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Early winter avifaunal diversity from Buxa Tiger Reserve and Rasikbeel Wetland Complex of northern part of West Bengal, India

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Abstract

The present study was carried out to record the avifaunal diversity and abundance in and around Buxa Tiger Reserve (Raja Bhat Khawa, Buxa Fort, Raimatang and Jayanti) and Rasikbeel Wetland Complex, situated at the northern part of West Bengal, India during 19th – 22nd November, 2013. A total of 60 bird species belonging to 31 families were identified during four days of study period of which 8 were winter migrants, one was summer migrant and rest were resident. Anthropogenic interventions have altered much of the natural habitat of the present study location; however, a healthy avifaunal diversity was recorded during the present study. More intensive investigations will certainly enrich our knowledge of avian diversity and distribution pattern from the present study location leading to the proper conservation of this important bird area.

Key words: Avifauna, Biodiversity, Habitat heterogeneity

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Introduction

Bird diversity study acts as an intrinsic tool to monitor habitat types both qualitatively and quantitatively (Bilgrami, 1995). Anthropogenic interventions have incessantly altered and destroyed natural habitat throughout the world and consequently reduced overall avifaunal diversity (Rapoport, 1993). Moreover, changes in climatic conditions in recent decades have been unanimously reported to influence bird diversity most negatively (Sekercioglu *et al*.,

2012). India with 88 threatened bird species is presently ranked at seventh position in the IUCN Red List of endangered birds (BirdLife International, 2010).

The northern part of West Bengal comprises a number of sanctuaries, national parks, reserve forests and wetlands supporting enormous biodiversity (Islam and Rahmani, 2004). Buxa Tiger Reserve (BTR) (National Park) and Rasikbeel Wetland Complex (RBWC) are two such most important areas that harbour large numbers of local and migratory birds (Islam and Rahmani, 2004). However, escalating threat from anthropogenic activities especially tourism pressure has altered much of the natural habitat of the present study location. Thus it was most imperative to prepare a checklist of birds of these regions that are subjected to various degrees of pressures from human disturbances.

Materials and methods

The present study was conducted in two different habitat types Buxa Tiger Reserve (26°39′N, 89°34′48″E) and Rasikbeel Wetland Complex (26°21′N, 89°40′E) located in the northern part of West Bengal (Figs. 1-2).

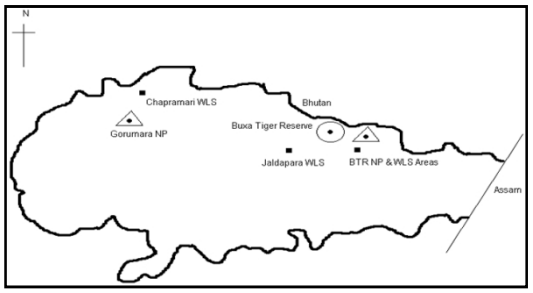

Figure 1. Map (without scale) of District Jalpaiguri showing Buxa Tiger Reserve, National Park and Wildlife Sanctuary Areas.

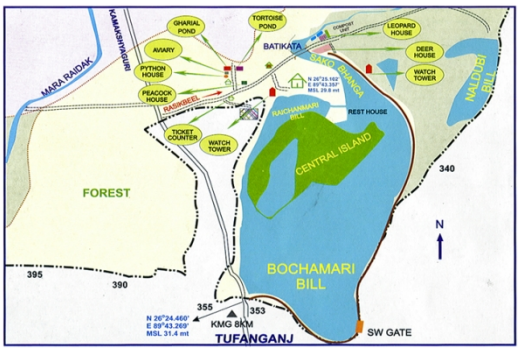

Figure 2. Map (without scale) of Rasikbeel Wetland Complex.

Buxa Tiger Reserve (BTR), in the Alipurduar Sub–Division of Jalpaiguri District was setup as the 15th Tiger Reserve in the country in 1983 at the northeastern corner of West Bengal bordering Bhutan and Assam. The present studies were conducted at or near Raja Bhat Khawa, Buxa Fort, Raimatang and Jayanti of BTR. The area of the BTR encompasses 760.87 Km^2 having a sanctuary of 269 km^2 and a National Park of 117.01 km^2 of pristine forests and is situated in the transition zone between Biome-8 (Sino-Himalayan Subtropical Forest) and Biome-12 (Indo-Gangetic Plain) (Islam and Rahmani, 2004). This reserve has distinct habitat division into zones like Tarai (transitional zone between forest belt and cultivated plains characterized by the presence of reeds and grasses), Bhabar (narrow forest belt characterized with complete absence of water sources) and hilly landscape mounts with an altitude of 1800 m and is crisscrossed by numerous rivers and rivulets. IBA site code of this region is IN-WB-01 with A1 and A2 criteria. Fraction of this IBA also falls within the Eastern Himalayas Endemic Bird Area (EBA 130) which consists of 21 restricted range species (Stattersfield *et al.*, 1998). According to Champion and Seth (1968) BTR has eight Sub–types.

The main floral and faunal composition of this forest are trees like Sal (*Shorea robusta*), Gamar (*Gmelian arborea*), Simul (*Bombax* sp.) and Chikrasi (*Chukrasia tabularis*) and animals like Asian Elephant (*Elephas maximus*), Tiger (*Panthera tigris*), Gaur (*Bos gaurus)*, Wild boar (*Sus scrofa*) and Sambar (*Cervus unicolor*). This IBA supports handsome avifaunal diversity. Wildlife Institute of India, Deharadun reported 523 bird species from this site. Inglis *et al*. (1918-1920) summarized the vertebrates list from Jalpaiguri District. Stevens (1923-1925) recorded a number of new species from Raidak River while Inglis (1952-1969) has given details of some avian species from Buxa area. Law (1953) and Sanyal (1995) each have recorded one new bird species from Buxa area. Allen *et al*. (1996) have recorded 227 birds from BTR while Prakash *et al*. (2001) have dealt with the role of avifauna as indicator species from BTR. Sivakumar and Prakash (2004) have recorded waterbirds within BTR while Sivakumar *et al*. (2006) have reported 22 new bird species from BTR. Roy *et al.* (2012) have reported 68 bird species from this forest area.

Rasikbeel Wetland Complex (RBWC) is the largest wetland complex in Coochbehar district of West Bengal covering around 18.40 Km^2 of area of which wetland occupies almost 1.78 Km^2 areas. According to The Ministry of Environment and Forests (MoEF), Government of India Rasikbeel is among the 94 identified wetlands of national importance, many of which are protected areas (NWCP, 2009). The vast wetland complex comprises variable sized water bodies namely, Rasikbeel, Nildoba Beel, Raichangmari Beel, Bochamari Beel and some others. The nature of the beels is of oxbow lake and formed by meandering of Raidak, Sakobhanga and Ghoramara River. The floral composition of Rasikbeel includes Sal (*Shorea robusta*), Teak (*Tectona grandis*), Gammar (*Gmelina arborea*), Khair (*Bauhinia purpurea*), Arjun (*Terminalia arjuna*), Simul (*Bombax* sp.) etc. along with a number of wetland plants. The faunal diversity recorded from this area comprises 13 species of mammals, 165 birds, 7 reptiles, 5 amphibians, 49 fishes, 3 molluscs and more than 15 species of butterflies. Rasikbeel also hosts a rescue center for Leopard (*Panthera pardus*), Python (*Python* sp.), Gharial (*Gavialis gangeticus*), Spotted Deer (*Axis axis*), tortoise, birds and small rodents recognized by central zoo authority.

Birds were counted following the point count method (Sutherland, 2006). Distances were recorded in terms of concentric zones around the point (eg. 30 m, 50 m, 100 m) up to the visible limit. Bird density was calculated following formula: $\check{D} = (n_1 + n_2 / \pi r^2 m) \log_e (n_1 + n_2/n_2)$ [where, r = radius of concentric zone from the point of observation (30 m and 50 m); n_1 = number of birds counted within r; n_2 = number of birds counted beyond r; m = number of replicate counts (6 in this case)]. Strategic point counts were conducted during the first two hours after sunrise (0600–0800 hr), during noon (1100-1300 hr) and in the evening (1600–1800 hr) between the 19th November and 22nd November 2013 from the two study location. Six replicate point readings (at least 200 m apart for continuous 10 minutes) were recorded during the two hours of survey in the morning, during noon and in the evening and were summed up for the cumulative value. Sampling was done for two continuous days before moving to the next study location. The birds were identified using Olympus 8x40 DPS I

binoculars and field guides of Grewal *et al.* (2002), Kazmierczak and Perlo (2000), Grimmett *et al*. (2011) and Ali (2012).

Results and discussion

During the short span of the present study 60 species of bird belonging to 31 families were recorded. Of these, 45 bird species were recorded from BTR and 37 were recorded form Rasikbeel Wetland Complex. Both the study sites had 23 bird species in common. 8 winter migrants were found from the RBWC during the study period, of which Lesser Adjutant (*Leptoptilos javanicus*) is considered vulnerable under IUCN threatened category version 3.1 (BirdLife International, 2013). A summer migrant Dark–sided Flycatcher (*Muscicapa sibirica*) was seen in BTR though its abundance was low. A checklist of the observed bird species is given below (Tab. 1).

Birds are always related to folklore, religion and culture of India. Study of bird diversity gives an estimate of the overall biodiversity of a region, as it occupies almost any habitat (Furness and Greenwood, 1993). Even they respond quickly to any kind of environmental change in and around their habitat and serve as good bioindicators (Padoa-Schioppa *et al.* 2006).

In recent times conservation of biodiversity has become the most talked about subject (Ehrlich and Wilson, 1991) and with increasing rates of anthropogenic effects on biodiversity at global as well as regional scale framing of conservation strategies is the biggest challenge. Since holistic inventory of diversity needs impossible levels of time and effort (Lawton *et al*., 1998) scientists around the globe most recently have emphasized on performing rapid inventories (Pearson, 1994; Chakravarthy and Sridhar, 1995; Roy *et al*., 2011). Short span biodiversity surveys are gaining importance nowadays and rapid checklist are prepared (Chakravarthy and Sridhar, 1995; Roy *et al*., 2011).

The present study recorded 60 species of birds from the two regions surveyed on a short span. A previous record from these two regions depicted 68 species from BTR and 75 from RBWC itself (Roy *et al*., 2012). Allen *et al.* (1996) have recorded about 227 species of bird from the entire range of BTR while Sivakumar *et al*. (2006) have recorded 284 bird species during their study period. Considering the short study span in the present investigation it was obvious that less bird diversity was observed, however, mention may be made that due to habitat fragmentation and degradation avian diversity along with other biodiversity is alarmingly decreasing from this pristine forest area of West Bengal. Rasikbeel Wetland Complex, considered as an abode of winter wetland birds are also suffering from anthropogenic interventions, resulting in gradual decrease of avifaunal diversity which needs serious attention.

Presently almost all preserved areas are confronting major anthropogenic disturbances like urbanization, tourist pressure, livelihood dependence (mainly in the form of cattle grazing and fuel wood collection) and pollution (Islam and Rahmani, 2004; Mallick, 2010; Karmakar, 2011). Since British Raj a broad region of the forests has been converted to monoculture land of timber producing trees. Moreover, forests have been cleared off for making space for tea gardens and other types of cultivation purposes. To add salt to the wound poaching of wild animals and timber smuggling are major issues for North Bengal forests like most other parts of India. Natural calamities like forest fire

Table 1. Checklist of birds found in the present study along with their migration status and IUCN threatened category.

SN	Common name	Scientific name	BTR	RBWC	Migration status	IUCN category
Order: Passeriformes						
Family: Chloropseidae						
1	Golden–fronted Leafbird	*Chloropsis aurifrons*	B	–	R	LC
Family: Muscicapidae						
2	Grey–headed Canary–flycatcher	*Culicicapa ceylonensis*	E	–	W	LC
3	Oriental Magpie–robin	*Copsychus saularis*	B	B	R	LC
4	White–capped Water–redstart	*Phoenicurus leucocephalus*	E	–	R	LC
5	Dark–sided Flycatcher	*Muscicapa sibirica*	E	–	S	LC
6	Taiga Flycatcher	*Ficedula albicilla*	A	A	W	LC
Family: Campephagidae						
7	Long–tailed Minivet	*Pericrocotus ethologus*	B	–	W	LC
8	Large Cuckooshrike	*Coracina macei*	C	–	R	LC
Family: Sturnidae						
9	Common Myna	*Acridotheres tristis*	A	A	R	LC
10	Asian Pied Starling	*Gracupica contra*	A	A	R	LC
11	Jungle Myna	*Acridotheres fuscus*	B	B	R	LC
12	Hill Myna	*Gracula religiosa*	A	–	R	LC
13	Chestnut–tailed Starling	*Sturnia malabarica*	A	A	R	LC
Family: Dicruridae						
14	Black Drongo	*Dicrurus macrocercus*	A	A	R	LC
15	Hair–crested Drongo	*Dicrurus hottentottus*	–	D	R	LC
16	Lesser Racket–tailed Drongo	*Dicrurus remifer*	C	C	R	LC
17	Greater Racket–tailed Drongo	*Dicrurus paradiseus*	D	–	R	LC
Family: Pycnonotidae						
18	Red–vented Bulbul	*Pycnonotus cafer*	B	B	R	LC
19	Red–whiskered Bulbul	*Pycnonotus jocosus*	B	B	R	LC
20	Black–crested Bulbul	*Pycnonotus flaviventris*	C	–	R	LC
Family: Oriolidae						
21	Black–hooded Oriole	*Oriolus xanthornus*	B	–	R	LC
Family: Corvidae						
22	House Crow	*Corvus splendens*	A	A	R	LC
23	Eastern Jungle Crow	*Corvus levaillantii*	–	C	R	LC
24	Rufous Treepie	*Dendrocitta vagabunda*	B	C	R	LC
Family: Artamidae						
25	Ashy Woodswallow	*Artamus fuscus*	D	–	R	LC
Family: Timaliidae						
26	Jungle Babbler	*Turdoides striata*	–	B	R	LC
Family: Laniidae						
27	Brown Shrike	*Lanius cristatus*	C	–	W	LC
28	Long–tailed Shrike	*Lanius schach*	D	–	R	LC
Family: Motacillidae						
29	White Wagtail	*Motacilla alba*	–	C	W	LC
30	Grey Wagtail	*Motacilla cinerea*	D	–	W	LC
Family: Irenidae						
31	Asian Fairy–bluebird	*Irena puella*	D	–	R	LC
Order: Coraciiformes						
Family: Alcedinidae						
32	White–throated Kingfisher	*Halcyon smyrnensis*	A	A	R	LC
33	Stork–billed Kingfisher	*Pelargopsis capensis*	–	B	R	LC
34	Common Kingfisher	*Alcedo atthis*	–	B	R	LC
Family: Coraciidae						
35	Indian Roller	*Coracias benghalensis*	B	B	R	LC
Family: Meropidae						
36	Little Green Bee–eater	*Merops orientalis*	–	A	R	LC
Order: Columbiformes						

Family: Columbidae						
37	Rock Pigeon	*Columba livia*	A	A	R	LC
38	Eurasian Collared Dove	*Streptopelia decaocto*	B	–	R	LC
39	Spotted Dove	*Stigmatopelia chinensis*	A	A	R	LC
Order: Bucerotiformes						
Family: Bucerotidae						
40	Oriental Pied Hornbill	*Anthracoceros albirostris*	C	–	R	LC
Order: Falconiformes						
Family: Accipitridae						
41	Black Kite	*Milvus migrans*	A	–	R	LC
42	Griffon Vulture	*Gyps fulvus*	D	–	W	LC
43	Black Eagle	*Ictinaetus malayensis*	–	C	R	LC
Order: Ciconiiformes						
Family: Ardeidae						
44	Indian Pond–heron	*Ardeola grayii*	A	A	R	LC
45	Black–crowned Night–heron	*Nycticorax nycticorax*	C	–	R	LC
46	Cattle Egret	*Bubulcus ibis*	A	A	R	LC
47	Little Egret	*Egretta garzetta*	C	B	R	LC
Family: Ciconiidae						
48	Lesser Adjutant	*Leptoptilos javanicus*	–	C	R	VU
Order: Galliformes						
Family: Phasianidae						
49	Red Junglefowl	*Gallus gallus*	D	–	R	LC
50	Indian Peafowl	*Pavo cristatus*	C	–	R	LC
Order: Gruiformes						
Family: Rallidae						
51	Common Moorhen	*Gallinula chloropus*	–	A	R	LC
52	White–breasted Waterhen	*Amaurornis phoenicurus*	–	B	R	LC
Order: Anseriformes						
Family: Anatidae						
53	Cotton Pygmy–goose	*Nettapus coromandelianus*	–	A	R	LC
Order: Charadriiformes						
Family: Jacanidae						
54	Bronze–winged Jacana	*Metopidius indicus*	–	A	R	LC
Family: Scolopacidae						
55	Green Sandpiper	*Tringa ochropus*	–	D	W	LC
Order: Piciformes						
Family: Picidae						
56	Black–rumped Flameback	*Dinopium benghalense*	B	B	R	LC
57	Fulvous–breasted Woodpecker	*Dendrocopos macei*	–	D	R	LC
Family: Ramphastidae						
58	Blue–throated Barbet	*Psilopogon asiaticus*	B	B	R	LC
Order: Cuculiformes						
Family: Cuculidae						
59	Green–billed Malkoha	*Phaenicophaeus tristis*	E	–	R	LC
Order: Apodiformes						
Family: Apodidae						
60	House Swift	*Apus nipalensis*	B	C	R	LC

(BTR = Buxa Tiger Reserve, RBWC = Rasikbeel Wetland Complex, A–E = Relative abundance of the bird species, where A used for species more likely observed and E used for species rarely observed I the present study, R = Resident, W = Winter Migrant, S = Summer Migrant, LC = Least Concerned, VU = Vulnerable)

also have disastrous effects on wildlife from the present study locations (Islam and Rahmani, 2004).

To sum up the present study reveals a healthy state for bird diversity, but alarming conditions are also prevailing at the same time. A rapid decrease in diversity in this region can be well accredited to the deteriorating habitat conditions and disturbance pressure. Prakash *et al*. (2001) have already recognized monoculture plantations, tea gardens, tree cutting, firewood collection, grass cutting, fires and cattle grazing as the major threats to birds in this parts of the world. Ever growing railways through the forest patches can also be considered as an added threat to the overall diversity of this region. Thus prevention and protection along with proper conservation strategies are the best solutions to the present problem.

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