

## Conservation threats to the water birds in Deepor Beel, Assam

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**ABSTRACT:**

Water birds are becoming increasingly exposed to human activity as human population expands. We initiated this study to document the current conservation threats of water birds in Deepor Beel, the lone Ramsar site in Assam. The study revealed the presence of 39 species of water birds from 16 different families. Out of these species nine species were winter visitors to the wetland and the rest 29 species were breeding residents. Currently, Deepor Beel is facing dangers from various angles. Most of these are anthropogenic in nature. The prominent conservation threats were soil digging, encroachment, agricultural practices, hunting and trapping of water birds, excessive fishing, fragmentation and degradation of wetland habitat due to the establishment of railway line were most severe in nature. All these anthropogenic factors were bringing danger to the proper survival of water birds. Thus, the present study will greatly helped in perusing conservation strategies for proper management of the water birds as well as their habitat.

**Keywords:**

Water bird, Ramsar, Anthropogenic, Anatidae, Encroachment, Soil digging, Deepor Beel.

**Article Citation:**

Jyotismita Das and Saikia PK.

Conservation threats to the water birds in Deepor Beel, Assam  
Journal of research in Biology (2011) 6: 435-439

**Dates:**

**Received:** 24 Sep 2011 / **Accepted:** 28 Sep 2011 / **Published:** 12 Oct 2011

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## INTRODUCTION

Human conflicts with animals go back at least as far as humans have been a species (Cansdale 1952, Fisher and Lockley, 1954). Birds are widely recognized as good bioindicators of the quality of ecosystems (Gill, 1994) and health of the environment. Kumar *et al.* (2006) gives a clear status of wetland birds in his work. Wetland birds play a significant cultural and social role in local communities as well as being an important component of wetland ecosystem (Kumar *et al.* 2006). Due to continuous degradation of wetland ecosystems, it becomes a great matter of concern regarding the status of wetland dependent birds. Increasing attention of conservation of this water bodies brings an extensive research to this field. Deepor Beel which is the lone Ramsar site of Assam is facing danger from various angles in this regard. In this study, attempt had been made to identify the current conservation threats to the water birds in and around the Beel periphery. Thus the study provides immense scope in conservation of the water birds and its habitat. The importance of wintering areas in the dynamics of water bird populations is suggested by the potentially crucial role these areas play in courtship or pairing and deposition of fat stores used later as energy for reproduction (Heitmeyer and Fredrickson, 1981; James, 1989; Baldassarrea and Bolen, 1994). Winter habitat quality has been linked to annual survival recruitment, and reproductive success of waterfowl (Baldassarre and Bolen, 1994). The area has not received much attention especially from the biological point of view Bera *et al.*2008). The present correspondence is an attempt regarding conservation and preservation of the lone Ramsar site of Assam by identifying different threat factors prevailing in and within the Beel periphery.

## MATERIAL AND METHODS

### Study area

Deepor Beel is a large natural wetland having great biological and environmental importance (Deka and Goswami, 1992). This large water body is a great food source and breeding ground for a variety of migratory birds, amphibians, reptiles, insects, micro and macrophytes, terrestrial weeds and important taxa of ecological and economic importance (Bera *et al.* 2008). The Deepor Beel Ramsar site has a total area of 40 Km<sup>2</sup> of which 4.14 Km<sup>2</sup> had declared as a Bird Sanctuary (Das *et al.* 2011). In November 2002, it was listed as a Ramsar site owing to its rich wetland

biodiversity and sociocultural importance. Again, considering the varieties of bird species found in the Beel, Birdlife International has also declared Deepor Beel as an Important Bird Area (IBA). At maximum flooding the Beel becomes above four meters in deep and during the dry season the depth drops to about 1-1.5 meter. Deepor Beel (Coordination: 26°03'26"-26°09'26"N and 90°36'39"-90°41'25"E) is situated on the Southern bank of the river Brahmaputra and Village Maj Jalukbari, Pachim Jalukbari, Dharapur and National Highway No.37 lie on the North; Dakhin Jalukbari, Tetelia and Pachim Baragoan to the East; Gorbhanga Reserve Forest, Chakardew Hill and Chilla Hill to the South West and the Village Azara and Kahikuchi to the west. Deepor Beel has a mesothermal climate. The temperature ranges between 10.6°C to 32°C. Deepor Beel appears to be relatively high with respect to the biodiversity of free floating, emergent and submerged aquatic macrophyte (Saikia and Bhattacharjee, 1987).

Avian data as well as data on threat factors were collected from March 2007 to March 2010. For watching, counting and identifying birds Binocular (10X50), telescope (25-40X), camera (Cannon 110 PS), note book, guide book, pen, pencil etc were used. Birds were identified by seeing their characteristics feature in accordance with the identification keys involved in Ali and Ripley (1983), Grimmett *et al.* (1999). Data on threat factors were collected by direct observation, personal interviews.

## RESULTS

The present survey reveals the presence of 38 species of water birds from 16 different families (**Table 1**). Of all these nine species were species are winter visitors to the wetland and the rest 29 species were breeding residents. The study also documented the presence of endangered, vulnerable and Schedule I species under the Wildlife Protection Act, 1972. These are greater adjutant stork, lesser adjutant stork and large whistling teal etc.

The study documented different threat factors which were continuously prevailing within the Beel periphery. Most of these factors were anthropogenic in nature. Soil digging, encroachment, agricultural practices around the Beel, hunting and trapping of water birds, excessive fishing, habitat fragmentation for the construction of railway line, brick making factories within the Beel ecosystem was the prominent threat factors



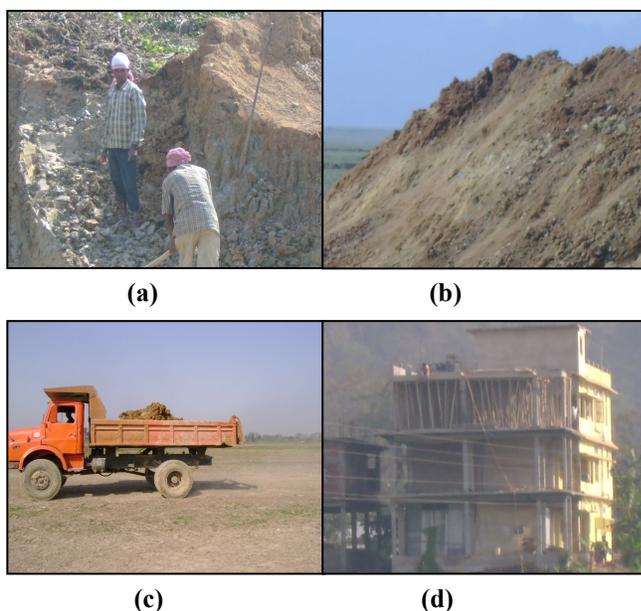
which are continuously prevailing in and within the Beel periphery. Encroachment in various forms like house construction and other development activities were degrading the Beel ecosystem in utmost level. For construction and developmental works people were engaged to clear the aquatic vegetation which is very important for the survival of water birds inhabiting there. Apart from this, soil digging processes were carried out day and night within the Beel for fulfilling the need of people. The intensity of soil digging was documented high within the

Beel. Different people were engaged in this work apart from using heavy vehicles for the transportation of soil to different localities. Thus, it was seen that the Beel bed was dugged out in extreme level and water birds were forced to leave the Beel ecosystem. In winter season many water birds were illegally netted by using various nets and traps. Again Deepor Beel acts as a staging ground for winter migratory birds. Many migratory and local breeding ducks were netted down illegally which brings major threat to their survival.

TABLE 1. List of the name of the water birds of Deepor Beel along with their scientific names

Common Name	Scientific Name	Family	Comments
Large whistling teal	<i>Dendrocygna bicolor</i>	Anatidae	Br(*)
Lesser whistling teal	<i>Dendrocygna javanica</i>	Anatidae	Br
Gaganey	<i>Anas querquedula</i>	Anatidae	Wv(**)
Northern Pintail	<i>Anas acuta</i>	Anatidae	Wv
Red crested poachard	<i>Rhodonessa rufina</i>	Anatidae	Wv
Ruddy shelduck	<i>Tadorna ferruginea</i>	Anatidae	Wv
Mallard	<i>Anas platyrhynchos</i>	Anatidae	Wv
Little egret	<i>Egretta garzetta</i>	Ardeidae	Br
Great egret	<i>Casmerodius albus</i>	Ardeidae	Br
Cattle egret	<i>Bulbulcus ibis</i>	Ardeidae	Br
Intermediate egret	<i>Mesophoyx intermedia</i>	Ardeidae	Br
Purple heron	<i>Ardea purpurea</i>	Ardeidae	Br
Indian pond heron	<i>Ardeola grayii</i>	Ardeidae	Br
Yellow bittern	<i>Ixobrychus sinensis</i>	Ardeidae	Br
White throated kingfisher	<i>Halcyon smyrensis</i>	Alcedinidae	Br
Pied kingfisher	<i>Ceryle rudis</i>	Alcedinidae	Br
Ruddy kingfisher	<i>Halcyon coromanda</i>	Alcedinidae	Wv
Asian open billed stork	<i>Anastomus oscitans</i>	Ciconiidae	Br
Lesser adjutant stork	<i>Leptoptilos javanicus</i>	Ciconiidae	Br
Greater adjutant stork	<i>Leptoptilos dubius</i>	Ciconiidae	Br
Brahminy kite	<i>Haliastur Indus</i>	Accipitridae	Br
Black Kite	<i>Milvus migrans</i>	Accipitridae	Br
Little cormorant	<i>Phalacrocorax niger</i>	Phalacrocoracidae	Br
Great cormorant	<i>Phalacrocorax carbo</i>	Phalacrocoracidae	Br
Black Dongo	<i>Dicrurus macrocercus</i>	Corvidae	Br
Bronze Winged Jacana	<i>Metopidius indicus</i>	Jacanidae	Br
Pheasant tailed jacana	<i>Hydrophasianus chirurgus</i>	Jacanidae	Br
White breasted waterhen	<i>Amaurornis phoenicurus</i>	Rallidae	Br
Common coot	<i>Fulica atra</i>	Rallidae	Br
Common moorhen	<i>Gallinula chloropus</i>	Rallidae	Br
White wagtail	<i>Motacilla alba</i>	Passeridae	Wv
Yellow wagtail	<i>Motacilla flava</i>	Passeridae	Wv
Barn Swallow	<i>Hirundo rustica</i>	Hirundinidae	Br
Common hoopoe	<i>Upupa epops</i>	Upopidae	Br
Red wattled lapwing	<i>Vanellus indicus</i>	Charadriidae	Br
Green bee eater	<i>Merops orientalis</i>	Meropidae	Br
Asian palm swift	<i>Cyprsiurus balasiensis</i>	Apodidae	Br
Black headed gull	<i>Larus ridibundus</i>	Laridae	Wv

\* Br means Breeding migrant; \*\* Wv means Winter visitor



**Plate 1 (a.b.c.d). Showing different conservation threats prevailing within Deepor Beel**  
**(a) & (b) Soil digging within the Beel,**  
**(c) Transportation of soil using vehicle**  
**(d) Construction processes**

Pesticides and fertilizers were used in large scale in agricultural practices around the Beel which enter the Beel as runoff and thus accelerated eutrophication. Excessive fishing practices were done within Beel by using different jals, traps etc. for the purpose of consumption and selling. Sometimes it was seen that peoples were using water pumps for fishing purposes. Thus, fishes including smaller and larger ones were caught up in heavy rates and this acted as a potential threat to the survival of water birds as some water birds exclusively depended on fishes for their survival. Again the construction of railway line along the Southern and Eastern boundary of Deepor Beel divided the Beel into two parts, also acted as a factor of wetland encroachment.

## DISCUSSION

Saikia (2005) had reported 232 species of aquatic avian fauna belonging to 42 different families in his study in Deepor Beel. Among these species 137 species were residential and 97 species were migratory. But the present study explored only 38 species of birds from 18 different families. Of all these species 9 species are winter visitors to the wetland and the rest 29 species are breeding residents. Thus it can be seen that the species numbers are quite declining. These threats are

generally forcing the biodiversity of the Beel to become extinct. Bildstein *et al.* (1991) had reported that as a result of human impacts, many coastal wetlands in the Western Hemisphere have already been lost. Saikia and Kakati (2010) had reported the same case of anthropogenic dangers within the Beel periphery. Barman (1997) had also reported that the highest value of threats in Deepor Beel. Habitat loss is the most important threat factors for bird species. This is also correlated with the work of Collar *et al.* (1994) where they found that habitat loss not only affects the anatids but also other bird species. Kafle *et al.* (2008) had reported that anthropogenic factors are the root causes for lake degradation and habitat destruction of waterbirds. For these threat factors the birds might be shifting their place to other for proper survival or they become forced to restrict themselves in their distribution. This work correlates with the work of Barman (1997) where he found that the wintering bird populations are more affected in the valley due to the anthropogenic pressures on their wintering sites and thus are forced either to shift their wintering location or to restrict their distribution to protected areas only subject to changes of their finding suitable wintering sites invade the protected area. Berthold (1993) had also reported in his work that four factors have impact on migratory birds population at their stop-over sites and winter quarters: restriction of habitats, hunting and trapping, disturbance, and effects of biocides. In Yunnan province habitat destruction and over-hunting were the major threats to the wetlands species (Wen *et al.* 1995). In Similarity, the major threats to the water birds at Deepor Beel Ramsar site were habitat loss, disturbance, and bird trapping.

Deepor Beel, the lone Ramsar site of Assam is facing dangers from various angles. In spite of heavy destruction processes, the water birds are still visiting the wetland. So, proper management practices should be taken for preventing the heavy destruction processes so that the biodiversity of this Ramsar site can be protected.

## ACKNOWLEDGMENTS

The authors offer their thanks to the Head, Department of Zoology, Gauhati University, Guwahati: 781014 for providing help to carry out the research work. The authors are again thankful to the University grant commission (UGC). We are highly grateful to the forest personals as well as different boatmen, without their help, this work were not possible to be completed.




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**REFERENCE**

- Ali S and Ripley SD. 1983.** *Handbook of the Birds of India and Pakistan.* Oxford Univ. Press 48-49.
- Bildstein G, Thomas B Dugan J Patrick, Gordon H David, Erwin Michael, Nol Erica, Payne X Laura, Stanley ES. 1991.** Approaches to the Conservation of Coastal Wetlands in the Western Hemisphere. *The Wilson Bull.*, 103(2):218-254.
- Berthold 1993.** Bird Migration: A General Survey. Oxford University Press, Oxford.
- Baldassarre GA and Bolen EG. 1994.** Waterfowl ecology and Management. Wiley, New York.
- Barman R. 1997.** An ecological analysis of the wetlands in relation to wetlands in relation to waterbird diversity of Brahmaputra valley, Assam. PhD Thesis. Department of Zoology, Gauhati University. 1-185.
- Bera SK, Dixit S, Basumatary SK and Gogoi R. 2008.** Evidence of biological degradation in sediments of Deepor Beel Ramsar Site, Assam as inferred by degraded palynomorphs and fungal remains. *Current science* 178(2):178-180.
- Cansdale GS. 1952.** Animals and man. Hutchinson, London.
- Collar NJ, Crosby MJ, Stattersfield AJ. 1994.** Birds to Watch 2: The world list of Threatened birds. Birdlife International, Cambridge, U.K.
- Deka SK and Goswami DC.1992.** Hydrology, Sediment Characteristics and Depositional Environment of Wetlands: A case study of Deepor Beel, Assam. *J. of Assam Scien. Socie.*, 34 (2):62-84.
- Das Jyotismita and Saikia PK. 2011.** Species diversity of water birds in Deepor Beel, Assam *Journal of research in Biology* 5:363-369.
- Fisher J and Lockley RM. 1954.** Seabirds - an introduction to the natural history of the sea-birds of the North Atlantic. Collins, London.
- Gill FB. 1994.** *Ornithology.* 2nd edition, New York.
- Grimmett R, Inskipp C, Inskipp T. 1999.** Pocket Guide to the Birds of the Indian Subcontinent. Oxford University Press, Oxford, New York. 1-384.
- Heitmeyer ME and Fredrickson LH. 1981.** Do wetlands conditions in the Mississippi Delta hardwoods influence Mallard recruitment. *Trans.N. Am. Wild. Nat. Res. Conf.* 46:44-57.
- James RA. Jr. 1989.** Mate feeding in wintering western Grebes. *J. Field ornith.*, 60:358-360.
- Kumar A, Tak PC, Sati JP. 2006.** Residential, population and conservation status of Indian wetland birds. *Waterbirds around the world* (Eds) Boere GC and Galbraith C.A and Stroud DA. The Stationery Office, Edinburgh, UK. 308.
- Kafle G, M Cotton, Chaudhary JR, Pariyar H, Adhikari H, Bohora SB, Chaudhary U, Ram A, Regmi B. 2008.** Status of and threats to waterbirds of Rupa Lake, Pokhara, Nepal. *Journal of Wetlands Ecology* 1(1/2):9-12.
- Saikia PK and Bhattacharjee PC. 1987.** A study of the Avifauna of Deepor Beel a Potential Bird Sanctuary in Assam. *Wetland and Waterfowl Conservation in Asia* (Eds) Parisah D and Prentice RC. Asian Wetland Bureau/ International Waterfowl & Wetlands Research Bureau, Kuala Lumpur.52:188-195.
- Saikia PK. 2005.** Qualitative and Quantitative Study of Lower and Higher Organisms and Their Functional role in the Deepor Beel Ecosystem. Funded by North Eastern Space Applications Centre, Department of Space, Government of India, Umium, Meghalaya, Shillong 1-97.
- Saikia PK and Kakati M. 2010.** Biodiversity in Deepor Beel Ramsar Site of Assam India: Faunal Diversity. *Lap Lambert Academic Publishing* 132.
- Wen X, Yang L and Yang X. 1995.** Status of waterbirds in wetlands of Yunnan plateau, China (Eds) Y. Chen Study of Wetlands in China. Jilin Science Technology Press, Chang Chun., 248-255.