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RESEARCH ARTICLE

STUDIES ON PRESENT STATUS OF AQUATIC BIRDS IN AND AROUND TIGHRA RESERVOIR GWALIOR DISTRICT MADHYA PRADESH, INDIA

*Lodhi, R. K., Gurjwar, R. K., Rawat, S. N., Dutta, R. and Rao, R. J.

Conservation Biology Lab, School of Studies in Zoology, Jiwaji University, Gwalior (M.P.) - 474011

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ABSTRACT

Avifauna plays a significant role in ecological balance of an ecosystem. Their diversity related to the habitat diversity that provides a variety of roosting, nesting, feeding and breeding sites. The present study on aquatic birds carried out at Tighra reservoir. This study helps to evaluate bird density and diversity, species composition, abundance and distribution of aquatic birds of Tighra reservoir. Respectively total 56 species were found belong to 17 families and 8 orders. The most dominant species were coot and Red crested pochard. Line transects and point count methods were adopted for the observation of bird at four selected sites in study area. The species consist migratory, residential and residential migratory were recorded.

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INTRODUCTION

Birds are found throughout the world, at approximately all altitudes and in nearly every climate. Birds are often common denizens of the ecosystems and they have been considered as an indicator species of inhabited areas (Blair, 1999). Population of birds is a sensitive indicator of pollution in both terrestrial and aquatic ecosystem (Gaston, 1975). Avifauna is an important constituent as well as an important link in the food chain of any ecosystem. Birds have been considered as useful biological indicators because they are ecologically versatile and inhabit all kinds of habitats (Sivaperuman and Jayson, 2006). In Indian wetlands 318 species of birds are recorded out of which 193 species are fully dependent on wetlands (Vijayan, 1986). Waterbirds are an important component of most of the wetland ecosystem as they occupy several trophic levels in the food web of wetland nutrient cycles. Activities of waterbirds are considered as indicator of quality of the wetland ecosystem and form the terminal links in many aquatic food chains, and as a result they reflect changes originating in several different ecosystem components (Custer and Osborne, 1977). Wetland birds provide us with some of nature's most wonderful sights, from vast flocks wheeling overhead to newly hatched chicks drying in the sun. Apart from their beauty and recreational and economic

importance, these birds are excellent indicators of water quality and measures of biodiversity. Wetlands are extremely important areas throughout the world for wildlife protection, recreation, sediment control, flood prevention. Wetlands are important bird's habitats and birds use them for feeding, roosting, nesting and rearing their young (Vishwakarma et al., 2014). The present study attempt to made to know the status of avifauna of reservoir to keeping in view the conservation value of aquatic birds and overview of diversity and threats to reservoir bird.

Study Area

The Tighra reservoir, the life line of Gwalior, was primarily constructed to fulfill the water supply of the city. Tighra Dam is huge water reservoir which is located about 23 km. from Western site of Gwalior city. The reservoir is constricted on Saank River in 1917 situated near Tighra village in Gwalior district, Madhya Pradesh (Fig. 1). The Tighra Reservoir is perennial water sources and lies between 78° 01'30" E to 77° 57'54" E longitude and 26° 11'42" N to 26° 14'08" N latitude an altitude of 218.58 m from mean sea level. The catchment area of this reservoir is 412.25 Sq km with maximum depth 24 m and 1341m long. It has capacity of 4.8 million cubic meters and it can pass up to 1274 cubic m/s. The reservoir is surrounded by hills from three sides. The hills on the north and western side are 300 m high and those on southern and south east side are about 225m high. At the south western side river Sank joins the reservoir through a gorge. About a dozen of

*Corresponding author: Lodhi, R. K.

Conservation Biology Lab School of Studies in Zoology, Jiwaji University, Gwalior- 474011

small nalla has drain in the reservoir from the hill slopes. In the north east of the reservoir there is a concrete masonry wall.

aquatic birds from Bahadur Sagar (Jhabua) M.P. Yardi *et al.*, (2004) reported 64 species of birds in Salim Ali Lake,

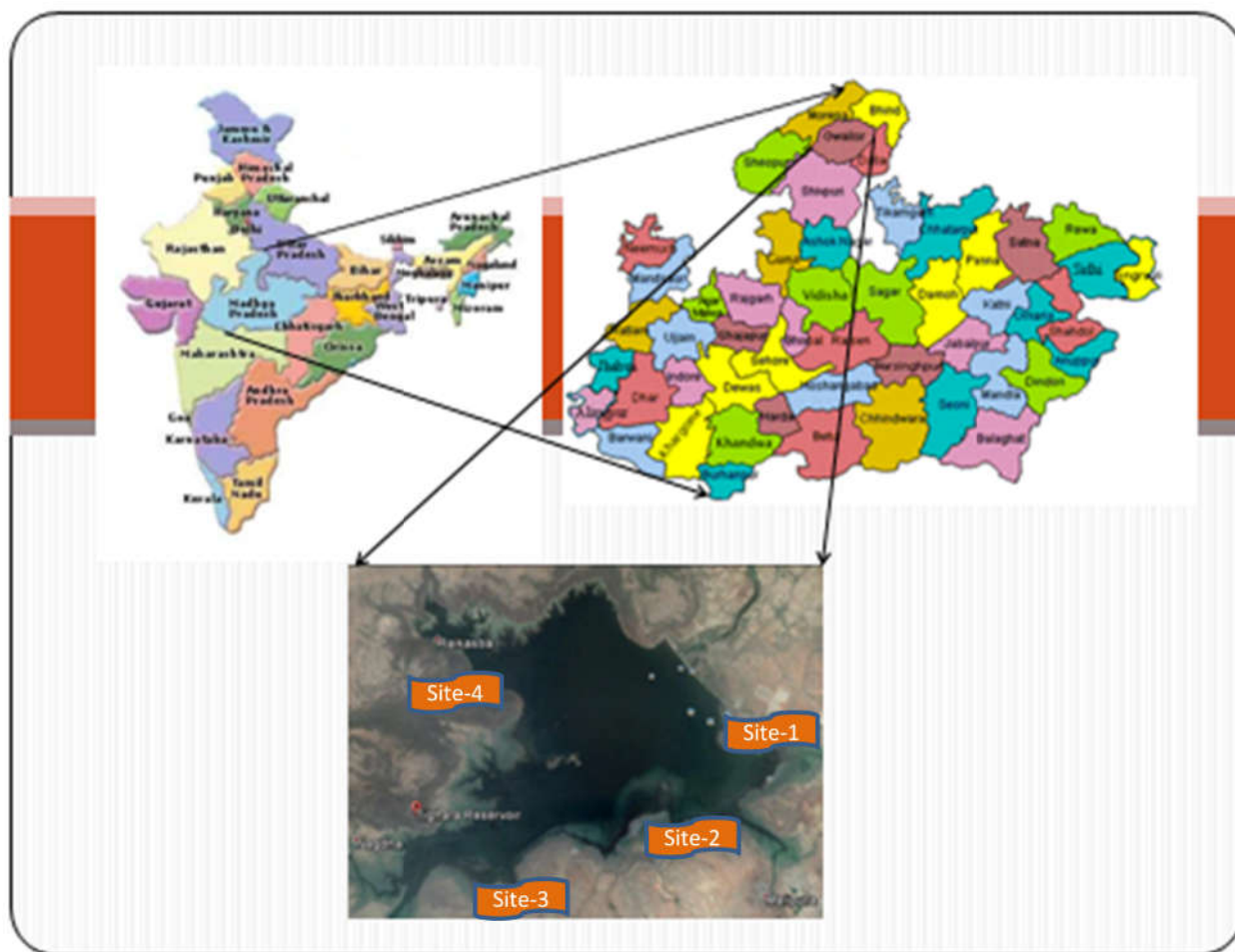


Figure 1. Satellite Map showing study area of Tighra reservoir

MATERIALS AND METHODS

Birds were observed during rainy, winter and summer season at most active period of birds early morning 6:30-10:00 am and evening 4:00-6:30 hour April 2015 to March 2016. The study area was surveyed for recording of avifauna by applying line transect method (Sale and Berkmueller, 1988) and point transect method (Verner, 1985). The birds were observed with the help of Binoculars (Nikon Action 8X40) at different spots at every location while walking along the boundary of the selected sampling sites. Photographs were taken where ever necessary to identify birds accurately to the generic and species level by using camera (Canon D-60). The birds were identified and classified on the basis of standard field guides by Ali (2006) and Grimmett *et al.*, (2001).

RESULTS AND DISCUSSION

During the research work a total 56 species of birds belonging to 17 families and 8 orders were recorded from Tighra reservoir. Out of these, 30 species were migrants, 16 were residential migrants and 10 were residential. The majority of the aquatic birds observed during the present study were the migratory and residential migratory. Same work reported by Kedar and Patil (2005) recorded 60 bird species from Rishi Lake and its surrounding area. Prakash (1999) described 12 species of

Aurangabad. The check list of bird species was prepared with their Occurrence status, residential status with their scientific name in Table 1. Out of 56 species most of the species (17) belongs to Anatidae family respectively in study area (Fig. 2). Among the total species most of the species were Least concern (51 species), Vulnerable (3 species) and near threatened (2 species). The most of birds observed during this study were migrant 53% while residential migrant species were 29%, residential species were 18% of total recorded (Fig. 3).

The status of some bird species like Spot-billed duck, Common Moorhen, Great Cormorant, Grey Heron, Large Egret and Intermediate Egret observed in Chhilchhila Wildlife Sanctuary was different from their Haryana State status (Tak *et al.*, 2010). There was a variation in number of aquatic bird species recorded during summer, monsoon and winter seasons. Lameed (2011) reported that the species that are winter visitors use wetlands for rest and other activities while waiting for the favorable condition of their home range. Individually number of bird species were high in winter seasons and less were in rainy seasons. The occurrence of the migratory birds in the area indicates that the critical habitat is important for the organisms. Likewise, the occurrence of these birds in the area suggests that the area provides a favorable condition for the bird's breeding, feeding and nesting.

Table 1. Birds species checklist with taxonomic position of Tighra reservoir, Madhya Pradesh

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

VC- Vulnerable; LC- Least concern; NT- Near threatened

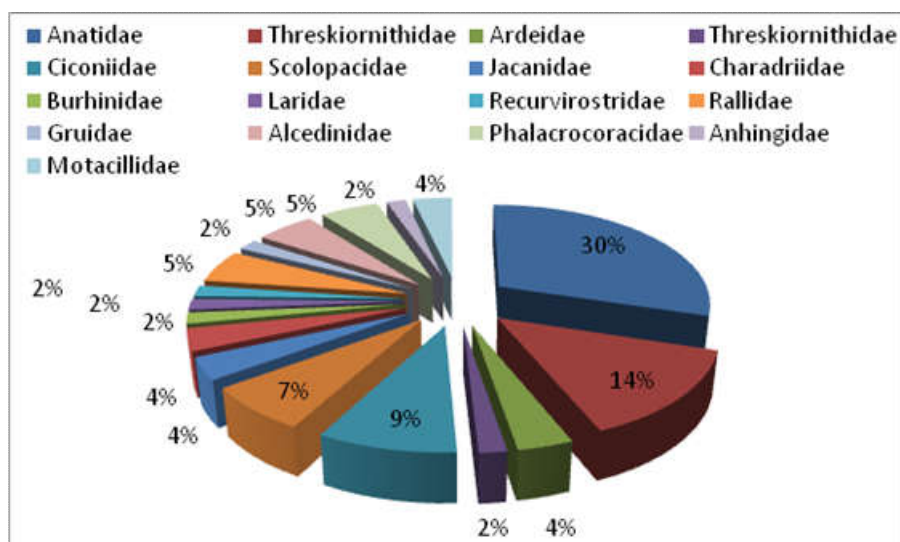


Figure 2. Family-wise distribution of aquatic birds of Tighra reservoir

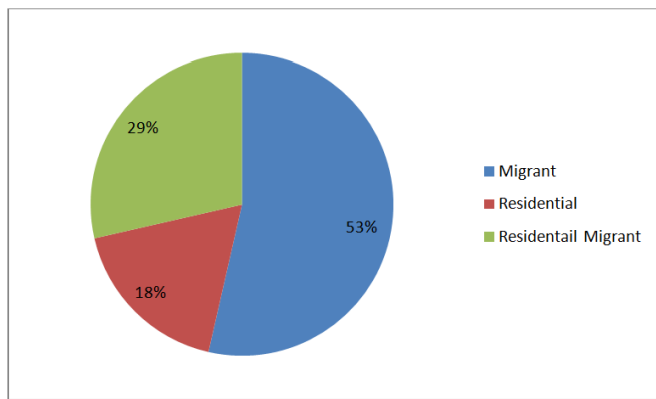


Figure 3. Residential status of Aquatic birds of Tighra Reservoir

Conclusion

On the basis of this study found that among these species most of them were migratory. Some of were residential migratory and a few were local residence. The abundance of the bird shows that the habitat of this reservoir is suitable for birds. From the above results it could be conclude that the abundance of avifauna indicates the healthy status of reservoir owing the availability of water, safe habitat and food sources for both adults and nestlings and essential nesting/roosting sites in and around the reservoir are important for the occurrence and abundance of aquatic bird populations. The preservation of reservoir is crucial for the survival of both resident and migratory birds because they provide the birds with specialized microhabitats and different kinds of food sources.

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