DIVERSITY AND ABUNDANCE OF WETLAND BIRDS OF SAHEBKHEDI POND, UJJAIN (MADHYA PRADESH), INDIA

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Abstract: Ujjain is a place of great historical and religious importance in India and is dotted with a number of holy water bodies and ponds. These wetlands support a rich avian diversity and serve as winter sojourn. Sahebkhedi is one of the important wetland for avian habitat. A total of 59 species of wetland birds belonging to 46 genera and 13 families distributed in 8 orders have been recorded in Sahebkhedi pond. This wetland is under pressure from diverse anthropogenic activities. This paper provides an overview of status of wetland birds and threats to them in the study area.

Key words: Abundance, diversity, Sahebkhedi pond, Wetland birds.

Introduction: Wetlands are defined as lands transitional between terrestrial and aquatic eco-systems where the water table is usually at or near the surface or the land is covered by shallow water [1]. Wetlands are among the most productive ecosystems in the world and play vital role in flood control, aquifer recharge, nutrient absorption and erosion control. In addition, wetlands provide home for a huge diversity of wildlife such as birds, mammals, fish, frogs, insects and plants [3]. Thus wetlands help in maintaining biodiversity of flora and fauna. Wetlands in India cover an area of 58.2 million hectares [11]. Of 1340 bird species found in India [1], [9], 310 species are known to be dependent on wetlands [7]. Wetlands in India, as elsewhere, are facing tremendous anthropogenic pressures [11], which can greatly influence the structure of bird community [6], [13], [12]. Water birds have long attracted the attention of the public and scientists because of their beauty, abundance, visibility and social behaviour, as well as for their recreational and economic importance. Recently, water birds have become of interest as indicators of wetland quality and as parameters of restoration success and regional biodiversity.

Ujjain is a place of great historical and religious importance in India. It is dotted with a number of holy water bodies and ponds. According to the residents of Sahebkhedi village and water resources division of Ujjain city, it was constructed in 1977-78. Sahebkhedi Pond is localities at the Sahebkhedi village (Tehsil and District Ujjain) 12KM far away from Ujjain head quarter. Latitude and longitude of tank side are 75`49" and 29`14`59"respectively. The surface area of the tank is 60.47 sq km maximum and minimum depth 18.60m and 4.50m respectively. Its gross storage capacity of water is 12.47mkum. The perennial Sahebkhedi tank is surrounded by dam on one side and remaining three sides is agricultural fields. The earthen bund of Sahebkhedi tank has plantation of large trees of 17 species. The bank side tree flora belongs 14 families. Huge trees with thick and dense canopy, which serve as roosting and nesting sites for birds. The cultivated lands around Ujjain have paddy and wheat as main crops. With their capacity to support different aquatic life forms paddy fields provide suitable habitat type for wetland birds. Village ponds which profusely dot the landscape around Ujjain perform many ecological and socio-economic functions. These wetlands are used for nesting, feeding, breeding and wintering grounds by different species of both local as well as migratory birds. Keeping this in view, a survey of wetland birds was carried out in Sahebkhedi wetland from January 2010 to December 2012.

Materials and methods: The study was carried out in wetland habitat namely Sahebkhedi pond. Observations were made over a period of two years i.e. during January, 2010 to December, 2012. Regular surveys were done by systematically walking on fixed routes through the study area. Birds were mostly observed during the most active period of the day, i.e., from 6 to 10 am in the morning and from 5 to 7 pm in evening. However, observations were also made during other timings according to convenience. Observations were carried out with the aid of 7×35 and 10×50 Nikon binoculars. Birds seen were recorded along with habitat type, season and frequency of occurrence. Identification of birds was done using field guides [1], [5] and only those species with confirmed identity are reported in this paper. The checklist was prepared using standardized common and scientific names of the birds following [9]. Abundance of the recorded bird was established upon the following criteria: Common- recorded 9-10 times out of 10 visits, fairly common recorded 6-8 times out of 10 visits, uncommon-recorded 3-5 times out of 10 visits, rare- recorded 0-2 times out of 10 visits.

Results and discussion: A total of 59 species of wet lands birds belonging to 46 genera and 13 families distributed in 8 orders have been recorded from the study area. Details such as common and scientific names, status and abundance of the

wetland birds are presented in Table 2. Ciconiiformes, Charadriiformes appeared to be the most crowded order represented by 3 families. Of all, family Anatidae dominated the list with 15 species. It represented 25.42% of the total number of water bird species surviving under wetland conditions of Sahebkhedi pond (Table 2). Out of total 59 species, 22 were resident, 25 were resident migrant and 12 were migrants' species. Based on the frequency of sightings, *Podiceps rufficollis*, *Ardea grayii*, *Phalacrocorax niger*, *Anas acuta* *Halcyon smyrnensis*, *Amaurornis phoenicurus*, *Himantopus himantopus*, *Vanellus indicus*, *Bubulcus ibis* and *Ardeola grayii* etc. were the common species inhabiting this pond, while *Nyctocorax nyctocorax* , *Ixobrychus cinnamomeus* , *Limosa limosa*, *Numenius arquata*, *Recurvirostra avosetta* and *Ceryl rudis* were rarely sighted. These water birds were found to utilize different wetland habitats extensively for foraging, nesting and roosting on the emergent and fringed vegetation. Water birds, being generally at or near the top of most wetland food chains are highly susceptible to habitat disturbances and are therefore good indicators of general condition of aquatic habitats [8], [4], [6]. The rich diversity of the wetland birds documented during the present study may be because of availability of varied sources of feed as well as foraging. The wetland birds are in general being heterogeneous in their feeding habits [1]. Thus wetland birds exploit a variety of habitats and depend upon a mosaic of microhabitats for their survival. Paddy fields with stray trees and scattered vegetation cover might have extended comfortable shelter and suitable foraging grounds for the wetland birds. This habitat by supporting different food sources like fish, crustaceans, invertebrates, water plants and planktons further add to the diversity of wetland birds [2].

TABLE: 1 Status of bird families recorded in Sahebkhedi pond

	Family	No. of species	% occurrence
1	Podicipedidae	1	1.69
2	Phalacrocoracidae	3	5.08
3	Ardeidae	9	15.25
4.	Ciconiidae	4	6.77
5.	Threskiornithidae	3	5.08
6.	Anatidae	15	25.42
7.	Gruidae	1	1.69
8.	Rallidae	6	10.16
9.	Jacanidae	2	3.38
10.	Charadriidae	9	15.25
11.	Recurvirostridae	2	3.38
12.	Laridae	1	1.69
13.	Alcedinidae	3	5.08

Conclusion: The wetland avian diversity Sahebkhedi pond could be due to the presence of a mosaic of different types of avian habitats. But this heritage is today threatened by the increased human interference, direct and indirect, resulting in habitat destruction and fragmentation. Study has also revealed that anthropogenic activities like mass bathing in holy ponds, cutting of emergent and fringed vegetation, draining of water, release of sewage, throwing of domestic garbage, weeds, developmental activities like construction of roads and retaining walls are some major threats to the bird diversities of this aquatic habitat. Thus proper scientific methodology is required for upkeep of this water body. Water birds require a cluster of platforms within the water bodies in order to sit there for basking during the winters. There are no platforms available within the village ponds observed during present study. Hence the suitable measures should be taken, to ensure that artificial platforms are made available within the pond with thick cover of vegetation. It is also recommended that profuse green belt to be created in and around each and every pond to facilitate easy means of roosting and perching. Wetland need to be patrolled to minimize disturbance in the more sensitive areas, particularly during the breeding season. For sustainable upkeep of the water bodies it is important to involve local people and sensitize them about the role of this wetland in the welfare of humans.

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TABLE 2: Wetland birds recorded at Sahebkhedi pond, Ujjain (M.P.), India.						
S.N.	**Name of species**	**Common name**	**Family**	**Order**	**R/S**	**Abn**
1.	*Podiceps ruficollis*	Little grebe	Podicipedidae	Podiciformies	R	C
2.	*Phalacrocorax carbo*	Large cormorant	Phalacrororacidae	Peleconiformies	RM	FC
3.	*Phalacrocorax foscicollis*	Indian shag	— " —	— " —	RM	UC
4.	*Phalacrocorax niger*	Little cormorant	— " —	— " —	RM	C
5.	*Ardea cinerea*	Grey heron	Ardeidae	Ciconiiformes	RM	UC
6.	*Ardea purpurea*	Purple heron	— " —	— " —	RM	FC
7.	*Ardea alba*	Large egret	— " —	— " —	RM	UC
8.	*Ardeola grayii*	Pond heron	— " —	— " —	R	C
9.	*Nycticorax nycticorax*	Night heron	— " —	— " —	R	RA
10.	*Ixobrychus cinnamomeus*	Chestnut bitter	— " —	— " —	RM	RA
11.	*Bubulcus ibis*	Cattle egret	— " —	— " —	RM	C
12.	*Egretta intermedia*	Small egret	— " —	— " —	RM	UC
13.	*Egretta garzetta*	Little egret	— " —	— " —	R	C
14.	*Mycteria leucocephala*	Painted stork	Ciconiidae	Ciconiiformes	RM	FC
15.	*Ciconia ciconia*	White stork	— " —	— " —	RM	UC
16.	*Dissoura episcops*	Whitenecked stork	— " —	— " —	RM	UC
17.	*Anastomus oscitans*	Openbill stork	— " —	— " —	R	UC
18.	*Threskiornis melanocephalus*	Black headed ibis	Threskiornithidae	— " —	R	FC
19.	*Pseudibis papillosa*	Black ibis	— " —	— " —	R	UC
20.	*Platalae leucorodia*	Spoonbill	— " —	— " —	R	UC
21.	*Anser indicus*	Barheaded goose	Anatidae	Anseriformes	RM	FC
22.	*Dendrocygna javanica*	Lesser whistling teal	— " —	— " —	R	FC
23.	*Tadorna ferruginea*	Ruddy shelduck	— " —	— " —	RM	C
24.	*Anas acuta*	Pintail	— " —	— " —	M	C
25.	*Anas creca*	Common teal	— " —	— " —	M	C
26.	*Anas poecilorhyncha*	Spotbill duck	— " —	— " —	RM	C
27.	*Anas platyrhynchas*	Mallard	— " —	— " —	RM	C
28.	*Anas strepera*	Gadwall	— " —	— " —	M	UC
29.	*Anas penelop*	Wigeon	— " —	— " —	M	UC
30.	*Anas querquedula*	Gergany teal	— " —	— " —	M	UC
31.	*Anas clyeata*	Shoveller	— " —	— " —	M	UC
32.	*Aythya ferina*	Common pochard	— " —	— " —	RM	UC
33.	*Aythya nyroca*	White eye pochard	— " —	— " —	R	RA
34.	*Nattapus coromandelianus*	Cotton teal	— " —	— " —	M	FC
35.	*Sarkidiornis melanotos*	Nukta or comb duck	— " —	— " —	RM	C
36.	*Grus antigone*	Sarus crane	Gruidae	Gruiciformes	R	UC
37.	*Gallicrex cinerea*	Water cock	Rallidae	— " —	R	FC
38.	*Gallinula chloropus*	Indian moorhen	— " —	— " —	RM	FC
39,	*Amaurornis phoenicurus*	White breastedWaterhen	— " —	— " —	R	C
40.	*Rallus aquaticus*	Water rail	— " —	— " —	R	UC
41.	*Porphyrio porphyrio*	Purple moorhen	— " —	— " —	R	C
42.	*Fulica atra*	Common coot	— " —	— " —	RM	C

43.	*Hydrophasianu chirurgus*	Pheasant tail jacana	Jacanidae	Charadriiformes	R	C
44.	*Metopidius indicus*	Bronze winged jacana	— " —	— " —	R	C
45.	*Vanellus indicus*	Red watled lapwing	Charadriidae	— " —	R	C
46.	*Charadrius dubius*	Little ringed plover	— " —	— " —	RM	RA
47.	*Limosa limosa*	Black tailed godwit	— " —	— " —	M	RA
48.	*Tringa glariola*	Spotted sandpiper	— " —	— " —	M	C
49.	*Tringa hypoleucos*	Common sandpiper	— " —	— " —	RM	C
50.	*Gallinago gallinago*	Common snipe	— " —	— " —	RM	UC
51.	*Calidris minuta*	Little stint	— " —	— " —	M	RA
52.	*Numenius arquata*	Euroasian curlew	— " —	— " —	M	RA
53.	*Calidris testacea*	Curlewsandpiper	— " —	— " —	M	RA
54.	*Himantopus himantopus*	Black winged stilt	Recurvirostridae	Recurvirostriformes	R	C
55.	*Recurvirostra avosetta*	The avocet	— " —	— " —	RM	RA
56.	*Sterna aurantia*	River tern	Laridae	Charadriiformes	R	FC
57.	*Alcedo atthis*	Small bluekingfisher	Alcedinidae	Coraciiformes	RM	FC
58.	*Ceryl rudis*	Pied kingfisher	— " —	— " —	R	RA
59.	*Halcyonsmyrnensis*	White breasted kingfisher	— " —	— " —	R	C

Abbreviation: R= Residential, RM= Residential migratory, M= Migratory, R/S=Relative status, Abn=Abundance, C= Common, FC= fairly common, UC= Uncommon, RA= Rare.

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