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RESEARCH ARTICLE

BIODIVERSITY CONSERVATION IN WETLAND OF DIHAILA LAKE WITH REFERENCE TO MIGRATORY BIRDS

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ABSTRACT

Dihaila Lake is an irrigation Lake constructed in Karera Bustard Sanctuary Mahya Pradesh India with a water spread area of 420 ha at FRL receiving water from a huge catchment area of about 446 sq. km. The Lake has been identified under National Wetland Conservation program by Ministry of Environment and Forests (Govt. of India). The Lake supports a rich biodiversity including fishes, birds, reptiles and Mammals. This Lake supports the fish biodiversity include some importance fish species from conservation point of view. A large number of water birds visit the reservoir during winter season. Both these features make the Lake a biodiversity hotspot and need a systematic conservation strategy. The most positive aspect of the Lake is its catchment area which is predominantly forested and most of it is covered under Karera Bustard Sanctuary notified under Wildlife Protection Act 1972 of Govt. of India. Similarly, the migratory birds also visit the reservoir during winter season. The present paper deals with various types of habitats available in the Lake and its surrounding area. The mosaic of habitats makes it a unique avifaunal refuge. Protected catchment area is also a supportive feature for the conservation of bird species. The paper discusses in detail the aquatic habitats available in the Lake, their biological features (presence of macrophytes and benthos), habitat utilization patterns of birds and conservation aspects.

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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 (Mitsch and Gosselink 1986). The various reservoirs, shallow ponds and numerous tanks support wetland biodiversity and add to the countries wetland wealth. It is estimated that freshwater wetlands alone support 20% of the known range of biodiversity in India (Deepa and Ramachandra 1999). Wetlands in India occupy 58.2 million hectares, including areas under wet paddy cultivation (Directory of Indian Wetlands). One of the best known functions of wetlands is to provide a habitat for birds. Wetlands are important bird habitats, and birds use them for breeding, nesting rearing young. Birds also use wetlands as a source of drinking water and for feeding, resting, shelter, and social interactions (Stewart, 2007). Looking for the urgent need to conserve the wetlands as waterfowl habitats an international treaty was signed which is called Ramsar conservation. The official name of the treaty, "the Conventions of Wetlands of International Importance especially as waterfowl habitat reflects the original emphasis upon the conservation and wise use wetlands primarily as habitat for water birds. Over the years, however, the conservation has broadened its scope of implementation to

cover all aspects of wetland conservation an wise use, recognizing wetlands as ecosystems that extremely important for biodiversity conservation and for the well being of human communities, thus fulfilling the full scope of the Convention text.

MATERIALS AND METHODS

Dihaila Lake is one of the major irrigation projects of Madhya Pradesh constructed in Karera bustard Sanctuary. The Karera Bustard Sanctuary is situated in the central highlands of India. It is situated 55 km from Shivpuri, Madhya Pradesh on Bombay-Kanpur highway (NH-25) and 125 km. southern side of Gwalior. Geographically, it lies between 25° 20' - 25° 38'N latitude and 77° 38' - 77 ° 57' E longitudes. This Lake is an important source of fish production in the area. Regular fish stoking is made in this Lake every year. The water of the Lake is mainly used for the irrigation purpose. It is also used for fisheries, trapa culture and other domestic purposes by the local residents. The wetland supports a rich biodiversity and provide habitat for wildlife including migratory birds. The reservoir has been studied for biodiversity aspects but no work has been done on ecology and biodiversity of migratory birds which is an important aspect of wetland ecology. Study of avifaunal diversity of Dihaila wetland was conducted between June, 2010 and March, 2011. The birds were identified and counted with the help of Binoculars (Nikon Action 8X40) at different spots at every location and field guides such as a Pictorial Guide to the Birds of the Indian Subcontinent (Ali, 2006) and

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List of birds recorded in Dihaila Lake, Karera Bustard Sanctuary during September, 2010 to March, 2011

S.No.	Order	Family	Scientific Name	Common Name	Status	Hindi Name
1	Podicipediformes	Podicipitidae	<i>Podiceps cristatus</i>	Great Crested Grebe	RM	Pandubi
s2			<i>Podiceps ruficollis</i>	Little Grebe	R	Dubdubi,
3	Pelecaniformes	Phalacrocoracidae	<i>Phalacrocorax fuscicollis</i>	Large Cormorant	RM	Pan-kowwa
4			<i>Phalacrocorax niger</i>	Little Cormorant	RM	Pan-kowwa, Jograbi, Ganhill
5	Ciconiformes	Ardeidae	<i>Ardea cinerea</i>	Grey Heron	RM	Anjan, Sain, Nari-bagla
6			<i>Ardea purpurea</i>	Purple Heron	RM	Lal-anjan
7			<i>Ardeola grayii</i>	Pond Heron	R	Andha bagla, Chama
8			<i>Egretta intermedia</i>	Intermediate Egret	RM	Madhayam bagla
9			<i>Bubulcus ibis</i>	Cattle Egret	RM	Surkhia bagla Doria bagla
10			<i>Ardea alba</i>	Large Egret	RM	Bada-bagla
11			<i>Egretta garzeta</i>	Little Egret	R	Karchia, kilchia bagla
12		Threskiornithidae	<i>Platalea leucorodia</i>	Spoonbill	RM	Chamcha, Dabil, Chamach-baza
13			<i>Threskiornis aethiopica</i>	White Ibis	R	Safed baza, Didhar, Munda
14			<i>Pseudibis papillosa</i>	Indian Black Ibis	R	Baza, Karan-kul
15		Ciconiidae	<i>Ephippiorhynchus</i>	Blacknecked Stork	R	Banaras, Loha-sarang
16			<i>Ciconia ciconia</i>	Whitenecked Stork	R	Laglag
17			<i>Anastomus oscitans</i>	Openbilled Stork	R	Ghonghila, Gungla, Ghungil
18			<i>Mycteria leucocephala</i>	Painted Stork	RM	Bagula
19	Anseriformes	Anatidae	<i>Aythya ferina</i>	Common Pochard	M	Lal seer
20			<i>Sarkidiornis melanotus</i>	Comb Duck (Nukta)	R	Nakta
21			<i>Anser indicus</i>	Bar-headed Goose	M	Rajhans, Sawan, Birwa, Kareyee-h
22			<i>Anas crecca</i>	Common Teal	M	Choti murghabi, Kerra, Souchuruka
23			<i>Anas clypeata</i>	Northern Shoveller	M	Tidari, Punana, ghirah, Tokarwala
24			<i>Tadorna ferrugines</i>	Ruddy Shelduck	M	Chakwa-chakwi
25			<i>Anas acuta</i>	Northern Pintail	M	Sand, seenkh par
26			<i>Anser anser</i>	Greylag Goose	M	Kalhans, badi-satpeti bat
27			<i>Aythya nyroca</i>	Red Crested Pochard	M	Badak
28			<i>Dendrocygna javanica</i>	Lesser Whistling Teal	RM	Choti seelhi, seelkahi
29			<i>Ansa poecilorhyncha</i>	Spot-Billed Duck	RM	Gugral
30	Falconiformes	Accipitridae	<i>Circus aeruginosus</i>	Marsh Harrier	M	Kutar, safed sira
31	Gruiformes	Rallidae	<i>Fulica atra</i>	Coot	RM	Aari, Thekari, Dasari,
32			<i>Porphyrio porphyrio</i>	Indian Purple Moorhen	R	Kharim, kaim
33			<i>Gallinula chloropus</i>	Indian Moorhen	RM	Jal-murghi
34			<i>Amaurornis phoenicurus</i>	White-brested Waterhen	R	Jalmurgi
35		Grudae	<i>Grus antigone</i>	Sarus Crane	R	Saras
36	Charadriiformes	Charadriidae	<i>Vanellus indicus</i>	Red-wattled Lapwing	R	Titeeri, Titai
37			<i>Tringa hypoleucos</i>	Common Sandpiper	RM	Panewa
38		Recurvirostridae	<i>Himantopus himantopus</i>	Black-winged Stilt	R	Tinghur
39		Scolopacidae	<i>Tringa nebularia</i>	Greenshank	M	Tringa
40	Passeriformes	Hirundinidae	<i>Hirundo smithii</i>	Wire-tailed Swallow	R	-
41		Motacillidae	<i>Motacilla caspica</i>	Grey Wagtail	R	-
42			<i>Motacilla maderaspatensis</i>	White-browed Wagtail	RM	-
43	Coraciiformes	Alcedinidae	<i>Ceryle rudis</i>	Pied Kingfisher	R	Kilkila
44			<i>Alcedo atthis</i>	Small Blue Kingfisher	R	Kilkila
45			<i>Halcyon smyrnensis</i>	White-breasted Kingfisher	R	Kilkila

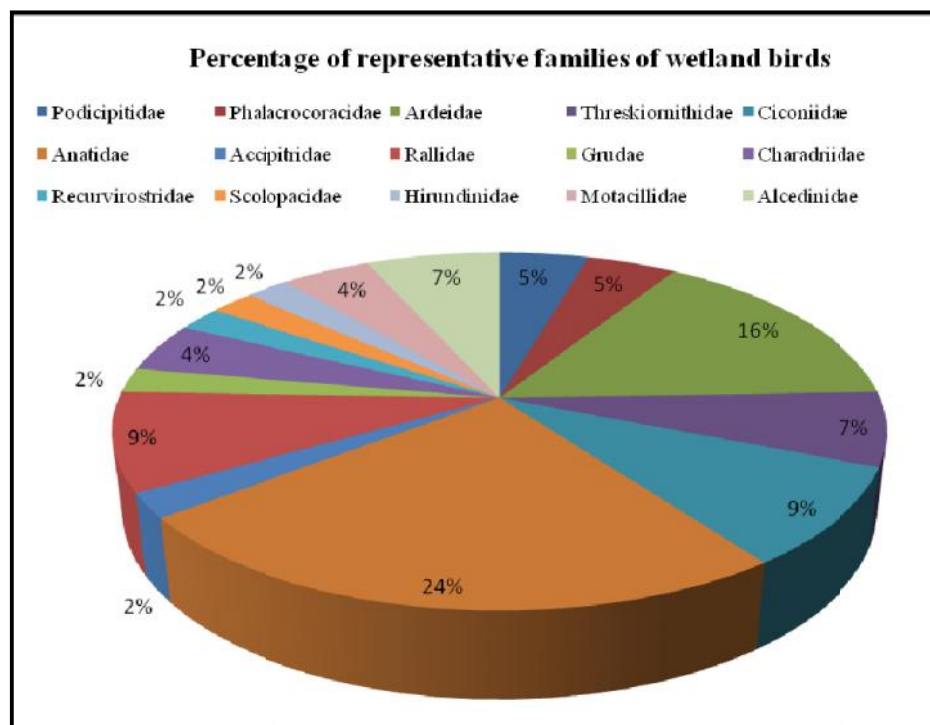


Fig.1. Percentage representation of bird families at Dihaila Lake in Karera Bustard Sanctuary, M.P.

Water birds of Northern India (Alfred *et al.*, 2001), were used for identifying the birds. The birds were identified up to order level and check list was prepared using the standardized common and scientific names of the birds of the Indian subcontinent by Manakkadan and Pittie, (2001).

RESULTS AND DISCUSSION

In the present study 45 species of birds belonging to 13 families and 9 orders were recorded between September and March (Fig. 1). According to their migratory status, the bird species are divided into three types as Resident, Resident Migrant and Migrant. Out of these, 19 (42%) species were resident, 16 (36%) resident migrant and 10 (22%) migrant. The status of bird species are given in Fig 2.

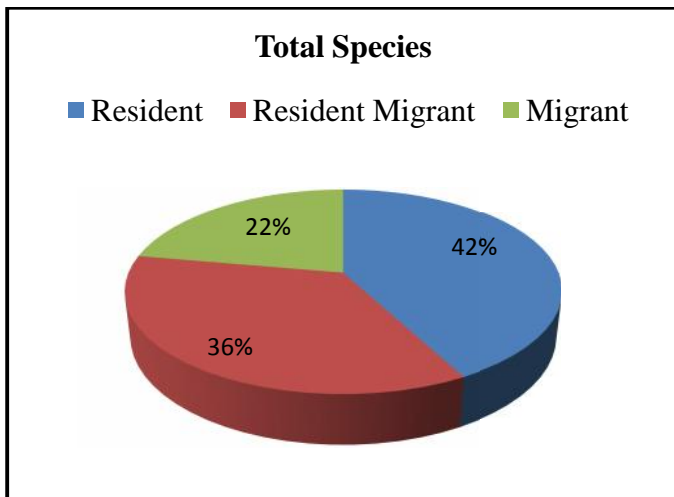


Fig. 2. Status of bird species at Dihaila Lake in Karera Bustard Sanctuary, M.P.

Both Anatidae and Charadriidae were found to be the most dominant families represented by 13 species in which Anatidae family represented by 11 species and 7 families were recorded in Ardeidae family. Surana (2007) recorded Anatidae to be most dominant family with 12 species and Ardeidae with 9 species in Chimdi Lake of Nepal. Kumar (2006) recorded Ardeidae to be the most dominant family in Bharatpurzha river basin in Kerala and Kurup (1991) attributed it to the larger mudflat which attracts shorebirds in large numbers. In the present study Ardeidae was found to be the third dominant species indicating the wetland moderately supports shorebirds. Rathore and Sharma (1996) also reported Anatidae to be dominating family with 12 species in Sarsai Nawar in UP. Vijayan (1988) also reported 17 species of Anatidae in Bharatpur wetland. 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. Seasonal variation was clearly indicates in the present study. 46 species were recorded during September belonging to 14 families and 8 orders. Anatidae was the most dominant family contributing 11 species during this month also. Ardeidae was the second dominant family contributing 7 species in the month of September. A sharp increase was recorded during December when 45 species of waterbirds in the wetland were recorded belonging to 15 families and 7 orders. Anatidae family was the most dominant family. This indicate that most of the wintering waterbirds belonging to Anatidae and Ardeidae family. In the month of January there was a total no of 60 species belonging to 16 families and 9 orders. There was a gradual decline in species richness in the lake as the weather condition changes from colder to warmer. This is the time when migratory species start

migrating back. Only 53 species of waterbirds were recorded during the March consisting of 16 families. Vijayan (1988) while working on Bharatpur wetland also recorded similar observations. Members of Charadriidae and Anatidae family were found to dominate among the winter migratory birds. Their monthly occurrence pattern clearly indicated that these birds found between October and March. Sivaperuman (2000) recorded the maximum no of birds in the month of January and minimum in June in Kole wetland of Thrissur district which supports our observation.

Conclusion

The above observation indicate that the wetland support at least 10 migratory species of water birds and most of them are ducks feeding and foraging in open water zone. Rathore and Sharma (1999) indicate that most of the members of family Anatidae are herbivore in nature and depend on aquatic flora. They dive up to the depth of 3 meter for feeding. Hence a habitat with open water with submerged vegetation is the most suitable habitats should be mapped in Dihaila Lake and attempts should be made to keep them free from human interference.

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