

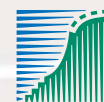
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# Waterbirds around the world

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*Edited by G.C. Boere, C.A. Galbraith and D.A. Stroud*

*Assisted by L.K. Bridge, I. Colquhoun, D.A. Scott,  
D.B.A. Thompson and L.G. Underhill*



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*Cover photography:* Whooper Swans *Cygnus cygnus* arriving at Martin Mere, England. Photo: Paul Marshall.  
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## Nesting sites and breeding success of Black-necked Crane *Grus nigricollis* in Ladakh, India

Pankaj Chandan<sup>1</sup>, Parikshit Gautam & Archana Chatterjee

<sup>1</sup>Senior Project Officer, WWF-India, Field Office, Hemis Complex, Zangsti Road, Leh - 194101, Ladakh, India.  
(email: pchandana@wwfindia.net)

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Ladakh contains some of the world's most unique and spectacular wetlands and is the only known breeding ground of Black-necked Crane *Grus nigricollis* in India. The study area was situated in the Changthang region of eastern Ladakh, part of the Trans-Himalayas of the Tibetan Plateau. (Fig. 1). This harsh environment, at an altitude of 4 000 m and above, is a cold, sparsely vegetated desert, with a short summer season, home to only highly adapted flora and fauna. Strong and unpredictable winds make the area highly inhospitable, with summer temperatures from 0° C to 30° C and winter from -10° C to -40° C (Mishra & Humbert-Droz 1998). The region has numerous brackish and freshwater wetlands, which apart from their hydrological importance, are home to a wide variety of flora and fauna. Most of these wetlands are of glacial origin and remain frozen from December to March. A unique nomadic tent

dwelling tribe, the Changpas, roam the wetlands of Ladakh in search of pasturelands.

To identify appropriate wetlands to survey, a thorough literature review was carried out and based on this information, 22 wetlands were identified for an intensive survey. Surveys were undertaken from 2000 to 2003: a limited survey of a few wetlands in 2000 and 2001 and a survey of all wetlands in 2002 and 2003. All known and probable nesting and feeding sites were visited from April to November during each year. Data was collected on the number of nests, eggs laid, hatching success and survival of fledglings. Rapid surveys were made in March and April, and October to November to establish arrival and departure dates. The day a Black-necked Crane was first sighted was treated as arrival date (Oring & Lank 1982), and the last day when the species was sighted was considered as its departure date (Bhupathy *et al.* 1998).

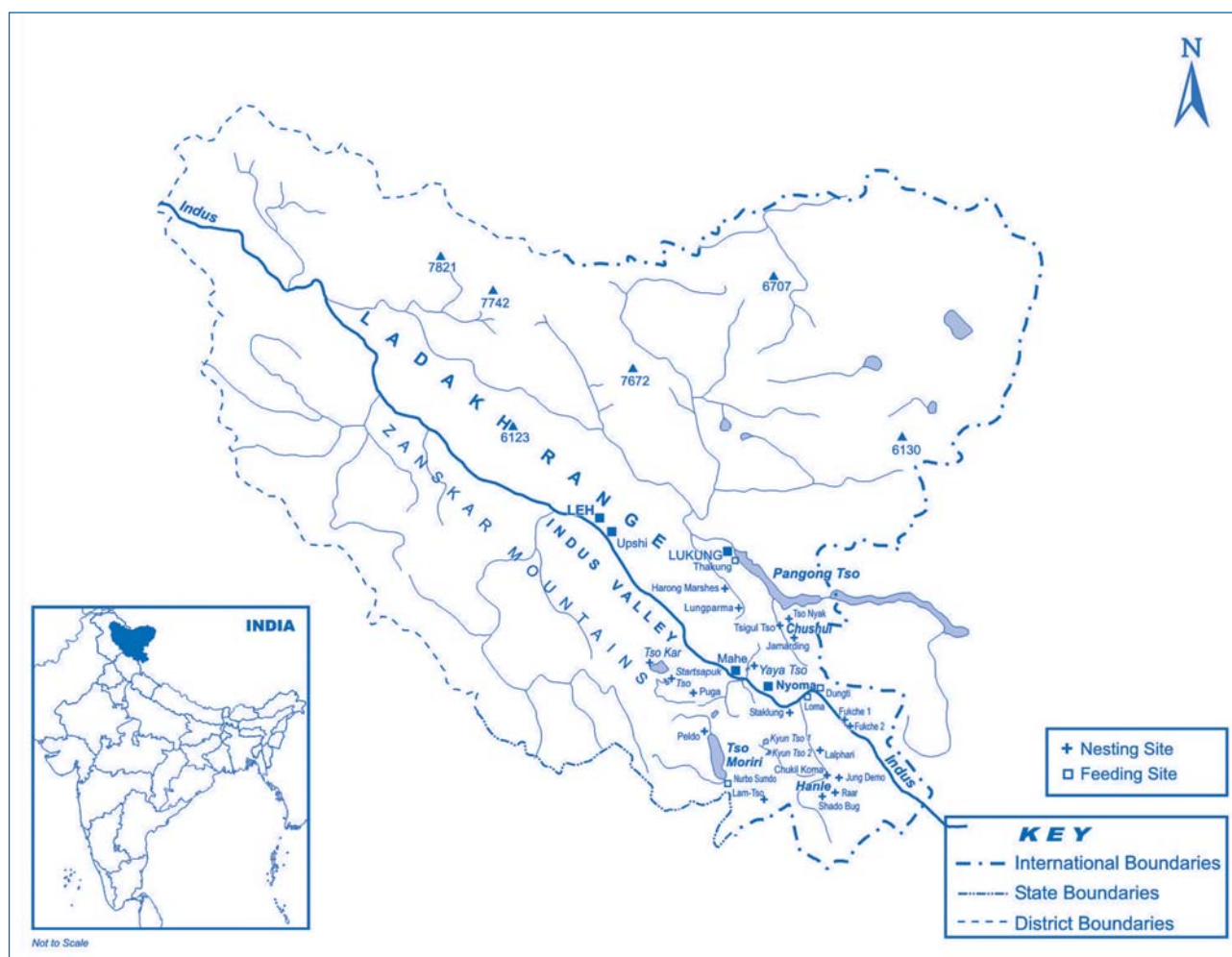


Fig. 1. Map of feeding and nesting sites of Black-necked Cranes *Grus nigricollis* in Ladakh.

**Table 1.** Surveys and breeding records of Black-necked Crane *Grus nigricollis* in Ladakh.

Month / Year	No. of wetlands covered	No. of Black-necked Cranes		No. of chicks fledged	Reference
		Total sightings	Breeding pairs		
June 1919	2	3	1	-	Ludlow (1920)
June 1924	7	11	4	-	Osmaston (1925)
May-June 1926	8	10	5	-	Meinertzhagen (1927)
June 1976	4	5	2	-	Hussain (1976)
July 1978	10	12	1	-	Gole (1981)
May-June 1980	10	14	3	-	Gole (1983)
June 1982	9	13	3	-	Nurba (1983)
June 1983	6	7	2	-	Hussain 1985
August-October 1986	8	16	2	-	Narayan <i>et al.</i> (1987)
July-November 1987	5	9	1	-	Akhtar (1989)
Sep-October 1992	14	17	4	-	Chacko (1992)
May-Sep 1995	18	22	5	6	Chacko (1995)
May-August 1996	18	25	12	9	Chacko (1996)
June-September 1997	18	38	12	9	Pfister (1998)
April– December 2002	22	59	15	10	This study
April– November 2003	22	60	16	10	This study

Data for estimating breeding productivity was collected from 15 pairs of birds in 2002 and 16 pairs in 2003. The reproductive output of each nest was followed through the various stages of the life cycle, from the clutch laid, through hatching/fledging and recruitment into the breeding population. As there were few sub-adults present, these were included in the adult category. Productivity was calculated as the number of young reared per successful female in the population in a year. The Mayfield (1961) method (successful nests / all nests) was used to determine nesting success.

Black-necked Cranes arrived in the wetlands of Changthang, their only known nesting area in India, in the last week of March or first week of April and leave in the last week of October or first week of November, along with their chicks. Other waterbirds also bred in these wetlands: Bar-headed Goose *Anser indicus*, Brown-headed Gull *Larus brunicephalus*, Great-crested Grebe *Podiceps cristatus*, Ruddy Shelduck *Tadorna ferruginea* and Lesser Sand Plover *Charadrius mongolus*.

Table 1 summarises numbers and breeding records from previous surveys and this survey. In 2002 and 2003, totals (adults and chicks) of 59 and 60 birds respectively were recorded; the highest number ever recorded in Ladakh. Six new breeding sites were found (Table 2). A total of 15 nests were found in 2002, and 16 in 2003. Nesting success was 33.3% in 2002 and 31.5% in 2003, less than recorded in previous years: 60% in 1995, 43% in 1996, 37.5% in 1997. In each year 10 chicks were reared – a productivity of 0.66 in 2002 and 0.62 in 2003, lower than in previous studies of Black-necked Cranes in Ladakh between 1992 and 1997 - 0.75 – 1.2 young per pair (Chacko 1995, 1996, Pfister 1998), but within the range of productivity reported for other crane species of 0.23–1.39 young per pair (Pomeroy 1980, Walkinshaw 1981, Neumann 1987; Tarboten *et al.* 1987, Mafabi 1991, Prange & Mewes 1991, Winter 1991).

The 2002 April to December survey of 22 wetlands found Black-necked Cranes nesting in all wetlands except for Tsomoriri and Kyun Tso 1, Kyun Tso 11 and Pangong Tso. Three new nesting sites (Yaya Tso, Chukil Koma and Staklung)

were recorded, the Yaya Tso site (altitude 4 720 m) was the highest recorded breeding location in India. Of the 15 breeding pairs, 14 laid two eggs each and one pair laid only one egg. At many nests, eggs were eaten by feral dogs. Of the 12 chicks that hatched two were lost: the chick at Jung Demo was eaten by a feral dog, but the cause of the loss a chick at Lungparma could not be ascertained. In October, 10 healthy chicks and 49 adults were recorded in different wetlands. A Crane tagged at Hanle, Ladakh in 1995 was recorded in 2002 in a breeding pair, but the nest was abandoned after the egg was eaten by a dog.

Although the 2000 and 2001 surveys covered only four wetlands (Tsomoriri, Tsokar, Startsapuk Tso & Puga), nesting at the northern end of Tsomoriri in 2000 was the first record for the area. This nest was washed out by a major water level rise. No nesting was recorded at Puga or Tsokar in 2000, but in 2001, one nest was found at each wetland; again first nesting records for these sites. The Tsokar nest was unusual as it was built within an area of mounds near Thukjay village, rather than the more usual sites with open visibility. All four eggs at the Tsokar and Puga sites were eaten by dogs. However, the nest at Startsapuk Tso successfully produced two chicks during 2000 and 2001.

In January 2003, a pair of Cranes was recorded overwintering at Lam Tso Chumur wetland which was completely frozen, their survival due to nomads in that area feeding them. This is the first recorded case of a pair of Black-necked Cranes staying during the harsh Ladakh winter.

Although our more extensive surveys found a larger breeding population than previously recorded its overall breeding productivity appears to be declining. This seems to be due to increased human activities such as unplanned development and grazing. However, our frequent observations of dogs taking eggs during incubation suggest that this is the major threat to the breeding population of cranes in Ladakh.

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**Table 2.** Wetlands in which Black-necked Cranes *Grus nigricollis* have been recorded nesting in Ladakh. \* indicates sites covered during present study. Sites with geographic coordinates and altitude provided are those where nesting was recorded in 2002.

Name of Site	First year nesting recorded	Location	Altitude (m)	Reference
Tsigul Tso, Chuchul *	1978	33°34' 43.4"N 78°37' 27.6"E	4 445	Gole (1983)
Shado Bug, Hanle *	1980	32°44' 42.3"N 78°58' 25.3"E	4 298	Gole (1983)
Lam Tso Chumur *	1980	32°42' 38.0"N 78°33' 22.2"E	4 405	Gole (1983)
Mankhang/Lalphari *	1994	32°57' 18.8"N 78°54' 15.8"E	4 215	Chacko (1995)
Tso Nyak, Chuchul *	1995	33°37' 43.8"N 78°40' 36.6"E	4 348	Chacko (1995)
Sato (Horong Marshes) *	1996			Chacko (1996)
Lungparma *	1996	33°46' 29.5"N 78°22' 50.5"E	4 558	Chacko (1996)
Jamarding, Chuchul *	1996	33°35' 29.0"N 78°41' 01.6"E	4 394	Chacko (1996)
Fukche 1 *	1995	32°57' 21.4"N 79°11' 56.3"E	4 180	Chacko (1996)
Fukche 11 *	1997	32°57' 51.4"N 79°11' 56.3"E	4 178	Pfister (1998)
Raar, Hanle *	1996	32°46' 47.3"N 78°57' 02.0"E	4 326	Chacko (1996)
Jung Demo, Hanle *	1996	32°48' 07.6"N 78°57' 41.6"E	4 305	Chacko (1996)
Startsapuk Tso *	1996			Chacko (1996)
Peldo, Tsomoriri	2000			This study
Puga	2001			This study
Tsokar	2001	33°19' 45.6"N 78°02' 07.7"E	4 582	This study
Staklung	2002	33°05' 20.7"N 78°42' 25.9"E	4 173	This study
Chukil, Hanle	2002	32°46' 53.9"N 78°59' 20.9"E	4 276	This study
Yaya Tso	2002	33°18' 59.2"N 78°29' 08.8"E	4 720	This study

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## REFERENCES

- Akhtar, S.A.** 1989. Some Observations on the Breeding Behaviour of the Black-necked Crane *Grus nigricollis* in Ladakh. Asia Crane Congress, Rajkot, India. 17 pp.
- Bhupathy, S., Vijayan, V.S. & Mathur, R.** 1998. Population Ecology of Migratory Waterfowl in Keoladeo National Park. Bharatpur. Journal of the Bombay Natural History Society 95: 287-294.
- Chacko, R.T.** 1992. A Summer Study of the Black-necked Cranes Breeding in Some Remote High Altitude Areas of Ladakh, India. Unpublished Report.
- Chacko, R.T.** 1995. A Summer 95 Study of the Black-necked Cranes Breeding in Some Remote High Altitude Areas of Ladakh, India. Unpublished Report.
- Chacko, R.T.** 1996. A Summer 96 Study of the Black-necked Cranes Breeding in Some Remote High Altitude Areas of Ladakh, India. Unpublished Report.
- Gole, P.** 1981. Black-necked Cranes in Ladakh. Crane Research Around the World: Proceedings of The International Crane Symposium at Sapporo, Japan in 1980.
- Gole, P.** 1983. Future of Black-necked Cranes in Indian Sub-continent. In G.W. Archibald & R.F. Pasquier (eds). Proceedings International Crane Workshop 1983, Bharatpur, India: 51-54.
- Hussain, S.A.** 1976. Preliminary report. Bombay Natural History Society/World Wildlife Fund – India. Ladakh Expedition.
- Hussain, S.A.** 1985. Status of Black-necked Crane in Ladakh – 1983, Problems and Prospects. Journal of the Bombay Natatural History Society 82: 449-458.
- Ludlow, F.** 1920. Notes on the Nidification of Certain Birds in Ladak. Journal of the Bombay Natatural History Society, 27: 141-146.
- Mayfield, H.** 1961. Nesting Success Calculated from Exposure. Wilson Bulletin 73 : 255-61.
- Mafabi, P.G.** 1991. The Ecology and Conservation Status of the Grey Crowned Crane in Uganda. In: J. Harris (ed), Proceedings 1987 International Crane Workshop. International Crane Foundation, Baraboo, Wisconsin, USA: 363-367.
- Meinertzhagen, R.** 1927. Systematic Results of Birds Collected at High altitudes in Ladakh and Sikkim, Part 11. Ibis 69: 624.
- Mishra, C. & Humbert-Droz, B.** 1998. Avifaunal Survey of Tsomoriri Lake and Adjoining Nuro Sumdo Wetland in Ladakh, Indian Trans-Himalaya. Forktail 14: 865-867.
- Narayan, G., Akhtar, A., Lima, R. & D'Cunha, E.** 1987. Black-necked Crane *Grus nigricollis* in Ladakh 1986. Journal of the Bombay Natatural History Society, 83 (Supplement): 180-195.
- Neumann, T.** 1987. Breeding Status of the Common Crane in the Federal Republic of Germany. In G.W. Archibald & R.F. Pasquier, (eds.), Proceedings of the 1983 International Crane Workshop. International Crane Foundation, Baraboo, Wisconsin, USA: 243-245.

- Nurbu, C.** 1983. Notes on the Black-necked Crane in Ladakh. In G.W. Archibald & R.F. Pasquier, eds., Proceedings of the 1983 International Crane Workshop, Bharatpur India. International Crane Foundation, Baraboo, Wisconsin, USA: 55-56.
- Osmaston, B.B.** 1925. On the Birds of Ladakh. Ibis 12: 662.
- Oring, L.W., & Lank, D. W.** 1982. Sexual Selection, Arrival Times, Philopatry and Site Fidelity in the Polyandrous Spotted Sandpiper. Behavioural Ecology Sociobiology 10: 185-191.
- Pfister, O.** 1998. The Breeding Ecology and Conservation of the Black-necked Crane *Grus nigricollis* in Ladakh India. Unpublished Thesis. University of Hull, UK.
- Pomeroy, D.E.** 1980. Aspects of the Ecology of Crowned Cranes *Balearica regulorum* in Uganda. Scopus 4:29-35.
- Prange, H. & Mewes, W.** 1991. The Common Crane in the German Democratic Republic. In J. Harris, (ed.), Proceedings of the 1987 International Crane Workshop. International Crane Foundation, Baraboo, Wisconsin, USA: 263-269.
- Tarboton, W.R., Barnes, P. R. & Johnson, D.N.** 1987. The Wattled Crane in South Africa during 1978-1982. In G.W. Archibald & R.F. Pasquier, (eds.), Proceedings of the 1983 International Crane Workshop. International Crane Foundation, Baraboo, Wisconsin, USA: 353-361.
- Walkinshaw, L.H.** 1981. The Sandhill Cranes. In J.C. Lewis & H. Masatomi, (eds.), Proceedings of the International Crane Symposium, Sapporo, Japan, 1980. International Crane Foundation USA: 151-162.
- Winter, S. W.** 1991. The Demoiselle Crane in the Agricultural Landscape of the Ukrainian Steppe Zone. In J. Harris, (ed.), Proceedings of the 1987 International Crane Workshop. International Crane Foundation, Baraboo, Wisconsin, USA: 285-295.



Russian experts taking biometrics of juvenile Siberian Crane *Grus leucogeranus* in Kytalyk, Yakutia. Photo: Crawford Prentice.