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Aquatic Birds of Hebbal Lake, Bengaluru

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Abstract During the present investigation the occurrence, percent frequency, ecological status and food sources of different species of aquatic birds was recorded at Hebbal lake. During the study period there were about 26 species of aquatic birds belonging to 11 families under eight orders were recorded. Maximum number of species were belong to Ardeidae (8) followed by Alcedinidae (3), Motacillidae (3), Anatidae, Rallidae, Ciconiidae, Phalacrocoracidae (2 each) and Charadridae, Pelecanidae, Scolopacidae and Podicipitidae (leach). Of the various recorded water bird species, *Bubulcus ibis* (cattle egret) showed 98.25% frequency, whereas *Ardea goliath* (Giant heron) was less frequently (20.22) observed. Based on percent frequency of occurrence of water birds in the lake, 14 species were considered as common, 8 are less common and 4 were rarely found in the lake.

Keywords Hebbal lake, Aquatic birds, Occurrence, Percentage frequency, Ecological status.

Introduction

Urban lakes and wetlands provide habitat for biodiversity conservation. Birds are kmown to be useful biological indicators of health of an ecosystem as they respond to secondary changes resulting from primary causes. Because of their high mobility birds react very rapidly to any change in their habitat. Urban development is one such change which often affects the population and diversity of terrestrial as well as water birds. The aquatic bird communities of the Bangalore region are important bioindicators of lake ecosystems which should be protected to conserve the biodiversity and environment. Although aquatic bird species in some lakes of Bangalore have been recorded [2, 3] their composition, abundance

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Table 1. Mean percentage frequency, occurrence, residing status and food habitats of aquatic birds daring the study period in the Hebbal lake. *0–25% = Re (Rare), 26–65% = Lc (Less common), 66–100% = C (Common), C = Carnivorous, H = Herbivorous, I = Insectivorous, O = Omnivorous, P = Piscivorous, M = Migrant, R = Resident, RM = Resident Migrant.

Sl. No.	Scientific name	Common name	Occurrence status	Mean percent frequency	Food habitat	Residing status
	Order: Ciconiiformes,	Family: Ardeidae				
1	*Bubulcus ibis*	Cattle egret	C	99.00	C/I	RM
2	*Egretta garzetta*	Little egret	C	93.55	C	R
3	*Egretta intermedia*	Median egret	Lc	28.25	C	RM
4	*Ardea alba*	Large egret	Lc	50.11	C	RM
5	*Ardea cinerea*	Grey heron	C	93.00	C	RM
6	*Nycticorax nycticorax*	Night heron	Re	22.00	C/I	R
7	*Ardea goliath*	Giant heron	Re	20.22	C	RM
8	*Ardea herodias*	Great blue heron	Re	21.78	C	RM
	Order: Ciconiiformes,	Family: Ciconiidae				
1	*Mycteria leucocephala*	Painted stork	Lc	42.11	C	RM
2	*Anastomus oscitans*	Openbill stork	Re	24.11	C/I	R
	Order: Podicipediformes,	Family: Podicipitidae				
1	*Tachybaptus ruficollis*	Little grebe	Lc	51.22	C/I	R
	Order: Pelecaniformes,	Family: Pelecanidae				
1	*Pelecanus philippensis*	Spotted billed pelican	Lc	47.00	P	RM
	Order: Pelecaniformes,	Family: Phalacrocoracidae				
1	*Phalacrocorax carbo*	Large cormorant	Lc	43.22	P	RM
2	*Phalacrocorax niger*	Little cormorant	C	96.22	P	RM
	Order: Anseriformes,	Family: Anatidae				
1	*Anas poecilorhyncha*	Spotbill duck	Lc	54.22	H	RM
2	*Anas querquedula*	Garganey teal	C	78.22	H	M
	Order: Gruiformes,	Family: Rallidae				
1	*Porphyrio porphyrio*	Purple moorhen	Lc	30.78	O	R
2	*Fulica atra*	Common coot	C	90.22	O	RM
	Order: Charadriiformes,	Family: Charadridae				
1	*Charadrius dubius*	Little ringed plover	C	65.30	C/I	RM
	Order: Charadriiformes,	Family: Scolopacidae				
1	*Tringa hypoleucos*	Common sandpiper	C	90.11	C/I	RM
	Order: Coraciiformes,	Family: Alcedinidae				
1	*Ceryle rudis*	Pied kingfisher	C	75.00	P/I	R
2	*Alcedo atthis*	Small blue kingfisher	C	81.67	P/I	RM
3	*Halcyon smyrnensis*	White breasted kingfisher	C	89.45	C/I	R
	Order: Passeriformes,	Family: Motacillidae				
1	*Motacilla flava*	Yellow wagtail	C	55.22	I	RM
2	*Motacilla alba*	White wagtail	C	50.22	I	RM
3	*Motacilla maderaspatensis*	Largepied wagtail	C	90.22	I	R

Fig. 1. Map showing the Hebbal lake

and diversity have not been thoroughly studied in Hebbal lake. Hebbal lake is the success story of a conserved water body that faced lot of controversies and issues pertaining to its rejuvenation and maintenance. But, today it is a haven for a large number of migratory birds.

In a comparative study of sub-urban wetland and irrigation reservoir it was demonstrated that the natural sub-urban lake supported resident species of birds while the reservoir supported migratory species [4]. One of the main reasons why lakes should be protected and nurtured is that they are home to a great ecosystem that keeps the balance of life around us. Birds form a large part of the lake ecosystems and certainly add to the aesthetic appeal of a natural scene. Studies showed that depressed abundance of various bird species in most parts of the world today especially in urban areas are of particular concern as many cities are growing rapidly both in area and in population. The aquatic bird communities of the Bangalore region are important bioindicators of lake ecosystems which should be protected to conserve the biodiversity and environment. Although aquatic bird species in some lakes of Bangalore have been recorded [2, 3] their composition, abundance and diversity have not been thoroughly studied in Hebbal lake. Hebbal lake in the success story of a concerved water body that faced lot of controversies and issues pertaining to its rejuvenation and maintenance. But, today it is a haven for a large number of migratory birds.

Materials and Methods

Study area

The Hebbal lake is lies between 13° 02´ 47.57´´ N latitude and 77° 35´ 13.66´´ E longitudes at an elevation range 839 m above sea level with an water area of the

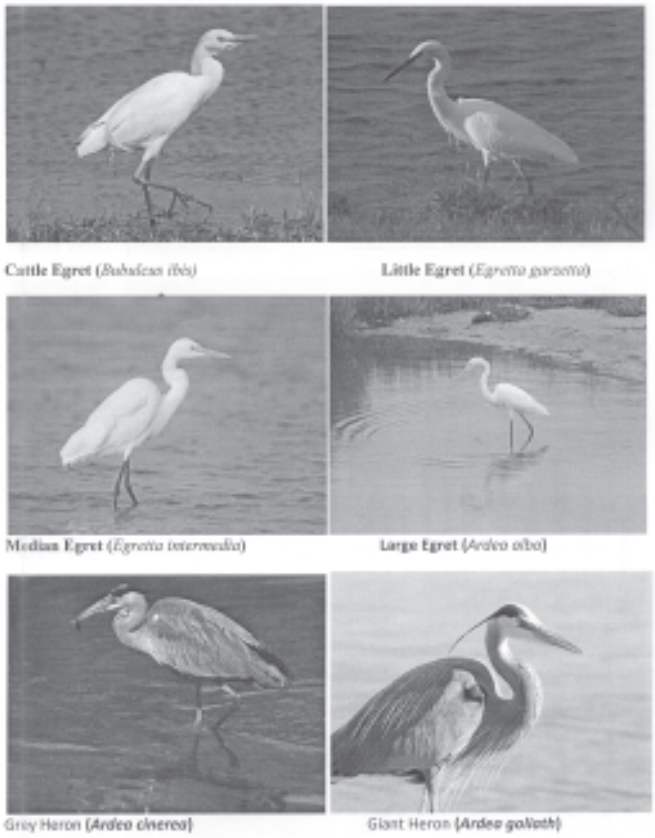

Fig. 2. Different kinds of water birds observed in Hebbal lake during the study period.

lake is 78.04 ha (Fig. 1). It is situated in the north of Bangalore at the mouth of National Highway 7, along the junction of Bellary Road connecting city to the International Airport and the Outer Ring Road.

The study will be based on field observation carried out during January 2013 to December 2013 (1 year). At each site, using line transects/ points counting of birds was made for 30 minutes within the visible radius at different times of the day from morning 07.00 AM to evening 06.00 PM when they are most active and conspicuous. Surveys were conducted once monthly. Regular field observations were also made on the nests, nesting sites, feeding habitat, food source, water source and anthropogenic activities. The identification of birds was done using field guides. The checklist was prepared using standardized common and scientific names of the birds of the Indian subcontinents. The status of birds are categorized as resident (R), Migratory (M) and as resident migrante (RM).

Results and Discussion

During the present investigation the occurrence, percent frequency, ecological status and food sources of different species of aquatic birds was recorded at

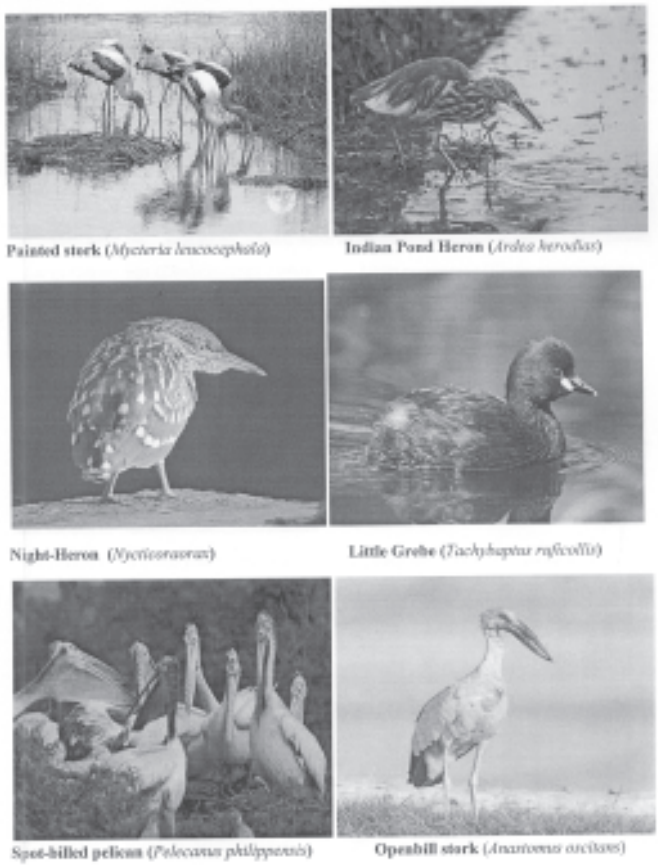

Fig. 3. Different kinds of water birds observed in Hebbal lake during the study period.

Hebbal lake are given in Table 1. During the observation there were about 26 species of aquatic birds belonging to 11 families under eight orders were recorded (Figs. 2—6). In Hebbal lake maximum number of species were belong to Ardeidae (8) followed by Alcedinidae (3), Motacillidae (3), Antidae, Rallidae, Ciconiidae, Phalacrocoracidae (2 each) and Charadridae, Pelecanidae, Scolopacidae and Podicipitidae (1 each). However 34 species of water birds were recorded in the Hebbal lake during his study [3]. Of the 26 aquatic bird species, 7 species were carnivorous/ insectivorous, 7-carnivorous, 3-piscivorous, 3-insectivorous, 2-herbivorous, 2-omnivorous and 2-piscivorous/insectivorous. Feeding habit and residing status of individual bird species is given in the Table 1. Similarly, of the 26 recorded species, 17 were resident migrants, 8 are pure resident and 1 species is pure migrants. Similar occurrence of water birds also recorded in Hebbal lake [3] and in the lakes of north Bengaluru [2]. Similar pattern of occurrence of aquatic birds also recorded in Didwana inland saline lake, Nagaur Rajasthan in India [1] and in shorebirds of Pulicat lake in India [2]. Of the various recorded water bird species, *Bubulcus ibis* (cattle egret) showed 98.25% frequency, whereas *Ardea goliath* (Giant heron) was less frequently (20.22) observed. Among the bird species recorded from Hebbal lake, the Painted stork (*Mycteria leucocephala*), Spot-

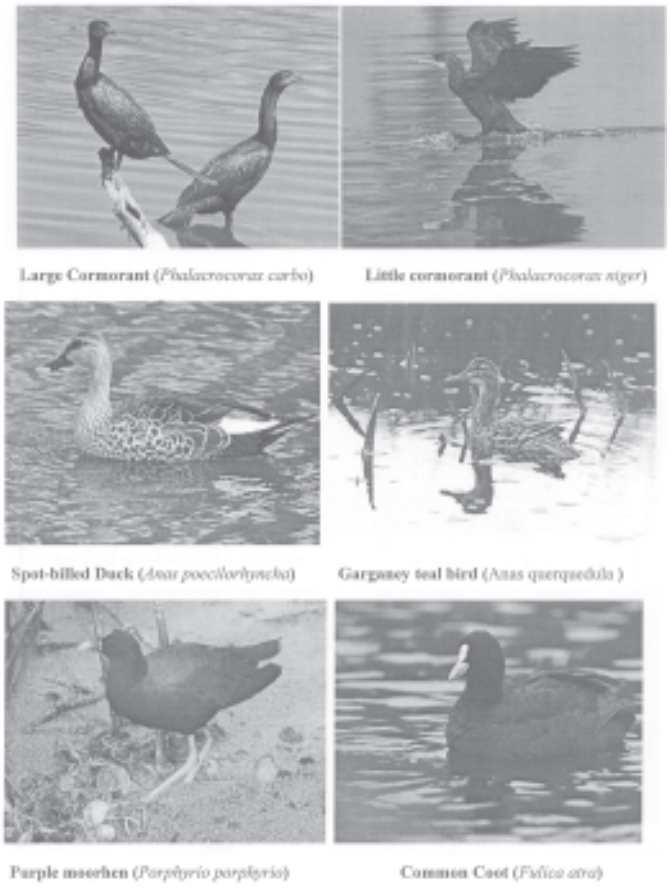

Fig. 4. Different kinds of water birds observed in Hebbal lake during the study period.

ted billed pelican (*Pelecanus Philippensis*), Pied kingfisher (*Ceryle rudis*), Yellow wagtail (*Motacilla flava*), White wagtail (*Motacilla alba*) and Largepied wagtail (*Motacilla maderaspatensis*) are nearer threatened. This is mainly due to the urbanisation, cleaning of vegetation at the bunds for commercial purpose, five and release of sewage waste was serious threats to the habitat together with cattle grazing, wood cutting, weeds and fishing are some major threats to the bird diversity of the lake.

Hebbal lake is the success story of a conserved water body that faced lot of controversies and issues pertaining to its rejuvenation and maintenance. But, today it is a haven for a large number of migratory birds. Serving as a nesting ground for many a species. Among the bird species recorded from Hebbal lake, few species are nearer threatened. This is mainly due to the urbanization, cleaning of vegetation at the bunds for commercial purpose, fire and release of sewage waste was serious threats to the habitat together with cattle grazing, wood cutting, weeds and fishing are some major threats to the bird diversity of the lake. Hence full protection to the existing habitats

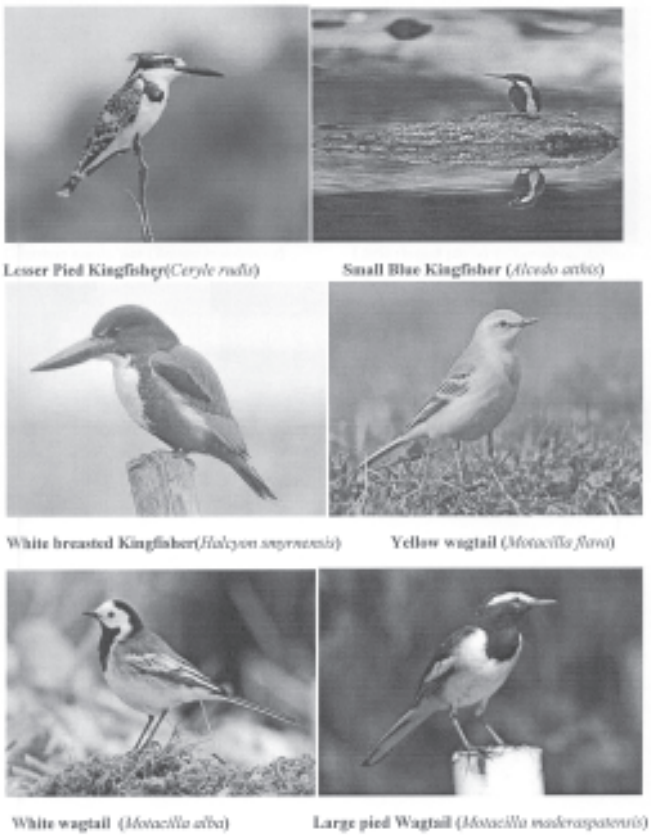

Fig. 5. Different kinds of water birds observed in Hebbal lake during the study period.

should be given with special attention during the migratory period. Continuous monitoring of lake should be enacted properly as from the origin point till the end to overcome these situations. This monitoring also helps in keeping the connectivity of lake conscious. Repeated studies of same lake for a longer

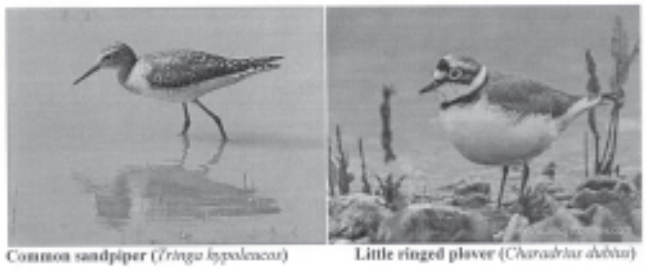

Fig. 6. Different kinds of water birds observed in Hebbal lake during the study period.

period will help to determine the status of abundance and conservation aspects of water birds.

References

1. Bhatnagar SP, Shukla SK, Bhatnagar M (2008) An annotated checklist of waterfowl of the Didwana Inland Saline Lake, Nagaur, Rajasthan, India. Newsl For Bird Watchers 48 : 53—55.
2. Manjunath P, Subbarao P, Bhat H (2005) Waterbird diversity at the Tanks of North Bangalore. Proc Nat Seminar on bird ecology and conservation, Bangalore, Nov 12–13, pp 97—99.
3. Rajashekara S, Venkatesha MG (2011) Community composition of aquatic birds in lakes of Bangalore. Ind J Environ Biol 32 : 77—83.
4. Rathod J, Padate GS (2008) A comparative study of avifauna of a sub-urban wetland and an irrigation reservoir of Savli Taluka, district Vadodra. Proc Taal 2007: 12th World Lake Conf, pp 537—541.