

Avifaunal survey of Tsomoriri Lake and adjoining Nuro Sumdo Wetland in Ladakh, Indian trans-Himalaya

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The results of a ten day avifaunal survey (19-28 July, 1996) of Tsomoriri Lake and the adjoining Nuro Sumdo wetland in eastern Ladakh, Indian trans-Himalaya are reported. Thirty-four bird species were identified, including 14 of water birds that breed in the area. At least three Black-necked Cranes *Grus nigricollis*, an endangered species, and 826 Bar-headed Geese *Anser indicus* were sighted. A breeding colony of Brown-headed Gulls *Larus brunnicephalus*, comprising approximately 250 adults and chicks was sighted. The wetlands are threatened by pollution due to increased tourism. The necessity of developing Nuro Sumdo into a protected area, and the formulation of an ecologically sensitive tourism plan is emphasized.

INTRODUCTION

The high mountain lakes and bogs in the Ladakh region of the Indian trans-Himalaya represent the only breeding grounds of Bar-headed Geese *Anser indicus* in India, and the only breeding grounds of the Black-necked Crane *Grus nigricollis* outside China (with the exception of Sikkim where they have recently been found breeding - Tim Inskipp, Usha Lachungpa, pers. comm.). The largest of these lakes entirely within Indian limits is the Tsomoriri, believed to be the most important breeding locality for waterfowl in Ladakh (Anon. 1993). The results of an avifaunal survey of the Tsomoriri lake and an adjoining wetland called Nuro Sumdo (or Nurbu Sumdo) are reported here and the conservation problems in the area are discussed. The survey was conducted from 19-28 July, 1996.

STUDY AREA

Tsomoriri lake (32°07'N to 32°50'N and 78°03'E to 78°20'E) in eastern Ladakh is spread over an area of ca. 120 km² of the Rupshu Desert in the northernmost Indian state of Jammu and Kashmir. This high altitude brackish lake is situated at about 4,650 m above mean sea level, and remains frozen in winter. The lake is fed by springs and snow melt and has a maximum depth of 40 m. On the north and east sides, the lake is bounded by rolling hills of the Tibetan cold desert. The western side is bordered by steeper peaks exceeding 5,500 m. The Pare Chu river, which originates about 40 km upstream, flows along the southern side. Between Tsomoriri in the north, and the Pare Chu in the south, lies the Nuro Sumdo wetland, covering an area of ca. 20 km². Unlike Tsomoriri, Nuro Sumdo is a bog, criss-crossed by small rivulets which eventually drain into the Pare Chu.

The area is characterized by an arid, cold desert climate. The summer temperature ranges from 0° to 30°C, falling to between -10° and -40°C in winter. *Caragana* and *Astragalus* species characterize the steppe

vegetation, while *Potamogeton* species occur in shallow parts of Tsomoriri lake (Anon. 1993). The bogs in Nuro Sumdo include several species of *Carex*, *Primula*, and *Pedicularis*. Other common species are *Juncus thomsonii* and *Leontopodium* sp. Large mammalian fauna in the area includes ungulates such as Nayan *Ovis ammon hodgsoni*, Bharal *Pseudois nayaur*, and Kiang *Equus kiang*. Large carnivores reported to occur are the Snow Leopard *Uncia uncia* and the Tibetan Grey Wolf *Canis lupus chanku*.

METHODS

We traversed a total distance of 140 km on foot in the surveyed area, which included the ca. 90 km perimeter of Tsomoriri. Birds were observed using 7 X 50 and 7 X 42 binoculars. While all species of birds were recorded, only the water birds were enumerated. For waterfowl, the birds were classified as adult or young based on their relative size. We tried to avoid double counts by:

- i) rejecting sightings with even a small possibility of double counting
- ii) dividing into two teams of 2 observers each, who radiated out in opposite directions along the Tsomoriri. We could thus simultaneously census the opposite banks (ca. 3-6 km apart), reducing the chances of double counting.

RESULTS

Thirty-four species of birds were identified in the surveyed area, which included 14 species of water birds (Appendix). Three adult Black-necked Cranes were seen in the north-eastern part of Nuro Sumdo. We saw a single adult in the same area five days later, which was probably a double count. A total of 805 Bar-headed Geese were counted in Tsomoriri, and another 21 in Nuro Sumdo. This population comprised 62 % goslings. We found a nesting colony of Brown-headed Gulls *Larus*

Table 1. Water bird census of Tsomoriri and Nuro Sumdo wetlands in eastern Ladakh, Indian trans-Himalaya

		<i>Tsomoriri</i>	<i>Nuro Sumdo</i>
RUDDY SHELDUCK <i>Tadorna ferruginea</i>	Adult	26	12
	Young	56	14
BAR-HEADED GOOSE <i>Anser indicus</i>	Adult	306	8
	Young	499	13
MALLARD <i>Anas platyrhynchos</i>		1	0
COMMON POCHARD <i>Aythya ferina</i>		2	0
COMMON MERGANSER <i>Mergus merganser</i>	Adult	5	0
	Young	6	0
BLACK-NECKED CRANE <i>Grus nigricollis</i>		0	3
COMMON REDSHANK <i>Tringa totanus</i>		11	1
GREEN SANDPIPER <i>T. ochropus</i>		7	1
COMMON SANDPIPER <i>Actitis hypoleucos</i>		7	1
LESSER SAND PLOVER <i>Charadrius mongolus</i>		33	0
BROWN-HEADED GULL <i>Larus brunnicephalus</i>		283*	0
COMMON TERN <i>Sterna hirundo</i>		7	3
GREAT CRESTED GREBE <i>Podiceps cristatus</i>	Adult	16**	0
	Young	7	0
WHITE-THROATED DIPPER <i>Cinclus cinclus</i>		3	2
Unidentified ducks		31	0
Unidentified waders		3	0

* including a nesting colony of an estimated 250 birds.

** including 6 adults attending a nest each with eggs.

brunnicephalus on an island 50 m off the northern bank of Tsomoriri. This ca. 30 x 6 m island supported an estimated 250 adults and chicks. Along the northern bank, we also found six nests of Great Crested Grebe *Podiceps cristatus* with eggs. The census results for all the 14 water birds are summarized in Table 1.

DISCUSSION

The trans-Himalaya is one of the most fragile, and yet the least represented of all the biogeographic zones in the Indian protected area network (Rodgers and Panwar 1988). This biogeographic zone harbours 12 mammal and bird species listed in Schedule I of the Indian Wildlife (Protection) Act, 1972 (Anon. 1992). Among the birds, the Black-necked Crane and the Tibetan Snowcock *Tetraogallus tibetanus* occur in the surveyed areas.

A pair of Black-necked Cranes had been reported to breed in the area previously (Anon. 1993). The Black-necked Grebe *Podiceps nigricollis* has also been reported to breed here, though it was not sighted during this survey (Anon. 1993). The survey confirmed the use of these wetlands for breeding by 13 other species of water birds. While the Nuro Sumdo area seems important for Black-necked Crane, Tsomoriri is an extremely important breeding area for Bar-headed Geese.

The survey corroborates the importance of Tsomoriri and Nuro Sumdo from an avifaunal viewpoint. While their conservation significance is evident, developmental activities and increasing tourism threaten these important wetlands. The area had remained closed to tourism because of its location close to the politically sensitive Sino-Indian border. However, with its opening

up in 1994, Korzok, the only village in the vicinity of the wetlands, has become an important tourist centre. Apart from representing one of the highest inhabited places in the world, the village has an important Buddhist monastery. A road from Leh, the capital of Ladakh 200 km north-west to Korzok, runs for more than 5 km along the edge of Tsomoriri. The village lies along the north-western edge of Tsomoriri, and consists of ca. 75 households, largely belonging to a semi-nomadic pastoral tribe called *Changpa*. *Changpa* livestock, which includes goat, sheep, cattle, horses, donkeys, yaks *Bos grunniens*, and cattle-yak hybrids, graze in the bogs and meadows of the wetlands. In addition, several government establishments exist in Korzok. There are plans to construct a hotel. During the survey, several tourist groups were camping by the Tsomoriri, with their vehicles driven right up to the edge of the lake. We found discarded garbage, including metal cans and polythene, not only around Korzok but also in the more remote areas of Nuro Sumdo. This is because an old 125 km long trade route linking Korzok in the north to the villages around Kibber Wildlife Sanctuary in the south (in the adjoining state of Himachal Pradesh), has now become a popular trekking route. This route passes through the entire western side of Nuro Sumdo and Tsomoriri. Several tourist groups with donkeys and mules make this trek each year. Although tourism is restricted to the short summer, this is the breeding time for the avifauna.

We suspect that, as elsewhere in the Himalaya, the ecosystem homeostasis that traditionally characterized the trans-Himalayan Buddhist communities is degenerating in the area (Goldstein 1981). Polyandry,

a traditional social system that restricted the growth of the *Changpa* population, is breaking down (Bhattacharji 1993). With increasing tourism, Korzok seems headed towards a market economy. Apart from tourists and tour organizers, a floating summer population from other parts of the state is becoming established. Shops catering to the increased demands of tourism are being run seasonally by this migrant population. Given the present situation, along with an obvious lack of any drainage system in this remote, hilly village, pollution of Tsomoriri in the near future is not difficult to foresee. Similarly, with the growing popularity of the Korzok-Kibber route, currently advertized by several trekking agencies, pressure on the Nuro Sumdo wetland and the c. 15 camp-sites along the route is likely to intensify rapidly.

Administratively, Tsomoriri has been declared as a wetland reserve, but Nuro Sumdo does not have a protected area status (Sahi 1993). So far, no measures have been undertaken towards the conservation of these wetlands. Affording a protected area status to Nuro Sumdo, and enforcing an ecologically sensitive tourism plan are urgently needed if these wetlands and their avifauna are to be conserved. The proposed change in status would lead to the formation of a large, contiguous trans-Himalayan conservation unit due to the presence of the 1400 km² Kibber Wildlife Sanctuary immediately south of Nuro Sumdo.

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APPENDIX

Birds sighted in Tsomoriri and Nuro Sumdo wetlands, eastern Ladakh, Indian trans-Himalaya

TIBETAN SNOWCOCK *Tetraogallus tibetanus*

RUDDY SHELDUCK *Tadorna ferruginea*

BAR-HEADED GOOSE *Anser indicus*

COMMON MERGANSER *Mergus merganser*

HILL PIGEON *Columba rupestris*

BLACK-NECKED CRANE *Grus nigricollis*

TIBETAN SANDGROUSE *Syrrhaptes tibetanus*

COMMON REDSHANK *Tringa totanus*

GREEN SANDPIPER *T. ochropus*

COMMON SANDPIPER *Actitis hypoleucos*

LESSER SAND PLOVER *Charadrius mongolus*

BROWN-HEADED GULL *Larus brunnicapillus*

COMMON TERN *Sterna hirundo*

GOLDEN EAGLE *Aquila chrysaetos*

COMMON KESTREL *Falco tinnunculus*

GREAT CRESTED GREBE *Podiceps cristatus*

RED-BILLED CHOUGH *Pyrrhocorax pyrrhocorax*

COMMON RAVEN *Corvus corax*

WHITE-THROATED DIPPER *Cinclus cinclus*

BLACK REDSTART *Phoenicurus ochruros*

WHITE-WINGED REDSTART *P. erythrogaster*

DESERT WHEATEAR *Oenanthe deserti*

PALE MARTIN *Riparia diluta*

EURASIAN CRAG MARTIN *Hirundo rupestris*

GREATER SHORT-TOED LARK *Calandrella brachydactyla*

EURASIAN SKYLARK *Alauda arvensis*

HORNED LARK *Eremophila alpestris*

TIBETAN SNOWFINCH *Montifringilla adamsi*

WHITE WAGTAIL *Motacilla alba*

CITRINE WAGTAIL *M. citreola*

ROBIN ACCENTOR *Prunella rubeculoides*

GREAT ROSEFINCH *Carpodacus rubicilla*

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