

SIGHTING STORKS



Status and Distribution of Greater Adjutant Storks (*Leptoptilos dubius*) in the Ganga and Kosi River Floodplains Near Bhagalpur, Bihar

Sunil K. Choudhury



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March 2004

An Occasional Report of a Rapid Survey conducted by the Wildlife Trust of India



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PREFACE

WTI has involved itself in many classic Rapid Action Projects that have helped conservation, but one that sticks in the memory is that of rescuing falling Greater Adjutant Stork chicks in Assam using circus-style safety nets. Therefore, when another Greater Adjutant Stork RAP came up, we were ready for it.

This one, although equally important, was not as charismatic as the earlier one; it only involved a survey. The results, though, were equally dramatic—the first confirmed sighting of the endangered stork species in Bihar. The Greater Adjutant Stork is one of the most endangered of storks globally and India has 80 % of the global population of 1000 birds. Any addition to the population of this species by sighting them from previously unknown areas is of immense conservation value. This range extension of the species further west of Assam is commendable and the Vikramshila Biodiversity Research and Education Centre require kudos for conducting the surveys. The Gangetic and Kosi floodplains have thrown up another important species to conserve and the Wildlife Trust of India is committed to help establish the breeding status of the species in this ecosystem.

Vivek Menon
Executive Director,
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EXECUTIVE SUMMARY

Of the 20 species of storks found in the world, the Greater Adjutant Stork *Leptoptilos dubius* is perhaps the most endangered (IUCN 2003). In India, this largest of Asian storks has drastically reduced in numbers, and is confined to the Brahmaputra Valley of Assam, (Saikia and Bhattacharjee 1989, Rahmani *et al.* 1990).

No information was available on sightings of the Greater Adjutant Storks from the Gangetic plains of Bihar, India, prior to sightings in 2001. Sightings of 25 Greater Adjutant Storks from the floodplains of Vikramshila Gangetic Dolphin Sanctuary were reported by the author to the Journal of the Bombay Natural History Society. A Rapid Action Project (RAP) based on this report was commissioned for systematic search and tracking the movement of Greater Adjutant Storks for nesting and roosting places within and around Vikramshila Gangetic Dolphin Sanctuary.

Field surveys revealed that the Greater Adjutant Storks were regularly sighted in two areas, Narainpur - Pasraha - Maheshkhut area under Bhagalpur and Khagaria districts and the wetlands near Bahattrra and Jagatpur village under Bhagalpur district. However, in spite of all search efforts, nesting and roosting trees could not be located. Loss of habitat caused due to agriculture, fishing and a shift in land-use patterns posed a threat to the existing stork population that could be conserved by implementing the following recommendations:

1. Continuance of the project: Though the nesting of Greater Adjutants could not be located, continuance of the project and a further search of Greater Adjutants is highly recommended.

2. Project treatment: In future, the species should be treated as a conservation-dependent and future projects should bear this in mind.

3. Government involvement: State government officials (preferably the Forest department) should also be involved.

4. Conservation forum: An interactive forum for different working groups, working on the protection and conservation of Greater Adjutants may be established for proper sharing of experiences. WTI may take a lead in this direction.

INTRODUCTION

Of the 20 species of storks found in the world, the Greater Adjutant Stork *Leptoptilos dubius* is perhaps the most endangered (IUCN 2003). Earlier widely distributed in Nepal, Bangladesh, Myanmar, Thailand, Cambodia and South Vietnam (Baker 1929, Flemming *et al.* 1979, Ali and Ripley 1987, Hancock *et al.* 1992), this largest of Asian storks has drastically reduced in numbers, and is confined to the Brahmaputra Valley of Assam, India (Saikia and Bhattacharjee 1989, Rahmani *et al.* 1990) with a small breeding population in Cambodia (Mundkur *et al.* 1995).

No information was available on the recent sightings of Greater Adjutant Storks from the Gangetic plains of Bihar, India, prior to the author's sightings in 2001. The sightings of 25 Greater Adjutant Storks were reported from the floodplains of Vikramshila Gangetic Dolphin Sanctuary (VGDS: 25°17' N and 86°49' E) in Bhagalpur district of Bihar (Communicated to the Journal of Bombay Natural History Society, Accepted for publication). According to Dr. Asad R. Rahmani, Director, Bombay Natural History Society, Greater Adjutant Storks have not been sighted outside Assam in India in recent decades (*pers. comm*, 2002–03). Based on this report, the Wildlife Trust of India(WTI) awarded a project for systematic search and tracking the movement of Greater Adjutant Storks for nesting and roosting places within and around the Vikramshila Gangetic Dolphin Sanctuary (0013/02/WTI/RAP). The project was successfully completed and the findings were quite interesting.

Based on field surveys, it was found that the Greater Adjutant Storks were regularly sighted in two areas, Narainpur-Pasraha-Maheshkhut area under Bhagalpur and Khagaria districts (25°23'17" N and 86°58'18" E), and the wetlands near Bahattrra and Jagatpur village in the Bhagalpur

district (25°20' 282" N and 87°02'372" E). However, in spite of all search efforts, nesting and roosting trees could not be located (2002–03).

Greater Adjutant Storks are resident migratory wetland bird species with a resident population of special conservation interest. Keeping its endangered status in view and with Bhagalpur and adjoining districts confirmed as its new distribution range; WTI was approached for financial support for a study on further search of Greater Adjutant Storks in Ganges and Kosi river floodplains near Bhagalpur. WTI sanctioned the present project for six months, i.e. from November 2003 to April 2004) under Rapid Action Project (RAP).

2. OBJECTIVES

- Extensive search for Greater Adjutant Stork (GAS) population in the Ganga and Kosi river floodplains near Bhagalpur.
- Search for breeding population and nesting and roosting trees of Greater Adjutant Stork in the study area.
- Data collection on the habitat conditions and the vegetation of the areas of their sighting.
- Documentation of human activities around the areas of Greater Adjutant Stork sightings.
- Recommendations for future action plan in the area.

3. PROJECT AREA

The areas selected for this study were the middle Ganga floodplains and Kosi river floodplains near Bhagalpur in the state of Bihar. In Bihar, meanders, loops, ox-bow lakes, and extensive floodplains characterize both the rivers. The River Kosi originates in Himalayas and flows out to

the plains between the Nepal border and the Ganga. The Kosi is one of the major tributaries of the river Ganga and is known for changing its course and abandoning channel beds. These oxbow lakes, swamps in the floodplains and abandoned channel beds are good repository of fishes and a preferred habitat for a variety of birds.

The field survey was conducted from October 2003 to March 2004. The areas surveyed for Greater Adjutants include:

1. Bhagalpur-Narainpur-Pasraha-Maheshkhut. (Mainly Ganga river floodplain)
2. Maheshkhut-Sonbarsa Raj-Karua mor on NH 31 (Mainly Kosi river floodplain)
3. Bhagalpur-Naugachhia-Karhagola on NH 31(Both Ganga and Kosi river floodplains)
4. Bhagalpur-Katihar-Surapartal-Bagharbil-Mujawar tal-Gogabil Bird Sanctuary (mainly Kosi river floodplain)
5. Bhagalpur-Lakhisarai-Balgudar (Harohar river floodplain)
6. Bhagalpur-Sonbarsa diara-Sultanganj (Ganga river floodplain, Vikramshila Gangetic Dolphin Sanctuary)

These six routes were selected for field surveys based on the feedback from the previous study on Greater Adjutant Storks in the area, and on the feedback taken from local people.

4. METHODS

A survey sheet was designed to collect relevant information, such as habitat conditions and vegetation of the area of GAS sightings, GPS coordinates (as far as practicable), weather conditions, human activities in the area, number of birds, age (sub-adult or juvenile), number and types of roosting and nesting trees, number of nests (if found) and other details. Based on background information on the topography of the area, the habitat was classified into ten types and each type was assigned a code. Habitat types comprised temporary water-pool, permanent water-pool, pond, lake, river floodplains, river island, river dead/abandoned channels, grassland, cropland and wasteland.

Birds were observed using naked eyes and 7x50 binoculars. Bird identification was made by referring to Ali (1979), Ali & Ripley (1978), Sonobe & Usui (1993) and Grimmet (1999).

4.1 Field Survey for GAS

Altogether 42 field surveys were conducted from 20th October 2003 to 30th March 2004 in search of Greater Adjutant Storks. For search trips, seven pre-selected routes were followed. Two research persons independently followed a route each, accompanied by volunteers of Vikramshila Biodiversity Research and Education Centre (VBREC).

Of all the routes selected for surveys, six were in the floodplain areas of River Ganga and Kosi; and one in the Harohar river floodplain. River Harohar joins River Keul near Rehua (Lakhisarai District) that ultimately joins the River Ganga near Surajgarha (Munger District). Thus, extensive surveys for search of Greater Adjutant Stork population were made, and

this comprised the area under the districts of Bhagalpur, Khagaria, Katihar, Purnea, Lakhisarai and Munger.

During these surveys, attention was focused on search of Greater Adjutant Storks, but data on the sightings of Lesser Adjutant Storks was also recorded. The project on GAS. has thus yielded additional data on the Lesser Adjutant Stork.

Not a single Greater Adjutant Stork was recorded during the survey made from 20th October; 2003 to 22nd February 2004. This was contrary to the observations made during 2002–03 by the team. At that time, GAS was recorded four times between 13th November 2002 and 21st Feb. 2003. All the sightings were in Naugachhia-Satishnagar-Maheshkhut-Khagaria (25°23'17" N & 87°58'18" E) route on either side of NH 31. The sighting areas comprised the shallow water pool with sparsely distributed sedges and grasses, marshy wetland in Kosi floodplains shallow water pool between the railway track and NH 31, crop lands and water drying muddy pans.

Roopan Mandal, the local contact person informed the project investigator that 16–17 GAS had arrived on 13th February 2004 at a permanent water pool by the side of NH 31, seven kilometers from Naugachhia towards Purnea. Santosh Kumar Tiwari, one of the research persons with a team of volunteers visited the area on 23rd February 2004 and sighted 21 adult GAS near Situwaldhar wetland (formed due to overflow of river Kosi during monsoon), almost five kilometers west of Naugachhia (25°24'18" N & 87°11' 16"E). Eleven adult GAS were observed foraging in the shallow water of the wetland (30–60cm deep water), two were seen roosting on a babul tree *Acacia sp.*, three on a semul tree *Bombax ceiba*; and three were in flight. Gular pouch was

visible in only five GAS, but were not prominent. A bulge (half-ball size) of brick red/deep orange colour was observed on the neck of only four GAS. The team observed the activities of the birds initially for three and half hours, i.e. 12:00PM to 3:30 PM. Except three, all other Greater Adjutants took flight and spread out in the area (not visible). The survey team followed the GAS in flight, went a further three kilometers towards the west and sighted one GAS in a wetland near Madrauni. Both the wetlands, where the GAS were sighted, had sparse vegetation. The wetlands were around village settlements and near NH 31. Hence, the area was full of human activities. A number of babool trees *Acacia sp.* were found distributed haphazardly in the nearby agricultural fields.

The area near Madrauni village under Naugachhia P.S. and 10 km west to Naugachhia has a network of large and small wetlands. The wetlands south to NH 31 have the overflow waters of River Kosi and the wetlands north to NH 31 have waters of the River Ganga. The area has a number of orchards and has a good tree cover of different species. This provides a good habitat for foraging and roosting of GAS. This was further substantiated by the sightings of 13 GAS on 26th February and 3 GAS on 9th March 2004 in the same area. About 20 GAS landed in Situwaldhar wetland in the morning hours and flew to adjacent wetlands, mainly Muralichak wetland, Gidraha dhar, Madrauni wetland etc. during the afternoon hours. This was also confirmed by the local people of the villages Bania, Madrauni etc. who visit their agricultural fields near the wetland everyday. In addition to GAS, other bird species were also recorded from the wetland areas. They included open billed storks, little egret, median egret, white ibis, black ibis, marsh harrier, kestrel, red wattled lapwing, spotted sandpiper, etc.

Another contact person trained for GAS sighting in 2002 - 03, Karelal Mandal reported the sighting of five adult GAS on 15 February 2004 in Bisauni Diara, near Mouzma, about 16 km upstream of Bhagalpur; and the sighting of six adult GAS in Kulharia wetlands, seven km towards Bhattkhand near Narainpur. Both sightings were in the Ganga river floodplains.

5. DISCUSSION

Threat to Greater Adjutant Storks: Loss of habitat.

Table 1 shows that the GAS were sighted in three areas during the survey conducted under this project:

Madrauni: Located at 25°24'18"N & 87°11'16"E, where a number of temporary and permanent wetlands have been formed due to overflow of River Ganga and Kosi water, about 10 km from Bhagalpur. The area has a good stand of trees, agricultural fields and human settlements near the wetlands. Fishing is a common activity in these wetlands. Temporary wetlands dry up by April – May. GAS have not been sighted in this area after March. This is the season when farmers harvest their crops and the whole area is full of activity and noise causing disturbance to wetlands. Hence, GAS depart from this area in search of another place for food and shelter.

Pasraha: Only one GAS was sighted near Pasraha (25°23'17"N & 86°58'18"E) , GAS had previously been sighted in more numbers and more frequently in the years 2001–03. There has been a great change in the land-use pattern in this area. Earlier, the stretch of land between the railway track and NH.31 was not under cultivation. The contour of the

area was uneven. In post-monsoon period, this stretch was full of water giving an appearance of a river corridor. Hence, the longitudinal stretch along the rail-track and NH. 31 was an ideal habitat for the Greater Adjutant Storks. Since the last two years, people have started cultivating 'sunflower' in the area. Hence, the land is now under active cultivation, associated with various activities all through the year. Farmers use water from the temporary water pools for irrigating the crops. As a result of all this, the features of the land have changed and probably that is the reason GAS have abandoned this area, since only one GAS was sighted twice during the project period.

Ganga floodplains: GAS was sighted in the River Ganga floodplains, near Bhagalpur, near Bisauni diara. 17 km upstream of Bhagalpur and near Bhatkhand, nearly 40 km from Bhagalpur. GAS have been regularly sighted in the River Ganga floodplain since 2001.

Jagatpur Wetland: In the year 2002–03, 20 GAS (13 adults and 7 immature) were sighted in the Jagatpur wetland (25°20'235" N & 87°02'625"E) –a highly eutrophic permanent wetland, under Bhagalpur district. Several field surveys made to Jagatpur wetlands, could not result in observing any Greater Adjutant Stork on any trip. A change in the attitude of local people was also noticed here. They were more interested in farmland than the wetland and had converted a major portion of the dried wetland in the post monsoon period to cropland for cultivation of cash crops like vegetables and banana. As the area is only 15 km from the city and well connected by road, the people are motivated to grow vegetables in the area. This has shrunk the wetland and upset its eco-balance. All sorts of human activities including the operation of tractors are a deterrent for the visiting birds. That may be a reason that the Greater Adjutant Storks have not visited this wetland in 2004.

However, GAS could not be sighted in other potential areas, which were selected this year based on feedback by local people. The area is so vast that it is difficult to move with limited resources. Another major problem is the threat of violence by anti-socials in the area. Several secondary information about sightings of GAS in remote floodplain areas of the rivers Ganga and Kosi could not be followed up because of security reasons. The nesting of Greater Adjutants could not be located in spite of the best efforts of the project team. Despite records of GAS present in the area for seven to eight months and the belief that they also breed in this area, the hypothesis could not be proved. The questions that arose from this survey are: -

1. Is this GAS population an isolated population or a migratory population from the Brahmaputra valley?
2. Why do they migrate from Assam to this area?
3. Do they return to the Brahmaputra valley for breeding?
4. How should the 'Search of GAS' program be designed to collect more authentic information on GAS?

6. RESULTS

1. Confirmation on the presence of a small population of Greater Adjutant Storks in the River Kosi and middle Ganga plain near Bhagalpur. Since 2001, when 25 Greater Adjutants had first been sighted, this highly endangered bird species is sighted every year (2000–04) numbering over twenty.
2. Confirmation of the project area under study as new range of distribution for Greater Adjutants in India.

3. Important information collected on the distribution, roosting, nesting and feeding of Lesser Adjutant Storks.

7. RECOMMENDATIONS

7.1. Continuance of Project:

Though the nesting of Greater Adjutants could not be located, the continuance of the project on further search of Greater Adjutants is highly recommended. Compared to the Brahmaputra valley in Assam, where the nodes of the breeding population are well identified, this area is quite large with a heterogeneous landscape; it needs more search efforts to cover the area to ascertain the actual number of Greater Adjutants present in the area.

7.2 Project Treatment:

In future, the species should be treated as conservation dependent and future projects should bear this in mind

7.3 Involvement of the State Government:

State government officials (preferably Forest department) should also be involved.

7.4 Interactive Conservation Forum

An interactive forum for different working groups, working on the protection and conservation of Greater Adjutants may be established for proper sharing of experiences. WTI may take a lead in this direction.

Table 1: Survey for Greater Adjutant Storks in the Ganga & Kosi flood plains area
From 20th October 2003 to 22 January 2004

Survey Area	GPS Coordinates	No. of Birds Sighted	Place of sighting	Trees/Vegetation	Nesting/Roosting Trees	No. of Nests	Remarks
Village Gandhigram ,Bihpuria tola at Karhagola, Dist-Katihar (72 km from Bhagalpur)	25°29' 324" N ;87°22' 989" E	29 LAS:15 chicks and 14 adults	Village area	Pakar(<i>Ficus infectoria</i>), Bargad (<i>F benghalensis</i>), Kadamb(<i>Anthocephalus cadamba</i>), Bamboo (<i>Bambusa indica</i>)	Nesting tree-Silk-cotton tree (<i>Bombax ceiba</i>),Roosting tree -Pakar (<i>Ficus infectoria</i>), Bargad -(<i>F benghalensis</i>), Kadamb(<i>Anthocephalus cadamba</i>)	7	One adult bird present on each nest tending their chicks.
Koyla Village, Pashara, Dist-Khagaria	NR	4 LAS Adult	Village area	Arjuna (<i>Terminalia arjuna</i>), Sisham (<i>Dalbergia sissoo</i>)	Nesting tree - Arjuna (<i>Terminalia arjuna</i>) -Nos.2	3	Adults in nest.
Between Piparpanti and Koyla Village ,at Pashara, Dist-Khagaria	NR	3 LAS: 2 Chicks, 1 Adult	Farm land, Temporary water pool	Arjuna (<i>Terminalia arjuna</i>), Wheat (<i>Triticum vulgaris</i>)	Nesting tree - Arjuna (<i>Terminalia arjuna</i>) -No.1	1	Adult tending chicks.
Village Sonbarsa ghat ,Dist - Khagaria, (1 km from Kosi River bridge)	NR	2 LAS Adult	Village area and Grove	Arjuna (<i>Terminalia arjuna</i>), Sisham (<i>Dalbergia sissoo</i>), Bamboo (<i>Bambusa indica</i>)	Nesting tree - Arjuna (<i>Terminalia arjuna</i>) -No.1	0	Birds observed building nest.
Between Usaraha and Ramnagar ,at Dumari Sonbarsa (2 km from Kosi River bridge)	NR	2 LAS Adults	Grove	Arjuna (<i>Terminalia arjuna</i>), Sisham (<i>Dalbergia sissoo</i>), Bamboo (<i>Bambusa indica</i>)	Nesting tree - Arjuna (<i>Terminalia arjuna</i>) -No.1	2	-
Wetlands near Bahattra and Jagatpur village	25°20' 82" N; 87°02'3 72" E	1 LAS Adult	Permanent water pool	<i>Eichhornia sp.</i> In wetland, Arhar (<i>Cajanus cajan</i>) & water weeds	-	-	Bird was observed foraging for food in a small patch of marshy land.

Jagatpur wetlands, Bhagalpur	25°20'28" N, 87°02'372" E	4 LAS Adults	Marshy wetland - littoral zone	<i>Eichhornia sp.</i> , <i>Nymphaea sp.</i> & other aquatic weeds	-	-	-
Bihpuria Tola, Karagola, Dist. Katihar.	25°29'324" N; 87°22'989" E	28 LAS: 14Chicks and 14 adults	Village area	Pakar(<i>Ficus infectoria</i>), Bargad (<i>F benghalensis</i>), Kadamb(<i>Anthocephalus cadamba</i>), Bamboo (<i>Bambusa indica</i>)	Nesting tree-Silk-cotton tree (<i>Bombax ceiba</i>), Roosting tree - Pakar (<i>Ficus infectoria</i>), Bargad (<i>F benghalensis</i>), Kadamb(<i>Anthocephalus cadamba</i>)	7	Compared to 20.10.2003 sighting, one chick had died due to a fall from the nest as reported by villagers.
Pasraha - Satishnagar, Dist. Khagaria	NR	6 LAS Adults	Temporarily marshy wetland near railway tracks	Grasses and sedges sparsely distributed in shallow water.	-	-	-
Village Gharari, Navtolia at Mirganj, Dist- Purnia, (29 Km approx from Purnia)	NR	3 LAS: 2 Chicks, 1 Adult	Village area	Bamboo (<i>Bambusa indica</i>) Pakar(<i>Ficus infectoria</i>), Silk-cotton tree (<i>Bombax ceiba</i>)	Nesting tree -No.1 Peepal (<i>Ficus religiosa</i>)	1	Chicks were making their exploratory flights.
Mokama village, Bishnupur, Dist-Purnia (49 km approx from Purnia)	NR	16 LAS: 8 Chicks, 8 Adults	Village area	Bamboo (<i>Bambusa indica</i>), Silk-cotton tree, (<i>Bombax ceiba</i>), Sisham (<i>Dalbergia sissoo</i>), Peepal (<i>Ficus religiosa</i>), Bargad (<i>F benghalensis</i>)	Peepal (<i>Ficus religiosa</i>) Nesting tree Nos.3, Lachhaura or Lathauva, Nesting tree No.1, Kadamb(<i>Anthocephalus cadamba</i>), Silk-cotton tree (<i>Bombax ceiba</i>) Roosting tree	4	-
Orlaha village, at Bishnupur, Dist-Purnia (38km approx from Purnia)	NR	2 LAS	Permanent Wetland Shallow water with sparsely distributed grasses and Eichhornia sp.	<i>Cyperus sp.</i> , <i>Eichhornia sp.</i> and other 30 to 60 cm long grasses	-	-	-

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Village Sonsa, Brahaman tola at Gowasi, Dist - Purnia (9 km approx to Purnia)	NR	9 LAS: 6 Chicks, 3 Adults	Village area temporary water pool adjacent to western boundary wall of Chunapur Air Force Station	Bamboo (<i>Bambusa indica</i>), Babol (<i>Acacia nilotica</i>), Jungle jilabi (<i>Pithecobium dulce</i>), Kadamb (<i>Anthocephalus cadamba</i>), Arjun (<i>Terminelia arjuna</i>), Mango (<i>Mangifera indica</i>), <i>Titvant sp.</i> , <i>Lantana sp.</i> Sisham (<i>Dalbergia sissoo</i>)	Bargad (<i>F. banghalensis</i>), Nesting tree No.1, Mango (<i>Mangifera indica</i>), Bamboo (<i>Bambusa indica</i>)	3	-
1.5 Km on the outskirts of Manihari Block (27km from Katihar)	NR	1 LAS Adult	Mahananda floodplain, Temporary water pool	Drying grasses and other aquatic weeds	-	-	-
Between Surapartal and Kanta Kosh village (33Km approx from Katihar)	NR	1 LAS Adult	Temporary and permanent water pools, farmland near the village.	Babool (<i>Acacia nilotica</i>)	Babool (<i>Acacia nilotica</i>)	-	-
Bagharbil, 1.5 km from to Gogabil (34 Km approx from Katihar)	NR	12 LAS Adults	Permanent wetland with weeds, village farmland.	90 - 100 cm high grasses <i>Cyperus sp.</i> Paddy seedlings and wheat crop in the fields	Sisham (<i>Dalbergia sissoo</i>), Kadamb (<i>Anthocephalus cadamba</i>)	-	-
Mujwartal to Rasmohan Chowk, 12 km from Gogabil, Katihar	NR	3 LAS Adults	Farmland	Wheat crop	-	-	-
Gogabil Bird Sanctuary (38km from Katihar)	NR	4 LAS Adults	Permanent Wetland, Farmland	100 - 120 cm high grasses	-	-	-
Bhagalpur - Sultanganj (both upstream & downstream), VGDS	NR	5 LAS Adults	Floodplain near Sonbarsa (upstream) & near Moujama (downstream)	-	-	-	-
Naugachhia - Bihpur, Dist. Bhagalpur	NR	3 LAS Adults	Ganga & Kosi floodplain	Mixed vegetation including herbaceous & woody sps	-	-	-
Madrauni village, Naugachhia, Bhagalpur	NR	4 LAS Adults	Kosi floodplains	Grasses sedges & marshy plants	-	-	-

Bihpuria Tola, Karagola, Dist. Katihar.	25°29' 324" N; 87°22' 989" E	28 LAS: 14Chicks and 14 adults	Village area	Pakar(<i>Ficus infectoria</i>), Bargad (<i>F benghalensis</i>), Kadamb(<i>Anthocephalus cadamba</i>), Bamboo (<i>Bambusa indica</i>)	Nesting tree-Silk-cotton tree (<i>Bombax ceiba</i>), Roosting tree -Pakar (<i>Ficus infectoria</i>), Bargad - (<i>F benghalensis</i>), Kadamb(<i>Anthocephalus cadamba</i>)	7	Compared to earlier sighting at the same place, the grownup chicks were observed trying to make exploratory flights.
Ganga floodplains near Bhagalpur	25°17'36 N, 86°59'258" E	2 LAS Adults	Diara land, wet sandy soil	<i>Saccharum spontaneum</i> , <i>Tamarix sp.</i> sparsely distributed	-	-	-

From 6th February 2004 to 30th March 2004

Survey Area	GPS coordinates	No. of birds sighted	Place of sighting	Vegetation	Nesting/Roosting trees	No. of nests	Remarks
Maheshkhunt - Karuwamor Sonbarsaraj (Dist.-Khagaria)	NR	04 LAS (Chicks)	Diaraland and village area.		<i>Dalbergia sisso</i>	02	Adult Storks feeding their chicks.
Maheshkhunt - Pirnagra, Chakarmania (Dist.-Khagaria)	NR	00	Kosi flood plain area		<i>Terminalia arjuna</i>	02	Villagers reported that it is the nest of LAS.
Khurahan-Aalamnagar Basanbara-Pansalwa, (Dist. - Madhepura & Khagaria)	NR	12 LAS (Younger)	Kosi flood plains and village area.		<i>Bombax Ceiba-2 Dalbergia sisso</i>	06	Younger of LAS were making mock flights
Shankarpur diara , Near Jamunia dhala at Navgacchia (Dist.- Bhagalpur)	NR						
Harohar river, from Balgudar to Rehuwa, (Dist.Lakshisari)	NR	00	-	-	-	00	Hundreds of Lesser Whistling Ducks and Little Cormorants observed feeding in river.

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Bhagalpur - Kahalgaon, (Dist.- Bhagalpur)	NR	02 LAS (Adults)	Wetlands & Ganga floodplains	Shallow water Pool with sparsely distributed grasses and sedges in between river Ganga and Highway.	-	00	Birds were sighted feeding in water pool.
Murli Chauk ,Situwaldhar, Wetland at Navgacchia , Dist.- Bhagalpur, 05 KM away from Navgacchia towards Purnia by NH-31.	25 24 18 N, 87 11 16 E	21 GAS (Adults)	Spilled water of river Ganga temporary water pool.	Water surface clear, marginal area covered by grasses up to 1-10 cm. Height.	<i>Bombax ceiba, Ficus religiosa, Accasia nilotica</i>	00	11 GAS sighted feeding in a loose group, 05 GAS observed with Gular Pouch, their neck back had ¼ Orange sized & Orange coloured ridge. 02 GAS observed on <i>Accasia nilotica</i> & 05 GAS on <i>Bombax ceiba</i> while 03 GAS were hovering over wetland.
Wetlands near Bahattra and Jagatpur Villages (Dist.- Bhagalpur)	25 20 282 N, 87 02 372E	05 (Blacknecked Stork, 02 adult & 03 Young)	Temporary and Permanent Wetlands in Ganga flood plain area.	<i>Eichhornia sp. Hydrilla sp. Potamogeton sp.</i> etc. 45 % of water surface covered by <i>Eichhornia sp.</i>	-	00	All birds sighted feeding with Openbilled Storks and Herons.
Murli Chauk ,Situwaldhar Wetland at Navgacchia , Dist.- Bhagalpur, 05 KM away from Navgacchia towards Purnia by NH-31	25 24 18 N, 87 11 16 E	13 GAS (Adults)	Spilled water of river Ganga temporary water pool.	Water surface clear, marginal area covered by grasses up to 1-10 cm. Height.	<i>Bombax ceiba, Ficus religiosa, Accasia nilotica</i>	00	GAS Were feeding very close approx 50m to busy NH. One Gas was searching prey in approx 60cm deep water.
Badi Catting Wetland, at Pasraha (Dist. - Khagaria)	NR	01 GAS (Adult), 02 LAS (Adult)	Permanent Wetland & Ganga floodplains	<i>Eichhornia sp., Hydrilla sp., Potamogeton sp.</i> Wetland was circled by herbacious weeds and grasses	<i>Bombax ceiba, Ficus religiosa</i>	00	GAS was sitting with a flock of Little Cormorants & Intermediate Egrets. LAS observed feeding. At 10:20AM a mixed flock of about 21 LAS & GAS observed hovering very high in the western sky.

Sakrohar village, at Beldaur, (Dist-Khagaria, 107 KM from Bhagalpur, by NH-31 and NH-107)	25 36 260 N, 86 49 537 E	40 LAS (24 young & 16 Adults) 15 White Backed Vulture(Adult)	Orchards.Village area, swamp area in Kosi flood plain		<i>Bombax ceiba</i> -02, <i>Diablerie Sisso</i> -01, (Nesting trees of LAS), Palm sp. (02+02 = 04)	12 LAS, 02 White Backed Vulture	Young of LAS observed on nesting trees, adults were bringing young's meal. One Vulture observed sitting on their nest where as four Vultures observed sitting on two palm trees and rest 10 Vultures hovering very high.
Pasraha Dhala (Dist.-Khagaria.	NR		Permanent Wetland & Ganga floodplains	<i>Eichhornia sp.</i> , <i>Hydrilla sp.</i> <i>Potamogeton sp.</i> Wetland was circled by herbacious weeds and grasses	<i>Bombax ceiba</i> , <i>Ficus religiosa</i>		
Navgacchia-Murli chauk - Madrauni Chauk , Dist.-Bhagalpur, 05-08 KM away from Navgacchia towards Purnia by NH-31.	25 24 18 N, 87 11 16 E		Spilled water of river Ganga temporary water pool.	Water surface clear, marginal area covered by grasses up to 1-10 cm. Height.	<i>Bombax ceiba</i> , <i>Ficus religiosa</i> , <i>Accasia nilotica</i>		
Navgacchia-Murli chauk - Madrauni Chauk , Dist.-Bhagalpur, 05-08 KM away from Navgacchia towards Purnia by NH-31	25 24 18 N, 87 11 16 E	01 GAS (Adult) 07 LAS, (03 Young & 04 Adults)	Spilled water of river Ganga temporary water pool and receding water pool.	Water surface clear, marginal area covered by grasses up to 1-10 cm. Height.	<i>Bombax ceiba</i> , <i>Ficus religiosa</i> , <i>Accasia nilotica</i>	00	GAS observed on <i>Bombax ceiba</i> . In evening when hundreds of Open billed Storks arrived on the tree GAS flew out to sit on <i>Accasia nilotica</i> . In another receding water pool young of LAS observed feeding with the group of Ibis and Egrets while adults observed feeding in another water pool.

Table 2: Survey for Greater Adjutant Storks in the Ganga & Kosi flood plains area
From 6th February 2004 to 30th March 2004

SI No.	Survey Date (s)	Survey Area	GPS Coordinates	No. Of Birds Sighted	No. of Nests	Habitat	Vegetation(s)	Nesting/ Roosting Trees Sighted	Remarks
01.	06.02.2004	Maheshkhunt - Karuwamor, Sonbarsaraj (Dist.- Khagaria)	NR	04 LAS (Chicks)	02	Diaraland and village area.		<i>Dalbergia sisso</i>	Adult Storks feeding their chicks.
02.	07.02.2004	Maheshkhunt - Pirnagra, Chakarmani (Dist.- Khagaria)	NR	00	02	Kosi flood plain area		<i>Terminalia arjuna</i>	Villagers reported that it is the nest of LAS.
03.	08.02.2004	Khurahan- Aalamnagar, Basanbara- Pansalwa, (Dist. - Madhepura & Khagaria)	NR	12 LAS (Younger)	06	Kosi flood plains and village area.		<i>Bombax ceiba-2, Dalbergia sisso</i>	Young of LAS were making mock flights
04.	15.02.2004	Shankarpur diara , Near Jamunia dhala at Navgacchia (Dist.- Bhagalpur)	NR						
05.	20.02.2004	Harohar river, from Balgudar to Rehuwa (Dist.Lakkhisari)	NR	00	00	-	-	-	Hundreds of Lesser Whistling Ducks and Little Cormorants observed feeding in river.
06.	22.02.2004	Bhagalpur - Kahalgaon (Dist.- Bhagalpur)	NR	02 LAS (Adults)	00	Wetlands & Ganga floodplains	Shallow water pool with sparsely distributed grasses & sedges b/n river Ganga & Zhighway.	-	Birds were sighted feeding in water pool.

SI No.	Survey Date (s)	Survey Area	GPS Coordinates	No. Of Birds Sighted	No. of Nests	Habitat	Vegetation(s)	Nesting/ Roosting Trees Sighted	Remarks
08	24.02.2004		25 20 282 N 87 02 372E	05 (Blacknecked Stork, 02 adult & 03 young)	00	Temporary and permanent wetlands in Ganga floodplain area.	<i>Eichhornia sp.</i> , <i>Hydrilla sp.</i> , <i>Potamogeton sp.</i> etc. 45 % of water surface covered by <i>Eichhornia sp.</i>		All birds sighted feeding with Openbilled Storks and Herons.
09	26.02.2004	Murli Chauk, Situwaldhar wetland at Navgacchia, Dist.- Bhagalpur, 05 km away from Navgacchia towards Purnia by NH-31	25 24 18 N. 87 11 16 E	13 GAS(Adults)	00	Spilled water of river Ganga temporary water pool.	Water surface clear, marginal area covered by grasses up to 1-10 cm. Height.	<i>Bombax ceiba</i> , <i>Ficus religiosa</i> , <i>Accasia nilotica</i>	GAS Were feeding very close approx 50m to busy NH, one GAS was searching prey in approx 60cm deep water.
10	02.03.2004	Badi Catting Wetland, at Pasraha (Dist. - Khagaria	NR	01 GAS (Adult) 02 LAS (Adult)	00	Permanent Wetland & Ganga floodplains	<i>Eichhornia sp.</i> , <i>Hydrilla sp.</i> , <i>Potamogeton sp.</i> Wetland was circled by herbaceous weeds and grasses	<i>Bombax ceiba</i> , <i>Ficus religiosa</i>	GAS was with a flock of Little Cormorants & Intermediate Egrets. LAS observed feeding. at 10:20AM a mixed flock of about 21 LAS & GAS observed hovering very high in the western sky.

Sighting Storks

SI No.	Survey Date (s)	Survey Area	GPS Coordinates	No. Of Birds Sighted	No. of Nests	Habitat	Vegetation(s)	Nesting/Roosting Trees Sighted	Remarks
11	03.03.2004	Sakrohar village, at Beldaur, (Dist-Khagaria, 107 km from Bhagalpur, by NH-31 and NH-107)	25 36 260 N 86 49 537 E	40 LAS (24 Young & 16 Adults) 15 White Backed Vulture (Adult)	12 LAS 02 White Backed Vulture	Orchard s. village area, swamp area in Kosi flood plain		<i>Bombax ceiba</i> -02, <i>Diablerie Sisso</i> -01, (Nesting trees of LAS) Palm sp. (02+02 = 04)	Young of LAS observed on nesting trees, adults were bringing young meal. One Vulture observed sitting on their nest whereas four Vultures observed sitting on two palm trees and 10 Vultures hovering very high.
12	03.03.2004	Pasraha Dhala (Dist.-Khagaria.	NR			Permanent wetland & Ganga floodplains	<i>Eichhornia</i> sp. <i>Hydrilla</i> sp. <i>Potamogeton</i> sp. Wetland was circled by herbaceous weeds and grasses	<i>Bombax ceiba</i> , <i>Ficus religiosa</i>	
13	09.03.2004	Navgachhia-Murlichauk - Madrauni Chauk, Dist.-Bhagalpur, 05-08 km away from Navgachhia towards Purnia by NH-31.	25 24 18 N 87 11 16 E			Spilled water of river Ganga temporary water pool.	Water surface clear, marginal area covered by grasses up to 1-10 cm. Height.	<i>Bombax ceiba</i> , <i>Ficus religiosa</i> , <i>Accasia nilotica</i>	

SI No.	Survey Date (s)	Survey Area	GPS Coordinates	No. Of Birds Sighted	No. of Nests	Habitat	Vegetation(s)	Nesting/Rooting Trees Sighted	Remarks
14	16.03.2004	Navgacchi - Murli chaur - Madrauni Chauk , Dist.- Bhagalpur, 05-08 km away from Navgacchi towards Purnia by NH-31	25 24 18 N 87 11 16 E	01 GAS (Adult) 07LAS (03 Young & 04 Adults)	00	Spilled water of river Ganga temporary water pool and receding water pool.	Water surface clear, marginal area covered by grasses up to 1-10 cm. height.	<i>Bombax ceiba</i> , <i>Ficus religiosa</i> , <i>Accasia nilotica</i>	GAS observed sitting on <i>Bombax ceiba</i> . In evening when hundreds of Open billed Storks arrived on the tree GAS flew out to sit on <i>Accasia nilotica</i> . In another receding water pool young of LAS observed feeding with the group of Ibis and Egrets while adults observed feeding in another water pool.
15	18.03.2004	Gogabill - Mandua - Bhendiyah i- Bagharbill - Bholahan. (Dist. - Katihar approx 34 km south - east to Katihar.	NR	05 LAS (Adults)	00	Permanent Wetlands, Water pools and Farmlands.	Marginal area was full of 200-300cm long grasses and Paddy crop.	<i>Bombax ceiba</i>	02 LAS in Gogabill and 03 LAS in Bagharbill observed searching prey. Approx 120 fishermen and they fishing with 30 small boats, moreover 15 labour-eradicating waterweeds for MAKHANA crop disturbed Gogabill. People reported GAS could frequently sighted here during flood seasons.
16	19.03.2004	Lahitola - Bardia/bari (Dist. - Katihar)	NR	04 LAS (Adults)	00	Permanent Wetlands, Water pools and Farmlands.	Water pools with few waterweeds.	<i>Accasia nilotica</i>	02 LAS observed sitting on <i>Accasia nilotica</i> near Lahitola. At Bardia/bari 02 LAS observed feeding in a permanent wetland.

Sighting Storks

SI No.	Survey Date(s)	Survey Area	GPS Coordinates	No. Of Birds Sighted	No. of Nests	Habitat	Vegetation(s)	Nesting/Roosting Trees Sighted	Remarks
17	20.03.2004	Manihari - Naryanpur (Dist. - Katihar, 20 km south to Katihar in Manihari road)	NR	02 LAS (Adult)	00	Permanent Wetland circled by cultivated fields.	<i>Eichhornia</i> sp., <i>Hydrilla</i> sp., <i>Eliocharis</i> etc. present in the water body.	<i>Dalbergia sisso</i>	LAS observed sitting on <i>Dalbergia sisso</i> between wetland and road.
18	21.03.2004	Munjwartal - Rasmohan chauk (Dist. - Katihar, 36-40 km from Katihar.)	NR	02 LAS (Adult)	00	Village area, Temporary water pools and cultivated fields.	Water bodies with few waterweeds.	-	02 LAS and 01 Eurasian Marsh Harrier (<i>Circus aeruginosus</i>) observed hovering over water bodies of Munjwartal.
19	30.03.2004	Flood plain towards Northern bank - opposite to "Pani Tanki" Ghat, Barari. (Dist. - Bhagalpur)	NR	02 GAS (Adult)	00	Ganga river flood plains	No Vegetation.	-	GAS observed foraging for food in the shallow waters of the river.

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Emergency Relief Network Digest 2005 – 2006

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Believed to be confined to the Brahmaputra valley of Assam, the sighting of 25 endangered Greater Adjutant Storks in the floodplains of the Ganga and Kosi rivers paved the way for a Rapid Action Project on studying the status and distribution of this endangered bird in Bihar. This report documents the sightings of the GAS in Bihar and recommends measures to conserve the species.



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