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**A Checklist
of Waterbirds
of Tadoba-
Andhari Tiger
Reserve (TATR),
Maharashtra,
India**





Abstract

The paper offers the checklist of waterbirds of Tadoba-Andhari Tiger Reserve (TATR) based primarily on field work carried out between January to June 2014. A total of 63 species of waterbirds belonging to 16 families were observed during the six months duration. Anatidae was the most represented family with 14 species followed by 10 species in the Ardeidae family and 8 birds of Scolopacidae family. The Ardeidae family is the most abundant family reported from the area. Birds like Pond heron, Cattle egret and Little egret were sighted at 96% of all the water bodies. Except three bird species namely Black Headed Ibis, Darter and Lesser Adjutant all the other bird species found in TATR are categorized as "Least concern (LC)" in the International Union for Conservation of Nature (IUCN). The present study provides a baseline data on waterbirds of this landscape. The well-distributed water bodies in the reserve serve as good habitat for a lot of migratory birds. Erai dam, Moharli Lake, Kolsa Lake are used by the birds throughout the migration season. The climatic conditions in this Central Indian landscape provide a favorable breeding and roosting ground to these winter visitors.

Keywords : Black Headed Ibis, Darter, Lesser Adjutant, Maharashtra, TATR, Waterbirds

Introduction

Regular assessment of physical and biological components of landscape is essential to describe the biodiversity in any ecosystem. Terrestrial and aquatic ecosystems are highly interdependent and are mutually responsible for health of the ecosystem in general (Green and Elmberg 2014). Waterbirds are known to enhance the conservation value of aquatic ecosystems by facilitating various ecosystem services like expediting nutrient recycling, serving as a key food resource, regulating other aquatic taxa population (Green and Elmberg 2014). Some waterbirds are marked as indicators of aquatic biodiversity (Amat and Green 2010).

It is hence very critical to keep the pulse of these key aquatic taxa to ensure health of the water bodies in any landscape. Limited information is available on the waterbirds of Maharashtra in general and TATR in particular (Palchore 2011, Pawar 2012, Kasambe 2002, 2003, 2007). Tadoba-Andhari Tiger Reserve (TATR) situated in the Central Indian landscape is not only an abode for large mammals but also harbors a significant diversity of avifauna. Of the 288 bird species (Bird Checklist of Tadoba 2010) recorded so far in this landscape, 70 of them are waterbirds. Few perennial water sources in the TATR, Erai dam being the largest which is about 42.50 km² along with other satellite wetlands spread across the landscape serves as a very good habitat for the waterbirds. However there is no information available regarding the species occurrence in these water bodies. In order to enrich the existing information on waterbirds of TATR landscape, the study was conducted to prepare a checklist of the species observed in the few key water bodies in and around TATR.

Study Area

Tadoba National Park and Andhari Wildlife Sanctuary were constituted as a tiger reserve in 1995. Geographically it is located between 20°30'4.6" N to 19°59'51.3"N to 79°12'3.4"E to 79°40'53.9" E. This is the largest National park of Maharashtra spread over an area of 1700 km². Predominantly a Southern tropical dry deciduous forest (Champion and Seth 1968) with Bamboo (*Dendrocalamus strictus*), Teak (*Tectona grandis*), Ain (*Terminalia tomentosa*), Tendu (*Diospyros melanoxylon*) and Mahua (*Madhuca indica*) as other associated species. TATR is a matrix of bamboo mix forest with few riparian patches interspersed in the area with Arjuna (*Terminalia arjuna*), Jamun (*Syzigium cumini*).

TATR holds a wide array of vertebrate and invertebrate species with mammal (65 species), birds (288 species) and butterfly (74 species). The dry deciduous bamboo forest is known for large carnivores like Tiger (*Panthera tigris*), Leopard

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(*Panthera pardus*), Dhole (*Cuon alpinus*), with other mammalian species like Sloth bear (*Melursus ursinus*), Gaur (*Bos gaurus*), Sambar (*Rusa unicolor*), Chital (*Axis axis*). Avifaunal species includes rare birds like Lesser Adjutant (*Leptoptilos javanicus*), Black-headed ibis (*Threskiornis melanocephalus*), Asian paradise flycatcher (*Terpsiphone paradisi*) while butterfly taxa mainly comprises of Danaid Eggfly (*Hypolimnas misippus*), Striped Tiger (*Danaus genutia*), Blue Tiger (*Tirumala limniace*) etc.

Water-bodies in and around Tadoba-Andhari Tiger Reserve (TATR) were surveyed for the presence of waterbirds during January 2014 to June 2014. The region has two main rivers, the Erai River in the west and the Andhari River in the east. The Tadoba (1.2 km²) and Kolsa lakes (0.8 km²), Naleswar Talao (5.69 km²) constitute the largest water bodies in the TATR. Other than these large water bodies Telia Lake, Moharli Lake, Junona Talao, Pahami Talao constitutes other important water bodies (Fig 1). Most of the annual rainfall (1175 mm) is received between June and September, with a minimum temperature of about 3°C in December, rising to a maximum of about 48°C in May (Khawarey & Karnat, 1997).

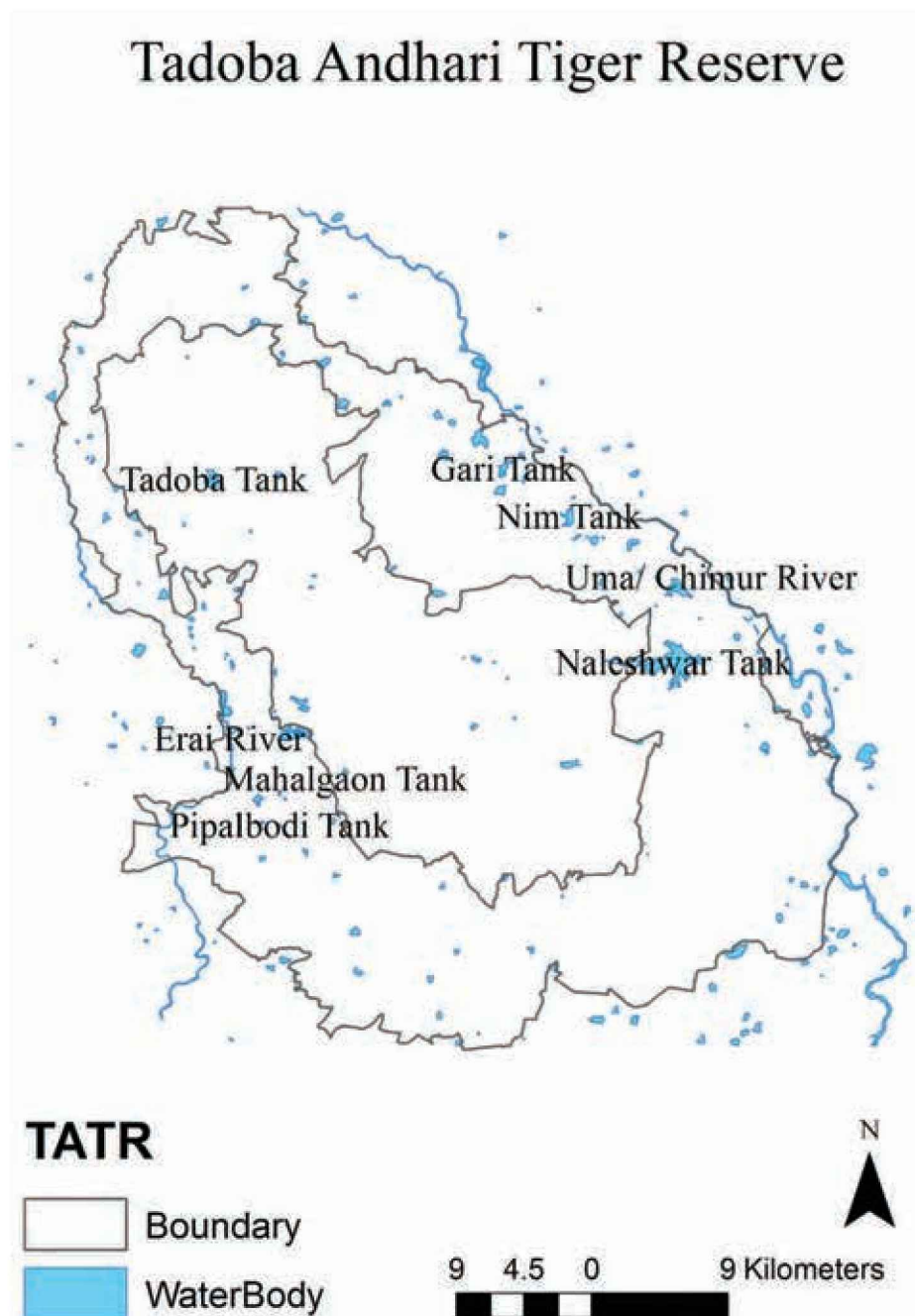


Figure 1 : Major water bodies in and around TATR

Methods

The checklist is based primarily on the field work carried out between January to June 2014 (Table 1). Approximately 153 days were spent recording the bird diversity. The observations were carried out from 0600-1800 hrs with an 8x40 Nikon monarch binoculars and birds were identified using a standard field guide (Grimmett *et al.* 2011). 12 water bodies were selected for the study. Each site was visited at an interval of 3-4 days to record the bird species observed opportunistically. For every site three observations were recorded following a scan sampling method keeping five minute interval between subsequent scans. Morning and afternoon timings were followed to record the observations which also overlap with the peak activity period of the birds. In the winter, the major wetlands were visited regularly for monitoring the migratory birds. Wetland visits were conducted both on foot and with vehicle depending on road accessibility and maintaining the least disturbance for the waterbirds.

Table 1 : List of water bird species identified in the area and their status according to IUCN Red list

Family and common name	Scientific names	Status	Frequency	Breeding	IUCN Status
Podicipedidae - Grebes					
Great crested grebe	<i>Podiceps cristatus</i>	Migrant	Rare	NA	LC
Little Grebe	<i>Tachybaptus ruficollis</i>	Resident	Common	B	LC
Phalacrocoracidae - Cormorants					
Great cormorant	<i>Phalacrocorax carbo</i>	Local migrant	Uncommon	NA	LC
Indian cormorant	<i>Phalacrocorax fuscicollis</i>	Migrant	Uncommon	NA	LC
Little cormorant	<i>Phalacrocorax niger</i>	Resident	Common	B	LC
Anhingidae - Darters					
Darter	<i>Anhinga melanogaster</i>	Local migrant	Common	B	NT
Ardeidae - Herons, egrets, bitterns					
Grey heron	<i>Ardea cinera</i>	Resident	Fairly common	B	LC
Purple heron	<i>Ardea purpurea</i>	Resident	Common	B	LC
Little heron	<i>Butorides straitus</i>	Local migrant	Common	B	LC
Indian pond heron	<i>Ardeola grayii</i>	Resident	Common	B	LC
Cattle egret	<i>Bulbulcus ibis</i>	Resident	Common	B	LC
Large egret	<i>Casmerodius albus</i>	Resident	Common	B	LC
Intermediate egret	<i>Mesophox intermedia</i>	Resident	Fairly common	B	LC
Little egret	<i>Egretta garzetta</i>	Resident	Common	B	LC
Black-crowned night heron	<i>Nycticorax nycticorax</i>	Resident	Common	B	LC
Cinnamon bittern	<i>Ixobrychus cinnamomeus</i>	Resident	Rare	NA	LC
Ciconidae - Storks					
Asian openbill	<i>Anastomus oscitans</i>	Resident	Common	B	LC
Wooly necked stork	<i>Ciconia episcopus</i>	Resident	Uncommon	NA	LC
Black stork	<i>Ciconia nigra</i>	Migrant	Rare	NA	LC
Black-necked stork	<i>Ephippiorhynchus asiaticus</i>	Migrant	Rare	NA	LC
Lesser adjutant	<i>Leptoptilos javanicus</i>	Resident	Uncommon	B	VU
Painted stork*	<i>Mycteria leucocephala</i>	Vagrant	Rare		NT
Threskiornithidae - Ibis					
Black-headed Ibis	<i>Threskiornis melanocephalus</i>	Resident	Common	B	NT
Red-naped Ibis	<i>Pseudibis papillosa</i>	Resident	Fairly common	B	LC
Anatidae - Ducks, geese, swans					
Bar-headed goose	<i>Anser indicus</i>	Migrant	Uncommon	NA	LC
Lesser whistling duck	<i>Dendrocygna javanica</i>	Resident	Common	B	LC

Ruddy shelduck	<i>Tadorna ferruginea</i>	Migrant	Uncommon	NA	LC
Northern pintail	<i>Anas acuta</i>	Migrant	Uncommon	NA	LC
Common teal	<i>Anas crecca</i>	Migrant	Uncommon	NA	LC
Spot-billed duck	<i>Anas poecilorhyncha</i>	Resident	Common	B	LC
Gadwall	<i>Anas strepera</i>	Migrant	Common	NA	LC
Eurasian wigeon	<i>Anas penelope</i>	Migrant	Uncommon	NA	LC
Garganey	<i>Anas querquedula</i>	Migrant	Uncommon	NA	LC
Northern shoveller	<i>Anas clypeata</i>	Migrant	Uncommon	NA	LC
Common pochard	<i>Aythya ferina</i>	Migrant	Uncommon	NA	LC
Tufted duck	<i>Aythya fuligula</i>	Migrant	Uncommon	NA	LC
Cotton pygmy goose	<i>Nettapus coromondelianus</i>	Resident	Common	B	LC
Mallard	<i>Anas platyrhynchos</i>	Migrant	Uncommon	NA	LC
Rallidae - Rails, coots					
Brown crane	<i>Amauornis akool</i>	Resident	Uncommon	NA	LC
Whitebreastedwaterhen	<i>Amauornis phoenicurus</i>	Resident	Common	B	LC
Common moorhen	<i>Gallinula chloropus</i>	Resident	Uncommon	B	LC
Purple swamphen	<i>Porphyrio porphyrio</i>	Resident	Common	B	LC
Common coot	<i>Fulica atra</i>	Resident	Common	B	LC
Jacanaidae - Jacanas					
Pheasant-tailed jacana	<i>Hydrophasianus chirurgus</i>	Resident	Common	B	LC
Bronze-winged jacana	<i>Metopidius indicus</i>	Resident	Common	B	LC
Rostratulidae - painted-snipes					
Greater painted-snipe	<i>Rostratula benghalensis</i>	Resident	Uncommon	NA	LC
Scolopacidae - Sandpipers					
Common sandpiper	<i>Actitis hypoleucos</i>	Migrant	Common	NA	LC
Wood sandpiper	<i>Tringa glareola</i>	Migrant	Common	NA	LC
Green sandpiper	<i>Tringa ochropus</i>	Migrant	Uncommon	NA	LC
Marsh sandpiper	<i>Tringa stagnatilis</i>	Migrant	Uncommon	NA	LC
Spotted redshank	<i>Tringa erythropus</i>	Migrant	Uncommon	NA	LC
Common redshank	<i>Tringa tetanus</i>	Migrant	Common	NA	LC
Common green shank	<i>Tringa nebularia</i>	Migrant	Uncommon	NA	LC
Pin-tailed snipe	<i>Gallina gostenura</i>	Migrant	Uncommon	NA	LC
Charadriidae - Plovers, lapwing					
Red-wattled lapwing	<i>Vanellus indicus</i>	Resident	Common	B	LC
Yellow-wattledlapwng	<i>Vanellus malabaricus</i>	Resident	Uncommon	NA	LC
Little ringed plover	<i>Charadrius dubius</i>	Resident	Common	B	LC
Recurvirostridae - Stilts					
Black-winged stilt	<i>Himantopus himantopus</i>	Resident	Common	B	LC
Alcedinidae - Kingfishers					
Common kingfisher	<i>Alcedo atthis</i>	Resident	Common	B	LC
Pied kingfisher	<i>Ceryle rudis</i>	Resident	Common	B	LC
Halcyonidae - Tree kingfisher					
White-throated kingfisher	<i>Halcyon smyrnensis</i>	Resident	Common	B	LC
Stork-billed kingfisher	<i>Pelargopsis capensis</i>	Resident	Fairly common	B	LC
Burhinidae - Stone curlew					
Indian Stone curlew	<i>Burhinus indicus</i>	Resident	Uncommon	NA	LC

Results

A total of 63 species of waterbirds belonging to 16 families were observed during the six months duration (Table 1). Anatidae was the most represented family with 14 species followed by 10 species in the Ardeidae family and 8 birds of Scolopacidae family. The Ardeidae family is the most abundant family in the landscape. Birds like pond heron, Cattle egret and little egret were sighted at 96% of all the water bodies. Except three bird species namely Black headed ibis, darter and Lesser adjutant (Table 2) all the other bird species found in TATR are categorized as "Least concern LC" in the International Union for Conservation of Nature (IUCN) (<http://www.iucnredlist.org/>).

Table 2 : List of globally threatened birds in the area and their status according to IUCN Red list

Species	Status (IUCN Red List 2014)
Black headed ibis (<i>Threskiornis melanocephalus</i>)	NT (Near threatened)
Darter (<i>Anhinga melanogaster</i>)	NT (Near threatened)
Lesser adjutant (<i>Leptoptilos javanicus</i>)	VU (Vulnerable)

Black-headed Ibis : Two pairs of black headed ibis were sighted regularly near the Tadoba lake. One juvenile was also observed with the pair in the month of April which is indicating the breeding status of the individuals observed. Presence of these birds exclusively near Tadoba lake suggests the site preference either because of a suitable nesting site or a good foraging ground. Further study is needed to explain the preferences.

Darter : One pair was seen resident at the Tadoba Lake while two pairs were observed regularly in the Erai reservoir. Both these pairs were observed foraging in the respective water-bodies suggesting their preferences for these sites as foraging grounds.

Lesser Adjutant : One pair was observed on the nest in the vicinity of the Erai reservoir in the month of May. Individual birds were sighted inside the TATR core boundary near Katezari water body, Pahami talao and Pandharpauni water body. All these water bodies though perennial, the changing water regime suggests the local migration of the species towards a larger water source in crunch season. Further long term study will be helpful in discerning the conclusion regarding such dynamics.

Water bodies within the legislative boundary of TATR (Tadoba Lake, Telia Lake, Kolsa Lake) are well protected since there is no human presence around but it is crucial to assess the water bodies in the buffer zone of tiger reserve since there is a gradation of exposure to anthropogenic activities according to the number of villages in the surrounding. No of human activities like fishing, farming, washing etc. are affecting the water quality and quantity thereby causing a direct threat to the presence of waterbirds in the area.

Discussion

This is the first documentation of water birds of TATR. Fishing and other human activities in the water bodies pose a big threat to the resident and breeding water birds in TATR. In the Erai dam, the fishing activities have increased over the last few years. Since 2013, Greater flamingos (*Phoenicopterus roseus*) which were earlier regular visitors, have not been reported from Erai dam. Records of more than 200 Greater Flamingos sighted in Erai reservoir during monsoon date only an year back (personal communications with local birdwatchers). The other species reported earlier include Sarus Crane (*Grus antigone*) and Painted stork (*Mycteria leucocephala*). It is important to investigate the reasons behind recent disappearance of these bird species in the water bodies of TATR. Other than having good number of water birds some of bigger water bodies like Tadoba lake and Telia lake also support good population of marsh crocodiles. Our preliminary assessment showed that among the 16 water birds species observed in the area, 9 species were observed from Tadoba Lake while 14 and 15 species have been reported from Kolsa Lake and Erai dam respectively where the marsh crocodiles are rarely seen. It will be interesting to see the effect of presence of marsh crocodiles on water bird diversity of these water bodies. A detailed and long term study is required to understand the nesting ecology of the resident water bird species with a context of other associated natural parameters like water vegetation, salinity, food availability and anthropogenic parameters like pollution, human activities in TATR.

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