

AVIFAUNAL DIVERSITY OF MALLATHAHALLI LAKE IN BANGALORE URBAN DT., KARNATAKA, INDIA

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ABSTRACT

The study was conducted from July 2015 to July 2017 to determine and understand the occurrence and diversity of avifauna in the Mallathahalli Lake of Bangalore Urban District. During the study period, 46 species of both terrestrial as well as aquatic birds belonging to 30 families were identified, of which 9 families were aquatic birds and 21 families were terrestrial birds. There were 4 species of migratory birds out of 46, showing diurnal migration. There was a significant reduction in the number of bird species both terrestrial and aquatic during the summer season and also varied greatly during winters and monsoons. Of the total 24 species of aquatic birds, *Fulica atra* and *Tachybaptus ruficollis* was the most common and the least common *Threskiornis melanocephalus*. Among the 22 species of terrestrial birds, *Acridotheres tristis* was the most common and the least frequent was *Pycnonotus cafer*. The most commonly encountered bird species were from the families Anatidae, Podicipedidae, Ardeidae, Phalacrocoracidae, Rallidae, Accipitridae, Scolopacidae, Charadriidae, Laridae, Meropidae and Hirudinidae. All the birds surviving around the area, live dependent on the wetland and crop vegetation surrounding the lake, and anthropogenic interventions are gradually causing a decline in avifaunal diversity which must be monitored further and protected.

INTRODUCTION

Lakes are usually considered as barometers of ecology and regulate the climate of an urban locale (Benjamin *et al.*, 1996). They are complex water and land interactive systems, which are the most fertile regions and productive sites in the world. Wetlands are also one of the most threatened habitats because of their vulnerability and attractiveness for their development (Hollis *et al.*, 1988). Avifauna, always has an important link of the food chain in nature. Hence, it is also very important to know their diversity, migratory status, population size, distribution pattern, conservation status *etc.* (Patil, 2013) As a result, there are a large number of aquatic as well as terrestrial birds surviving dependent on the aquatic system. Many species of birds respond to very slight changes in habitat structure, therefore serving as bio indicators of changes in the environment (Robert *et al.*, 2001).

Of more than 9,000 bird species of the world, the Indian subcontinent houses 1,300 species or over 13% of the world's bird species (Grimmet *et al.*, 2004). India has a diverse range of wetland systems, which harbors a large variety of species of birds that are dependent on the ecosystem.

The current study was conducted to devise an inventory on the species of birds that live around the Mallathahalli Lake of Bangalore, Karnataka, and understand their dependence on the aquatic system. This work can be marked as a preliminary study on the ecosystem of the area and can be used for further studies and analysis on the decline of the aquatic region and its surroundings.

MATERIALS AND METHODS

Mallathahalli Lake is a freshwater, natural lake located on the western fringe of Bangalore city in a less urbanized area currently under development. This lake falls in the Vrishabhavathi valley of the Bangalore urban district, and the primary source of water to the lake is rainfall and sewage (Ravikumar *et al.*, 2013). The sewage inlets are at the north, north east, and north west corners of the lake. The lake is roughly irregular in shape, covering approximately 25.9 ha of surface area and a perimeter of approximately 2.9 kms. The catchment area of the lake is about 625 ha, with 3 islands within its premises.

The study was conducted by marking 6 points with a distance of approximately 500 m from each other. Random sampling method was used to spot the birds from the points (Inac *et al.* (2008). The observations were conducted 2 h after sunrise and 2 h before sunset every weekend for a period of 2 years from July 2015 to July 2017. Seasonal changes in the density and diversity of the avifauna were also recorded. The birds observed were classified on the basis of Birds of the Indian Subcontinent (Grimmet and Inskipp, 2011).

RESULTS AND DISCUSSION

During the study period, 46 species of both terrestrial as well as aquatic birds belonging to 30 families were identified, of which 9 families were aquatic birds and 21 families were terrestrial birds. There were 4 species of migratory birds out of

Table 1: Resident Birds recorded in and around Mallathahalli Lake during 2015-2017

Sl. No.	Common Name	Scientific name	Order
1	Purple Swamp Hen	<i>Porphyrio porphyrio</i>	Gruiformes
2.	Common Moorhen	<i>Gallinula chloropus</i>	Gruiformes
3	White-Breasted Water Hen	<i>Amaurornis phoenicurus</i>	Gruiformes
4	Common Coot	<i>Fulica atra</i>	Gruiformes
5.	Purple Heron	<i>Ardea purpurea</i>	Ciconiiformes
6.	Indian Pond Heron	<i>Ardeola grayii</i>	Ciconiiformes
7	Little Grebe	<i>Tachybaptus ruficollis</i>	Podicipediformes
8	Spot-Billed Duck	<i>Anas poecilorhynca</i>	Anseriformes
9.	White-Throated Kingfisher	<i>Halcyon smyrnensis</i>	Coraciiformes
10.	Little Cormorant	<i>Phalacrocorax niger</i>	Pelecaniformes
11.	Great Cormorant	<i>Phalacrocorax carbo</i>	Pelecaniformes
12.	Little Egret	<i>Egretta garzetta</i>	Ciconiiformes
13	Cattle Egret	<i>Bubulcus ibis</i>	Ciconiiformes
14.	Intermediate Egret	<i>Mesophoyx intermedia</i>	Ciconiiformes
15.	Red-Wattled Lapwing	<i>Vanellus indicus</i>	Charadriiformes
16	Wire-Tailed Swallow	<i>Hirundo smithii</i>	Passeriformes
17.	Pied Bushchat	<i>Saxicola caprata</i>	Passeriformes
18.	Asian Open Bill	<i>Anastomus oscitans</i>	Ciconiiformes
19.	Ashy Prinia	<i>Prinia socialis</i>	Passeriformes
20.	Green Bee-Eater	<i>Merops orientalis</i>	Coraciiformes
21.	Black Drongo	<i>Dicrurus macrocercus</i>	Passeriformes
22.	Laughing Dove	<i>Streptopelia senegalensis</i>	Columbiformes
23.	Red-Vented Bulbul	<i>Pycnonotus cafer</i>	Passeriformes
24.	Brahminy Starling	<i>Sturnus pagodarum</i>	Passeriformes
25	House Sparrow	<i>Passer domesticus</i>	Passeriformes
26.	House Crow	<i>Corvus splendens</i>	Passeriformes
27.	Indian Robin	<i>Saxicoloides fulicata</i>	Passeriformes
28.	Yellow-Eyed Babbler	<i>Chrysomma sinense</i>	Passeriformes
29.	Asian Pied Starling	<i>Sturnus contra</i>	Passeriformes
30.	Common Myna	<i>Acridotheres tristis</i>	Passeriformes
31	Asian Koel	<i>Eudynamis scolopacea</i>	Cuculiformes
32.	Rose-Ringed Parakeet	<i>Psittacula krameri</i>	Psittaciformes
33.	Spotted Dove	<i>Streptopelia chinensis</i>	Columbiformes
34.	Eurasian Golden Oriole	<i>Oriolus oriolus</i>	Passeriformes
35.	Common Sandpiper	<i>Actitis hypoleucos</i>	Charadriiformes
36	Brahminy Kite	<i>Haliastur indus</i>	Accipitriformes
37.	Greater Coucal	<i>Centropus sinensis</i>	Cuculiformes
38.	Tawny Eagle	<i>Aquila rapax</i>	Accipitriformes
39.	Bush Warbler	<i>Horornis diphone</i>	Passeriformes
40.	Raven Crow	<i>Corvus corax</i>	Passeriformes
41.	Coppersmith Barbet	<i>Megalaima haemacephala</i>	Piciformes
42.	White-browed Wagtail	<i>Motacilla maderaspatensis</i>	Passeriformes

Table 2: Seasonal Local Migrants recorded in and around Mallathahalli Lake during 2015-2017

Sl.No.	Common Name	Scientific name	Order
1	Black-headed Ibis	<i>Threskiornis melanocephalus</i>	Ciconiiformes
2	Grey Heron	<i>Ardea cinerea</i>	Ciconiiformes
3	Black-winged Stilt	<i>Himantopus himantopus</i>	Charadriiformes
4	River Tern	<i>Sterna aurantia</i>	Charadriiformes

46, showing diurnal migration. There was a significant reduction in the number of bird species both terrestrial and aquatic during the summer season and also varied greatly during winters and monsoons. Of the total 24 species of aquatic birds, *Fulica atra* and *Tachybaptus ruficollis* was the most common and the least common *Threskiornis melanocephalus*. Among the 22 species of terrestrial birds, *Acridotheres tristis* was the most common and the least frequent was *Pycnonotus cafer*. The most commonly encountered bird species were from the families- Anatidae, Podicipedidae, Ardeidae, Phalacrocoracidae, Rallidae, Accipitridae, Scolopacidae,

Charadriidae, Laridae, Meropidae, and Hirudinidae (Table 1). Resident birds such as water hens, herons, kingfishers, parakeets, green bee eater, bulbul, common coot, and little cormorant etc. were found regularly throughout the study period. The seasonal local diurnal migrants observed throughout the study period were Black-headed Ibis (*Threskiornis melanocephalus*), Grey Heron (*Ardea cinerea*), Black-winged Stilt (*Himantopus himantopus*), and River Tern (*Sterna aurantia*) [Table 2]. *Threskiornis melanocephalus* was observed only once during the entire survey.

Mallathahalli Lake is seen to be largely affected by several

sources of pollution, which include washing of clothes, animals, vehicles, etc. The lake has also been determined to be organically polluted because of the misuse of the lake sides as public toilets (Ravikumar *et al.*, 2013). The southern part of the lake has also been used as a crematorium. To the west of the lake, there is an Areca plantation surrounded by several housing encroachments. The sewage line enters the lake from the north east and eastern banks of the lake. Cattle grazing can be seen to the west and north of the lake. The Areca plantations, in particular, are inhabited by most of the terrestrial birds that have been identified. A few nests were also observed in the lush vegetation surrounding the circumference of the lake area. Although pollution and encroachment have partly gulped the lake, there have been restoration works initiated by the BBMP, Bengaluru, which has been working on the regeneration of the water body to some extent. All these have had significant effects on the birds living there, which resulted in a partial reduction in the number of species identified over a period of 2 years.

Order Passeriformes was also seen dominant as recorded by Reginald *et al.* (2007) in the Singanallur Lake of Tamil Nadu. Similar studies that have been referred to during the study period include- Saxena (1975) had studied the flora and fauna of the Bharatpur Bird Sanctuary. Hussain *et al.* (1984) profiled the avifauna of Chilka Lake in Orissa. Singh and Roy (1990) studied the diversity of birds in Kavar Lake in Bihar. Sanjay (1993) studied the ecology of birds at Kokkare-Bellur. Hosetti *et al.* (2001) studied the ornithological aspects of the Gudavi bird Sanctuary, Shimoga. Shanbhag *et al.* (2001) reported the impact of the Konkan Railway Project on the avifaunal diversity of Carambolim Lake in Goa. Inac *et al.* (2008) studied the bird species of Kumasir Lake, Turkey. Avifaunal diversity studies were also conducted by Motup (2013) in the Trans-Himalayan region and documented.

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