

Rec. zool. Surv. India : 108(Part-3) : 109-118, 2008

WATERBIRDS OF NAMDAPHA TIGER RESERVE, ARUNACHAL PRADESH WITH SPECIAL REFERENCE TO WHITE-BELLIED HERON *ARDEA INSIGNIS*

GOPINATHAN MAHESWARAN*

Zoological Survey of India, M-Block, New Alipore, Kolkata-700 053, India

INTRODUCTION

Namdapha Tiger Reserve has a rich aquatic bird fauna, mostly because of many freshwater lakes/ponds located at higher altitudes as well as within the evergreen forest patches and the complex river system it has. While surveys were carried out by the research team of the Zoological Survey of India (Ghosh, 1987) from March 1981 to March 1987, the following prominent waterbirds were recorded from Namdapha : Goliath Heron *Ardea goliath*, Large Egret *Casmerodius albus*, Chinese Pond Heron *Ardeola bacchus*, Little Egret *Egretta garzetta*, Common Merganser *Mergus merganser*, Eastern Marsh Harrier *Circus spilonotus*, and at least seven species of kingfishers, beside the migrant Common Teal *Anas crecca*. However, the team did not record any White-bellied Heron. Interestingly, I did not record Goliath Heron during my surveys in two years, which the team did so. The White-bellied Heron *Ardea insignis* (Family : *Ardeidae*) is a little known species occurring in swamps, marshes and forests from Nepal through Sikkim, Bhutan and northeast Assam in India to Bangladesh, Arakan and north Burma (Walters 1976). According to Ali and Ripley (1987), it is a highly endangered species and restricted to undisturbed reed beds and marshes in eastern Nepal and the Sikkim *terai*, Bihar (north of the Ganges river), Bhutan *duars* to northern Assam, Bangladesh, Arakan and north Burma (= Myanmar). In Assam, it has been reported from Kaziranga National Park (Barua and Sharma 1999), Jamjing and Bordoloni of Dhemaji district (Choudhury 1990, 1992, 1994), Dibru-Saikhowa Wildlife Sanctuary and Biosphere Reserve (Choudhury 1994), Pobitara Wildlife Sanctuary (Choudhury 1996a, Baruah *et al.* 2004) and also in Namdapha Tiger Reserve, Arunachal Pradesh (Choudhury 1996b).

*E-mail : gmaheswaran@yahoo.com

In January 1997, 16 White-bellied Herons were counted from Pobitara Wildlife Sanctuary, Assam—the biggest count for this species in Assam to date (Baruah *et al.* 2004). However, it has not been recorded from Nepal since 19th century, and is considered to be 'extirpated' (Baral and Inskipp, 2004). The White-bellied Heron is restricted to the southern foothills of the Himalayas, southwards at the eastern end through Bhutan and Assam, to northeast and northwest Burma. The only localities where the White-bellied Heron had been described as common were in northern Burma, for example along the Mali Kha river in Putao (Smythies 1953) and in the Irrawady river (Stanford & Ticehurst 1939). Since many years have passed by, no detailed accounts about the number of birds present in these areas are available, until King *et al.* (2001), had recorded a breeding-plumaged individual near the village of Ziyardum (1,000 m elevation) on 30 January 1998 in northern Myanmar (King *et al.* 2001). The team had also recorded few more individuals around Ziyardum in 1998 and 1999 and eventually these were the first sightings of this species for many years and also a handful of recent sightings in Myanmar. However, records in Myanmar as far southeast as Toungoo and Pegu suggest a migration or post-breeding dispersal (Hancock and Kushlan, 1984).

There have been a number of recent records from an area comprising north-eastern Bangladesh, Assam (India), and notably Bhutan (Inskipp and Inskipp 1993a,b). From Bhutan's forested rivers have come repeated sightings of solitary individuals. In Bangladesh, one solitary individual was seen on a reservoir (Harvey 1990) and a pair flushed from a forested lakeshore in the north-east (Thompson *et al.* 1993), and a solitary bird was seen in Namdapha Tiger Reserve in Arunachal Pradesh (Anon 1994). An unusual record of a solitary individual at Chilika Lake (Orissa), southwest of the Sundarbans (Jepson 1987) may be linked to a population reported in the Sundarbans (Scott 1989). The species is undoubtedly very rare and is considered to be globally threatened and categorized as Endangered A2c; C1 Vulnerable D1 (IUCN, 1996). However, since there is no justification for a population estimate of over 250 mature individuals, the scarcity and the combined known degree of habitat destruction and degradation over this species' range justifies classification as Critically Endangered (Kushlan and Hafner, 2000).

STUDY AREA AND METHODS

Surveys were carried in Namdapha Tiger Reserve and National Park (Figure 1), Arunachal Pradesh (27° 23' 30" N to 27° 39' 40" N and 96° 15' 20" E to 96° 58' 33" E) in 2005 and 2006 to find out the waterbird diversity with special reference to White-bellied Heron *Ardea insignis*. In 2005, surveys were conducted from 4-29 September (25 days), whereas in 2006 surveys were carried out from 12 November to 08 December (27 days). Different areas were surveyed (Table 1) within Namdapha to study its waterbird diversity in both the years. Namdapha Tiger Reserve (1,985 km²) is situated in Changlang district of Arunachal Pradesh bordering Myanmar. It has a wider altitudinal variation which rises from 200m to 4500m. The main river of the area is

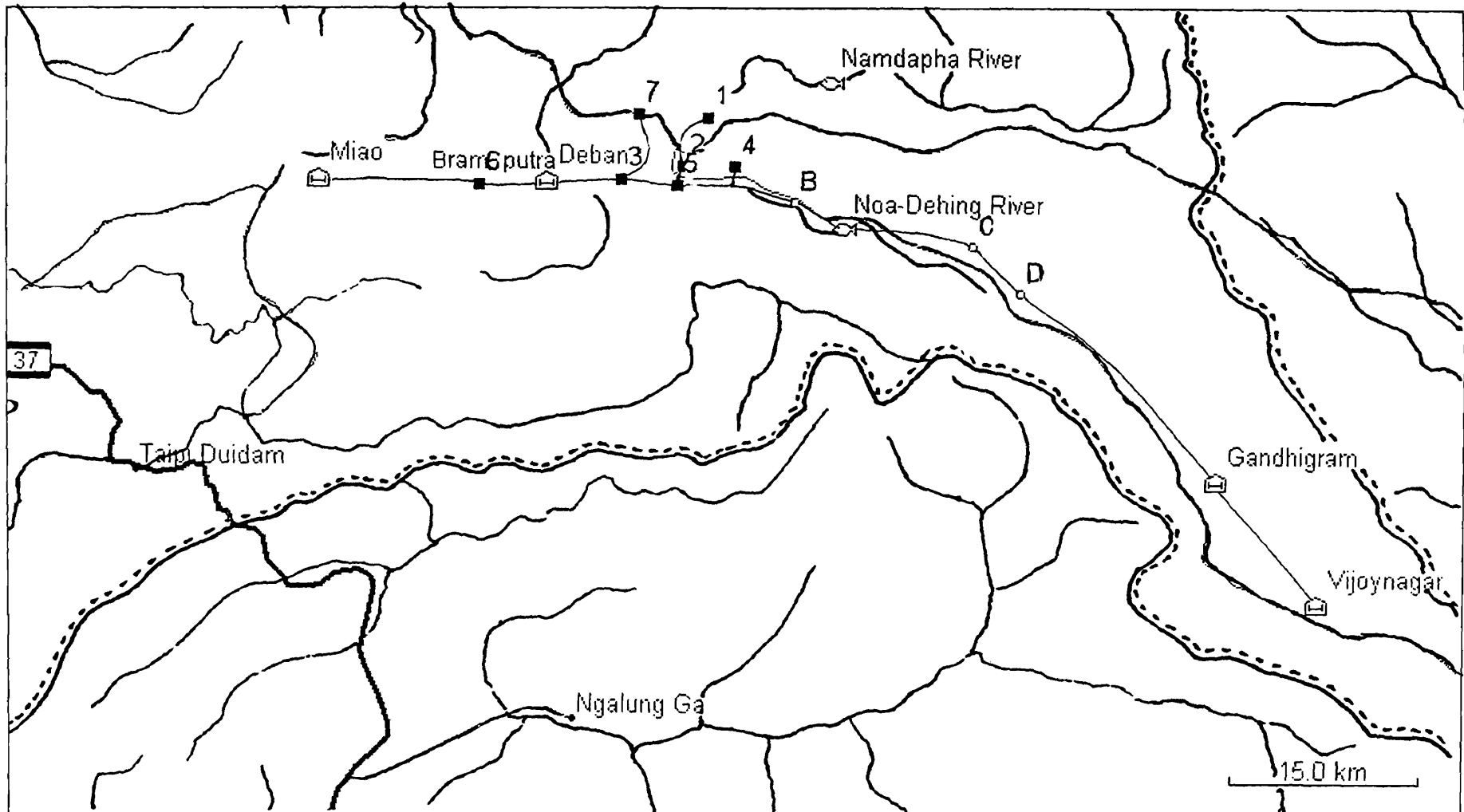


Fig. 1 : Showing the localities (black squares) where the White-bellied Herons were sighted inside the Namdapha Tiger Reserve and the small (white circles) and the big camps (symbol) being setup by the survey team.

1. Firmbase; 2. In between Firmbase and Embyong; 3. 30th Mile; 4. Burmanala; 5. Embyong; 6. Motijheel; 7. Ranijheel, B. 56 Mile camp, C. 63 Mile camp, D. 70 Mile camp.

Table 1 : Areas surveyed within Namdapha Tiger Reserve (in 2005 & 2006) and their coordinates.

Date	River	Place	Locality	Significant bird species recorded
05/09/2005	Noa-Dehing	Miao	27°31.58' N 96°31.13' E	Little Egret, Unidentified Duck
05/09/2005	Noa-Dehing	Embyong	27°29.32' N 96°29.42' E	–
05/09/2005	Noa-Dehing	7km from Miao	27°30.50' N 90°08.28' E	Little Egret, Common Sandpiper
07/09/2005	Noa-Dehing	Manabhum	27°30.03' N 96°14.29' E	–
09/09/2005	Noa-Dehing	Deban	27°30.06' N 96°23.42' E	Darter
09/09/2005	Debannala	Deban Junction	27°32.96' N 96°23.70' E	–
10/09/2005	Noa-Dehing	Deban to Miao	27°30.15' N 96°20.99' E	Darter, Great Stone Plover, White-breasted Kingfisher, Common Sandpiper
11/09/2005	Noa-Dehing	Deban to 18 th Mile	27°29.81' N 96°24.46' E	–
12/09/2005	Motijheel	Deban to Motijheel	27°29.05' N 96°19.81' E	–
15/09/2005	–	Deban to Haldibari	27°31.46' N 96°23.92' E	–
15/09/2005	–	Hornbill Camp	27°32.41' N 96°26.51' E	–
16/09/2005	–	Bulbulia Camp	27°32.05' N 96°27.54' E	–
16/09/2005	Namdapha	Firibase Camp	27°30.74' N 96°30.21' E	–
18/09/2005	Namdapha	Firibase	27°31.58' N 96°31.13' E	White-bellied Heron
19/09/2005	Namdapha	Embyong	27°29.32' N 96°29.42' E	White-bellied Heron
15/11/2006	Miao River	Miao	27°29.05' N 96°23.59' E	

Table 1 : (Cont'd.).

Date	River	Place	Locality	Significant bird species recorded
17/11/2006	Noa-Dehing	Deban	27°30.52' N 96°23.54' E	Black Stork, Brown Dipper
18/11/2006	Noa-Dehing	27-Mile	27°28.81' N 96°26.38' E	Common Merganser
19/11/2006	Noa-Dehing	Burmanala (40 Mile)	27°29.54' N 96°32.29' E	–
20/11/2006	Noa-Dehing	40 Mile	27°29 54' N 96°32.29' E	White-bellied Heron
21/11/2006	–	52-Mile	27°28.26' N 96°35.15' E	
22/11/2006	Noa-Dehing	56-Mile	27°27.35' N 96°39.36' E	–
23/11/2006	Noa-Dehing	62-Mile	27°25.94' N 96°43.45' E	–
23/11/2006	Noa-Dehing	72-Mile	27°24.39' N 96°46.04' E	–
24/11/2006	–	Gandhigram IB	27°16.50' N 96°54.88' E	Ibisbill, The Lapwing
25/11/2006	–	Vijoyagar IB	27°11.39' N 97°00.32' E	
30/11/2006	Namdapha- Noa-Dehing	Embyong	27°29.25' N 96°29.32' E	White-bellied Heron

Noa-Dehing or Diyun which originates from the mountains near the Chokan Pass on the Indo-Myanmar border and flows in east-west direction which finally joins Brahmaputra. The other major river within the Reserve is Namdapha, which originates from the Phongga Pass and runs north-south before joining Noa-Dehing at Embyong near Firmbase. Apart from these main rivers, there are numerous perennial rivers and rivulets and seasonal streams which drain out waters from both Dapha Bum and Patkai ranges to the river Noa-Dehing. The area is well known for excessive rainfall which starts in winter due to 'Western disturbances' and due to that June, July and August receive 75% of the annual rainfall which is roughly 1991 mm.

Surveys were undertaken to know the distribution of White-bellied Herons within Namdapha as there are reports of this species occurring here, and in northern Myanmar. Due to logistic reasons we did not carry out any survey for this species in Myanmar, instead covered the areas within

Namdapha bordering that country. Since most of the Park is very uneven and intersected by rivers and big streams, surveys were carried out by walking along the river Noa-Dehing. At an average around 10 km were covered everyday during the surveys. Sometimes, a total of 15-18 km were covered daily looking for waterbirds including White-bellied Herons along Noa-Dehing river from Miao to Embyong in 2005 and almost the same distance from Miao to Vijohnagar (Figure 1). Often country-made boats of local villagers were used to cross Noa-Dehing, especially where water levels were more. However, while going from Deban to Embyong via Firmbase, circuitous route was taken and passed through Haldibari, Hornbill Camp, Bulbulia and Ranijheel (*see* Figure 1) mainly to avoid the surging river as there was no boat available beyond Deban to cross Noa-Dehing. Field camp was set up for six nights at Firmbase close to a rivulet that was fed by Namdapha river. On certain days, other waterbodies such as Ranijheel and Motijheel were also visited (*see* Figure 1) situated inside the rainforest mainly to see other waterbirds, including White-winged Duck *Cairina scutulata*-as the Park is said to have a few remnant population of this little known species. In 2006, after surveying the nearby areas of Miao, I moved to Deban and then from there to Vijohnagar through Gandhigram along the river Noa-Dehing so as not to miss any significant sighting(s) of heron. Daily, I walked for 7-8 hours looking for herons on either side of the river. It took me six nights and seven days to reach Vijohnagar and the same number of days to return to Deban. Magellen-300 GPS was used to record the coordinates of various places and later on those points were plotted on the map.

RESULTS AND DISCUSSION

In two years (2005 & 2006), 52 days were spent within Namdapha Tiger Reserve covering more than 250 km on foot looking for waterbirds, especially the White-bellied Heron. More than 90% of the time was spent walking along the Noa-Dehing and the remaining time was spent in visiting other waterbodies such as Ranijheel and Motijheel-two important natural ponds situated within the thick forest patches. Waterbirds as well as other water-dependent species recorded inside the reserve are given in Table 2. White-bellied Herons were sighted twice in 2005 in the river Namdapha near Embyong-where the confluence of Noa-Dehing and Namdapha takes place, and thrice in 2006 in Namdapha and Noa-Dehing rivers (Table 3). Assuming that these five herons are part of the 250 mature individuals of the species exist today in the wild (Kushlan and Hafner, 2000), Namdapha Tiger Reserve is considered to support about 2% of the world's total population of this species.

Rivers of Namdapha are perennial and have different depths at different places with high water current in some of the places especially where boulders are more. Crystal clear fresh water supports varieties of fish fauna which in turn attracts various bird species especially Little Cormorant *Phalacrocorax niger*, Great Cormorant *Phalacrocorax carbo* (only in winter) and Darter *Anhinga melanogaster*. Many flocks of Little Cormorant each comprises of more than 50-120

Table 2 : List of waterbirds recorded in Namdapha Tiger Reserve, Arunachal Pradesh in 2005 & 2006.

	Common Name	Scientific Name	2005*	2006
1.	Great Cormorant	<i>Phalacrocorax carbo</i> (Linnaeus, 1758)	+	+
2.	Little Cormorant	<i>Phalacrocorax niger</i> (Vieillot, 1817)	+	+
3.	Darter	<i>Anhinga melanogaster</i> Pennant, 1769	+	+
4.	Little Egret	<i>Egretta garzetta</i> (Linnaeus, 1766)	+	+
5.	Black Bittern	<i>Dupetor flavicollis</i> (Latham, 1790)	+	+
6.	Black-crowned Night Heron	<i>Nycticorax nycticorax</i> (Linnaeus, 1758)	+	+
7.	White-bellied Heron	<i>Ardea insignis</i> Hume 1878	+	+
8.	Black Stork	<i>Ciconia nigra</i> (Linnaeus, 1758)	-	+
9.	Common Merganser	<i>Mergus merganser</i> Linnaeus, 1758	-	+
10.	Brahminy Shelduck	<i>Tadorna ferruginea</i> (Pallas, 1764)	-	+
11.	Greater Grey-headed Fishing Eagle	<i>Ichthyophaga ichthyaetus</i> (Horsfield, 1821)	+	+
12.	Elwe's (Black-tailed) Crake?	<i>Porzana bicolor</i> (Walden, 1872)	+	-
13.	Long-billed Plover	<i>Charadrius placidus</i> J.E. Gray, 1863	-	+
14.	Kentish Plover	<i>Charadrius alexandrinus</i> Linnaeus, 1758	+	+
15.	River Lapwing	<i>Vanellus duvaucelii</i> (Lesson, 1826)	+	+
16.	Red-wattled Lapwing	<i>Vanellus indicus</i> (Boddaert, 1783)	+	+
17.	Northern Lapwing	<i>Vanellus vanellus</i> (Linnaeus, 1758)	-	+
18.	Common Sandpiper	<i>Actitis hypoleucos</i> Linnaeus, 1758	+	+
19.	Ibisbill	<i>Ibidorhyncha struthersii</i> Vigors, 1832	-	+
20.	Great Stone-Plover	<i>Esacus recurvirostris</i> (Cuvier, 1829)	+	+
21.	Small Blue Kingfisher	<i>Alcedo atthis</i> (Linnaeus, 1758)	+	+
22.	Lesser Pied Kingfisher	<i>Ceryle rudis</i> (Linnaeus, 1758)	+	+
23.	White-breasted Kingfisher	<i>Halcyon smyrnensis</i> (Linnaeus, 1758)	+	+
24.	Large Pied Wagtail	<i>Motacilla maderaspatensis</i> Gmelin, 1789	+	+
25.	Brown Dipper	<i>Cinclus pallasii</i> Temminck, 1820	+	+
26.	Little Forktail	<i>Enicurus scouleri</i> Vigors, 1832	+	+
27.	Slaty-backed Forktail	<i>Enicurus schistaceus</i> (Hodgson, 1836)	+	+
28.	Plumbeous Redstart	<i>Rhyacornis fuliginosus</i> (Vigors, 1831)	+	+

'+' indicates the species was sighted; '-' indicates the species was not sighted.

*-please see 'Methods' for months during which the surveys were conducted.

Table 3 : Sightings of the White-bellied Heron in Namdapha Tiger Reserve in 2005 & 2006.

Date	River	Place	Locality	No. of birds
18/09/2005	Namdapha	Firmbase	27° 31.58' N 96° 31.13' E	01
19/09/2005	Namdapha- Noa-Dehing	Embyong	27° 29.32' N 96° 29.42' E	01
19/11/2006	Noa-Dehing	27 Mile	27° 29.21' N 96° 26.64' E	01
20/11/2006	Noa-Dehing	40 Mile	27° 29.54' N 96° 32.29' E	01
30/11/2006	Namdapha- Noa-Dehing	Embyong	27° 29.25' N 96° 29.32' E	01

individuals were seen in Noa-Dehing River right from Miao up to Gandhigram in November/December 2006. They seem to be the big competitors of White-bellied Heron since they both depend on the fishes. However, the hunting strategy of both species differ significantly; while former prefers deep waters of the rivers whereas the later prefers mostly the edges or the places where the water level is comparatively less and strewn with boulders. Unlike in other places (especially in Assam) where the White-bellied Herons were reportedly seen in water close to reed-beds, herons of Namdapha in turn prefer fast-flowing rivers with abundant fish where human interference is negligible.

Though I could not see any significantly important migratory species (other than the Great Cormorant), presence of White-bellied Heron in Namdapha in September to December reveals that it is not a migratory species. Official photographer of the Park had taken a video footage of a lonely White-bellied Heron foraging in the fringes of river Noa-Dehing close to Deban Guest House (approx. 27° 29.06' N, 96° 24.27' E) sometime in August 2005. In January 1993, a single heron was spotted on the banks of Noa-Dehing river in between Deban and M'Pen (Choudhury 1996b), further west of Embyong. Of the five sightings, one was in a place where the depth of water was not so high. Another sighting was in a place where the water current was relatively less with free-flowing water of roughly two feet. Presence of White-bellied Heron in such habitat is in total contrast to what Hancock and Kushlan (1984) have mentioned about it as a bird of the '*terai*' and '*duars*' White-bellied herons were also sighted in Assam *terai* (Choudhury, 1992 and Baruah *et al.* 2004). The reasons why the herons preferred such areas in Namdapha could be due to less human disturbance and abundant fish in the rivers of the Reserve. However, within Namdapha, the Firmbase area has tall grassland patches intermingled with small streams branching out from the mighty river-Namdapha. Though, many of such streams loose much of their water during winter, possibility of herons using such streams when they have more water is not ruled out.

More than 80% of the areas within Namdapha are still unexplored, thereby raising the speculation that one could possibly see few more herons in the interior areas where accessibility is difficult. In general, though the wetlands with shallow water are ideal habitats for herons, White-bellied Herons in particular prefer to feed on fishes of rivers. The reasons behind why White-bellied heron select secluded freshwater riverbeds are not clear and still to be explored. However, I speculate that, the less-disturbance in terms anthropogenic activities seems to be a prime criterion behind the heron's selection of such habitat. Unfortunately, illegal fishing is also evident within Namdapha mainly by various tribes. I had come across many abandoned fishing camps setup by tribes. Most of these camps seem very close to the rivers and I even sighted a White-bellied heron a few meters away from one of such camps in Firmbase. In Deban, Chakma tribes collect fish and fingerlings using fishing nets and mosquito nets, respectively. Fishing is also very rampant within the Park (from Miao to Vijoynagar) mainly by Lisu tribes who reside inside the Reserve. Floods in Namdapha are usual every year and they can drastically alter available feeding habitats by rendering large areas of usually suitable feeding habitats inhospitable for the herons. More surveys are needed in Arunachal Pradesh and also in the neighbouring Assam to find out the present status of this endangered species.

ACKNOWLEDGEMENTS

I would like to thank the Director, ZSI for his encouragement and support. I also would like to thank the Forest Department of Arunachal Pradesh for giving me permission to carryout surveys within Namdapha Tiger Reserve. My sincere thanks are also due to my field assistants Mosang, Nima, Wangthe, Eshi and Kenaki of Deban village, Arunachal Pradesh.

REFERENCES

- Ali, S. and Ripley, S.D. 1987. Compact Handbook of the Birds of India and Pakistan. Oxford University Press, New Delhi. Pp. 14.
- Anonymous. 1994. From the field. *Oriental Bird Club Bulletin*, **19** : 65-67.
- Baral, H.S. and Inskipp, C. 2004. The state of Nepal's birds 2004. Department of National Parks and Wildlife Conservation, Bird Conservation-Nepal and IUCN-Nepal, Kathmandu.
- Barua, M. and Sharma, P. 1999. Birds of Kaziranga National Park, India. *Forktail*, **15** : 47-60.
- Baruah, M., Chettri, G. and Bordoloi, P. 2004. Sighting of White-bellied Heron *Ardea insignis* Hume in Pobitora Wildlife Sanctuary. *J. Bombay Nat. Hist. Soc.*, **101**(2) : 311.
- Choudhury, A. 1990. Checklist of birds of Assam. Sofica Press and Publishers, Guwahati.
- Choudhury, A. 1992. Sighting of the Great White-bellied Heron in Kamjing Reserve Forest, Assam. *Newsletter for Birdwatchers.*, **32**(7 & 8) : 17.

- Choudhury, A. 1994. A report on bird survey in Dibru-Saikhowa Wildlife Sanctuary, Assam, India. *Report to the Oriental Bird Club*, U.K. 71 pp.
- Choudhury, A. 1996a. Recent records of the White-bellied Heron from Assam and Arunachal Pradesh. Abstracts of the Sálím Ali Centenary Seminar on Conservation of Avifauna of wetlands and Grasslands, Bombay Natural History Society, Mumbai.
- Choudhury, A. 1996b. Winter waterfowl count in Namdapha National Park. *Oriental Bird Club Bulletin*, **23** : 29-30.
- Ghosh, A.K. 1987. Qualitative analysis of faunal resources : Proposed Namdapha Biosphere Reserve, Arunachal Pradesh. Zoological Survey of India, Calcutta. Pp. 129.
- Hancock, J.A. and Kushlan, J.A. 1984. The Herons Handbook. Croom Helm, London, and Harper & Row, New York.
- Harvey, W.G. 1990. Birds in Bangladesh. University Press Ltd, Dhaka.
- Inskipp, C. and Inskipp, T. 1993a. Birds recorded during a visit to Bhutan in Autumn 1991. *Forktail*, **8** : 97-112.
- Inskipp, C. and Inskipp, T. 1993b. Birds recorded during a visit to Bhutan in Spring 1993. *Forktail*, **9** : 121-142.
- IUCN. 1996. IUCN Red List of Threatened Animals, IUCN, Gland, Switzerland and Cambridge, UK.
- Jepson, P. 1987. Recent reports. *Oriental Bird Club Bulletin*, **6** : 36-40.
- King, B., Buck, H., Ferguson, R., Fisher, T., Goblet, C., Nickel, H. and Suter, W. 2001. Birds recorded during two expeditions to North Myanmar (Burma). *Forktail*, **17** : 29-40.
- Kushlan, J.A. and Hafner, H. 2000. Heron Conservation. Academic Press, United Kingdom.
- Scott, D.A. 1989. A directory of Asian wetlands, IUCN, Gland, Switzerland.
- Smythies, B.E. 1953. Birds of Burma. 2nd ed. Oliver & Boyed, London.
- Stanford, J.K. and Ticehurst, C.B. 1938-1939. On the birds of northern Burma. *Ibis* (14)**2** : 65-102, 197-229, 391-428, 599-638; (14)**3** : 1-45, 211-258.
- Thompson, P.M., Harvey, W.C. and Johnson, D.L. 1993. Recent notable bird records from Bangladesh. *Forktail*, **9** : 13-15.
- Walters, M. 1976. Some observations on the eggs of the Great White-bellied Heron *Ardea insignis*. *J. Bombay Nat. Hist. Soc.*, **73** : 213-214.