	-	3	0.59
53	<i>Lanius cristatus</i>	-	-	-	-	-	-	+	+	-	-	-	-	2	0.40
54	<i>L. schach</i>	-	-	-	-	-	-	+	+	-	-	-	-	2	0.40
55	<i>Acrocephalus aedon</i>	-	-	-	-	-	-	-	-	-	-	+	+	2	0.40
56	<i>Acrocephalus dumetorum</i>	-	-	-	-	-	-	-	-	-	-	+	+	2	0.40
57	<i>Amondava amandava</i>	+	+	-	-	-	+	+	-	+	-	+	+	7	1.39
58	<i>Lonchura punctulata</i>	+	+	+	+	+	+	+	+	+	+	+	+	12	2.38
59	<i>L. malacca</i>	+	+	+	+	+	-	-	+	+	+	+	+	10	1.98
60	<i>Passer domesticus</i>	+	+	+	+	+	+	+	+	+	+	+	+	12	2.38
61	<i>Anthus rufulus</i>	-	-	-	-	-	+	+	+	+	-	+	+	6	1.19
62	<i>Motacilla alba</i>	-	-	-	-	-	+	+	+	+	+	+	-	6	1.19
63	<i>M. cinerea</i>	-	-	-	-	-	+	+	+	+	+	+	-	6	1.19
64	<i>M. tschutschensis</i>	-	-	-	-	-	+	+	+	-	-	+	+	5	0.99
65	<i>Ploceus hypoxanthus</i>	-	-	+	+	-	-	-	-	+	-	-	+	4	0.79
66	<i>P. philippinus</i>	-	-	-	-	-	-	-	-	-	-	+	+	2	0.40
67	<i>Acridotheres grandis</i>	+	+	+	+	+	+	+	+	+	-	+	+	11	2.18
68	<i>A. tristis</i>	+	+	+	+	+	+	+	-	+	+	+	+	11	2.18
69	<i>A. burmannicus</i>	-	-	-	-	-	-	+	+	+	+	+	+	6	1.19
70	<i>Mirafra microptera</i>	-	-	-	-	-	-	-	+	+	+	+	+	5	0.99
71	<i>Alaudala cheleensis</i>	-	-	-	-	-	-	-	-	-	-	+	+	2	0.40
72	<i>Copsychus saularis</i>	+	-	+	+	-	+	-	-	+	+	+	-	7	1.39
73	<i>Luscinia svecica</i>	-	-	-	-	-	-	+	+	-	-	+	+	4	0.79
74	<i>Saxicola maurus</i>	-	-	-	-	+	+	+	+	+	+	+	+	8	1.58
75	<i>S. caprata</i>	+	+	+	+	+	+	+	+	+	-	+	+	11	2.18
76	<i>S.ferrea</i>	-	-	-	-	-	-	-	-	-	-	+	+	2	0.40
77	<i>Pycnonotus cafer</i>	+	+	+	+	-	-	-	-	+	+	+	+	8	1.58
78	<i>P. blanfordi</i>	+	+	+	+	+	+	+	+	+	+	+	+	12	2.38
79	<i>Hirundo rustica</i>	-	-	-	-	+	+	+	+	+	+	+	+	8	1.58
80	<i>Turdoides gularis</i>	+	+	+	+	-	-	-	-	+	-	+	+	7	1.39
81	<i>Cisticola juncidis</i>	-	-	+	+	+	+	+	+	+	-	+	+	9	1.78
82	<i>Prinia inornata</i>	+	+	+	+	+	+	+	+	+	-	+	+	11	2.18
		30	29	32	32	33	47	57	57	60	35	51	46		

Table 1: Monthly Occurrence of species recorded from Paleik In (Lake) during June 2017 to May 2018.

+ = Present, - = Absent.

No.	Scientific name	Rainy season	Cold season	Hot season	All season
1	<i>Anser anser</i>	-	+	-	-
2	<i>Tadorna ferruginea</i>	-	+	-	-
3	<i>Dendrocygninae javanica</i>	+	+	-	-
4	<i>Anas zonorhyncha</i>	-	+	-	-
5	<i>Anastomus oscitans</i>	-	+	-	-
6	<i>Microcarvbo niger</i>	+	+	+	+
7	<i>Phalaracrocorax carbo</i>	+	+	+	+
8	<i>Anhinga melanogaster</i>	-	+	-	-
9	<i>Threskiornis melanocephalus</i>	-	+	-	-
10	<i>Plegadis falcinellus</i>	+	+	-	-
11	<i>Ixobrychus sinensis</i>	+	+	-	-
12	<i>I. cinnamomeus</i>	+	+	+	+
13	<i>Nycticorax nycticorax</i>	+	+	+	+
14	<i>Ardea cinerea</i>	+	+	+	+
15	<i>A. purpurea</i>	-	+	-	-
16	<i>A. alba</i>	+	+	+	+
17	<i>Ardeola bacchus</i>	-	+	-	-
18	<i>Bubulcus ibis</i>	-	+	+	+
19	<i>Mesophoyx intermedia</i>	+	+	+	+
20	<i>Egretta falcinellus</i>	+	+	+	+
21	<i>Porphyrio poliocephalus</i>	-	-	-	-
22	<i>Gallinula chloropus</i>	+	+	-	-
23	<i>Fulica atra</i>	-	+	+	-
24	<i>Amaurornis phoenicurus</i>	+	+	+	+
25	<i>Himantopus himantopus</i>	-	+	+	-
26	<i>H. leucocephalus</i>	-	+	-	-
27	<i>Hydrophasianus chirurgus</i>	-	-	+	-
28	<i>Vanellus cinereus</i>	-	+	-	-
29	<i>Charadrius dubius</i>	-	+	-	-
30	<i>Gallinago gallinago</i>	-	+	-	-
31	<i>Limnodromus scolopaceus</i>	-	+	-	-
32	<i>Tringa nebularia</i>	-	+	+	-
33	<i>T. glareola</i>	-	+	+	-
34	<i>T. ochropus</i>	-	+	-	-
35	<i>Columba livia</i>	-	-	+	-
36	<i>Spilopelia chinensis</i>	+	+	+	+
37	<i>Eudynamys scolopaceus</i>	+	+	+	+
38	<i>Centropus sinensis</i>	-	+	+	-
39	<i>Cacomantis merulinus</i>	-	+	+	-
40	<i>Athene brama</i>	-	+	+	-
41	<i>Halcyon smyrnensis</i>	+	+	+	+
42	<i>Alcedo atthis</i>	-	-	+	-

43	<i>Ceryle rudis</i>	-	+	+	-
44	<i>Merops orientalis</i>	+	+	+	+
45	<i>M. philippinus</i>	+	+	+	+
46	<i>Megalaima rafflesii</i>	-	-	+	-
47	<i>Jynx torquilla</i>	+	-	-	-
48	<i>Dicrurus macrocerus</i>	+	+	+	+
49	<i>D. annectans</i>	-	-	+	-
50	<i>Corvus splendens</i>	+	+	+	+
51	<i>Aegithina tiphia</i>	+	+	+	+
52	<i>Cinnyris asiaticus</i>	-	+	-	-
53	<i>Lanius cristatus</i>	-	+	-	-
54	<i>L. schach</i>	-	+	-	-
55	<i>Acrocephalus aedon</i>	-	-	+	-
56	<i>A. dumetorum</i>	-	-	+	-
57	<i>Amondava amandava</i>	+	+	+	+
58	<i>Lonchura punctulata</i>	+	+	+	+
59	<i>L. malacca</i>	+	+	+	+
60	<i>Passer domesticus</i>	+	+	+	+
61	<i>Anthus rufulus</i>	-	+	+	-
62	<i>Motacilla alba</i>	-	+	+	-
63	<i>M. cinerea</i>	-	+	+	-
64	<i>M. tschutschensis</i>	-	+	+	-
65	<i>Ploceus hypoxanthus</i>	+	+	+	+
66	<i>P. philippinus</i>	-	-	+	-
67	<i>Acridotheres grandis</i>	+	+	+	+
68	<i>A. tristis</i>	+	+	+	+
69	<i>A. burmannicus</i>	-	+	+	-
70	<i>Mirafra microptera</i>	-	+	+	-
71	<i>Alaudala cheleensis</i>	-	-	+	-
72	<i>Copsychus saularis</i>	+	+	+	+
73	<i>Luscinia svecica</i>	-	+	+	-
74	<i>Saxicola maurus</i>	+	+	+	+
75	<i>S. caprata</i>	+	+	+	+
76	<i>S. ferrea</i>	-	-	+	-
77	<i>Pycnonotus cafer</i>	+	+	+	+
78	<i>P. blanfordi</i>	+	+	+	+
79	<i>Hirundo rustica</i>	+	+	+	+
80	<i>Turdoides gularis</i>	+	+	+	+
81	<i>Cisticola juncidis</i>	+	+	+	+
82	<i>Prinia inornata</i>	+	+	+	+
		38	70	60	34
	% Composition of species	22.62	41.67	35.71	

Table 2: Seasonal occurrence of bird species recorded in Paleik In during 2017 to 2018.

+ = Present, - = Absent.

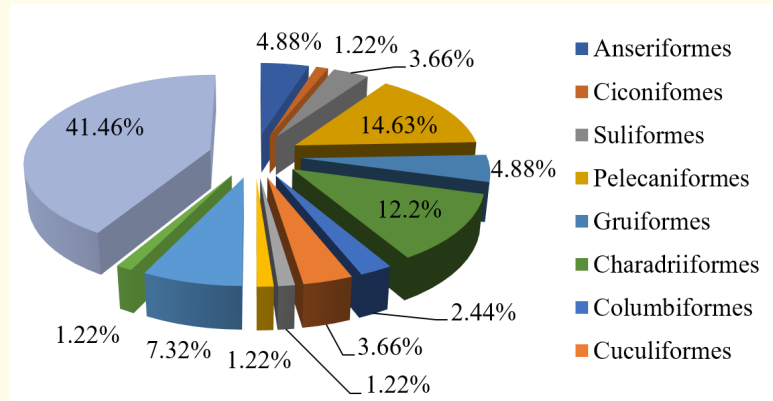


Figure 2: Relative occurrence of bird species composition under orders at Paleik Lake.

Khin Maung Oo [9] reported that most area in the Paleik Lake became flooded throughout the rainy season with sparse vegetation projecting above the water surface and some small trees present in the flooded area. Plankton population also declined during this period. These factors caused the population of the avian fauna to fall to a minimum level. He recorded 31 species of waterbirds confined to 21 genera, representing nine families and six orders during November 2007 to August 2008. In this study, there are 82 species recorded, 34 species are water birds, whereas 48 species are terrestrial birds and 38 species were recorded. It was observed that various species of birds occurred during the cold season in the Paleik Lake as it provide sufficient food, shelters, suitable breeding places and net sites.

The association of birds with their habitats has been essential to know for understanding the influence of biotic interactions on bird species distributions [10]. In the present study, the highest number of species was found in cold season 70 species, followed by 60 species in hot season and 38 species in rainy season. According to above data, the highest number of species was found in cold seasons and the lowest number in rainy season. Because of the most study area is covered with water and sheltering while raining in the rainy season and the cold season is favourable habitat as their food, shelter, breeding for birds.

Regarding the seasonally species in this studied, seven species: *Columbia livia*, *Spilopelia chinensis*, *Dicrurus macrocerus*, *Corvus splendens*, *Lonchura punctulata*, *Passer domesticus* and *Pycnonotus cafer* were monthly found in two years while ten species in rainy seasons, 36 species in cold season and 22 species were monthly found in hot season. Seven species were monthly found in all season and 27 species in the rainy season, 37 species in the cold season and 22 species in the hot were monthly found.

According to above data, the species occurrences are different in the two study years because of habitat and food availability changes in the study area. Water is not maintained in the northeast part of the lake. Trees, shrubs and vegetation are more growing in the edge of this area. Thus, habitat of the Paleik Lake is better for birds.

Conclusion

It is concluded that habitats of Paleik Lake prevent from the predators, breeding, wintering and migration stop over sites, and places to forage and roost for bird species. All of the habitats used as the role in its survival and the loss or degradation of any one of them can potentially have the population level impact. The habitat loss is the greatest threat to birds. The abundance of bird species depend on food availability and suitable habitat. Thus, Paleik Lake is the important role in habitat situation to conserve the bird species.

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