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Surveys for Lesser Adjutant *Leptoptilos javanicus* in and around Koshi Tappu Wildlife Reserve, Nepal

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Lesser Adjutant *Leptoptilos javanicus* occurs in India, Nepal, Bangladesh, Myanmar, Thailand, southern China, Laos, Cambodia, Vietnam, peninsular Malaysia, Brunei and Indonesia (BirdLife International 2001). Within this large range, most of the population is now confined to the Indian subcontinent (Choudhury 2000). The species is listed globally as Vulnerable (BirdLife International 2004) and nationally as threatened (Baral and Inskipp 2004) because it has a small and declining population owing to habitat loss and degradation, hunting and disturbance (BirdLife International 2001).

Lesser Adjutant was previously common in southern Nepal, but it is now mainly restricted to isolated areas (BirdLife International 2001), such as Koshi Tappu Wildlife Reserve (Fleming *et al.* 1984, Pokharel 1998). Although the reserve provides good habitat for many waterbirds, annual counts indicate that waterbird numbers are declining (Baral and Inskipp 2004). Apart from studies in Royal Chitwan National Park (Gyawali 2003a,b, Hungden and Clarkson 2003, Tamang 2003, Choudhary 2004),

systematic surveys of the species have not been carried out. I carried out such surveys in Koshi Tappu Wildlife Reserve, focusing on population size, nesting and habitat preferences.

STUDY AREA

Koshi Tappu Wildlife Reserve (hereafter Koshi Tappu) lies at 26°38'N 87°00'E on the banks of Sapta-Koshi River in Sunsari, Saptari and Udayapur districts of east Nepal. The reserve is characterised by sandy and silty soils with patches of scrub and mixed deciduous riverine forest scattered on the high ground. The vegetation consists primarily of *Acacia catechu* and *Dalbergia sisoo* trees, with tall elephant grass *Saccharum spontaneum*, *S. arundinacea* and cattail *Typha elephantina*. The reserve was gazetted in 1976 mainly to conserve habitat for the remaining population of buffalo *Bubalus arnee*. A total of 477 bird species has been recorded here, of which 18 are globally threatened (Bird Conservation Nepal 2004a). In particular,

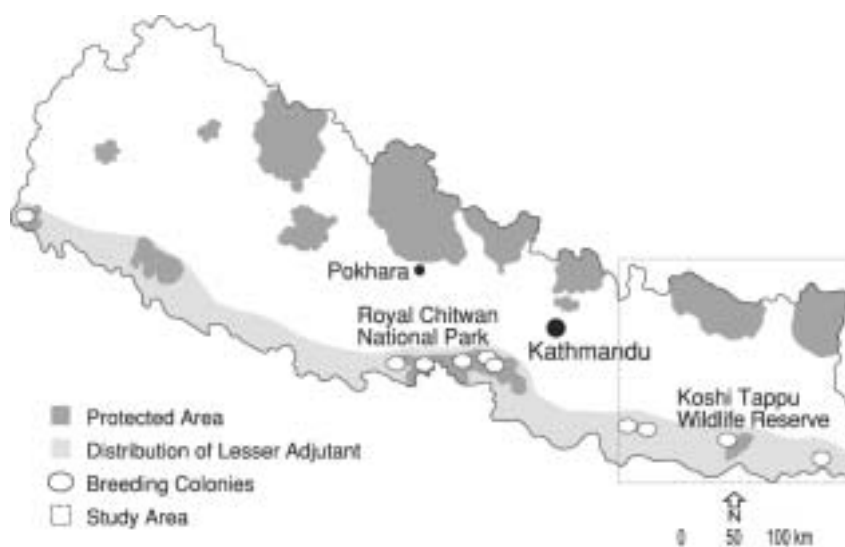


Figure 1. Map showing location of Koshi Tappu Wildlife Reserve and the distribution of Lesser Adjutant *Leptoptilos javanicus* in Nepal.

the reserve holds the largest population of Swamp Francolin *Francolinus gularis* (Vulnerable) in Nepal (Baral 1998, Dahal 2000, 2002). Koshi Tappu has been designated as a Ramsar site and an Important Bird Area (Baral and Inskipp 2001). Outside Koshi Tappu, the study covered Morang, Sunsari, Saptari, Udaypur and Siraha districts. These lie primarily in the lowland terai, apart from Udaypur which lies mainly in the hills. Agriculture is the major land use in these districts (Central Bureau of Statistics 1998).

METHODS

Data were collected from September 2003 to February 2004. Observations were made in all potential habitats of Lesser Adjutant; such areas were located by questioning knowledgeable local people. Nest searches were conducted during the breeding season (September to December). Care was taken not to disturb the birds, although many were close to human settlements and even highways. A nest was counted as active or apparently occupied if young were seen in the nest or at least one adult was on the nest (Bibby *et al.* 1992). Because the species is large and conspicuous, and colonies are relatively small, we were able to carry out direct counts of all individuals. When individuals were observed, the habitat they occupied was recorded as one of three classes: agricultural fields (paddy, wheat, and cereals), open wetlands and shallow marshes.

RESULTS

The greatest concentration of feeding storks was found between Lahan (Siraha district) and Inaruwa (Sunsari district) with 26 individuals in February 2004. Koshi Barrage and areas to the west were also good areas for feeding birds. During September–December 2003, of 15 birds seen feeding, 60% were in paddyfields, and 40% were in shallow marshes.

In total, 61 nests were found at four colonies (Table 1). The largest colony was at Urlabari, Morang, with 31 occupied nests (including 14 in just one tree). All nests were outside Koshi Tappu apart from those at Kamalpur, which lies in the buffer zone. All nests were found in karam *Adina cordifolia* (59%) or simal *Bombax ceiba* (41%), with 2–14 per tree. In total, 108 chicks (mainly old, nearly fledged individuals) were counted. Assuming that all survived to fledging and that each nest had a pair of adults tending, then the total population in the area was 231 individuals.

DISCUSSION

Population

The global population of this species is estimated to be 5,000 individuals (BirdLife International 2004). The number we estimated in eastern Nepal (231 individuals) thus represents almost 5% of the global population. We noted that some colonies had disappeared, presumably as a consequence of disturbance. No nests were found at Prakashpur, Sunsari district (one nest noted in 2001: personal observations), Tarahara, Sunsari district (six active nests in 1982–1983: BirdLife International 2001), and Mahadevpatti, Saptari district (eight nests in 2001–2002: personal observations). We found that Lesser Adjutants have declined in and around Koshi

Table 1. Colonies of Lesser Adjutant *Leptoptilos javanicus* found near Koshi Tappu.

Location (district)	Coordinates	Tree species	No. nests	No. chicks
Urlabari (Morang)	26°39'N 87°36'E	karam	31	56
Kamalpur (Saptari)	26°40'N 86°56'E	karam	5	10
Kali Khola (Siraha)	26°53'N 86°15'E	simal	8	13
Shobhapur (Siraha)	26°45'N 86°28'E	simal	17	29
Total			61	108

Table 2. Distribution of Lesser Adjutant *Leptoptilos javanicus* nests in central and western Nepal.

Place	Nests	Young	Source
Baghuaghera, Chitwan	7	8?	Gyawali 2003
Kachhuwani, Chitwan	2	2+3	Personal observations 2004
Between Dumaria and Jarneli, Chitwan	10	30	Personal observations 2004
Sukhibhar and TigerTops, Chitwan	12	24	Tamang 2003, Choudhary 2004
Gundri Khola, Nawalparasi	c.10	20	Tamang 2003, Choudhary 2004
Sukila Phanta, Kanchanpur district	c.10	20	Personal observations 1997
Total	c.51		

Tappu reserve. Only two birds were noted inside the reserve, with a further six seen in adjacent agricultural land. By contrast, Pokharel (1998) recorded 65 individuals in and immediately adjacent to the reserve during 1994–1995. In central and western Nepal, a combination of recently published counts and personal observations suggests a total breeding population of about 50 pairs (Table 2). Adding this to the total for east Nepal gives a national total of c.220 breeding individuals. This estimate falls within the range of 100–500 estimated for the country (H. S. Baral 1998 *in litt.* to BirdLife International 2001). Adding non-breeding birds and fledglings gives a population in the upper end of this range. This makes Nepal the second most important country for the species after India (Choudhury 2000).

The most important finding of this study is that all the nests found were outside protected areas. Even if we assume that all the nests in central and western Nepal lie within protected areas, the majority of the country's Lesser Adjutant population nest outside protected areas. This new information is alarming as it was previously thought that protected areas held the majority of the population. Birds may be safer nesting inside a protected area, but for feeding they prefer open fields, rice fields, and shallow marshes which are mostly outside protected areas.

Conservation

Lesser Adjutant is impacted by several threats, primarily habitat loss, disturbance and hunting (Shakya 1995, Giri 1997, Pokharel 1998, Petersson 1998, Gyawali 2003a,b, BirdLife International 2001). Feeding habitat is being converted to agriculture and infrastructural development. Current changes in agricultural practice may adversely affect adjutants. Farmers have switched to cash crops such as vegetables and fruit from traditionally grown crops such as paddy and wheat. Since paddyfields are apparently important feeding habitats for adjutants, these changes may have serious consequences. Further studies should investigate how dependent the birds are on paddyfields.

Nesting colonies are often close to human settlements, and many have been destroyed as villages and towns have expanded. The colony at Urlabari is threatened by planned construction. Even in protected areas such as Chitwan, loss of nest trees and lopping of branches on nest trees to feed domesticated elephants is a threat.

Agrochemicals pose a further threat (Pokharel 1998, Gyawali 2003b). In many villages there is a

practice of killing fish by poisoning the entire water system (Dahal 1999, personal observations). Such practices severely damage the local ecosystem and have impacts on species higher up the food chain, including Lesser Adjutant. As adjutants are large and conspicuous, they are easy targets for hunters. Bird parts, mainly the bills, are sold in shops in Kathmandu as medicine (Sapkota 2002).

Although efforts are underway to raise public awareness, mainly initiated by Bird Conservation Nepal, there is still widespread lack of knowledge about the value of birds. Many local people do not know that the Lesser Adjutant is globally threatened.

Despite the fact that Nepal holds a significant proportion of the world population, little has been done for its protection. The species has been recommended for inclusion on the protected species list of the National Parks and Wildlife Conservation Act 1973 (Bird Conservation Nepal 2004b). Lesser Adjutant uses agricultural habitats and often nests close to villages (*contra* Soothill and Soothill 1989), so it cannot simply be conserved by declaring protected areas. Local community-based approaches for conservation are therefore needed. Strong governmental commitment combined with the mobilisation of civil society is vital for this.

We recommend that: (a) periodic nationwide surveys should be carried out, preferably in coordination with surveys in India; (b) the species should be listed as protected under the National Parks and Wildlife Conservation Act and there should be total ban on hunting; (c) further research should be carried out on the dependence of the species on paddyfields, with a view to advising farmers on best practice; and (d) nesting locations should be protected and monitored with increased community participation.

ACKNOWLEDGEMENTS

For assistance in the field I would like to thank Bhesraj Ghimire, Dinesh Giri, Som GC, Badri Chaudhary, Ben Vickers, Raj Kumar Rai and Krishna Bindari. I would especially like to thank the Oriental Bird Club for generous financial support. I would like to thank D. B. Choudhary for providing me with information. I am grateful to Carol Inskipp, Suchit Basnet and Eben Goodale for their valuable comments and suggestions. I would like to thank Koshi Camp and Churia Forest Development Project for hospitality and support at Koshi and Sagarmatha zones respectively.

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Black-chinned Fruit-dove *Ptilinopus leclancheri* and Scaly Thrush *Zoothera dauma* on Taiwan

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In reviewing the taxonomy of certain Asian bird species, Collar (2004a,b) drew attention to two enigmas in the Taiwan avifauna, unaware that recent photographic and specimen evidence could shed a little more light on the issues. In one case, the paucity of records and specimens of Black-chinned Fruit-dove *Ptilinopus leclancheri* made it difficult to assess the existence and taxonomic status of the island's reputed population; in the other, the slender evidence that the Scaly Thrush *Zoothera dauma* breeds on Taiwan had never resulted in a satisfactory subspecific attribution, a circumstance which had led some publications to assume that no such population exists.

Black-chinned Fruit-dove

Black-chinned Fruit-dove was first found on Taiwan on 1 November 1922, when a male was captured in Tainan County (Hachisuka and Udagawa 1951, Wang *et al.* 1991, Lin 1997). Hachisuka and Udagawa (1951) gave the precise locality as 'Kijinsho', although we romanise

its name as 'Gwayren', and they mentioned two other specimens, one from 'Koshun (Hengchun)'—indicating that this is in the 'extreme south of the island'—without date, and one, a juvenile, from 'Botel Tobago' (i.e. Lanyu Island) in or before 1934. Forty years later, Ripley (1962) established the island's population as an endemic subspecies *taiwanus*, using a single specimen taken at Kenting on 19 July 1961; he also reported the 1922 specimen as immature, but this is not in Hachisuka and Udagawa (1951).

After another forty years the situation has by no means clarified. Baptista *et al.* (1997) did not recognise the subspecies, and only mentioned the species for 'Lan Hsü' (Lanyu), attributing the population there to the race *longialis* of the islands off the north of Luzon, although Dickinson *et al.* (1991) called *longialis* endemic to the Philippines. Gibbs *et al.* (2001), however, accepted the race *taiwanus*, and listed four localities, Tainan, Hsien, Hengchan and Lanyu. Of these 'Hsien' may merely be a transcription of 'county'