



## Conservation status of Bengal Florican *Houbaropsis bengalensis bengalensis* (Gmelin, 1789) (Gruiformes: Otidae) in Koshi Tappu Wildlife Reserve and adjoining areas, eastern Nepal

Hem Sagar Baral<sup>1</sup>, Ashok Kumar Ram<sup>2</sup>, Badri Chaudhary<sup>3</sup>, Suchit Basnet<sup>4</sup>, Hathan Chaudhary<sup>5</sup>, Tika Ram Giri<sup>6</sup> & Dheeraj Chaudhary<sup>7</sup>

<sup>1</sup> Charles Sturt University, School of Environmental Sciences, New South Wales, Australia

<sup>2</sup> Koshi Tappu Wildlife Reserve, Department of National Parks and Wildlife Conservation, PO Box 860, Babarmahal, Kathmandu, Nepal

<sup>3</sup> Himalayan Nature, PO Box 10918, Lazimpat, Kathmandu, Nepal

<sup>4,5,6</sup> Nepalese Ornithological Union, PO Box 21016, Thamel, Kathmandu, Nepal

<sup>7</sup> Koshi Camp Pvt Ltd, PO Box 21016, Kathmandu, Nepal

Email: <sup>1</sup> hem.baral@gmail.com (corresponding author), <sup>2</sup> rashok05@gmail.com, <sup>4</sup> suchitbas@googlemail.com,

<sup>5</sup> nepalbird@gmail.com, <sup>6</sup> giri\_tika@yahoo.com <sup>7</sup> birdlife@mos.com.np

Date of publication (online): 26 March 2012

Date of publication (print): 26 March 2012

ISSN 0974-7907 (online) | 0974-7893 (print)

Editor: Rajiv S. Kalsi

### Manuscript details:

Ms # o2948

Received 19 September 2011

Final received 28 December 2011

Finally accepted 16 February 2012

**Citation:** Baral, H.S., A.K. Ram, B. Chaudhary, S. Basnet, H. Chaudhary, T.R. Giri & D. Chaudhary (2012). Conservation Status of Bengal Florican *Houbaropsis bengalensis bengalensis* (Gmelin, 1789) (Gruiformes: Otidae) in Koshi Tappu Wildlife Reserve and adjoining areas, eastern Nepal. *Journal of Threatened Taxa* 4(3): 2464–2469.

**Copyright:** © Hem Sagar Baral, Ashok Kumar Ram, Badri Chaudhary, Suchit Basnet, Hathan Chaudhary, Tika Ram Giri and Dheeraj Chaudhary 2012. Creative Commons Attribution 3.0 Unported License. JoTT allows unrestricted use of this article in any medium for non-profit purposes, reproduction and distribution by providing adequate credit to the authors and the source of publication.

**Acknowledgements:** We acknowledge the firm support and guidance of Krishna Prasad Acharya, Director General of the Department of National Parks and Wildlife Conservation towards the conservation of birds and for the entire Koshi Tappu Wildlife Reserve. We would like to thankfully acknowledge the support to our conservation activities inside and outside the reserve from the staff of Koshi Tappu Wildlife Reserve. We would also like to thank the support given by the Van Tienhoven Foundation, Charles Sturt University - Australia, The Peregrine Fund USA, Manfred-Hermes-Stiftung for Nature Conservation and Environmental Protection (MHS), Parahawking: Share the Sky and The Wetland Trust UK who have provided support for Himalayan Nature's conservation activities based at Kosi Bird Observatory. This paper is the result of the generous support provided by these organisations. We thank Kosi Bird Observatory, Koshi Camp Pvt Ltd, Nature Safari Tours Pvt Ltd and Naturetrek Ltd for help on logistics. Mr Biswa Nath Uprety, former Director General, Krishna Bidari and Anish Timsina of Koshi Camp, Sanjib Acharya and Suman Acharya of Himalayan Nature kindly shared information on Bengal Florican sightings. Thanks to Carol Inskipp and David Buckingham who kindly commented on the paper. Last but not least we would like to thank Carol Inskipp for her guidance on this paper, continued interest and support to Nepal bird studies.

**Abstract:** Bengal Florican *Houbaropsis bengalensis* is one of the most critically threatened birds of the world. The species has restricted distribution within the Indian subcontinent extending southeast to parts of Cambodia and Vietnam. The population of the species is being monitored in Nepal since 1982. The most recent study on the species shows a precipitous decline in its population, even for a species mainly confined to protected areas. Koshi Tappu Wildlife Reserve and adjoining areas had been omitted in previous surveys mainly because the area was considered not to hold any significant number of the species. Opportunistic surveys in April and May 2011 indicated that there is a comeback of this species in Koshi Tappu Wildlife Reserve and the adjoining riverine grasslands. As many as 12 pairs were estimated. Further systematic surveys are recommended to find out the total population of the species.

**Keywords:** Bengal Florican, Koshi Tappu, Nepal, riverine grasslands, population estimates, systematic survey.

Bengal Florican *Houbaropsis bengalensis* is considered to be one of the rarest florican species of the world (del Hoyo et al. 1996) and was at one time described as the most threatened bird species in the Indian subcontinent (Inskipp & Collar 1984). It is a globally threatened species (IUCN status Critically Endangered; BirdLife International 2011), inhabiting alluvial grasslands in India, (from the Kumaon terai of Uttar Pradesh (now Uttarakhand) through Bihar and West Bengal to the foothills and plains of Arunachal Pradesh, Assam and Meghalaya), Nepal (in the Terai), Cambodia and southern Vietnam (Ripley 1982; Ali & Ripley 1987; del Hoyo et al. 1996). Two subspecies of Bengal Florican have been recognised: *H. b. bengalensis* from the Indian subcontinent and *H. b. blandini* from Cambodia and Vietnam (del Hoyo et al. 1996). Populations have declined chiefly as a result of

OPEN ACCESS | FREE DOWNLOAD



habitat loss and hunting and in the Indian subcontinent, the species no longer occurs outside protected areas (BirdLife International 2000, 2001). However, it is not known where the species goes during the non-breeding season. The most up-to-date estimate from Cambodia is 666–1004 mature birds (David Buckingham pers. comm. 2011). Nepal populations for subspecies *bengalensis* is estimated between 28–36, but there are no recent estimates from India (BirdLife International 2011).

A pioneering study on this species including the protected areas in the southern belt of Nepal and the northern part of India was conducted in 1982 with estimates of 56–82 as the total Bengal Florican population in Nepal (Inskipp & Inskipp 1983; Inskipp & Inskipp 1991). The study concluded that all important populations of the species lie within protected areas of lowland Nepal. Since 1982 there has been no systematic study carried out on this species at Koshi Tappu Wildlife Reserve.

In Nepal, a number of studies have been carried out since then, notably in Suklaphanta and Bardia (Weaver 1991), Bardia (Pokharel & Dhakal 1998), and Suklaphanta, Bardia and Chitwan (Baral et al. 2000, 2001, 2002a, 2003). Baral (1995a) and Rai (1996) have highlighted the urgency of surveys and some of the threats to the Bengal Florican. Repeat surveys of the Bengal Florican have found a decline in the population from three protected areas of central and western Nepal (Baral et al. 2003; Poudyal et al. 2008 a,b,c). A revisit to Nepal's lowland protected areas by the researchers who first surveyed floricans in 1982 further confirmed the degraded quality of grasslands (Inskipp & Inskipp 2001). Baral (2001) and Baral et al. (2002b) have concluded that the biggest threat to the Bengal Florican in the protected area is inadequate management of grasslands. Baral et al. (2002b) have further suggested that there may not be a viable population in Nepal. Poudyal et al. (2008 a,b,c) gave the most up-to-date survey data on this species from Chitwan, Bardia and Suklaphanta, the major Nepal strongholds of the species.

As one of the major recommendations by Poudyal et al. (2008a) and BirdLife International (2011), we gathered information on this species whilst working on Himalayan Nature's biodiversity related project activities and the Reserve's regular monitoring activities in the Koshi Tappu Wildlife Reserve and

adjoining areas of the Koshi River, eastern Nepal.

It is normally assumed that if a species is found within a protected area then it is safe and doing well (Krebs 2009). However, the above mentioned studies suggest that grassland management supportive to critically threatened species like the Bengal Florican is also needed inside protected areas.

The largest number of Bengal Floricans recorded for Koshi was 10 in April 1982 (cited in Inskipp & Inskipp 1983). This may be an underestimation because during that time, only partial coverage of the area was possible during the survey; for example the reserve could only be covered on elephant-back at that time (Carol Inskipp in litt. to H.S. Baral 25 June 2011). More recently, following the loss of grassland south of the barrage, this species has become a very rare bird at Koshi (Baral 1995b). Single birds have been seen in the western part of Koshi Tappu, within the reserve (Baral 1995a) and north of Koshi Tappu outside the reserve since 2004 (Badri Chaudhary pers. obs. 2011; Som G.C. pers. comm. 2010; Inskipp et al. 2011). A multitude of problems has been discussed as threats to this species in Koshi Tappu (Baral 1995a).

Systematic surveys have mostly focused in other protected areas and Koshi has been left out during organized surveys mainly because the area was considered unsuitable for Bengal Floricans. Koshi Tappu is a small reserve compared to others but is difficult to survey due to logistic problems. Koshi Tappu and its adjoining areas were surveyed in April and May 2011 for the Bengal Florican. Current study in Koshi area reveals an unknown population of Bengal Florican in the country and draws the attention of wider conservation community for more effective planning for its protection.

### Study area

Koshi Tappu Wildlife Reserve (= Koshi Tappu henceforth, 26°35'N & 87°05'E) occupies 175km<sup>2</sup> of the Sapta Koshi River floodplain at the most northeasterly extension of the Gangetic Plain (Image 1). It ranges in altitude from 75–81 m (Sah 1997). The reserve is located between two flood control embankments and is subject to annual flooding. An estimated 70% of the reserve's land area is covered in grasslands "phantas" followed by water and riverine forests. *Typha* and *Saccharum* are the main components of the grassland communities found here, although patches

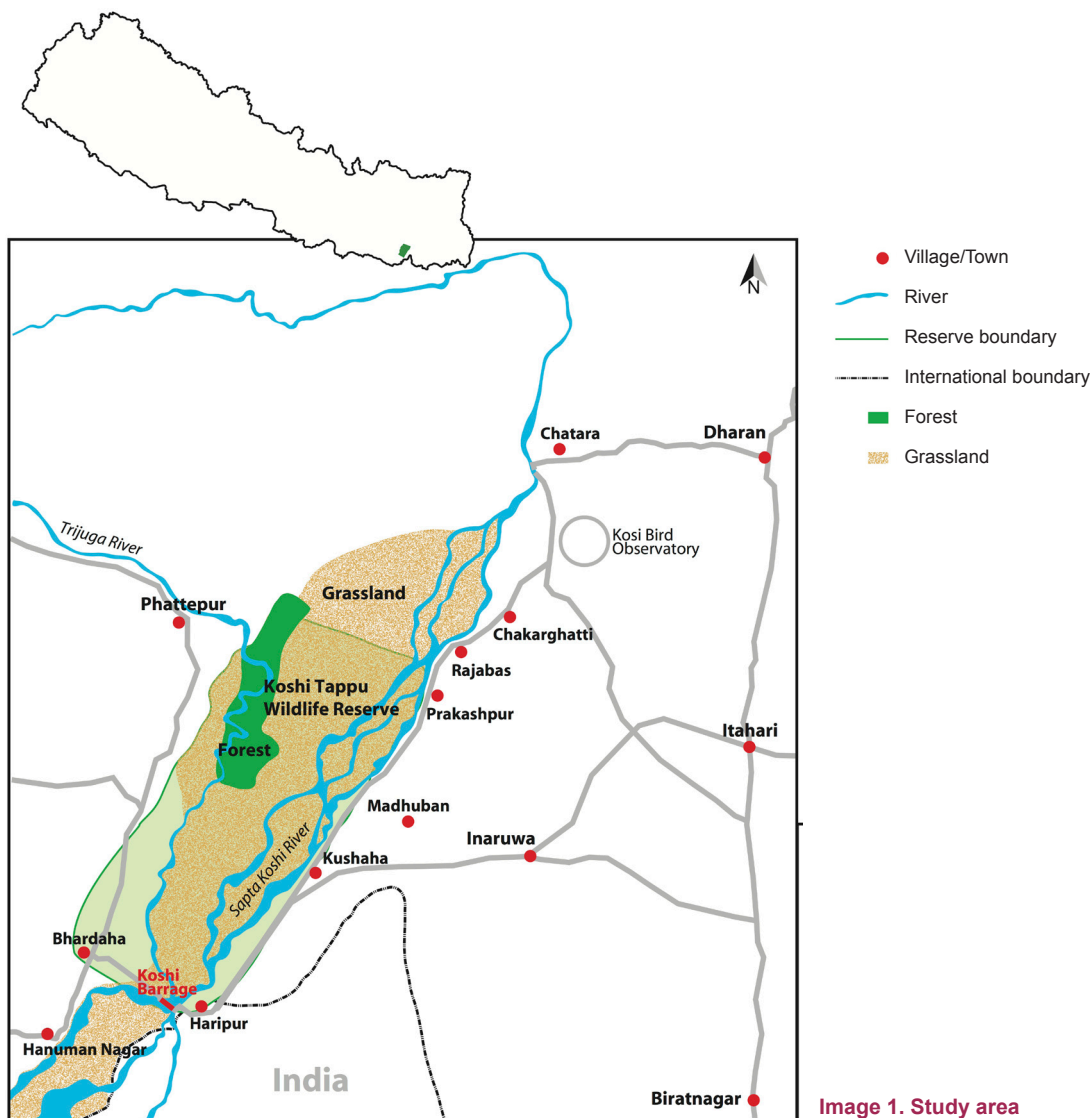


Image 1. Study area

of *Imperata* and *Phragmites* are often seen (Peet et al. 1999). Medium size *phantas* (patches of short grasslands) interspersed with young *Dalbergia sissoo* / *Acacia catechu* trees are found on sandy islands. Riverine vegetation with *Acacia catechu* / *Dalbergia sissoo* forest dominates on the islands and edges of the reserve. Mostly young trees grow inside and on the edges of the reserve within embankments, most old mature trees being swept away by annual monsoonal floods. The wetlands in the reserve have been identified as Nepal's first Ramsar Site (Sah 1997).

North of Koshi Tappu (26°47'N & 87°07'E), for about 20km, lies grassy islands, small settlements and farm areas with an estimated area of 70km<sup>2</sup>. Part of this area is subject to annual inundation from the Koshi floodwaters whereas the rest of the area remains above

the floods. Areas subjected to annual inundation have grasslands and large shingle banks. Towards the northern end, on a private property, lies the recently established Kosi Bird Observatory (KBO) from where some of these observations have been possible (Image 1).

South of Koshi Tappu lies the Koshi Barrage area (26°36'N & 87°03'E). This area is 7km from north to south and nearly 5km from east to west, totaling nearly 35km<sup>2</sup>. More than 50% of the wetland area at the barrage is covered by water, and the remaining area is subject to intensive agriculture at certain times of the year. During dry periods, several islands are vegetated with *Saccharum* spp., *Imperata cylindrica* and *Typha elephantine* dominated grasses. There is human disturbance in the form of grass collection for

fodder and livestock grazing. Koshi Barrage and Koshi Tappu have been identified as one of the 27 Important Bird Areas of Nepal by BirdLife International (Baral & Inskipp 2005).

### Methods

Koshi Tappu and its adjoining areas to north and south were visited in April and May 2011 during a programme of vulture counts, regular bird watching, and during routine monitoring of the Reserve for about 45 days. Field visits were undertaken using inflatable rubber boats, trained elephants, all-terrain vehicles or on foot, depending upon the purpose of the activity.

All Bengal Florican sightings were logged, along with information on habitat use, numbers and activity. Bengal Florican numbers were estimated based on these records and discussion with the Reserve staff.

### Results

Bengal Floricans were recorded from nine different sites along a 39-km north-south stretch of the Koshi River. Eliminating double counts of the same individuals from the same area, in total, 17 birds were recorded from these sites, of which seven were males and 10 were females. Only five individuals were recorded outside the reserve, two pairs from Jabdi (north of Koshi Tappu, near KBO) and one female seen twice near the Koshi Barrage area.

From the sightings this year, we estimated at least eight to 12-pairs of Bengal Florican for Koshi Tappu for the Spring/Summer of 2011. Five to nine pairs were located inside the reserve. As this information resulted from opportunistic sightings and surveys, a systematic and well planned survey may produce clearer results and better estimate of the status of floricans from Koshi Tappu and adjoining areas.

The size of the grasslands where floricans were found varied from 0.05km<sup>2</sup> to nearly 1km<sup>2</sup>. The larger patches were within the reserve and some of these were islands with a mosaic of various grass species. All sightings with dates, number and localities are presented in Table 1.

### Discussion

We have seen more floricans at Koshi this year compared to previous years during the same period of time. Probably habitat within the reserve improved

as compared to the past years. Ashok Kumar Ram, Warden of Koshi Tappu, claimed that the number of privately owned cattle inside the reserve had been drastically reduced because the Reserve Authority was actively controlling cattle grazing. Several hundreds of privately owned cattle have been driven out of the reserve (Ashok Kumar Ram pers. comm. 2011). Removal of grazing probably resulted in regeneration of grass communities preferred by the floricans.

Using a 4-wheel drive vehicle, the western side of the reserve was visited for the first time in many years. This has increased the frequency of visits by the Reserve staff to the interior of the Reserve and probably increased sightings of the floricans. Increased monitoring and patrolling activities by Reserve staff may have also reduced illegal entries of locals into the Reserve, making the area safer for the floricans. However, this alone cannot be the main cause of increased numbers of floricans as the eastern part of Koshi Tappu is now frequently visited by bird watchers.

As for the sighting of two pairs north of Koshi Tappu, nearly 15km outside the boundary, it may not have had much to do with the Reserve's better protected status. The pre-monsoonal rains had been more frequent this year compared to the previous years. Early rains this year might have helped to make the grasslands more habitable for the floricans by speeding up the growth of grasses. Additionally, areas north of Koshi Tappu may have been covered more frequently this year compared to last year resulting in more sightings of the species. The recently established Kosi Bird Observatory is acting as a major research station for birds in this region.

### Recommendations

The present paper is based on compilation of various observers' records. It is likely that there are more sites which hold Bengal Florican populations. Therefore, a scientifically planned survey of Bengal Florican should be carried out in Koshi Tappu, north and south of the Reserve in the Spring of 2012. The southern side should include parts up to the Nepal/India border south of the Koshi Barrage. The northern side should include all the islands, and grasslands up to the Kosi Bird Observatory (Jabdi).

The survey should be well coordinated. It will be best to position experienced observers in several

Table 1. Records of Bengal Florican during April and May 2011 from Koshi Tappu and adjoining areas

Date	Site	Time	M	F	Activity	Habitat	Habitat Size
28.iv.11	Jabdi, north of Koshi *	07:00		1	Standing in grassland	Cut over <i>Saccharum/Imperata</i> grasslands less than half m high	Island nearly 0.3km <sup>2</sup> in size
28.iv.11	Jabdi, north of Koshi *	07:10	1		Displaying	Cut over <i>Saccharum/Imperata</i> grasslands less than half m high	Island nearly 0.3km <sup>2</sup> in size
28.iv.11	Jabdi, north of Koshi *	07:20	1		Walking in grassland approximately one km away from the first male	Cut over <i>Saccharum/Imperata</i> grasslands less than half m high	Island nearly 0.3km <sup>2</sup> in size
28.iv.11	Jabdi, north of Koshi *	08:15		1	Standing in grassland whilst the first female still being watched by the group	Cut over <i>Saccharum/Imperata</i> grasslands less than half m high	Island nearly 0.3km <sup>2</sup> in size
17.iv.11	Prakashpur, Koshi east *	06:36	1	2	One female flying, male and female standing in grasslands	Dominated by <i>Saccharum spontaneum</i>	0.15km <sup>2</sup>
04.v.11	Prakashpur, Koshi east *	06:30		1	Standing in a new grassland	New, uncut grassland less than quarter of a metre, adjacent to older grassland nearly 2 m high	Island nearly 0.2km <sup>2</sup> in size
16.iv.11	Madhuban, Koshi east *	17:10	1	1	Male flying and female walking along the edge of grassland	Dominated by <i>Saccharum spontaneum</i> and with <5% <i>Typha elephantine</i> coverage	0.06km <sup>2</sup>
27.iv.11	Madhuban, Koshi east *		1	1	Male flying and female walking on high ground, <i>Saccharum spontaneum</i> dominated by grasslands, 1.5m	<i>Saccharum/Imperata</i> with other woody species running longer north south parallel to the river --width nearly 500 metre	Island nearly 1km <sup>2</sup> in size
04.v.11	Madhuban, Koshi east **	09:40		1	Flying west, crossing one of the river channels	Flying --grassland to grassland, 1.5 high	
12.ii.11	North Simalghari, west Koshi **	11:30	1	1	Walking along the edge of the grassland	Dominated by <i>Imperata cylindrica</i> with an average sward height of 50 cm with other species <i>Saccharum spontaneum</i> and small (1.5 m) <i>Acacia catetchu</i>	0.05km <sup>2</sup>
26.iv.11	Koshi Barrage *	16:32		1	Walking along the edge of the grassland	Cut over <i>Saccharum/Imperata</i> grasslands less than 1m high	Island nearly 0.05km <sup>2</sup> in size
21.iii.11	Koshi Barrage **	15:00		1	Flying above <i>S. spontaneum</i> grassland	Dominated by <i>Imperata cylindrica</i> with an average sward height of 50 cm with <i>Saccharum spontaneum</i> as a codominant species	0.1km <sup>2</sup>
29.iii.11	Near Mariya, south Simalghari, west Koshi **	15:20		1	Standing amongst <i>Acacia catetchu</i> bushes	Dominated by <i>Saccharum spontaneum</i> and <i>Imperata cylindrica</i> with few <i>Acacia catetchu</i> trees (1.5m)	0.07km <sup>2</sup>
25.iv.11	Mariya, west Koshi **	16:00	1		Walking in grassland	<i>Imperata</i> dominated grasslands (60 cm ht) with thinly dotted <i>Acacia</i> trees soon after burnig	0.1km <sup>2</sup>
27.iv.11	Pilot channel head, west Koshi **	12:00	1	1	Flying above grassland	<i>Imperata cylindrica</i> 40 cm and <i>Saccharum spontaneum</i> grasslands 70 cm soon after burning	0.05km <sup>2</sup>
01.v.11	Pilot channel head, west Koshi **	13:25	1		Walking along the edge of the grassland	Mainly <i>Saccharum spontaneum</i> 60 cm dotted with <i>Acacia</i> trees 150 cm	0.1km <sup>2</sup>

\* - Watched by a group of birders including one of the authors; \*\* - Reserve Staff

lekking areas and areas that are likely to be used by the floricans. The survey should be done in April-May for about two months. Reserve staff should be involved wherever possible to build their research capacity.

Habitat information and other details should be recorded systematically so that the results of such a study can contribute to better grassland management aiming to increase the florican's population.

## REFERENCES

- Ali, S. & S.D. Ripley (1987).** *Compact Handbook of the Birds of India and Pakistan*. Oxford University Press, New Delhi, xlii+737pp+104 colour plates.
- Baral, H.S. (1995a).** Some notes on Bengal Florican. *Bird Conservation Nepal Newsletter* 4(2): 5.
- Baral, H.S. (1995b).** *Birds of Koshi—Second Edition*. Department of National Parks and Wildlife Conservation, Participatory Conservation Programme and Bird Conservation Nepal, Kathmandu, 24pp.
- Baral, H.S. (2001).** Community Structure and Habitat Associations of Lowland Grassland Birds in Nepal. PhD Thesis. University of Amsterdam, Amsterdam, The Netherlands, x+235pp.
- Baral, H.S. & C. Inskipp (2005).** *Important Bird Areas in Nepal: Key Sites for Conservation*. Bird Conservation Nepal, Kathmandu and BirdLife International, Cambridge, 242pp.
- Baral, N., B. Tamang & N. Timilsina (2000).** The floricans in Royal Bardia National Park. *Danphe* 9(3): 4.
- Baral, N., B. Tamang & N. Timilsina (2002a).** Status of Bengal Florican *Houbaropsis bengalensis* in Royal Bardia National Park, Nepal. *Journal of the Bombay Natural History Society* 99(3): 413–417.
- Baral, N., N. Timilsina & B. Tamang (2001).** Bengal Florican *Houbaropsis bengalensis* in Royal Suklaphanta Wildlife Reserve, Nepal. *Oriental Bird Club Bulletin* 34: 30–33.
- Baral, N., N. Timilsina & B. Tamang (2002b).** Conservationists peep into floricans. *Danphe*: 11(1): 18–19.
- Baral, N., N. Timilsina & B. Tamang (2003).** Status of Bengal Florican *Houbaropsis bengalensis* in Nepal. *Forktail* 19: 51–55.
- BirdLife International (2000).** *Threatened Birds of The World*. BirdLife International. Cambridge, xii+852pp.
- BirdLife International (2001).** *Threatened birds of Asia - Part A*. BirdLife International, Cambridge, xxx+1516pp.
- BirdLife International (2011).** Species factsheet: *Houbaropsis bengalensis*. Downloaded from <http://www.birdlife.org> on 05/06/2011.
- del Hoyo, J., A. Elliott & J. Sargatal (1996).** *Birds of the World—Vol. 3*. Lynx Edicions, Barcelona, 821pp.
- Inskipp, C. & N.J. Collar (1984).** The Bengal Florican: its conservation in Nepal. *Oryx* 18(1): 30–35.
- Inskipp, C. & T.P. Inskipp (1983).** Report on a survey of Bengal Floricans *Houbaropsis bengalensis* in Nepal and India, 1982. Study Report No. 2. International Council for Bird Preservation, Cambridge, U.K., 54pp.
- Inskipp, C. & T. Inskipp (1991).** *A Guide to the Birds of Nepal*. Second edition. Christopher Helm, London, 400pp.
- Inskipp, C. & T. Inskipp (2001).** A re-visit to Nepal's lowland protected areas. *Danphe* 10(1/2): 4–7.
- Inskipp, C., H.S. Baral & T. Inskipp (2011).** *The State of Nepal's Birds 2010*. Department of National Parks and Wildlife Conservation and Bird Conservation Nepal, Kathmandu, x+96pp.
- Krebs, C.J. (2009).** *Ecology - The experimental Analysis of Distribution and Abundance—Sixth Edition*. Pearson Education Inc., San Francisco, USA, xvi+655pp.
- Peet, N., A.J. Watkinson, D.J. Bell & B.J. Kattel (1999).** Plant diversity in the threatened subtropical grasslands of Nepal. *Biological Conservation* 88: 193–206.
- Pokharel, C.P. & N.P. Dhakal (1998).** *Status of Bengal Florican Eupodotis bengalensis in Royal Bardia National Park, Western Lowland, Nepal*. Unpublished report to the Oriental Bird Club, UK, iii+12pp.
- Poudyal, L.P., P.B. Singh & S. Maharajan (2008a).** Status and distribution of Bengal Florican *Houbaropsis bengalensis* in Nepal. Final report to Oriental Bird Club and The Club 300 Foundation for Bird Protection Sweden, 40pp.
- Poudyal, L.P., P.B. Singh & S. Maharajan (2008b).** The decline of Bengal Florican *Houbaropsis bengalensis* in Nepal. *Danphe* 17(1): 4–6.
- Poudyal, L. P., P. B. Singh & S. Maharajan (2008c).** Bengal Florican *Houbaropsis bengalensis* in Nepal: an update. *BirdingAsia* 10: 43–47.
- Rai, H. (1996).** A serious threat to Bengal Florican *Houbaropsis bengalensis* in Bardia. *Bird Conservation Nepal Newsletter* 5(3): 1.
- Ripley, S.D. (1982).** *A Synopsis of The Birds of India and Pakistan—Second Edition*. Bombay Natural History Society, Bombay, xxvi+652pp.
- Sah, J.P. (1997).** *Koshi Tappu Wetlands: Nepal's Ramsar Site*. IUCN Bangkok, Thailand. xviii+254pp.
- Weaver, D. (1991).** A survey of Bengal Floricans *Houbaropsis bengalensis* at Royal Suklaphanta Wildlife Reserve and Royal Bardia National Park, western Nepal. Report to Oriental Bird Club. Unpublished, 14pp+viii.

