

AVIFAUNA OF KOTWAL RESERVOIR IN DISTRICT MORENA OF MADHYA PRADESH, INDIA

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Abstract: The present study is carried out to investigate the aquatic avifaunal diversity of Kotwal Reservoir located in the Morena district of Madhya Pradesh, India. Regular field visits were made for a period of 1 year from March 2016 to February 2017 to observe birds. A total of 47 species of birds were found belonging to 8 orders, 15 families and 40 genera. During the study period Anatidae was found to be the most dominant family with 11 species followed by Threskiornithidae with 9 species which was further followed Ciconiidae (5 species), Scolopacidae (4 species) and Rallidae (3 species). Among all the 47 species observed, 25 species were residential (R), 15 species were migratory (M) and 7 species were local migratory (LM). The occurrence of rich bird diversity suggests that Kotwal Reservoir provides a favourable condition for breeding, feeding and nesting of birds. So, proper conservation of reservoir is necessary step to prevent the loss of avifaunal diversity of that area.

Key Words: Morena, Kotwal Reservoir, Birds, Avifaunal Diversity

1. INTRODUCTION

Wetlands are most important ecosystems appreciated for providing quality and abundant habitats for avifauna. Birds use wetlands as a source of drinking water and for feeding, breeding, nesting, shelter and social interactions (Steward, 2007). It is estimated that freshwater wetlands alone support 20 per cent of the known range of biodiversity in India (Deepa and Ramachandra, 1999). Birds are important group of aquatic food chain. They feed on vegetation, fishes and other animals of the reservoir and hence maintain the balance in aquatic ecosystems (Donar et al., 2012). Urfi et al. (2005) reported that avifaunal diversity especially water birds attract people towards the wetlands as well as they are the good bio-indicators and useful models for studying a variety of environmental problems. According to Wetmore (1960) there are total 34 orders of birds, out of them 27 orders are of living birds of which two recently became extinct, and 7 orders belonging to fossil birds. Nowadays, avifaunal diversity has been decreasing due to the destruction of natural habitats and human disturbances (Bhadja and Vaghela, 2013).

During the last few decades considerable studies on avifauna diversity from different freshwater bodies of India have been carried out by researchers like, Ali (1932); Davidar (1985); Newton et al. (1986); Ghosal (1995); Rathore and Sharma (1999); Yardi et al. (2004); Kulkarni et al. (2005); Kumar (2006); Donar et al. (2012) and Bhadja and Vaghela (2013). However very little information is available about status of aquatic avifauna of Kotwal Reservoir, therefore, the present study provides a comprehensive check-list of birds to identify the status of aquatic avifaunal diversity of Kotwal Reservoir located in the Morena District of Madhya Pradesh.

2. MATERIALS AND METHODS

2.1. Study area

The present study was carried out at Kotwal Reservoir which is constructed on Asan River, a tributary of Chambal River near Kotwal Village in Morena District of Madhya Pradesh, India. It is 21 km away from Morena city towards east at an altitude of 246 m from mean sea level. Geographically the reservoir lies between 78° 65' 30" to 78° 70' 51" E longitude and 26° 29' 25" to 26° 31' 52" N latitude. The study area map is shown in **Figure 1**.

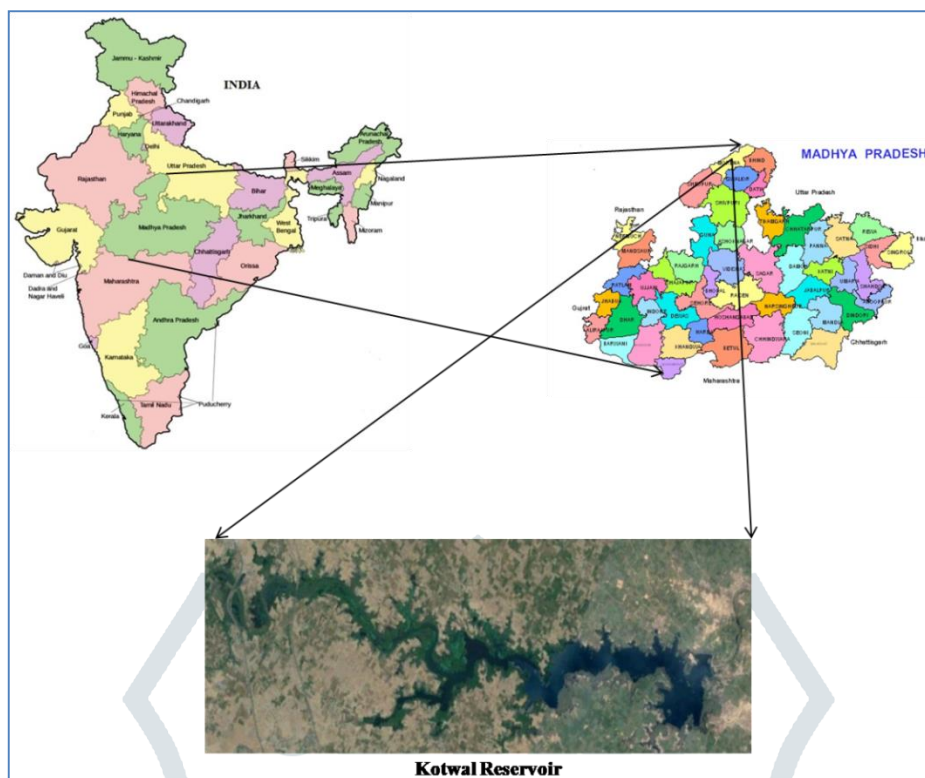


Figure 1: Map showing Study Area, Kotwal Reservoir

2.2. Methodology

The study was carried out for a period of one year i.e. from March 2016 to February 2017. Birds were observed during winter, rainy and summer season at most active period in the day that is, morning (6.00 am to 10.00 am) and late afternoon (4.30 pm to 7.00 pm). A direct visual count with binoculars was done and wherever possible an actual count was taken. Photographs were taken with the help of camera (Canon D-60) to identify birds accurately to the generic and species level. Identification was done using field guides of Grimmett et al. (1998) and Ali (2002). Classification of birds was carried out with the help of book of Indian birds by Ali (2002). Table and figures were prepared by using microsoft excel.

3. RESULTS AND DISCUSSION

In the present study a total of 47 species of birds were recorded belonging to 8 orders, 15 families and 40 genera (**Table 1**). The most dominant family observed was Anatidae with 11 species followed by Threskiornithidae with 9 species which was further followed Ciconiidae (5 species), Scolopacidae (4 species) and Rallidae (3 species). The families like Ardeidae, Jacanidae, Charadriidae, Alcedinidae and Phalaerocoracidae represented 2 species each and one species belonged to each of the families like Burhinidae, Laridae, Recurvirostridae, Alcedinidae and Motacillidae (**Table 1**). Similar observations were reported by Rathore and Sharma (1999) and Vijayan (1988) while working on Sarsai Nawar in UP and Bharatpur wetland respectively. Kumar (2006) recorded Ardeidae to be the most dominant family in Bharatpurzha river basin in Kerala. Basavarajappa (2006) recorded 27 species of water birds belonging to 13 families in the agro ecosystem of Maidan area of Karnataka which provided congenial habitat for the survival of waterbirds.

In the present study among all the 47 species 25 species were residential (R), 15 species were migratory (M) and 7 species were local migratory (LM) (**Table 1; Figure 3**). According to red list category of IUCN (2017) among 47 species of birds, 42 species were of Least Concern, 3 species viz. Common Pochard (*Aythya farina*), Woolly-necked stork (*Ciconia episcopus*) and Sarus Crane (*Grus antigone*) are Vulnerable and 2 species such as Painted Stork (*Mycteria leucocephala*) and Black Necked Stork (*Ephippiorhynchus asiaticus*) are Near Threatened (**Table 1; Figure 4**).

The occurrence of rich bird diversity suggests that Kotwal Reservoir provides favourable conditions for the breeding, feeding and nesting of birds. Studies have shown that birds migrate to different areas because of seasonal changes (Lank et al., 2003), availability of food (Scott, 1993) and threat of predation (Shirazi, 1993). Similar results were observed in the present study, 15 species of migratory birds were observed, which were mostly winter visitors. In the present study on Kotwal Reservoir, the factors responsible for the decline in population of aquatic birds are: extensive utilization of water for domestic purposes, over fishing and utilization of its marshy vegetation for grazing of livestock, similar threats were revealed by Scott (1993) and Manmohan and Saksena (2005). In addition to this water pollution due to agriculture run off, influx of sewage and industrial waste was found to be the another threat to Kotwal Reservoir and its associated biodiversity and the same observations were documented by Bhadja and Vaghele (2013) and Donar et al. (2012) in their studies on two different wetlands of India.

Table 1: List of birds recorded in Kotwal Reservoir during March, 2016 to February, 2017

S. No.	Order	Family	Common Name	Scientific Name	Residential Status	IUCN Status
1	Anseriformes	Anatidae	Common Shelduck	<i>Tadorna tadorna</i>	M	LC
2	Anseriformes	Anatidae	Cotton Pygmy-goose	<i>Nettapus coromandelianus</i>	M	LC
3	Anseriformes	Anatidae	Mallard	<i>Anas platyrhynchos</i>	M	LC
4	Anseriformes	Anatidae	Ruddy Shelduck	<i>Tadorna ferruginea</i>	R	LC
5	Anseriformes	Anatidae	Lesser Whistling-duck	<i>Dendrocygna javanica</i>	R	LC
6	Anseriformes	Anatidae	Common teal	<i>Anas crecca</i>	R	LC
7	Anseriformes	Anatidae	Comb duck	<i>Sarkidiornis melanotos</i>	LM	LC
8	Anseriformes	Anatidae	Indian Spot-billed Duck	<i>Anas poecilorhyncha</i>	R	LC
9	Anseriformes	Anatidae	Common Pochard	<i>Aythya ferina</i>	M	VU
10	Anseriformes	Anatidae	Red Crested Pochard	<i>Netta rufina</i>	R	LC
11	Anseriformes	Anatidae	Gadwall	<i>Mareca strepera</i>	R	LC
12	Pelecaniformes	Threskiornithidae	Red-naped Ibis	<i>Pseudibis papillosa</i>	M	LC
13	Pelecaniformes	Threskiornithidae	Night Heron	<i>Nycticorax nycticorax</i>	M	LC
14	Pelecaniformes	Threskiornithidae	Purple Heron	<i>Ardea purpurea</i>	LM	LC
15	Pelecaniformes	Threskiornithidae	Indian Pond-Heron	<i>Ardeola grayii</i>	R	LC
16	Pelecaniformes	Threskiornithidae	Cattle Egret	<i>Bubulcus ibis</i>	R	LC
17	Pelecaniformes	Threskiornithidae	Little Egret	<i>Egretta garzetta</i>	R	LC
18	Pelecaniformes	Threskiornithidae	Intermediate Egret	<i>Ardea intermedia</i>	R	LC
19	Pelecaniformes	Threskiornithidae	Eurasian spoonbill	<i>Platalea leucorodia</i>	M	LC
20	Pelecaniformes	Threskiornithidae	White Ibis	<i>Eudocimus albus</i>	M	LC
21	Pelecaniformes	Ardeidae	Grey Heron	<i>Ardea cinerea</i>	LM	LC
22	Pelecaniformes	Ardeidae	Great White Egret	<i>Ardea alba</i>	R	LC
23	Charadriiformes	Scolopacidae	Green Sandpiper	<i>Tringa ochropus</i>	R	LC
24	Charadriiformes	Scolopacidae	Little Stint	<i>Calidris minuta</i>	R	LC
25	Charadriiformes	Scolopacidae	Common Sandpiper	<i>Actitis hypoleucos</i>	LM	LC
26	Charadriiformes	Scolopacidae	Common Redshank	<i>Tringa totanus</i>	R	LC
27	Charadriiformes	Jacaniidae	Pheasant-tailed Jacana	<i>Hydrophasianus chirurgus</i>	LM	LC
28	Charadriiformes	Jacaniidae	Bronze-winged Jacana	<i>Metopidius indicus</i>	R	LC
29	Charadriiformes	Charadriidae	Red-wattled Lapwing	<i>Vanellus indicus</i>	R	LC
30	Charadriiformes	Charadriidae	Little Ringed Plover	<i>Charadrius dubius</i>	R	LC
31	Charadriiformes	Burhinidae	Eurasian Thick-knee	<i>Burhinus oedicephalus</i>	R	LC
32	Charadriiformes	Laridae	Great Black-backed Gull	<i>Larus marinus</i>	R	LC
33	Charadriiformes	Recurvirostridae	Black-winged Stilt	<i>Himantopus himantopus</i>	R	LC
34	Ciconiiformes	Ciconiidae	Black Stork	<i>Ciconia nigra</i>	M	LC
35	Ciconiiformes	Ciconiidae	Woolly-necked stork	<i>Ciconia episcopus</i>	M	VU
36	Ciconiiformes	Ciconiidae	Asian Openbill	<i>Anastomus oscitans</i>	M	LC
37	Ciconiiformes	Ciconiidae	Painted Stork	<i>Mycteria leucocephala</i>	M	NT
38	Ciconiiformes	Ciconiidae	Black Necked Stork	<i>Ephippiorhynchus asiaticus</i>	M	NT
39	Gruiformes	Rallidae	Common Coot	<i>Fulica atra</i>	M	LC
40	Gruiformes	Rallidae	Common Moorhen	<i>Gallinula chloropus</i>	R	LC
41	Gruiformes	Rallidae	White-breasted Waterhen	<i>Amauornis phoenicurus</i>	R	LC
42	Gruiformes	Gruidae	Sarus Crane	<i>Grus antigone</i>	M	VU
43	Coraciiformes	Alcedinidae	Pied Kingfisher	<i>Ceryle rudis</i>	R	LC
44	Coraciiformes	Alcedinidae	White-breasted Kingfisher	<i>Halcyon smyrnensis</i>	R	LC
45	Suliformes	Phalacrocoracidae	Little cormorant	<i>Microcarbo niger</i>	LM	LC
46	Suliformes	Phalacrocoracidae	Great Cormorant	<i>Phalacrocorax carbo</i>	LM	LC
47	Passeriformes	Motacillidae	White Wagtail	<i>Motacilla alba</i>	R	LC

Note:

R = Residential; M = Migratory and LM = Local Migratory;
 VU = Vulnerable; NT = Near Threatened and LC = Least Concern;

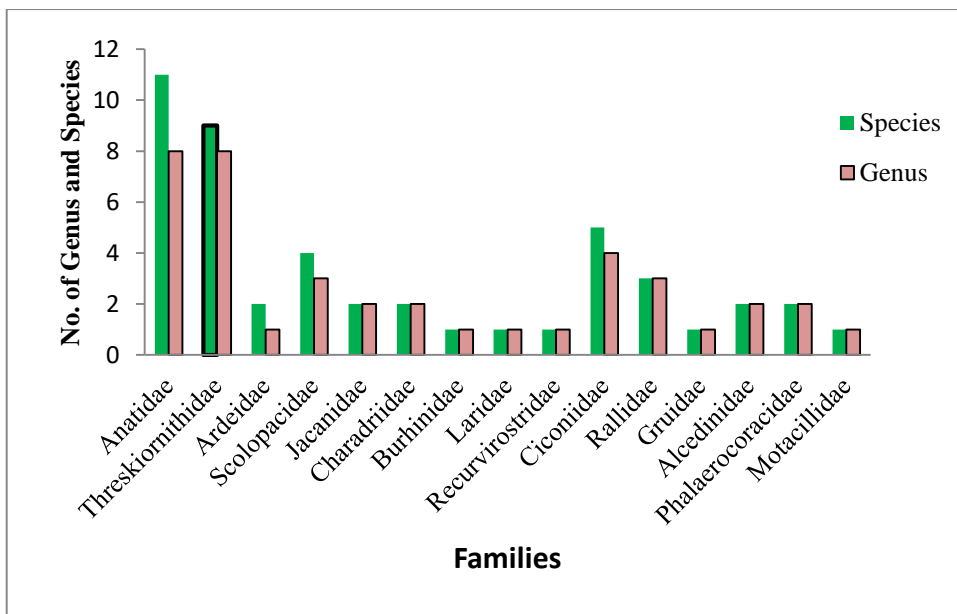


Figure 2: Showing Family wise number of genus and species

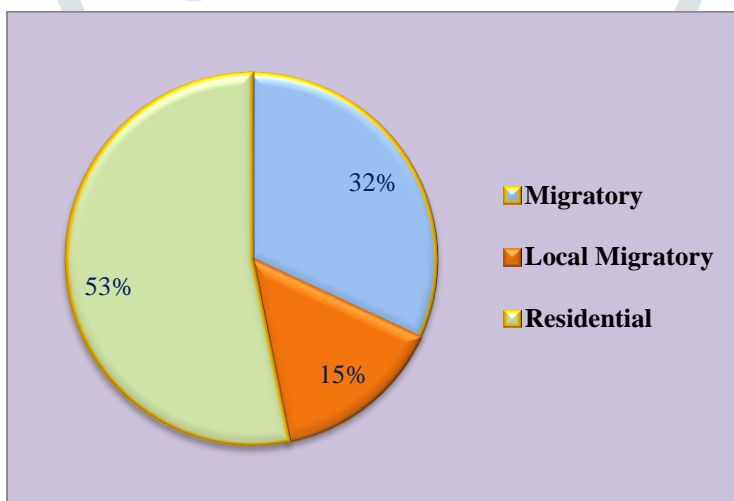


Figure 3: Showing Residential Status of Birds in Kotwal Reservoir

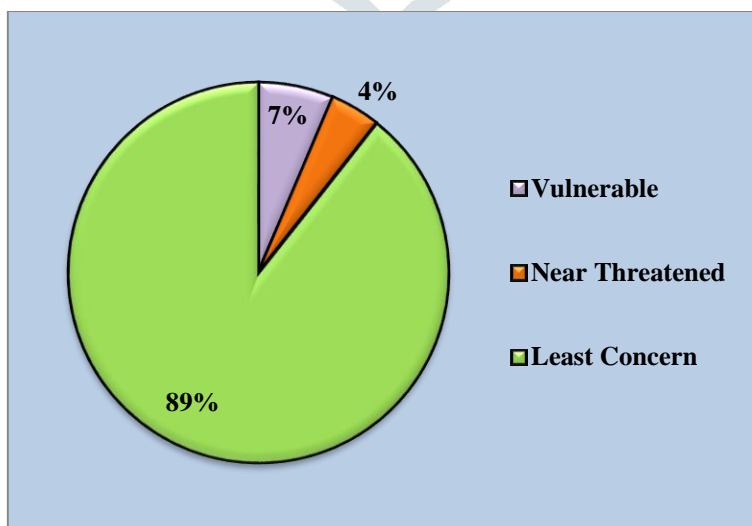


Figure 4: Showing IUCN Status of Birds in Kotwal Reservoir

4. CONCLUSION

From the above study it can be concluded that Kotwal Reservoir provides favourable conditions for breeding, feeding and nesting of both migratory and residential species of birds and hence it creates space for other animals which are directly or indirectly related to birds. Since there is no published Avifaunal checklist prior to this, therefore, the present work can also form the baseline for further research and comparative studies.

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