Sarus Crane population fluctuation at various wetlands at Bharatpur in Rajasthan State of India

Report submitted to the Society for Research in Ecology and Environment (SREE)as part of Interschool Education Programme on Wetland Conservation

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Sarus Crane (*Grus antigone*) population fluctuation at various wetlands at Bharatpur in Rajasthan State of India

INTRODUCTION

There are six species of cranes found in India i.e. Common Crane *Grus grus*, Demoiselle Crane *G. virgo*, Siberian Crane *G. leucogeranus*, Hooded Crane *G. monacha*, Black-necked Crane *G. nigricollis* and Sarus Crane *G. antigone*. The first 4 cranes are long distance migratory birds probably coming from central asian breeding graounds. Of these, first three are winter visitors and fourth is vagrant to India. The Black-necked and Sarus Cranes are breeding cranes of India. The former is restricted to northern most part of India especially in Ladakh region while the latter is distributed widely in the country.

The Sarus Crane has 3 disjunct populations in the Indian subcontinent, South-East Asia and northern Australia. The nominate race (c. 8,000 to 10,000 birds) inhabits Pakistan, northern and central India, and Nepal, with occasional vagrants in Bangladesh. Subspecies *sharpii* occurs in South-East Asia where its range has declined dramatically and it is now confined to Cambodia, extreme southern Laos, south Vietnam (c.800-1,000 birds between these three countries), and Myanmar (c.500-800 birds). The Australian population (*gilliae*) is estimated at less than 10,000 individuals. It is extinct in Thailand, Malaysia, the Philippines and probably China.

The Sarus Crane is the largest bird of India and the tallest flying bird of the world. It inhabits wet and dry grasslands, agricultural fields, marshes and pools, either open or enclosed by forest. It prefers a mixture of flooded, partially flooded and

dry ground for foraging, roosting and nesting. In the Indian subcontinent, populations make seasonal movements in response to monsoons and droughts. Cambodian breeding populations spend the non-breeding season in the Mekong delta region of Vietnam.

The Sarus Crane is listed as Vulnerable on the IUCN Red List 2007 because it has suffered a rapid population decline, which is projected to continue, as a result of widespread reductions in the extent and quality of its wetland habitats, exploitation and the effects of pollutants. It is listed on Appendix II of CITES and Appendix II of the Convention on Migratory Species.

The objective of the present report is 1) to focus on the present and past status of Sarus Crane 2) to throw light on the factors responsible for population decline, if any and 3) to recommend measures for Sarus conservation in the region.

STUDY AREA

The study was conducted in selected areas of Bharatpur district in Rajasthan State in a radius of about 100 km from Keoladeo National Park (KNP). Bharatpur is the eastern most district of Rajasthan which forms boundaries with Haryana in the North, Mathura and Agra districts in the east; Dholpur in the south; and Dausa, Sawai Madhopur and Alwar districts of Rajsthan in the west.

Bharapur forms part of the alluvial basin of the Ganga and the Yamuna Rivers. The district Bharatpur once used to be flooded throughout the year now remains dry most of the year. Many rivers have now dried up and only river providing water to the district is Gambhir originating from the hills of Krauli district in the southwest of Bharatpur. River Banganga is completely dried up and no more providing water to the district. Similarly is the case with the river Ruparel. These rivers have been dammed on the upper reach and hence water does not reach to lower end to Bharatpur.

The summer season (March, April, May) in Bharatpur is characterized by hot dry weather, dust storms, low humidity and scanty drizzles of only a few millimetres. The Park receives most of its precipitation from the southwest monsoon, which usually sets in during late June. The transitional period between the hot and the cold season, the post-monsoon is characterized by a gradual decrease in temperature and occasional showers. The winter is very cold with chilly winds and fog. The area develops high pressure during this season. Scanty showers due to northwestern disturbances also occur during this period. The climate of the area is sub-humid to semi-arid. The minimum temperature recorded during 1996-2000 was 3.7°C in December 1996 and the maximum 48.5°C in May 1998 (Meteorological Department, Bharatpur 1996-2000). The Lowest temperature recorded during 1982-1990 was – 0.5°C in January 1985 and the highest 50°C in May 1988 (Vijayan 1991).

Topographically, most of the land of Bharatpur is plain however some of the areas are considerably diversified by Aravalli hills, one of the oldest mountain ranges. The Mostly the land is very fertile and utilized for crops of wheat *Triticum aestivum*, Mustard *Brasica compastris*, pulses, Bajra *Pennisetum* spp, Dencha (fodder) *Sesbania bispinosa* etc. The forests of this district are dry deciduous and thorny type. The major tree species include *Acacia nilotica*, *Prosopis spicigera*, *Anogeissus pendula*, *Acacia catechu*, *Zizyphus mauritiana*, *Mitragyna parvifolia*, *Capparis sepiaria*, *C. deciduas*, *Salvadora persica* etc.

The sites surveyed in the present study possess largely agricultural fields, small seasonal and perennial wetlands (seasonal shallow marshes, village ponds and man made canals). Sites also had barren lands and patches of grasslands used as pastures for cows.

METHODOLOGY

There were 4 teams each consisting of 3 students who carried out crane surveys in different sites of Bharatpur district. Sites were selected after consultation with the personnel from Irrigation department. State gazetteers and old literatures were also consulted before starting surveys.
The sites were water logged areas known to hold good amount of waters throughout the year some 10 years ago.

Government bus service was used for carrying out surveys. Reaching at sites, information was collected on the presence of cranes there. Direct observations were made with the help of binoculars to locate Sarus Cranes. They were searched in their potential habitats such as along canals, marshes, village ponds etc and their numbers and GPS locations were recorded.

Questionnaire survey was also carried out by students. Questionnaires were designed in their local language. The main questions asked included about the numbers of cranes present in the past and any change in crop pattern. The target groups aged between 50-80 years. These were farmers, cow shepherd and nomad. Special attention was paid to collect information about communal roost sites of cranes in these areas. Potential sites were surveyed in the evening when these birds congregate at one place for spending nights.

RESULTS AND DISCUSSION

In all, 29 sites were surveyed in Bharatpur district for presence of Sarus cranes. Table 1 provides details of the surveyed sites. The work commenced in January 2007 and completed in December 2007.

Crane population in the past

It was found that in the past about a decade ago Sarus cranes were present at all the sites surveyed (Table 1). The highest number of cranes was 150 recorded in the past from Bhattaki village followed by Bash, Paigaon and Satvash (Table 1). The Sarus crane numbers ranged between 4-150 cranes in the past.

Present status of crane population

In the present survey, the presence of cranes was recorded from 12 sites through direct observations and no cranes could be observed from rest of the 17 sites however there were cranes present in the past (Table 1). In the present, the highest number of cranes were recorded from Bash and Bhattki i.e. 10 cranes followed by 4 cranes from seven sites namely Satvash, Kiravta, Jurehra, Indroli, Kanwara, Kadamkhandi, and Payigaion. 2 cranes each were recorded from 3 sites namely Angrawali, Nonera, and Parmadra.

In the study the present number of cranes ranged between 0-10 cranes which show a sharp decline of about 93% between the populations of the past and present (Fig 1).

Nonera was identified as an important site for Sarus cranes. It provided communal roosting ground for these birds where about 50 birds were found roosting communally. This brackish shallow wetland attracted these birds in the evening especially in summer. During day time not more than 2-10 cranes were sighted here.

Sarus cranes were observed in various habitat types. They were mostly sighted feeding in various agricultural fields such as wheat, paddy, and Bajra. They also used wheat harvested fields, wet barren lands with C*yperus* sp. , S*cirpus* sp. Vegetation. Their sightings were made from marshy areas along canal, village ponds and tubewells also (Table 1).

Crop pattern

The questionnaire survey revealed that there has been a prominent change in the crop pattern in Bharatpur region. A decade ago there used to be Chick pea (Chana) *Cicer arietinum*, Pea (Matter) *Pisum sativum*, Sugar cane *Saccharum officinarum*, lentil (Masoor) *Lens culinaris* in abundance besides other crops like Wheat *Triticum asetivum*, Mustard *Brassica campestris*, Barley *Hordeum Sp.*, Jowar *Sorghum Sp.* and Bajra *Pennisetum Sp.*. Now the farmers grow those crops which can be grown in dry land and require low amount of water such as wheat and mustard. The crops like Chick pea, Pea, lentil and Sugar cane is almost vanished from the region.

Reasons for declining Sarus crane population

One of the reasons of decline in population is related to the loss of these crops by farmers as these provided the cranes their diet. The low rainfall in the region is the main reason behind this change in crop pattern.

Poaching by certain tribes in the villages and disturbance due to blasting of mines are some other factors affecting the population of these birds.

Intensive pesticide use in the crops especially wheat and mustard are also thought to be responsible for declining population of cranes in the region. Aldrin has already proved dangerous to Sarus Crane in Keoladeo National Park of Bharatpur, Rajasthan. Between 1988 and 1990 the park lost 18 cranes (Murlidharan, 1993). On 23 November 2000, 15 Sarus Cranes and 3 common cranes were found dead in a field adjacent to the Keoladeo National Park, where wheat seed had been sown the previous day. Chemical analysis of seed samples from the field and the crane's alimentary tract contents identified residues of the organophosphate insecticide monocrotrophs.

Most of the marshes are lost to agricultural lands now and with that their natural food (Cyperacea family) is also lost.

With damming of rivers in the upper reaches has also worsened the situation and water does not reach to low lying Bharatpur.

Fig. 1. A comparison of present and past population of Sarus Crane from Bharatpur district, India

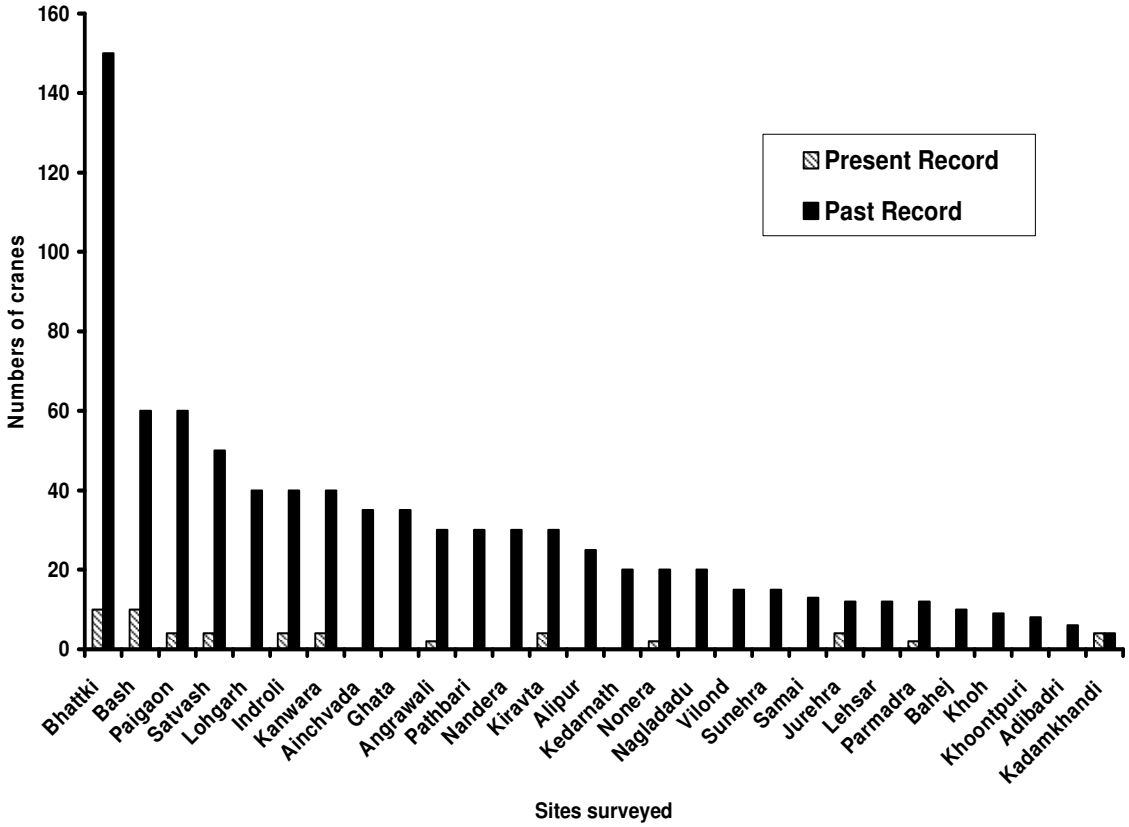

Table. 1. Sites surveyed for presence of Sarus crane in Bharatpur, India during 2007.

SN	Survey sites	GPS	Present Record	Sarus habitat use
1.	Angrawali	27°12.998 N 77°56.608 E	2	Wheat field
2.	Satvash	27°99.204 N 77°35.104 E	4	Paddy field, wetland
3.	Pathbari	27°92.103 N 77°23.004 E	nil	
4.	Kedarnath	27°37.178 N 77°11.673 E	nil	
5.	Vilond	27°36.578 N 77°12.892 E	nil	
6.	Khoontpuri	27°35.793 N 77°12.888 E	nil	
7.	Bahej	27°28.275 N 77°22.616 E	nil	
8.	Samai	27°26.360 N 77°23.945 E	nil	
9.	Kiravta	27°19.102 N 77°72.722 E	4	Wheat field, barren land, wetland
10.	Ainchbada	27°89.112 N 77°19.102 E	nil	
11.	Alipur	27°32.428 N 77°12.836 E	nil	
12.	Nandera	27°78.440 N 77°39.110 E	nil	
13.	Khoh	27°31.881 N 77°15.004 E	nil	
14.	Bash	27°46.983 N 77°12.543 E	10	Bajra field, wet land
15.	Bhattki	27°42.997 N 77°16.645 E	10	Bajra field, wet land
16.	Sunehra	27°39.069N 77°20.198E	nil	
17.	Jurehra	27°45.647 N 77°14.150 E	4	Harvested field, wet land
18.	Lohgarh	27°94.116N 77°28.088 E	nil	
19.	Nonera	27°78.34N 77°29.029 E	2	Paddy field, canal
20.	Lehsar	27°38.491N 77°13.040 E	nil	
21.	Nagladadu	27°27.275N 77°23.376 E	nil	
22.	Indroli	27°36.504N 77°88.803 E	4	Barren, wet wetland
23.	Ghata	27°22.304N 77°78.749 E	nil	
24.	Badrinarayan	27°31.991N 77°12.177 E	nil	
25.	Kanwara	27°12.866N 77°29.497 E	4	Wheat field
26.	Kadamkhandi	27°37.833N 77°19.370 E	4	wetland
27.	Adibadri	27°31.933N 77°12.182 E	nil	
28.	Parmadra	27°38.978N 77°16.263 E	2	
29.	Payigaon	27°45.646 N 77°14.150 E	4	Bajra field, wet land

RECOMMENDATIONS

Since the main threats identified are a combination of loss and degradation of wetlands, as a result of drainage and conversion to agriculture, wetland pollution from pesticides, fertilisers and industrial effluent, siltation owing to catchment deforestation and river basin alterations, and the hunting of adults and collection of eggs and chicks for mainly trade, food, and medicinal purposes. The other significant widespread threat is human disturbance of wetlands where water is drained off for irrigation purpose without thinking of future of these birds. Collision with powerlines and disturbance to mine blasting are other minor threats in these sites.

Keeping all these factors in mind the following are recommended as conservation measures for Sarus cranes in the region:

1) Conservation awareness campaigns should be initiated in schools and villages. Conservation awareness campaigns should be conducted at communities in and around important sites. Sarus cranes are biological indicators of the health of the eco system they are found in. Wherever they are found good wetlands are found. The role of these birds as bio indicators should be highlighted among students and local communities.

2) Monitoring of population of these birds should be made regular and protection to their nests, eggs and chicks should be provided.

3) Communal roosting sites should be protected by government and community on priority basis.

4) Conduct further surveys in surrounding areas of Bharatpur district.

5) Strict protection should be provided to important permanent wetlands in the dry season as these provide them roosting grounds.

6) Control pesticide use and industrial effluent disposal around feeding areas.

7) There should be strict control on the international trade of these birds.

8) The barren lands dominated by sedges, aquatic grasses and other vegetation should be urgently protected as these form natural foraging habitats for Sarus cranes.

REFERENCES

Ali S. and S.D.Ripley.1978.Handbook of Birds of India and Pakisthan. Vol. I. Bombay Natural History Society, Oxford University Press, Bombay.

BirdLife International 2007. *Grus antigone*. In: IUCN 2007. *2007 IUCN Red List of Threatened Species.* <www.iucnredlist.org>.

Baillie, J. and Groombridge, B. (compilers and editors) 1996. *1996 IUCN Red List of Threatened Animals*. IUCN, Gland, Switzerland.

BirdLife International 2006. *Threatened Birds of the World 2006*. Downloaded from http://www.birdlife.org on 04/05/2006.

BirdLife International. 2000. *Threatened Birds of the World*. Lynx Edicions and BirdLife International, Barcelona, Spain and Cambridge, U.K.

BirdLife International. 2004 *Threatened Birds of the World 2004*. CD-ROM. BirdLife International, Cambridge, U.K.

Collar, N.J., Crosby, M.J. and Stattersfield, A.J. 1994. *Birds to Watch 2. The World List of Threatened Birds* BirdLife International. Page Bros (Norwich) Ltd, U.K.

Murlidahran, S., Raghupati,A., and Sundermoorthy, T. (1993) Aldrin poisoning of Sarus crane (*Grus antigone*) and few Granivorous birds in Keoladeo National Park, Bharatpur, India Ecotoxicolgy2, 196-202.

Richard Grimmett,Carol Inskipp,Tim Inskipp,(1999) .Pocket Guide to the Birds of the Indian Subcontinent,Oxford university press.