

Status and Distribution of Bengal Florican *Houbaropsis bengalensis*
in Nepal, 2007



Prepared by

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Report to

The Oriental Bird Club, UK and
The Club 300 Foundation for
Bird Protection, Sweden

Department of National Parks and Wildlife Conservation, Kathmandu, Nepal
Bird Conservation Nepal, Kathmandu, Nepal

January 2008



OBC



Club 300



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Executive Summary

The Bengal Florican *Houbaropsis bengalensis*, a habitat specialist bird, is one of the three bustards found in the Indian subcontinent. It belongs to the Gruiformes order and Otididae family. It is listed as critically endangered on the IUCN Red Data Book, as protected on National Parks and Wildlife Conservation Act in Nepal and under Appendix 1 of CITES. A survey of the Bengal Florican was carried out in April-May 2007 in Suklaphanta Wildlife Reserve, Bardia National Park and Chitwan National Park in Nepal. The aim of the survey was to determine status, distribution and population change. The methods involved counting of lekking sites and identification of territories. Totals of 8-9 males and 2 females at Suklaphanta, 1-2 males at Bardia and 5-7 males at Chitwan were recorded. Compared to past studies, the population has declined by 56% since 1982 and by 30% since 2001.

Probable threats include loss of short grassland by anthropogenic and natural factors, inappropriate grassland management practices, disturbances and susceptibility to predators. Appropriate management interventions including proper timing of burning/cutting, uprooting of unfavorable species from the grasslands, and captive breeding and releasing chicks in their natural habitats which are recommended for long term conservation of this endangered bird.

Acknowledgments

The “Status and Distribution of Bengal Florican *Houbaropsis bengalensis* in Nepal, 2007” is a report based on research conducted on the grasslands in the Suklaphanta Wildlife Reserve, Bardia National Park and Chitwan National Park between April and May 2007.

The fieldwork was funded by The Oriental Bird Club UK and The Club 300 Foundation for Bird Protection, Sweden. Department of National Parks and Wildlife Conservation granted necessary permission to carry out the research. Chitwan National Park, Bardia National Park Suklaphanta Wildlife Reserve and Bird Conservation Nepal made available local and technical support. We highly acknowledge Ms Carol Inskipp and Dr Hem Sagar Baral in making this research successful. They provided help from the very inception of this project to this report writing. Dr David Buckingham made valuable comments and suggestions. Dr Henrik Lind, Dr Frederic Launay and Dr Tom Gray provided invaluable help.

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January 2008

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Participants

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Itinerary

Dates	Activities
10-15 April	Survey at Bardia National Park.
10 April	Study team reached at Thakurdwara Bardia. Short discussion with Jeet Bahadur Khadka (naturalist and senior Gamescout) and Omkar Joshi (Assistant Warden)
11-15 April	We stayed at Jeet Bahadur khadka's hotel for two days and then shifted to park guest house. Surveys were done at Lamkauli and Baghaura phantas in the morning and afternoon. Motor vehicles were used for the transportation means. Weather was clear for all days.
16-28 April	Survey at Suklaphanta Wildlife Reserve.
16 April	We went to Suklaphanta Wildlife Reserve. Local guides and park staff were arranged at Majhgaon to go for the survey. Mohandev Bhatta, Sujan Maharjan and Paras Bikram Singh collected foodstuffs; Mohandev Joshi provided us tents, sleeping bags and kitchen utensils from office store. After arranging all logistics, we moved Suklaphanta grasslands in the evening. Ranger Chandra Bahadur Chanda provided office vehicle for this purpose. We camped at the edge of Bahuni river eastern north corner of the grassland. Our camp was settled with laborers who were working for grassland management uprooting and cutting trees and bushes.
17-18 April	We conducted survey at Suklaphanta. 18 th morning was very much disturbed due to bad weather and we couldn't do survey in the morning. We moved our camp to old office building south from present army post.
19-22 April	Surveys were done at Suklaphanta. Weather of all mornings and evenings were clear and we did the survey at Suklaphanta.
23- 24 April	In the morning we visited Karaiya phanta. We moved to Malumela post on the afternoon of 24 th and Singhpur was visited on the evening.
25 April	We visited Singhpur Phanta in the morning and evening.
26-27 April	Haraiya phanta was visited using elephant back in the morning. We returned to reserve headquarter on the 27 th evening.

28 April	Brief discussions with Assistant Warden Nilambar Mishra, Ranger Chandra Bahadur Chanda, Senior Game scout Mohandev Bhatta.
29 April	Return to Kathmandu.
30 April to May 3	Rest and discussion.
May 4	Study team arrived at Sauraha sector of Chitwan National Park.
5-24 May	Survey in Chitwan National Park
May 5	Discussion, arrangement and travel to Amrite.
6-7 May	Surveys at Amrite grassland in the morning and evening. Elephants were used.
May 8	Survey at Amrite grassland in the morning and travel to Khagendramalli grassland in the afternoon. Discussion with Naturalist of Chitwan Jungle Lodge.
9-10 May	Survey in the Khagendramalli grassland in the morning and afternoon.
11-12 May	Survey in the Chapparchuli grassland. We used two elephants travel to this grassland from Khagendramalli Post.
12 May	In the afternoon, we travelled back to Sauraha. Discussions were held with Park staff.
13-14 May	Survey at Padampur phanta. This Phanta was human settlement and cultivated land since 4-5 years ago. Elephants' back, trees and view towers were used.
15 May	Travel to Devnagar Post from Sauraha
16 May	Survey at Dumaria Grassland
17 May	Travel to Kasara (National park Headquarter)
18-19 May	Survey at Jarneli Phanta. Discussion with naturalist of Machan Paradise Hotel.
20 May	Travel to Meghauli and stay at Chital Lodge. Discussion with Naturalist plus hotel owner Jeev Basyal. Visit to Budhirapti phanta.
21-22 May	Survey at Buddanagar Phanta and Budhirapti Phanta. Discussion with Naturalist Kaluram Tamang who works for Tiger Tops hotel.
23-24 May	Survey at Sukebhar and Bhimle grassland. Elephants and motor vehicles were used as transport means.
24 May	Back to home.

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1. Introduction

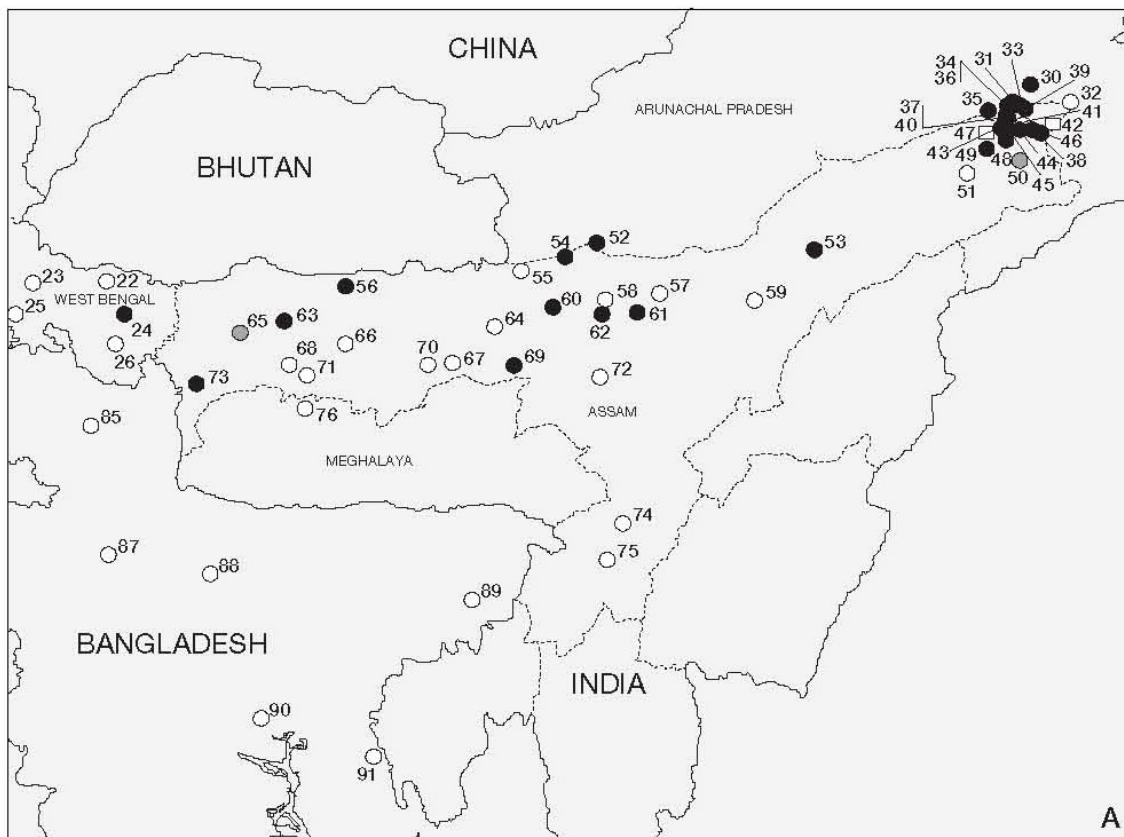
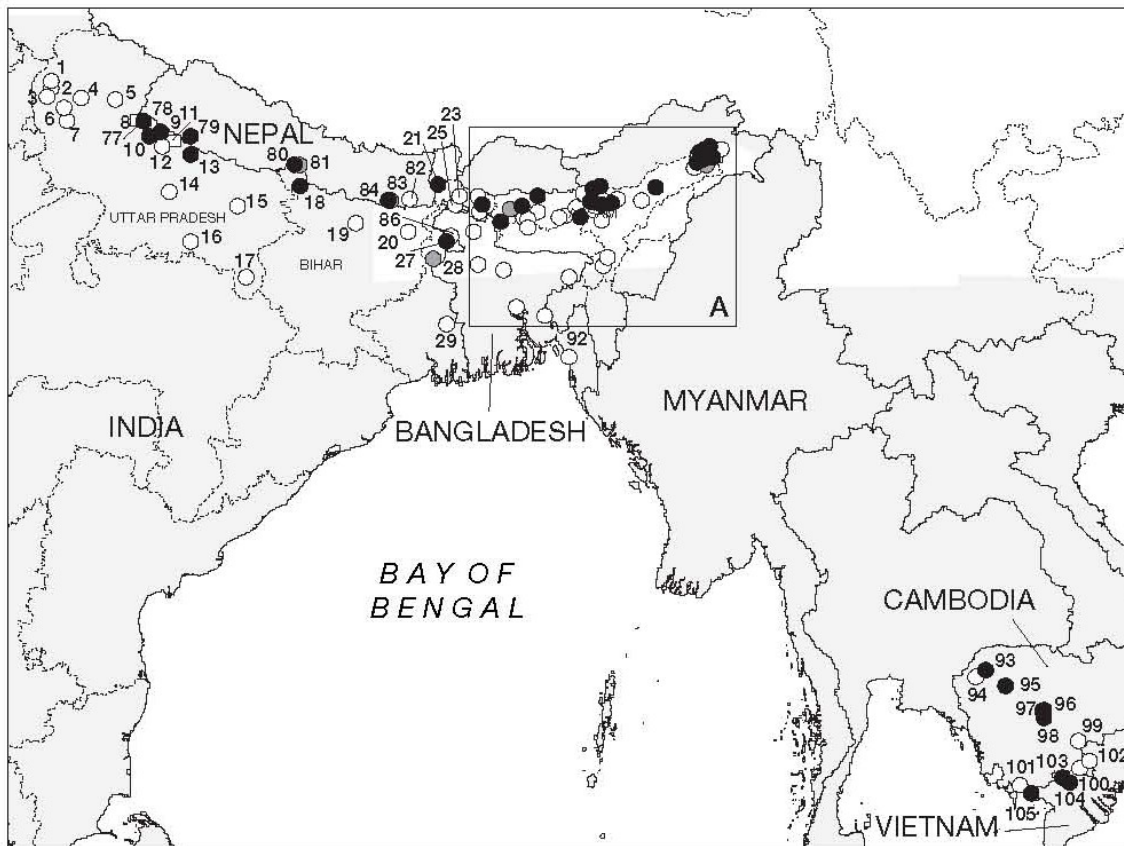
1.1. Background

Of the twenty six species of bustards worldwide, only three survive in the Indian subcontinent: the Great Indian Bustard *Ardeotis nigricaps*, the Lesser Florican *Sypheotides indica* and the Bengal Florican *Houbaropsis bengalensis*. The Great Indian Bustard does not exist in Nepal. Of the existing two species, only the Bengal Florican is probably breeding and the resident bustard of Nepal (Baral and Inskipp 2004). It is the rarest bustard in the world with a population of 250-999 (Birdlife International 2007).

Bengal Florican belongs to Gruiformes Order and Otididae Family. It has two sub species: *Houbaropsis bengalensis bengalensis* which exists in India and Nepal and *Houbaropsis bengalensis blandini* which subsists in Cambodia and Vietnam (Birdlife International 2001).

The Bengal Florican occurs in India (from the Kumaon Terai of Uttar Pradesh through Bihar and west Bengal to the foothills and plains of Arunanchal Pradesh, Assam and Meghalaya), Nepal Terai, Cambodia, Vietnam and historically in Bangladesh (Birdlife International 2001). There have been no recent records from Bangladesh and it is probably extinct in the country (Hussain 1985 cited in Birdlife International 2001). The species has also been reported from Bhutan, Myanmar and Thailand but there are no confirmed records in these countries (Birdlife International 2001). The world wide distribution of Bengal Florican is shown in figure 1.

In Nepal, the Bengal Florican has been recorded in the alluvial grasslands dominated by *Imperata cylindrica* of Chitawan National Park, Bardia National Park, Suklaphanta Wildlife Reserve, Koshitappu Wildlife Reserve and Koshi Barrage areas (Inskipp and Inskipp 1983, Weaver 1991) and regularly recorded in first three protected areas (Baral and Inskipp 2004).



Previous page's map- The distribution of Bengal Florican *Houbaropsis bengalensis*: (Map source [Birdlife international 2001](#)) (1) Saharanpur district;(2) Deoband; (3) Muzaffarnagar district; (4) Bijnur district; (5) Naini Tal; (6) Hastinapur; (7) Garhmuktesar; (8) Lagga Bagga; (9) Dudwa National Park; (10) Kishanpur Wildlife Sanctuary; (11) Katerniaghat Wildlife Sanctuary; (12) Kheri district; (13) Nanpara; (14) Lucknow; (15) Makhdumnagar; (16) Allahabad district; (17) Mirzapur district; (18) Champaran district; (19) Darbhanga district; (20) Purnea; (21) Darjeeling district; (22) Hasimara; (23) Ramshai; (24) Jaldapara Wildlife Sanctuary; (25) Jalpaiguri; (26) Koch Bihar; (27) West Dinajpur district; (28) Maldah; (29) Nadia; (30) Bomjir; (31) Dibang Reserve Forest; (32) Mishmi hills (foot of); (33) Dibang chapori; (34) Dotung river; (35) D'Ering Memorial Wildlife Sanctuary; (36) Paglam; (37) Mingmung; (38) Lohit river; (39) Deopani river; (40) Bholuka; (41) Sadiya; (42) Sunpura; (43) Sibia chapori; (44) Amarpur; (45) Siling Lalbeel; (46) Bhim chapori; (47) Kobo; (48) Paglamghat; (49) Dibru-Saikhowa National Park; (50) Dhopabor-Miajan; (51) Panitola; (52) Nameri National Park; (53) Majuli island; (54) Sonai-Rupai Wildlife Sanctuary; (55) Batabari; (56) Manas National Park; (57) Bishnath plain; (58) Tezpur; (59) Sibsagar district; (60) Orang National Park; (61) Kaziranga National Park; (62) Laokhowa Wildlife Sanctuary; (63) Bongaigaon district; (64) Mangaldai; (65) Kokrajhar district; (66) Barpeta; (67) Gauhati; (68) Goalpara; (69) Pobitora Wildlife Sanctuary; (70) Soalkuchi; (71) Mornai; (72) Khopili river; (73) Dhubri district; (74) Cachar district; (75) Silchar; (76) Garo hills (foot of); (77) Sukla Phanta Wildlife Reserve; (78) Bilauri; (79) Bardia National Park; (80) Chitwan National Park; (81) Rapti Dun; (82) Morang district; (83) Kosi Tappu Wildlife Reserve; (84) Kosi barrage; (85) Rangpur; (86) Dinajpur; (87) Bogra; (88) Madhupur; (89) Sylhet; (90) Dhaka; (91) Comilla; (92) Chittagong; (93) Ang Trapeang Thmor Reserve; (94) Sisophon; (95) Siem Reap; (96) Kompong Thom; (97) Kruos Kraoum; (98) Baray district; (99) Su Vu; (100) Soai Rieng; (101) Kampot; (102) Tay Ninh; (103) Hong Ngu; (104) Tram Chim Nature Reserve; (105) Ha Tien.

○ Historical (pre-1950) ● Fairly recent (1950–1979) ● Recent (1980–2001)

The species breeds in March to June, lays 1-2 eggs and is polygamous. The males are territorial for about four months during the breeding season ([Narayan 1990](#)). It has two types of territorial display: stand display and flight display, both performed to attract females and to warn other males ([Narayan and Rosalind 1990](#)). It is normally solitary in the breeding season, but sometime two to six males are forage and fly together ([Narayan 1990, Inskipp and Inskipp 1983](#)). A territorial male rises a little before or at the time of sunrise and remains active for about four hours thereafter. Later, it wanders away from the territory. Generally it reappears only in the afternoon and remains active to sunset time and a little later. Sometimes it flies dawn and dusk.

The Bengal Florican is a habitat specialist bird. It appears to favour relatively open short grassland (0.5-1 meter tall) sometimes with patches of tall grasses and scattered bushes and trees ([Ali and Ripley 1968-1998, Inskipp and Inskipp 1983, Mukharjee 1981, Narayan and Rosalind 1990](#)) usually in lowland below 300m ([Choudhary 1996, Baral et al. 1996](#)). Shorter grasslands are favored whilst foraging and displaying ([Birdlife International 2001](#)). Thus the shorter grassland dominated by *Imperata cylindrica*, interspersed with patches of taller grassland has been suggested for the long term survival of this species.

The species is omnivorous, eating grain, seeds, flowers, berries and small invertebrates such as slugs, grasshoppers, ants and beetles (Baker 1922-1930, Baral *et al.* 1996) and even frogs and other small reptiles (Choudhury 2000). In burned areas it eats burned seeds and insects driven out of the grasslands (Mukharjee 1981) and feeds on new grass shoots.

The Bengal Florican is a legally protected bird in Nepal. The Government of Nepal has protected the Bengal Florican as an endangered bird by including it under the Appendix 1 in the National Parks and Wildlife Conservation Act 1973. The species is listed under Appendix 1 of CITES and **critically endangered** in the IUCN Red Data Book being one of the world's 189 most threatened birds (Birdlife International 2007).

The Bengal Florican has a very small, rapidly declining population largely as a result of extensive loss of its grassland habitat. The key threats to the species are habitat loss and modification throughout its range (Birdlife International 2001). Previous surveys have shown that the Bengal Florican is rapidly declining in Nepal. This species is declining so quickly that the estimation of 60-86 adult population (Inskipp 1983) reduced to 32-60 in 2001 (Baral *et al.* 2003). Arguably this is a difficult species to survey accurately enough. The prime habitats where the species are frequently sighted are essential to maintain the long-term conservation of this bird. This survey was carried out so soon after the previous survey because the species is declining so quickly and also because more accurate population data is needed.

1.2. Objectives of the Study

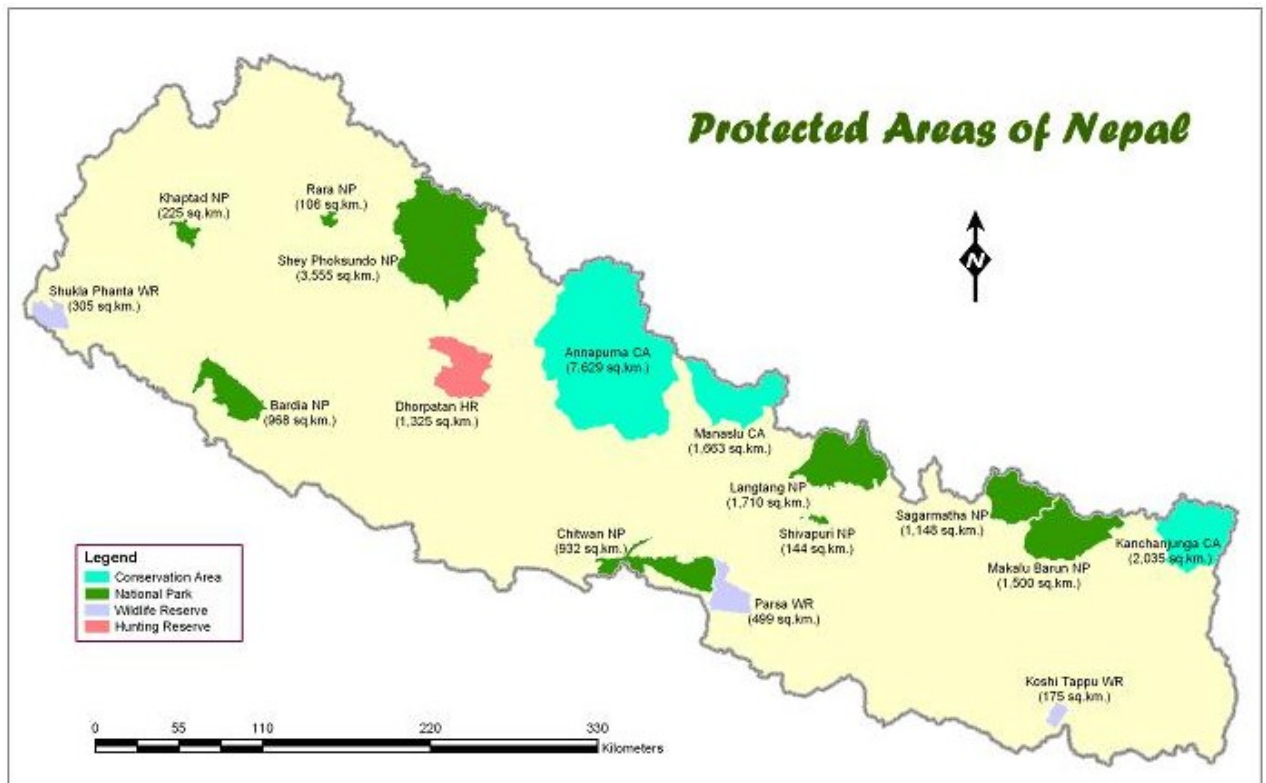
The general objective of the study was to update the existing information on Bengal Florican in lowland grasslands of Nepal and provide an outline management recommendation to ensure its long-term conservation. The specific objectives of the study were as follows:

- To update the population status of Bengal Florican in Chitwan and Bardia National Parks and Suklaphanta Wildlife Reserve of Nepal.
- To update and map the current distribution of Bengal Florican in Nepal.
- To provide management recommendations for conservation interventions.

2. Study Area

Nepal is located between the latitudes 26°22'-30°27'N and the longitudes 80°04'-88°12'E. It is situated on the southern slope of the central Himalaya in the Indian subcontinent and occupies a total area of 147,181 km². About 86 percent of total land area is covered by hills and mountains and the remaining 14 percent by flat lands of the Terai below 300m in elevation (Amatya and Shrestha 2002). Out of the total area of the country, forests comprise 29 percent, shrub-land and degraded forests 12 percent and grassland comprises 12 percent (Amatya and Shrestha 2002).

This study was carried out in the grasslands of lowland protected areas of Nepal. They were Chitwan National Park, Bardia National Park and Suklaphanta Wildlife Reserve. Figure shows the protected areas of Nepal.



2.1. Suklaphanta Wildlife Reserve

Background History

The reserve had been a famous hunting area for many years and was declared as Royal Hunting Reserve with an area of 131 km² in 1969 (Yadav *et al.* 2000). Later it was gazetted as the Royal Suklaphanta Wildlife Reserve in 1976 covering the area first 155 km² and later extended to the present area of 305 km² in 1981 (DNPWC 2003). After the peoples' revolution in 2006, the reserve was renamed as Suklaphanta Wildlife Reserve. Human population was relocated to outside the reserve from the extension area of 150 km² in 2005. The area of 243.5 km² surrounding the reserve was declared as buffer zone in 2004 to join the hands with local people for conservation and development.

Physical Attributes

The Suklaphanta wildlife reserve is situated in the extreme southwest of the terai in Kanchanpur district of Nepal. It lies between 28°45' - 29°00' latitudes and 80°10' - 81°45' longitudes (DNPWC 2005). The altitude ranges from 80m to 600m above sea level. It is bounded by the Syali River in the east, Mahakali River in the west and the Siwalik Hills in the north and east. Nepal-India international boarder demarcates the southern boundary beyond which lies the Luggabhugga florican reserve in India (Baral and Inskipp 2005). It lies on the Gangetic flood plains and the common soil types are sandy loam, silty loam, and clay loam (DNPWC 2003). The reserve possesses the largest grassland of Nepal (Baral and Inskipp 2005). Four rivers- Mahakali, Syali, Bahuni and Chaudhar; an irrigation canal; and four small lakes- Rani Tal, Solghaudi Tal, Kalikich Tal, and Shikari Tal are the major water sources of the reserve.

Ecological Attributes

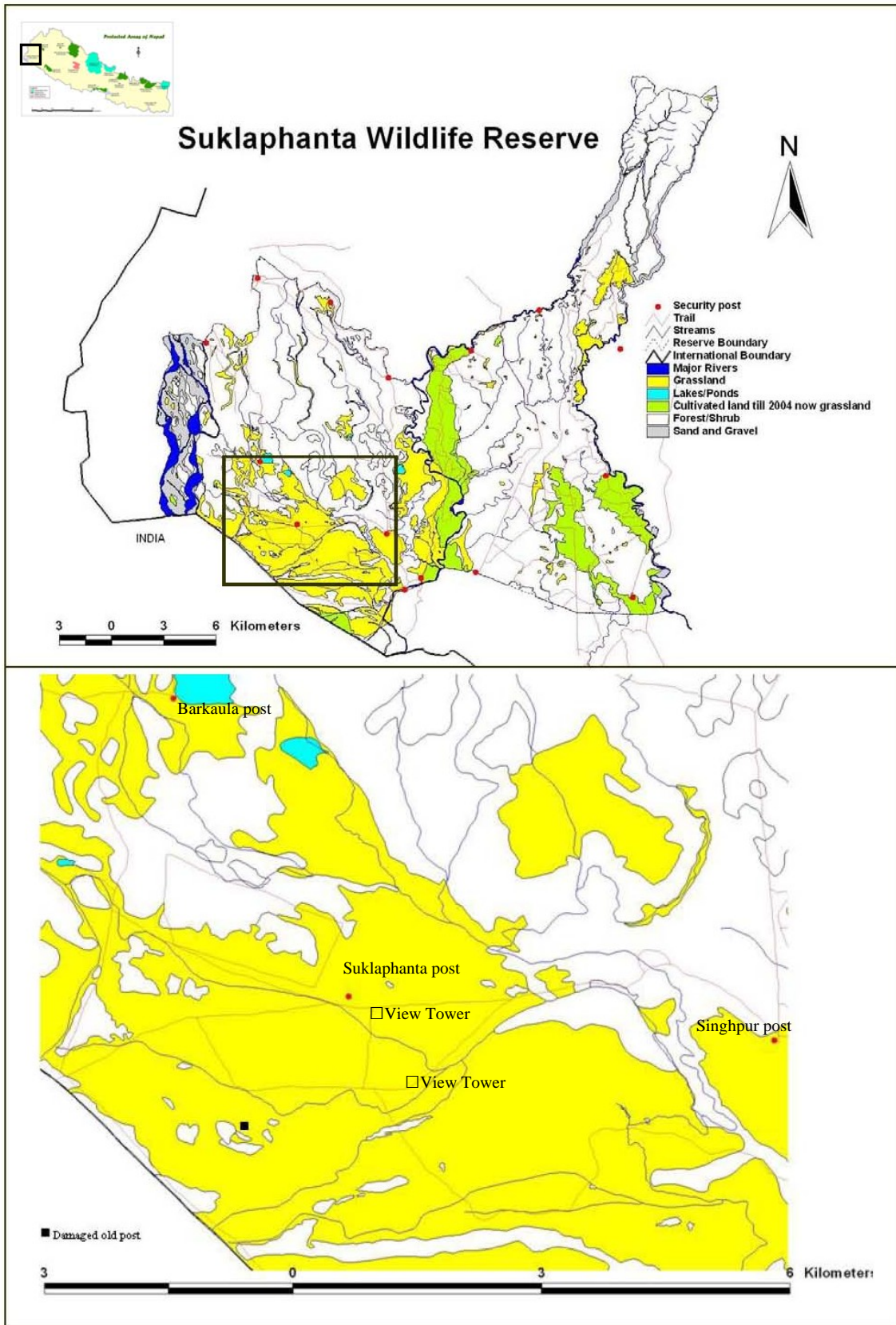
The area has a tropical monsoon climate with four different seasons: winter, spring, summer and monsoon. The months of December and January are fairly cold and misty with occasional frost. The mean monthly minimum temperature varies from 10 to 12°C in winter, gradually rising to 17°C in the spring and 26°C in the summer. Over 90% (1500-2000mm)

of the annual precipitation fall during monsoon between June and September (DNPWC 2007). Mean maximum temperatures are 40-42°C in April may (Balson 1976).

Suklaphanta Wildlife Reserve supports a wide range of biodiversity which is nationally and globally important. The climax vegetation type has Sal *Shorea robusta* as the dominant species in association with *Terminalia alata*, *Terminalia belerica*, *Largestromia parviflora*, and *Pterocarpus marsupium* (DNPWC 2003). Other habitat types are moist riverine forest (*Trewia nudiflora*, *Syzigium cumini*, *Mallotus philippinensis*) Khair Sissoo Forest (*Dalbergia sisoo*, *Acacia catechu*), savanna grasslands, floodplains and marshes (Balson 1976).

A total of 46 species of mammals, 17 species of herpetofauna and 28 species of fish have been recorded so far. The reserve harbours endangered species include Gangetic Dolphin *Platanista gangetica*, Asiatic Elephant *Elephas maximus*, One-horned Rhinoceros *Rhinoceros unicornis*, Royal Bengal Tiger *Panthera tigris tigris*, Hispid Hare *Caprolagus hispidus* and Asiatic Wild Dog *Cuon alpinus* and the largest herds of vulnerable Swamp Deer with 1,710 – 2,250 individuals (DNPWC 2003). Other vulnerable species include Sloth Bear *Ursus ursinus*, Smooth Coated Otter *Lutrogale perspicillata*, Marbled Cat *Felis marmorata* and Fishing Cat *Prionailurus viverrinus* (Bhujju et al. 2007).

A total of 349 species of birds has been recorded including 11 globally threatened species (Baral and Inskipp 2005, IUCN 2007). The reserve contains critically endangered Slender billed Vulture *Gyps tenuirostris*, White-rumped Vulture *G. bengalensis*, Red-headed Vulture *Sarcogyps calvus*, Bengal Florican *Houbaropsis bengalensis*; Endangered Egyptian Vulture *Neophron percnoptus*, and Vulnerable Swamp Francolin *Francolinus gularis*, Sarus Crane *Grus antigone*, Pallas's Fish Eagle *Haliaeetus leucoryphus*, Lesser Adjutant *Leptoptilos javanicus*, Hodgson's Bushchat *Saxicola insignis*, Finn's Weaver *Ploceus megarhynchus*. Suklaphanta is home to the largest population of Bengal Florican in Nepal.



Intensive Study Area

Suklaphanta, Karaiya, Haraiya and Singhpur phantas were selected on the basis of previous florican records and discussion with park staff and local people. Suklaphanta is a savanna grassland consisting both tall and short grassland. Singhpur, Haraiya and much of Karaiya phantas contain tall grassland. As tall grasslands were considered unsuitable habitat for Bengal florican at least for male, they were visited briefly. The study was intensively focused on the short grassland interspersed with tall grass patches in the central part of the Suklaphanta. *Imperata cylindrica* remained the dominant grass species in association with *Vetivera zizanioides*, *Cynodon dactylon*, *Saccharum spontaneum*, *S. munja*, *Themeda villosa*, *Eulaliopsis bipinnata*, *Phragmites karka*, *Arundo donax* and *Setaria species*.

2.2. Bardia National Park

Background History

As Suklaphanta wildlife reserve, Bardia National Park was also a hunting area before 1976. It was set aside in 1967 as Royal Hunting Reserve and gazetted in 1976 as Royal Karnali Wildlife Reserve with an area of 348 km². Later it was proclaimed as Royal Bardia Wildlife Reserve in 1982. It was extended to include the Babai valley in 1984 and 1572 families comprising about 95000 people residing in this valley were resettled in the Taratal area near Nepal-India boarder (Anon 1993, Timilsina et al. 2000). National Park status was gazetted in 1988 with an area of 968 km² (DNPWC 2005). After the peoples' revolution in 2006, the park's name was changed as Bardia National Park. In 1996, an area of 328 km² surrounding the park was declared a buffer zone, which consists of forests and private lands including cultivated lands.

Physical Attributes

Bardia National Park is situated in the mid western region of the sub tropical terai in Bardia district of Nepal. It lies between 28°15' - 28°35.5' latitudes and 80°10' - 81°45' longitudes (DNPWC 2005). The altitude ranges from 150m to 1441m above sea level. It is bounded by the Nepalgunj-Surkhet road in the east, the Geruwa River which is a branch of Karnali River in the west, and crest of the Siwalik Hills in the north. Along the southern edge a forest road

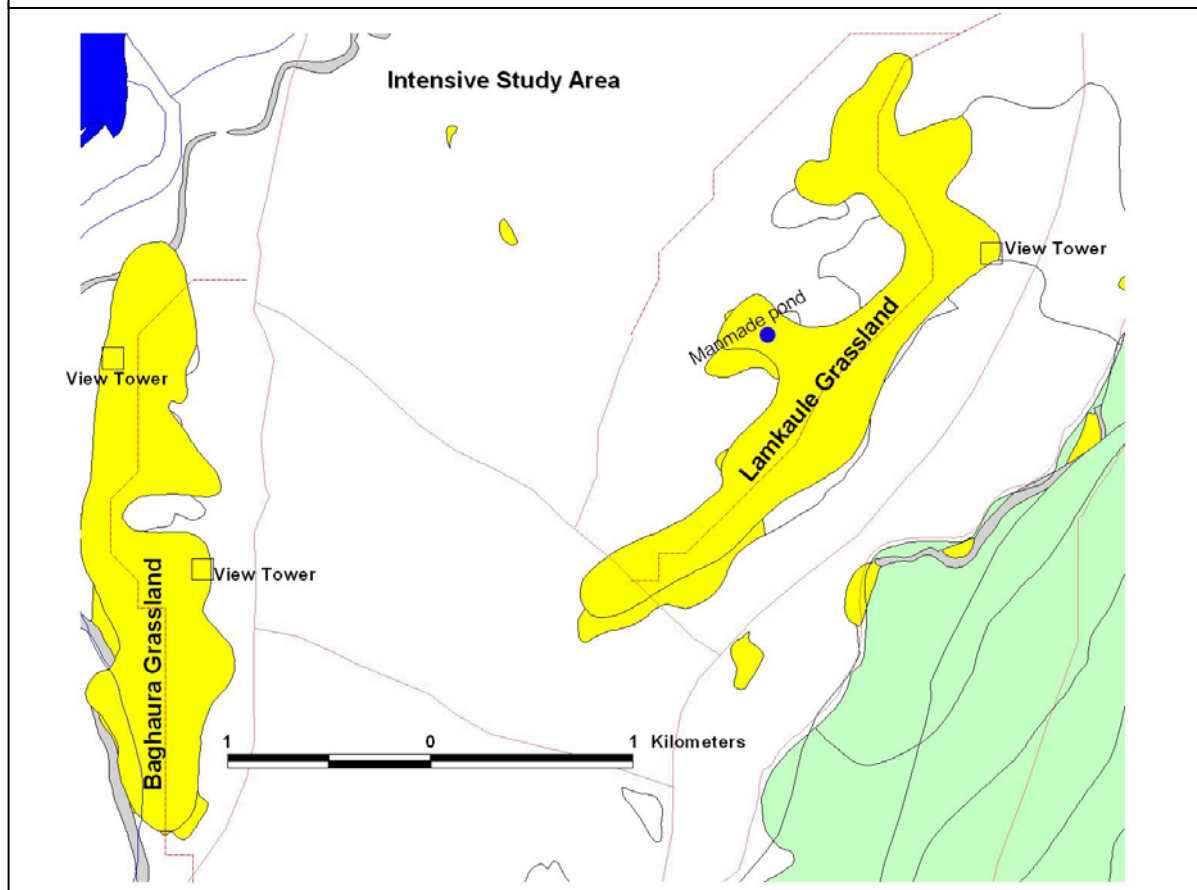
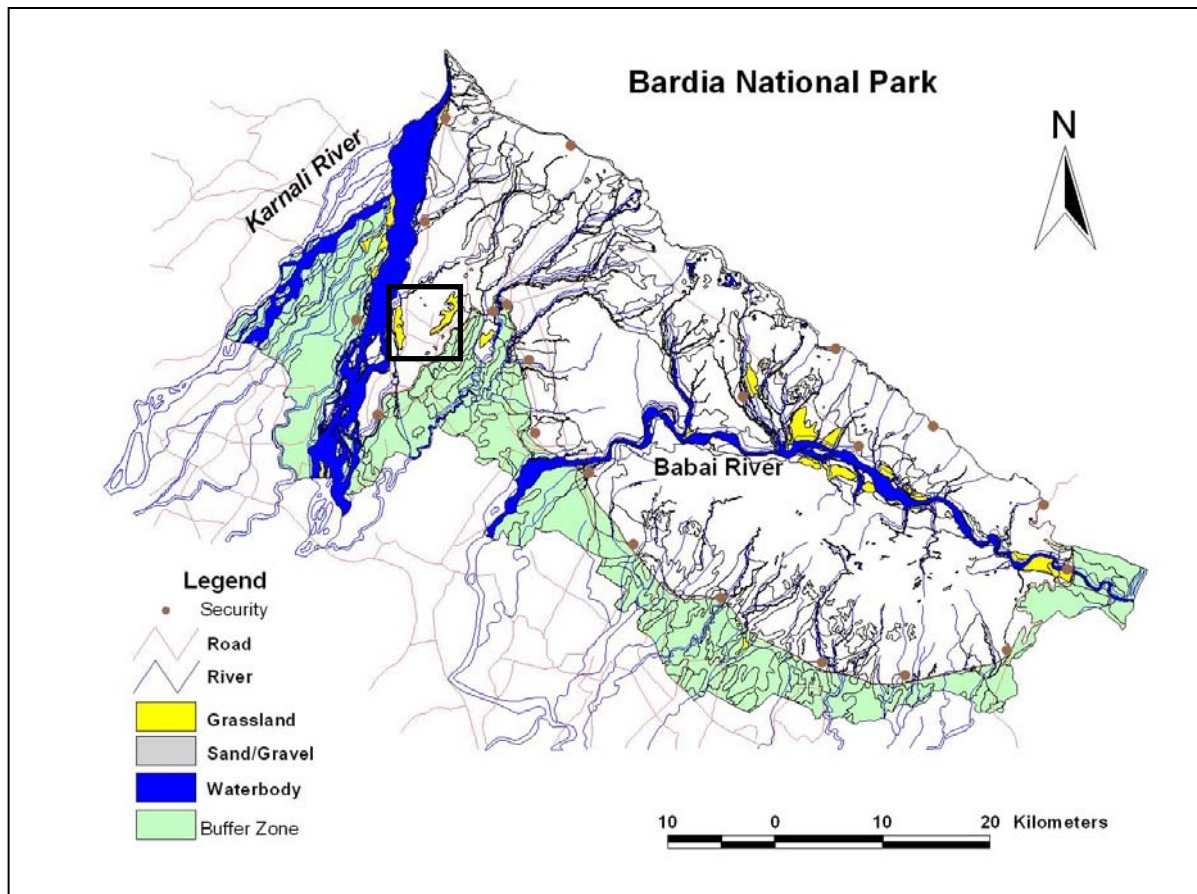
forms the boundary. The physiography of the park consists of Bhabar, Terai and floodplains. Most of the park lies in the Bhabar zone, consisting of rocks, boulders and sand inter-bedded with clay and silt driven down from Churia hills (Timilsina et al. 2007). Bardia is the largest protected area of the Terai of Nepal. Babai and Geruwa rivers are two large rivers flow into the parks. Khauraha, Baghaura and Lamkauli are the major grasslands.

Ecological Attributes

The park has three distinct seasons i.e. cool dry, hot dry and monsoonal each providing a unique experience (Dinerstein 1979). The climate is monsoonal with most precipitation falling between June and September. Mean annual rainfall to the south of the park has been recorded 1560mm whilst on the crest of the Churia hills on the north it is 2230mm (Peet 1999). From October through early April, the weather is cool and dry with the temperature falling as low as 10°C in January. The days are warm and nights are cool and pleasant. From April to June, the weather is hot dry the daytime reaching a peak in June at 45°C (Bolton 1976).

Bardia National Park is the most undisturbed wilderness area in the Terai of Nepal (DNPWC 2005). Approximately 70% of the park area is thickly forested with Sal *Shorea robusta* in association with *Terminalia tomentosa* and *Buchanania latifolia* (IUCN 1993, Peet et al. 1999). The remaining forests comprise Khair Sisoo forests (*Dalbergia sisoo* and *Acacia catechu*), moist riverine forests (*Syzigium cumini*, *Mallotus philippinensis*, *Bombax ceiba*, *Callicapra macrophylla* and *Murraya koenigii*), mixed hardwood forests (*Adina cordifolia*, *Casearia tomentosa* and *Mitragyna parviflora*) and grasslands. The grasslands are mainly located in the floodplains of Geruwa and Babai Rivers and range in size from <1 to 120 ha characterized by the dominance of *Imperata cylindrica* (Peet et al. 1999).

A total of 53 species of mammals, 50 species of herpetofauna and 121 species of fish have been recorded in the park (Bhujju et al. 2007). The park harbours endangered species include Gangetic Dolphin, Asiatic Elephant, One-horned Rhinoceros, Royal Bengal Tiger, Hispid Hare, Asiatic Wild-dog, Gharial Crocodile(CR) and Three-striped Turtle *Kachuga dhongoka*, Red-crowned Roofed Turtle *Kachuga kachuga* (CR), and vulnerable species



include Swamp Deer, Four horned Antelope *Tetracerus quadricornis* and Mugger Crocodile *Crocodylus palustris* (Bhaju et al. 2007).

A total of 426 species of birds has been recorded including 13 globally threatened species (Baral and Inskipp 2005, IUCN 2007). The park holds critically endangered Slender billed Vulture, White-rumped Vulture, Red-headed Vulture, Bengal Florican; Endangered Egyptian vulture, and Vulnerable Gray crowned Prinia, Lesser Adjutant, Greater Spotted Eagle *Aquila clanga*, Indian Spotted Eagle *Aquila hastate*, Pallas's Fish Eagle and Sarus Crane. Swamp Francolin *Francolinus gularis* and Lesser Florican *Sypheotides indica* were recorded in the past, but there are no recent records (Baral and Inskipp 2005).

Intensive Study Area

Lamkauli and Baghaura phantas were selected on the basis of previous florican records and discussion with park staff. Lamkauli was the largest and relatively dry phanta. A man made waterhole was in the mid of the phanta to trap monsoon water. Baghaura phanta was in the bank of Geruwa River. *Imperata cylindrica*, *saccharum spontanium* and *Narenga porphorycoma* were the dominating grass species of the phantas.

2.3. Chitwan National Park

Background History

The Chitwan National Park being the first protected area of Nepal declared as national park has a long history of over three decades in park management and rich experiences in nature conservation. As Suklaphanta and Bardia, the Chitwan was also a big game area for the royal families, Rana rulers and their guests. The area comprising the Tikauli forest from Rapti River to the foothills of the Mahabharat extending over an area of 175 km² was declared as Mahendra Deer Park in 1969. The area south of the Rapti River was demarcated as a Rhino Sanctuary in 1963. It was proclaimed as Royal Chitwan National Park with an area of 932 km² in 1973 (DNPWC 2005, DNPWC 2007). After the peoples' revolution in 2006, the park's name was changed to Chitwan National Park. In recognition of its unique biological resources of outstanding universal value, UNESCO designated CNP as a World

Heritage Site in 1984. In 1996, an area of 750 km² surrounding the park was declared a buffer zone, which consists of forests and private lands including cultivated lands. The buffer zone contains a Ramsar Site – Beeshazari Lakes.

Physical attributes

Chitwan National Park is situated in south central Nepal in the sub tropical lowlands of the inner terai of Chitwan, Makawanpur, Parsa and Nawalparasi districts. It lies between 27°16.56'- 27°42.14' Latitudes and 83°50.23'-84°46.25' Longitudes (DNPWC 2005). The altitude ranges from 110m to 850m above sea level. The park is bounded by the Rapti and Narayani River in the north, Parsa Wildlife Reserve in the east and madi settlements and India border in the south. The physiography of the park consists of the Terai and Siwaliks. Three major rivers Narayani, Rapti and Reu, and their floodplains; and several lakes and pools are the major water sources of the park.

Ecological Attributes

The park has a range of climatic seasons each offering unique experience. October through February with average temperature of 25°C offers an enjoyable climate. From March to June temperatures can reach as high as 43°C. The hot humid days give way to the monsoon season that typically lasts from late June until September when rivers become flooded and most of the roads are virtually impassable (DNPWC 2007). Mean annual rainfall of the park has been recorded 2150mm.

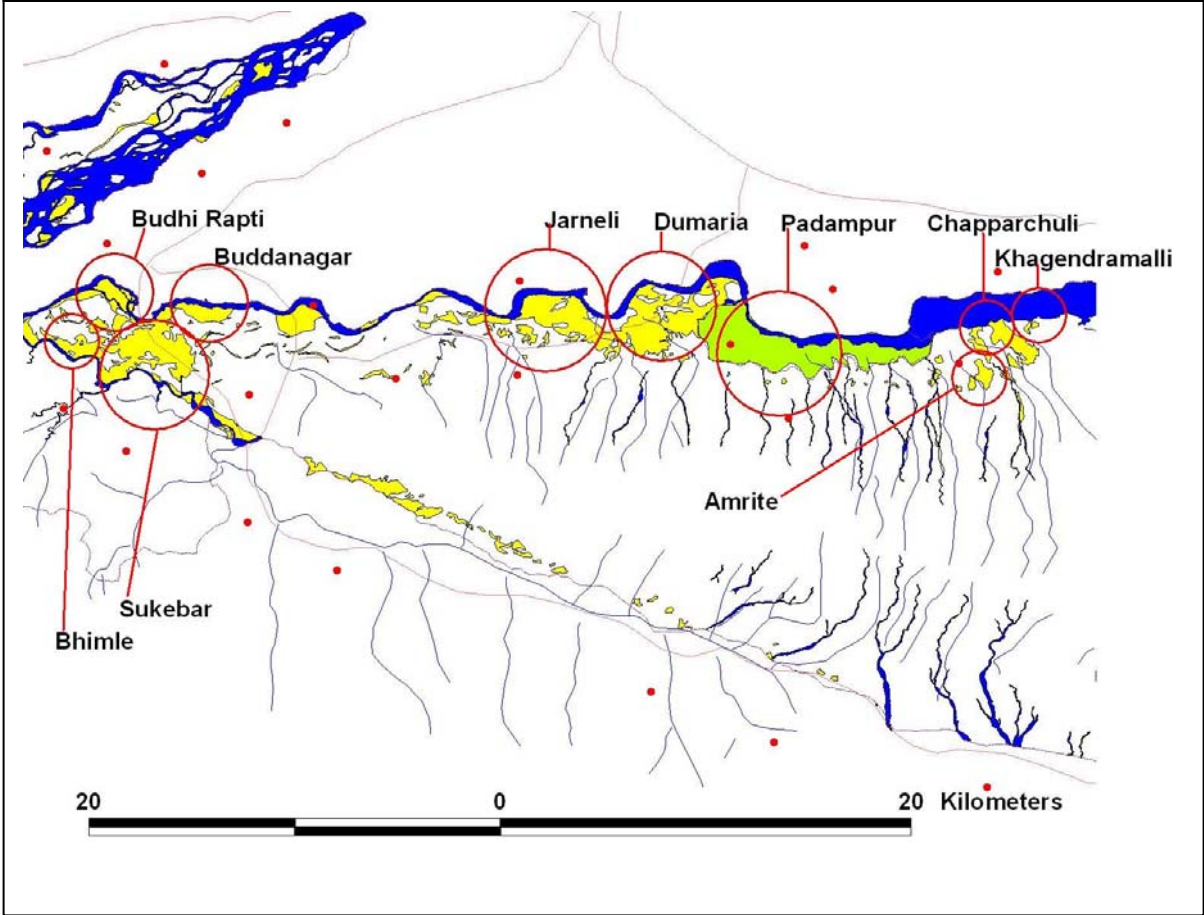
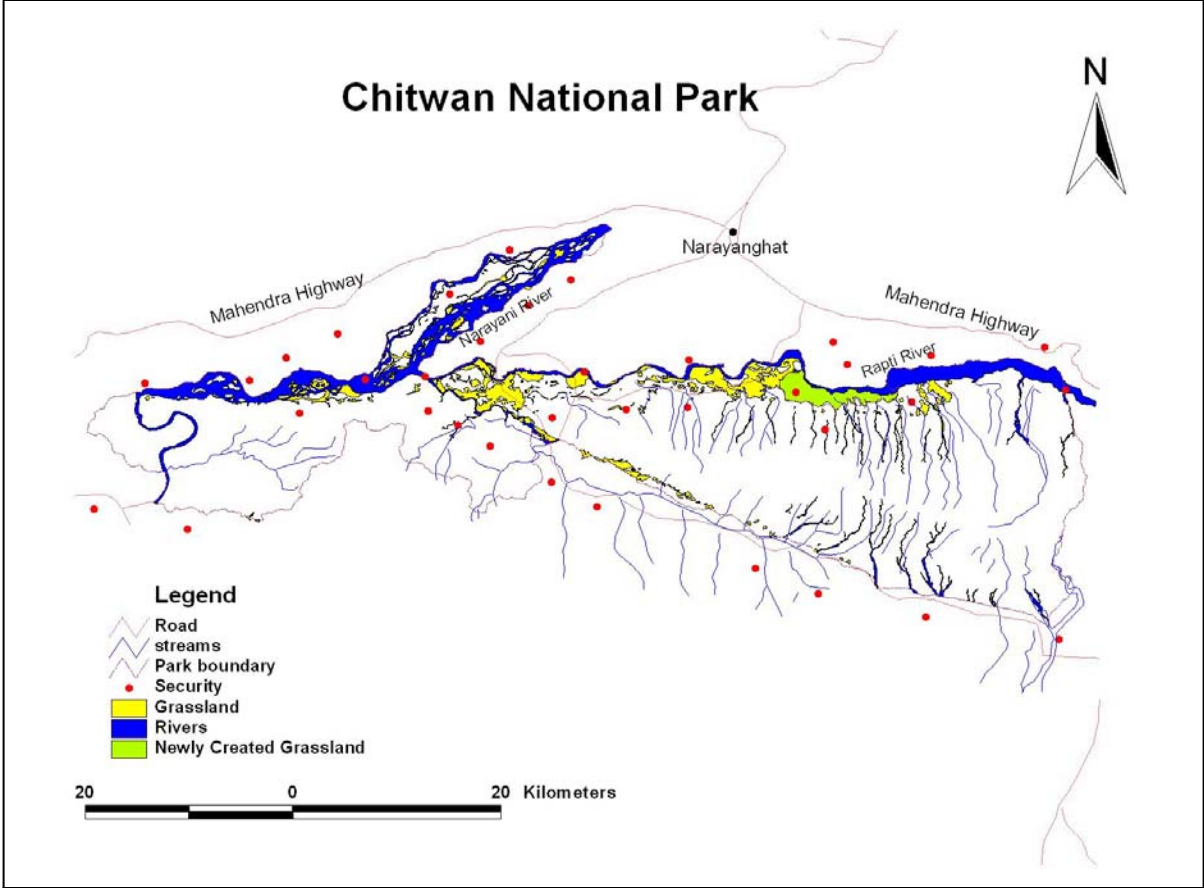
The Chitwan valley is characterized by tropical and subtropical forests. Roughly 70 percent of park vegetative cover is Sal forest, a moist deciduous vegetation type of the terai region. The remaining vegetation types include grassland 20%, riverine forest 7% and Sal with Chir pine *Pinus roxburghii* 3%. The later occurs at the top of the Churia range. The riverine forests consist of Khair, Sissoo and Simal *Bombax ceiba*. The grasslands are mainly located in the floodplains of the rivers and form a diverse and complex community with over 50 different types of grasses (DNPWC 2007).

A total of 56 species of mammals, 56 species of herpeto fauna and 126 species of fish have been recorded in the park. The park is especially renowned for its protection of One Horned Rhinoceros, Royal Bengal Tiger and Gharial Crocodile. Other endangered species include Asiatic Wild-dog, Gangetic Dolphin, Asiatic Elephant, Particoloured Flying Squirrel *Hylopetes alboniger*, Hispid Hare, Three-striped Turtle, Elongated Tortoise *Indotestudo elongate*, Red-crowned Roofed Turtle (CR), and Vulnerable species include Smooth Coated Otter *Lutrogale perspicillata*, Golden Cat *Catopuma temminckii*, Marbled Cat, Clouded Leopard *Pardofelis nebulosa*, Fishing Cat, Gaur Bison *Bos gaurus*, Four-horned Antelope, Sloth Bear, Irrawaddy Squirrel *Callosciurus pygerythrus*, Mugger Crocodile and Three-keeled Land Tortoise *Melanochelys tricarinata* (DNPWC 2000, BPP 1995).

A total of 540 species of birds has been recorded so far including 22 globally threatened species (Baral and Inskipp 2005, Baral and Upadhyaya 1998, IUCN 2007). The park contains critically endangered Bengal Florican, Slender-billed Vulture, White-rumped Vulture, Red-headed Vulture. Endangered Egyptian Vulture is resident species, Lesser Florican is rare monsoon visitor to grassland and Greater Adjutant is vagrant species. Vulnerable Indian Spotted Eagle, Lesser Adjutant, Gray crowned Prinia, Jerdon's Babbler *Chrysomma altirostre* and Slender-billed Babbler *Turdoides longirostris* are resident species. Vulnerable Sarus Crane, Greater Spotted Eagle, Imperial Eagle *Aquila heliaca*, Hodgson's Bushchat, Indian Skimmer *Rynchops albicollis* and Pallas's Fish Eagle are rare visitors in the park. There are no recent records of the last two species. Vulnerable Kashmir Flycatcher *Ficedula subrubra* and Lesser Kestrel *Falco naumanni* are rare passage migrant to open country; the first one is also a restricted range species. Vulnerable Bristled Grassbird *Chaetornis striatus* is a fairly common summer visitor to grasslands. Swamp Francolin *Francolinus gularis* was recorded in the past but there are no recent records (Baral and Inskipp 2005).

Intensive Study Area

All observed grasslands were Rapti flood plains in Chitwan National Park. Khagendramalli, Chapparchuli, Amrite, Padampur, Dumaria, Jarneli, Sukebar, Budhirapti, Bhimle and Buddanagar grasslands were selected on the basis of previous florican records and



discussion with park staff. Patches of *Imperata cylindrica* were surrounded by tall grasses and bushes in Sukebar grassland. Buddanagar and Budirapti were dominated by *Imperata cylindrica*. Amrite and Padampur were the newly created grasslands from cultivated lands and human settlements. *Impearata cylindrica* was the major grass species.

Photo: Suklaphanta Grassland, Nepal, 2007



3. Methods

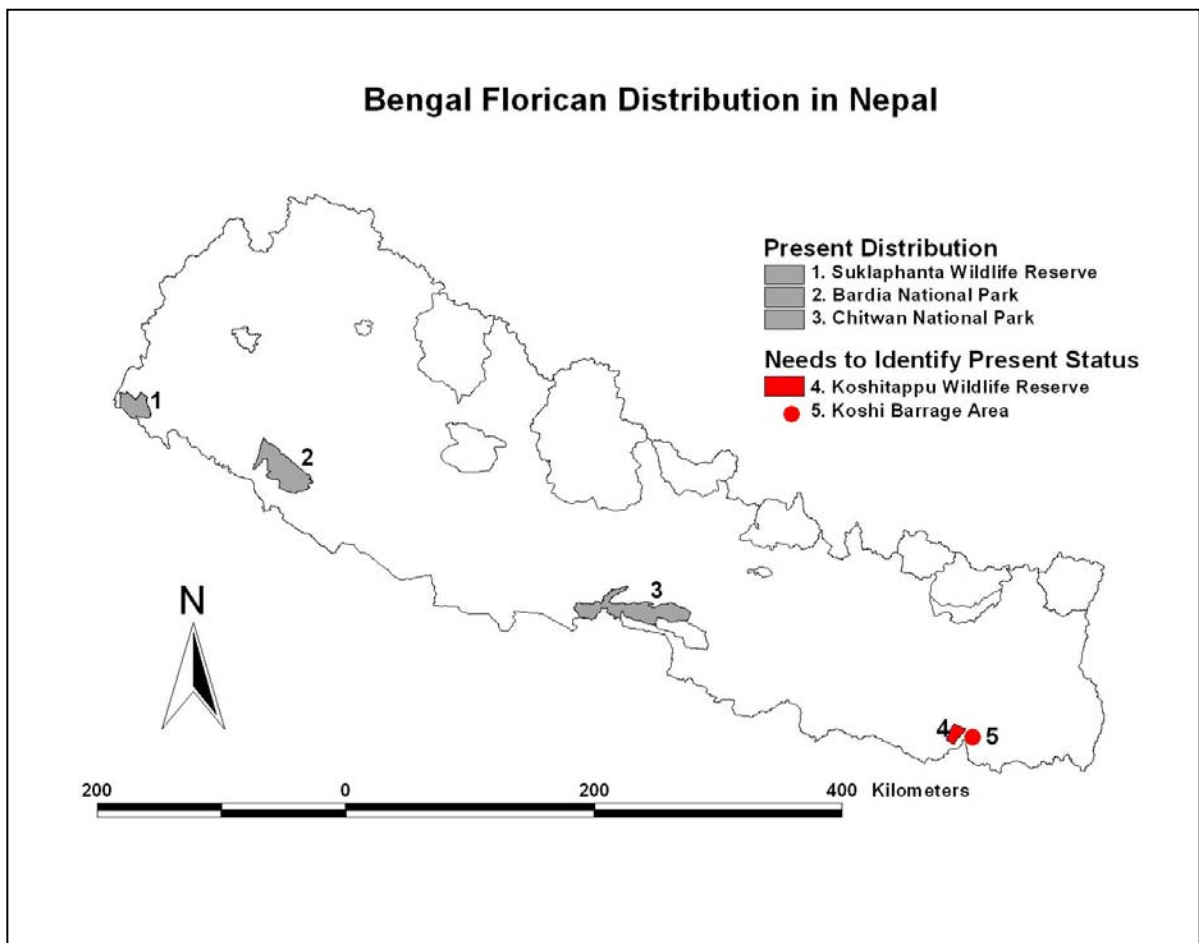
Known and potential florican habitats were visited during the breeding season (April-May) when displaying territorial males were most visible. The methods involved counting of lekking sites and identification of territories. In the breeding season, male floricans are very territorial. Different display sites were assumed to fit in different males. As females are more difficult to locate, population estimates were based on the assumption of an equal sex ratio. Observations were carried out in the morning (0630-0930 hrs) and afternoon (1630-1900 hrs) when the species were more active. Binoculars (Avocet 10X 50 and Nikon 8X 40 Action UWV) and Spotting Scope (Swift 839 searcher 20x and 40x, 60mm) were used from view towers and trees for a better view of the grassland generally with minimal disturbance to floricans. Some areas were observed from elephant back and from motor vehicles. The number and sex of individuals and other activities were noted down for each sighting of floricans. Group discussions and personal communications were held with protected area personnel and local people to gain information on the presence of Bengal Florican and its conservation.



4. Results and Discussion

4.1 Status and Distribution of Bengal Florican in Nepal

The present study recorded altogether 14-18 adult males and 2 females in the three protected areas of Nepal. This estimates 28-36 adult population assuming that floricans were in equal sex ratio. Two sub adults were reported from Chitwan. Most of the males were recorded from short grasslands dominated by *imperata cylindrica*. Compared to past studies, the population has declined by 56% since 1982 and by 30% since 2001.



Protected area	No of Male Florican recorded				Population Estimated in 2007
	1982	1990	2001	2007	
SWR	13	14	12-14	8-9	16-18
BNP	8-9	5	3	1	2-4
CNP	8-19	-	3	5	10-14
Total adult population estimated in Nepal in 2007					28-36

Suklaphanta Wildlife Reserve

Eight males and two females were recorded at Suklaphanta, among which six males were found to be maintaining their territory. The floricans were not recorded in Singhpur, Karaiya and Haraiya grasslands. Our team members Mohandev Bhatta and Devraj Joshi recorded one male near from 24 No boundary pillar of Nepal- India on 7th and 8th April 2007. Though we couldn't observe this bird in our three observations, we shouldn't overlook this bird from the total population estimate. It was concluded that the estimated number of Bengal florican at Suklaphanta were 8-9 adult males. Inskipp recorded 13 males in 1982 (Inskipp and Inskipp 1983, Inskipp and Collar 1984) and Baral recorded 12 males in 2000 at Suklaphanta (Baral et al. 2003) whereas Weaver recorded 14 males in 1990 (Weaver 1990). Compared to those studies, the number has declined by 38% since 1982 and by 33% since 2000.

The distance between two nearest territorial birds was 412 to 1500m apart. Basically males were seen when they flushed for few seconds 6-7m above the ground level and landed. Long flights of two males were seen two times flying together 1.5 to 2 kilometer (approximately) for 3-5 minutes. One female was seen flying 40-50m distance 6-7m above the ground and landed at a patch of relatively tall grasses, and another female was seen foraging in short grassland. Suklaphanta is the place for observation of Bengal Florican where an enthusiast can locate more than five lekking sites staying at one place. We observed five territorial males at once from a view tower.

Two territorial males were observed on newly managed grassland patches, one in the south from an old post (building) and next in western end of Suklaphanta, where bushes and trees had been removed. The Suklaphanta Wildlife Reserve Authority, has a plan to work on 100 hectare of grassland in 2007, and to uproot and remove the bushes and the trees from the grassland. This is good news for Bengal Florican conservation in Nepal.

Bardia National Park

Only one male was recorded at Lamkauli grassland of Bardia National Park. The bird was seen in all nine observations when it was displaying and foraging relatively same location at the north end of the grassland. No females and juveniles were recorded. We did not observe any floricans at Baghaura Phanta in this study. Bardia Conservation Project Manager Mr Naresh Subedi recorded a male Bengal Florican at Baghaura grassland at the end of March 2007. Perhaps the same bird was observed at Lamkauli grassland in our field visit. Inskipp and Inskipp recorded 8-9 males in 1982 (Inskipp and Inskipp 1983, Inskipp and Collar 1984). Weaver recorded 5 males and a female in 1990 (weaver 1991) and Baral *et al.* (2003) recorded 3 males and 2 females in 2000 in these areas. National Park Senior Game-scout and Naturalist Mr Jeet Bahadur Khadka had been updating Bengal Florican data for the past few years. He recorded 3 males in 2005 and 2 males in 2006, but no females or juveniles. When the survey results are compared, the number of Bengal Floricans has declined by 87% since 1982, by 80% since 1990 and by 66% since 2000.

Bardia's grassland is undergoing plant succession changing consecutively to tall grasses, bushes and trees. Most of the bushes were removed from the grassland, but trees were untouched during the grassland management in 2007 by the National Park Authority. More than 100 trees were found scattered in the Baghaura grassland. If these changes continue uninterrupted for a few more years, there will be a Baghaura forest instead of a Baghaura grassland. Apart from the succession, predators were also found to be big threat to floricans. During the study period, we observed a couple of Jackals in three out of a total of nine visits.

Chitwan National Park

Altogether five males were recorded at Chitwan, among which five were observed from Amrite, Padampur, Budhirapti, Sukebar, and Buddanagar grasslands. Inskipp and Inskipp (1983) recorded 8-19 males in 1982 and Baral *et al.* (2003) recorded three males in 2003. Compared to past studies the number has declined by 38% since 1982. Of the ten grasslands we visited, the floricans were absent from Khagendramalli, Jarneli and Dumaria grasslands. Chitwan Jungle Lodge's naturalist Mr Harka Bahadur Gurung recorded a male florican at Chapparchuli grassland regularly from last two years (Pers Communication with Mr

Gurung). However we did not observe the bird in our three observations in this grassland. This grassland was dominated by *Imperata cylindrica* but heavily encroached by bushes and trees. The grassland was also affected by human disturbances. During our visit, we counted 17 women who were collecting grasses for feeding their livestock.

The Amrite and Padampur were newly created grasslands where there were settlements five/six years ago. Both areas were observed by using domestic elephants. Two males were recorded from Amrite and Padampur grasslands. Both the areas were dominated by *Imperata cylindrica* with encroaching tall grasses and bushes.

Three males were recorded from Buddanagar, Budhirapti and Sukebar grasslands one male in each site. Patches of *Imperata cylindrica* were surrounded by tall grasses and bushes in Sukebar grassland. Buddanagar and Budirapti were dominated by *Imperata cylindrica* and these grasslands have high potential as good habitat for Bengal florican. Naturalist Jeet Bahadur Basyal of Cheetal Lodge recorded two males at Buddanagar on 27th March 2007. Chitwan National Park's Veterinary Doctor Mr Chitra Bahadur Khadka observed two sub adult males on 10th May at Bhimle grassland which suggests breeding is successful at Chitwan.

4.2. Conservation Recommendation

The Protected Area Authority removed trees and bushes from Suklaphanta, Padampur, Khagendramalli, Dumaria, Sukebar and Jarneli grasslands in 2007. This should be repetitively continued in all grasslands in the future. Not only bushes, but also saplings and trees should be removed from the Baghaura and Lamkauli phantas too. Local people are allowed to collect thatching material from the grasslands from the December to early January (Poudyal 2007). Human disturbances were very high in Chitwan followed by Bardia. Human disturbances and grazing pressure should be reduced. The disturbances at Suklaphanta were very much less as this grassland lies far from human habitations.

Fires in the protected areas seem essential to maintain the grassland ecosystem (Baral 2001). Controlled cutting and prescribed burning should be done before March. Late fires can be detrimental to young birds (Inskipp and Inskipp 1983). Maintaining interspersed small patches of taller grasses on the shorter grassland dominated by *Imperata cylindrica* is crucial when conducting grassland management activities such as burning and cutting. Preventing succession from *Imperata* grassland to tall grassland seems a challenging task. Researches should be carried out and grassland management plans should be prepared and implemented so that specialist grassland birds such as Bengal Florican and other grassland dependent taxa survive with viable populations.

Park staff play the vital role in implementing the grassland management practices. They have to know about the importance, status and behaviour of this endangered bird. So conservation education to staff, local people and school children is highly recommended. As this species has a very small and rapidly declining population, regular monitoring should be carried out in all potential habitats. Protected area staff can do this task regularly using a small budget, if they are trained well once. There has not been any survey at Koshitappu Wildlife Reserve and Koshi Barrage since 1982 when Inskipp and Inskipp recorded three males and a female. As there is still evidence of existence of Bengal Florican, surveys should be carried to find out its present status in this areas. A female was seen in January 2003 (Giri and Choudhary 2003) and a male was seen twice at Devighat, north of Koshitappu on April and May 2004 (Baral and Inskipp 2004).

The species is easily detectable in the breeding season only and unknown in other seasons. Detailed ecological studies should be done to know its status in all seasons. Feasibility studies of captive breeding and releasing chicks in their natural habitats are recommended for long-term conservation of this endangered bird. A conservation action plan should be prepared and immediately implemented.

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Photo: Bengal Florican male at Suklaphanta Wildlife Reserve, Nepal, 2007



Appendix I

Bustards of the World

SN	English Name	Scientific name	IUCN Status
1.	Arabian Bustard	<i>Ardeotis arabs</i>	
2.	Australian Bustard	<i>Ardeotis australis</i>	Near-threatened
3.	Bengal Florican	<i>Houbaropsis bengalensis</i>	Critically Endangered
4.	Black Bustard	<i>Eupodotis afra</i>	
5.	Black-bellied Bustard	<i>Eupodotis melanogaster</i>	
6.	Blue Bustard	<i>Eupodotis caerulescens</i>	Near-threatened
7.	Buff-crested Bustard	<i>Eupodotis gindiana</i>	
8.	Great Bustard	<i>Otis tarda</i>	Vulnerable
9.	Hartlaub's Bustard	<i>Eupodotis hartlaubii</i>	
10.	Heuglin's Bustard	<i>Neotis heuglinii</i>	
11.	Houbara Bustard	<i>Chlamydotis undulata</i>	Vulnerable
12.	Great Indian Bustard	<i>Ardeotis nigriceps</i>	Endangered
13.	Karoo Bustard	<i>Eupodotis vigorsii</i>	
14.	Kori Bustard	<i>Ardeotis kori</i>	
15.	Lesser Florican	<i>Sypheotides indicus</i>	Endangered
16.	Little Brown Bustard	<i>Eupodotis humilis</i>	Near-threatened
17.	Little Bustard	<i>Tetrax tetrax</i>	Near-threatened
18.	Ludwig's Bustard	<i>Neotis ludwigii</i>	
19.	Macqueen's Bustard	<i>Chlamydotis macqueenii</i>	Vulnerable (?)
20.	Nubian Bustard	<i>Neotis nuba</i>	Near-threatened
21.	Red-crested Bustard	<i>Eupodotis ruficrista</i>	
22.	Rueppell's Bustard	<i>Eupodotis rueppellii</i>	
23.	Savile's Bustard	<i>Eupodotis savilei</i>	
24.	Stanley's Bustard	<i>Neotis denhami</i>	Near-threatened
25.	White-bellied Bustard	<i>Eupodotis senegalensis</i>	
26.	White-quilled Bustard	<i>Eupodotis afroaoides</i>	

Appendix II

Globally Threatened and Near Threatened Birds of Nepal

SN	English Name	Scientific Name	IUCN Status
1.	Bengal Florican	<i>Houbaropsis bengalensis</i>	Critical
2.	Pink-headed Duck	<i>Rhodonessa caryophyllacea</i>	Critical
3.	Red-headed Vulture	<i>Sarcogyps calvus</i>	Critical
4.	Slender-billed Vulture	<i>Gyps tenuirostris</i>	Critical
5.	White-bellied Heron	<i>Ardea insignis</i>	Critical
6.	White-rumped Vulture	<i>Gyps bengalensis</i>	Critical
7.	Egyptian Vulture	<i>Neophron percnopterus</i>	Endangered
8.	Greater Adjutant	<i>Leptoptilos dubius</i>	Endangered
9.	Lesser Florican	<i>Sypheotides indicus</i>	Endangered
10.	Saker Falcon	<i>Falco cherrug</i>	Endangered
11.	Baer's Pochard	<i>Aythya baeri</i>	Vulnerable
12.	Baikal Teal	<i>Anas formosa</i>	Vulnerable
13.	Black-breasted Parrotbill	<i>Paradoxornis flavirostris</i>	Vulnerable
14.	Black-necked Crane	<i>Grus nigricollis</i>	Vulnerable
15.	Bristled Grassbird	<i>Chaetornis striata</i>	Vulnerable
16.	Cheer Pheasant	<i>Catreus wallichi</i>	Vulnerable
17.	Eastern Imperial Eagle	<i>Aquila heliaca</i>	Vulnerable
18.	Finn's Weaver	<i>Ploceus megarhynchus</i>	Vulnerable
19.	Greater Spotted Eagle	<i>Aquila clanga</i>	Vulnerable
20.	Grey-crowned Prinia	<i>Prinia cinereocapilla</i>	Vulnerable
21.	Hodgson Bushchat	<i>Saxicola insignis</i>	Vulnerable
22.	Indian Skimmer	<i>Rynchops albigollis</i>	Vulnerable
23.	Indian Spotted Eagle	<i>Aquila hastata</i>	Vulnerable
24.	Jerdon's Babbler	<i>Chrysomma altirostre</i>	Vulnerable
25.	Kashmir Flycatcher	<i>Ficedula subrubra</i>	Vulnerable
26.	Lesser Adjutant	<i>Leptoptilos javanicus</i>	Vulnerable
27.	Lesser Kestrel	<i>Falco naumanni</i>	Vulnerable
28.	Pallas's Fish-Eagle	<i>Haliaeetus leucoryphus</i>	Vulnerable
29.	Rufous-Necked Hornbill	<i>Aceros nipalensis</i>	Vulnerable
30.	Sarus Crane	<i>Grus antigone</i>	Vulnerable
31.	Slender-billed Babbler	<i>Turdoides longirostris</i>	Vulnerable
32.	Swamp Francolin	<i>Francolinus gularis</i>	Vulnerable
33.	Wood Snipe	<i>Gallinago nemoricola</i>	Vulnerable
34.	Black-bellied Tern	<i>Sterna acuticauda</i>	Near Threatened
35.	Black-headed Ibis	<i>Threskiornis melanocephalus</i>	Near Threatened
36.	Black-Necked Stork	<i>Ephippiorhynchus asiaticus</i>	Near Threatened
37.	Black-tailed Godwit	<i>Limosa limosa</i>	Near Threatened
38.	Blyth's Kingfisher	<i>Alcedo hercules</i>	Near Threatened
39.	Cinereous Vulture	<i>Aegyptius monachus</i>	Near Threatened
40.	Falcated Duck	<i>Anas falcata</i>	Near Threatened

41.	Ferruginous Pochard	<i>Aythya nyroca</i>	Near Threatened
42.	Great Hornbill	<i>Buceros bicornis</i>	Near Threatened
43.	Grey-headed Fish Eagle	<i>Ichthyophaga ichthyaetus</i>	Near Threatened
44.	Laggar Falcon	<i>Falco jugger</i>	Near Threatened
45.	Lesser Fish-Eagle	<i>Ichthyophaga humilis</i>	Near Threatened
46.	Oriental Darter	<i>Anhinga melanogaster</i>	Near Threatened
47.	Painted Stork	<i>Mycteria leucocephala</i>	Near Threatened
48.	Pallid Harrier	<i>Circus macrourus</i>	Near Threatened
49.	Red Kite	<i>Milvus milvus</i>	Near Threatened
50.	Rufous-rumped Grassbird	<i>Graminicola bengalensis</i>	Near Threatened
51.	Rufous-throated Wren-Babbler	<i>Spelaeorinis caudatus</i>	Near Threatened
52.	Satyr Tragopan	<i>Tragopan satyra</i>	Near Threatened
53.	Spot-billed Pelican	<i>Pelecanus philippensis</i>	Near Threatened
54.	Tytlar's Leaf Warbler	<i>Phylloscopus tytlari</i>	Near Threatened
55.	Wedge-billed Wren-Babbler	<i>Sphenocichla humei</i>	Near Threatened
56.	Yellow-breasted Bunting	<i>Emberiza aureola</i>	Near Threatened
57.	Yellow-rumped Honeyguide	<i>Indicator xanthonotus</i>	Near Threatened

Appendix III Protected Birds of Nepal

SN	English Name	Scientific Name	IUCN Status
1	Cheer Pheasant	<i>Catreus wallichii</i>	Vulnerable
2	Himalayan Monal	<i>Lophophorus impeyanus</i>	
3	Satyr Tragopan	<i>Tragopan satyra</i>	Near Threatened
4	White Stork	<i>Ciconia ciconia</i>	
5	Bengal Florican	<i>Houbaropsis bengalensis</i>	Critical
6	Lesser Florican	<i>Sypheotides indica</i>	Endangered
7	Sarus Crane	<i>Grus antigone</i>	Vulnerable
8	Great Hornbill	<i>Buceros bicornis</i>	Near Threatened
9	Black Stork	<i>Ciconia nigra</i>	

Appendix IV

Grasslands of the Study Areas

Grasslands	Habitat suitability for Bengal Florican	Surveyed/ Unsurveyed	Remarks
Suklaphanta Wildlife Reserve			
1. Suklaphanta	Suitable and regularly recorded	Surveyed in 1982, 1990, 2001 and 2007	Savanna grassland consisting both tall and short grasses. Short grassland interspersed with tall grass patches in the central part of the Suklaphanta.
2. Karaiya	Potential. Previous records by park officials	Surveyed in 1990, 2001 and 2007.	Short grass patches in the central part. Proper management needed. If managed suitably could provide additional habitat.
3. Singhpur	Potential. No records yet	Surveyed in 1982, 1990, 2001 and 2007	Mainly tall grasses with small patches of short grasses. If managed suitably could provide additional habitat.
4. Haraiya	Potential. No records yet	Surveyed in 2001 and 2007	
5. Barkaula	Unsuitable	Unsurveyed.	Tall and waterlogged grasslands.
6. surya phanta	Potential	Unsurveyed.	Newly created grassland from cultivated land and human settlements. Short and tall grassland interspersed. Growing scattered trees. If managed suitably, could provide additional habitat.
7. Andaiya-Pattaiya	Potential	Unsurveyed.	
8. Bhatpuri	?	Unsurveyed.	
9. Dhakka	?	Unsurveyed.	
10. Tarapur	?	Unsurveyed.	
11. Hirapur	?	Unsurveyed.	
12. Arjuni	?	Unsurveyed.	Heavily grazed and disturbed area.
13. Radhapur	Unsuitable	Unsurveyed.	
14. Kalikitch	Unsuitable	Unsurveyed.	Wetland plus grassland. Heavily grazing. Habitat is altering due to irrigation canal outlet.
Bardia National Park			
1. Lamkauli Phanta	Suitable and regularly recorded	Surveyed in 1982, 1990, 2000 and 2007	Short grassland but is undergoing plant succession changing consecutively to tall grasses, bushes and trees. Apart from the succession, predators were also found to be big threat to floricans.
2. Baghaura Phanta	Suitable		

3. Khauraha	Potential	Surveyed in 1998 and 2000	This phanta has lost its open areas due to succession. The Florican was recorded in 1998. If managed suitably could provide additional habitat.
Chitwan National Park			
1. Khagendramalli	Potential, one male record in 2001	Surveyed in 2001 and 2007	Very few short grasses intermixed with tall grasses.
2. Chappachuli	Potential, records by hotel staff	Surveyed in 2007	Very few short grasses intermixed with tall grasses.
3. Amrite	Suitable, recorded in 2007	Surveyed in 2007	Both the areas are dominated by <i>Imperata cylindrica</i> with encroaching tall grasses and bushes.
4. Padampur	suitable, recorded in 2007	Surveyed in 2007	
5. Dumaria	Potential, previous records(1982, 2001),	Surveyed in 1982, 2001,	The grassland is composed of smaller patches of scattered <i>Imperata cylindrica</i> .
6. Jarneli	Potential, previous records (2001)	Surveyed in 1982, 2001, 2007	Big grassland located in the middle of the Sal forest.
7. Sukebhar	Suitable, regularly recorded	Surveyed in 1982, 2001, 2007	Savannah grassland surrounded by riverine forests. Removal of trees and tall grasses, prescribed burning before march should be continued every year.
8. Bhimle	Potential, previous records(1982),	Surveyed in 1982, 2001, 2007	Very few short grasses interspersed with tall grasses.
9. Budhirapti	suitable	Surveyed in 2007	Grasslands are dominated by <i>Imperata cylindrica</i> and have high potential as good habitat for Bengal florican.
10. Buddanagar	suitable		
11. Kachuwani	Potential, previous records(1982),	Surveyed in 1982, 2001,	
12. Ghatgain/Lamital	Potential	Surveyed in 1982, 2001	Savanna grassland, small patches of <i>Imperata cylindrica</i> . Ox bow lake near by.

Note: Removal of trees and tall grasses, and prescribed burning before March is recommended every year in all grasslands.

Photo: Bengal Florican Male at Bardia National Park, Nepal, 2007



Photo: Bengal Florican Male at Suklaphanta Wildlife Reserve, Nepal, 2007



For further information

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