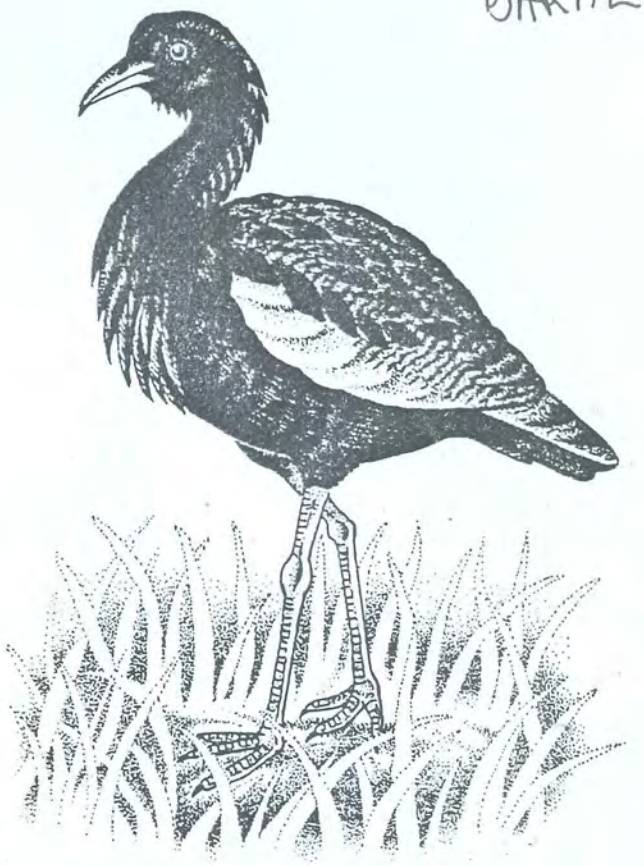
POPULATION STATUS AND DISTRIBUTION OF BENGAL FLORICANS *(Houbaropsis bengalensis)* IN ROYAL SUKLAPHANTA WILDLIFE RESERVE, NEPAL

TAMANG & BARAL (2000)



Final Report Submitted to
Oriental Bird Club, UK
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LIST OF ABBREVIATIONS & ACRONYMS

DNPWC	- Department of National Parks and Wildlife Conservation
RSWR	- Royal Suklaphanta Wildlife Reserve
IUCN	- World Conservation Union
CITES	- Convention on International Trade of Endangered Species
ICBP	- International Center for Bird Preservation
RCNP	- Royal Chitwan National Park
RBNP	- Royal Bardia National Park
KTWR	- Koshi Tappu Wildlife Reserve
°C	- Degree Celsius
UNDP	-United Nations Development Programme
PPP	- Park and People Project
HMG	- His Majesty the Government
mm.	- Millimeter
Sq. Km.	- Square Kilometer

CONTENTS

ABSTRACT

For assessing the population status of Bengal Florican (Houbaropsis bengalensis), ten days survey was carried out from May 5-14, 2000 in the Royal Suklaphanta Wildlife Reserve (RSWR), Nepal. Counting of lekking sites or identification of territories method was used. Total 12 Floricans (10 adult males/2 sub-adults) were recorded. No hens were recorded. Based on the present survey, probably no more than 30 Bengal Floricans remain in RSWR. Uncontrolled fire, predators and invasion of saplings were recorded as major threats to Floricans. Activities like proper management of grassland, control on predators and awareness campaigns were recommended. Since much of its ecological aspects remained obscure, maintaining the healthy population at all present habitat is the most crucial conservation strategy for this species.

1. INTRODUCTION

1.1 Background

The Bengal Floricans *(Houbaropsis bengalensis)* is included under the endangered species list of IUCN Red Data Book, Appendix I of CITES and one of the nine protected birds under National Park and Wildlife Conservation Act 1973 of His Majesty the Government of Nepal.

It's distribution range varies from Assam, East Pakistan, duars and terai of Bhutan, Bengal, Nepal and Kumaon, to less common, rare or straggler, west of the Manas, in Nepal and Kumaon terai (Ali and Ripley, 1969).

The known population of less than 300-400 individuals from its distribution range, puts it at serious risk from further habitat loss, warranting inclusion in the ICBP list of endangered species (Collar and Andrew, 1988 cited in Weaver, 1991). Bengal Floricans, one of the three bustard species endemic to the Indian Subcontinent, has undergone an alarming decline throughout its former range in the north and north-eastern regions as its grassland habitat has been lost to cultivation, afforestation or degraded by overgrazing.

In 1982, ICBP initiated a preliminary study of the status, distribution, ecology and behavior of the Bengal Floricans to gather lacking information. In Nepal, the survey located 35-50 Floricans distributed between five sites: Royal Chitwan National Park (RCNP), Royal Bardia National Park (RBNP), Royal Suklaphanta Wildlife Reserve (RSWR) and Koshi Tappu Wildlife Reserve (KTWR) and an unprotected area near the Koshi Barrage in the east of the country (Inskipp and Inskipp, 1983).

The Koshi Barrage site appears to have lost its small population since 1980 following a change in the course of river during the monsoon. There has been only one confirmed record from KTWR since 1986, a single in 1989 (Weaver, 1991). There has been no record from the KTWR since 1990. Considering the present situation, it is unlikely that Bengal Florican still thrives in the grasslands of KTWR. Due to rapid population growth and

urbanization in the Nepalese terai, the unprotected grasslands have been already converted to cultivated fields. So presence of Bengal Florican outside the protected grasslands is questionable.

Even, inside the protected grasslands the population of Bengal Florican is dwindling. Due to its elusive nature and diurnal habit, hunting pressure on this species is almost not. And hitherto, there is no official record of Florican hunting. Apparent cause of population decline can be attributed to improper management of the grassland habitat.

Since no information has been available for a great span of time; this study attempted to record the present population status of Bengal Florican in the RSWR. During present study, total 12 Floricans were recorded. No females were recorded. Based on present survey, probably no more than 30 Bengal Floricans remain in the RSWR. The population of Bengal Florican remained more or less same over last two decades. But this can have adverse effects in the long run.

1.2 Objectives

1. To estimate the current population status of Bengal Floricans in the study area.
2. To find out its distribution both inside and outside the reserve.
3. To generate awareness on conservation of Bengal Floricans among the local people.

2. STUDY AREA

2.1 Location and physiographic features

Royal Suklaphanta Wildlife Reserve (80°25' E and 28°35'N) is situated in the extreme south-west corner in the Far-Western Development Region of Nepal with an area of 305 Sq. Km. The north boundary adjoins agricultural land of settlements of Mahendranagar Municipality. The north-eastern boundary goes across the Mahendra highway upto the crest of Churia hills. The Syali river which flows into the Mahakali river demarcates the eastern boundary of the reserve. Its southern and western boundary is the international border between Nepal and India. From approximately three sides the reserve is bounded by settlements and agricultural land.

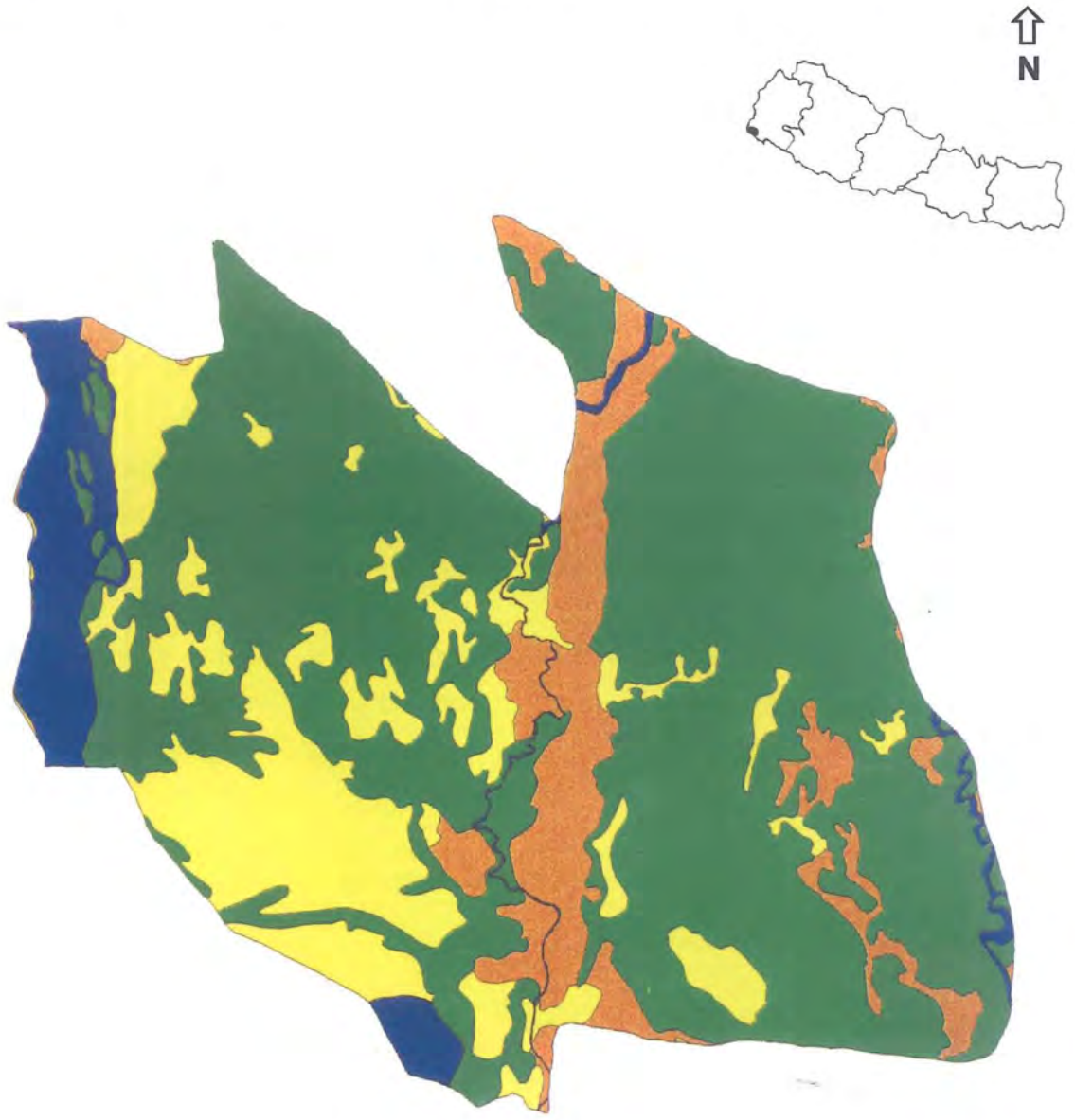
The area extends from the flat lands in the south to the Churia hill range in the north and contains many different eco-system and habitat type (Velde, 1997). The reserve and its surrounding areas are comprised of flood plains of various river system, notably the Mahakali, Bahuni, Radaha, Syali and Chaudhar, with hill wash and alluvial deposits. These rivers play a substantial role in shaping the ecosystem of the area. The siwalik ridge links the hills with terai forest by maintaining a natural corridor for the seasonal migration of wildlife.

2.2 History of the reserve

The reserve had been a famous hunting area for many years, and was declared as Royal Hunting Reserve in 1969 with an area of about 155 Sq. Km. An area of about 150 Sq. Km was extended eastward to create more habitat and a corridor from the terai to Churia hills for the seasonal migration of wildlife. The reserve was gazetted in 1976 as Royal Suklaphanta Wildlife Reserve (DNPWC, 1997).

Before the eradication of Malaria (1950) the original inhabitants were Tharus, but after 1950s flow of hill people was so great that they outnumbered Tharus. Still people from districts of Doti, Bazang, Darchula and Baitaidi are migrating towards Kanchanpur (Bhatta and Shrestha, 1977)

Figure 1: Land use pattern of Royal Suklaphanta Wildlife Reserve



	Area (Sq. Km.)
Abandoned/Agricultural land	34.92
River beds	21.36
Forest	193.33
Grass land	55.39
Total	**305.00**

(Source: Resources Nepal, 1998)

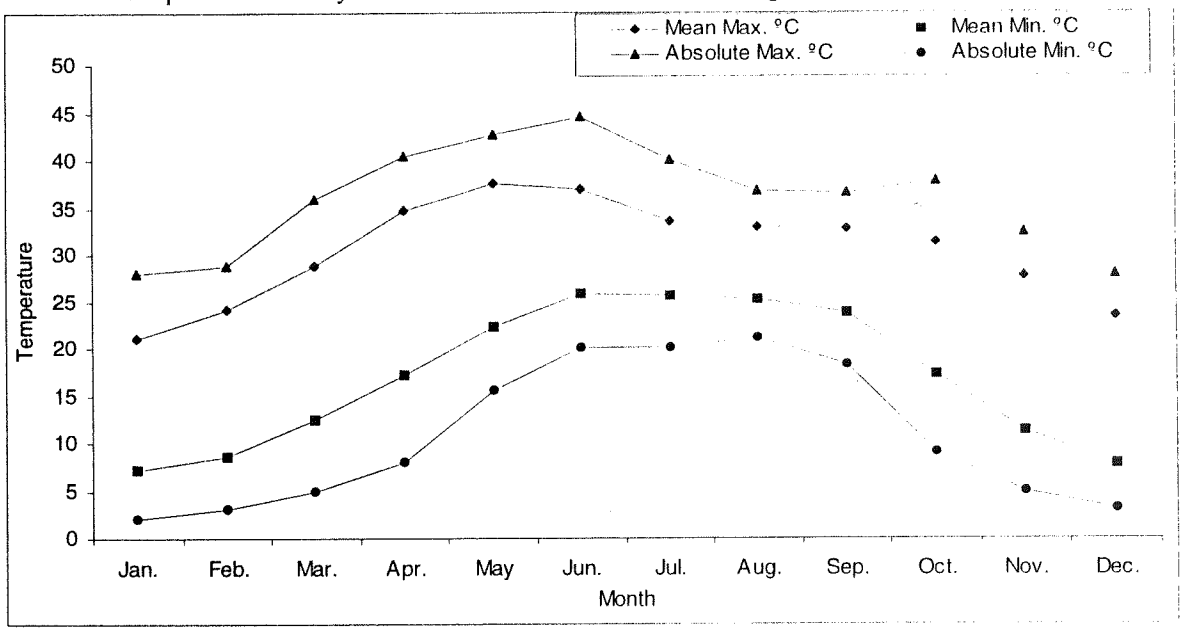
2.3 Climate

Royal Suklaphanta Wildlife Reserve has sub-tropical type of climate with more than 90% of the annual precipitation in monsoon season (June-September). There are three distinct season namely **Hot-dry** from February to mid-June, the **Monsoon** from mid-June to late September and **Cool-dry** from late September to mid-February. The temperature increased steadily during the hot season until the monthly maximum of 37.49 °C reached in May. In the cool season temperature decreased steadily until monthly minimum of 7. 06 °C reached in January.

For the period of 1990-1998, the highest average annual maximum and minimum temperature of 31.53 °C and 15.20 °C, recorded in the year 1991 and 1997, respectively. The absolute highest maximum temperature of 44.0 °C and minimum temperature of 2.1 °C were recorded in June 1995 and January 1994, respectively. The highest rainfall of 3055 mm and lowest of 1257 mm occurred in the year 1990 and 1992, respectively.

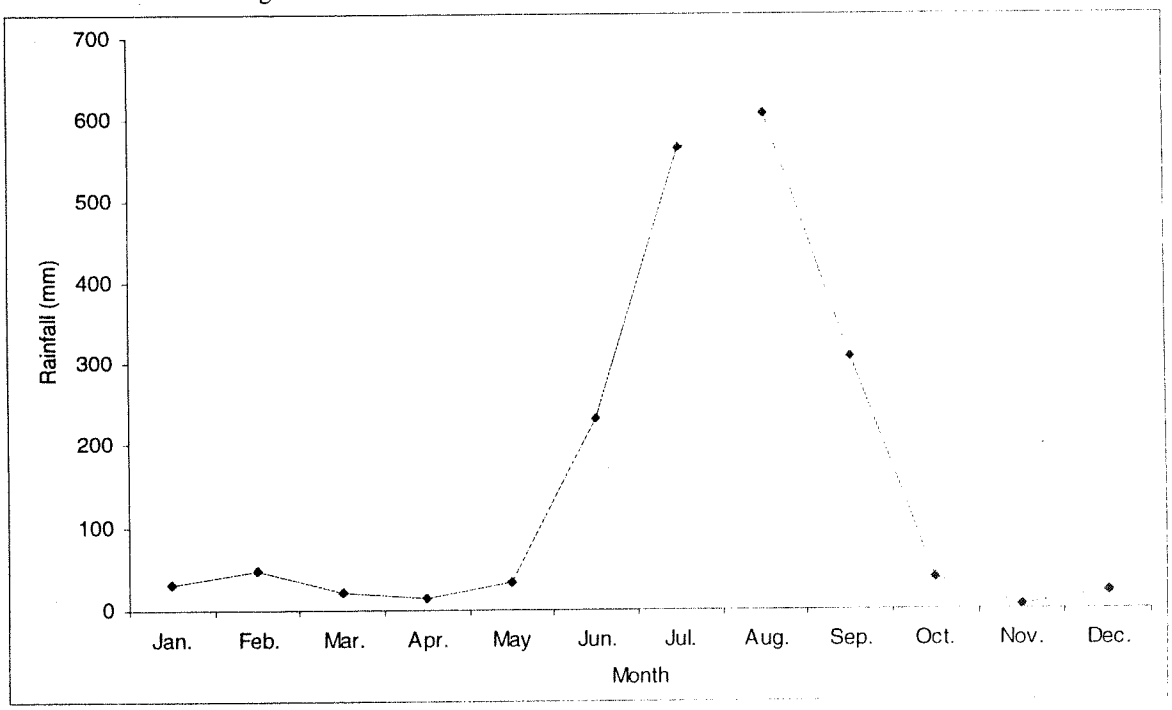
The highest mean monthly rainfall of 608.76 mm occurred in August and lowest monthly rainfall of 4.36 mm occurred in November. The highest monthly rainfall of 1437 mm occurred in July 1990.

Figure 2: Monthly variations in mean maximum, mean minimum, absolute maximum, absolute minimum temperature for the year 1990-1998 recorded at Mahendranagar.



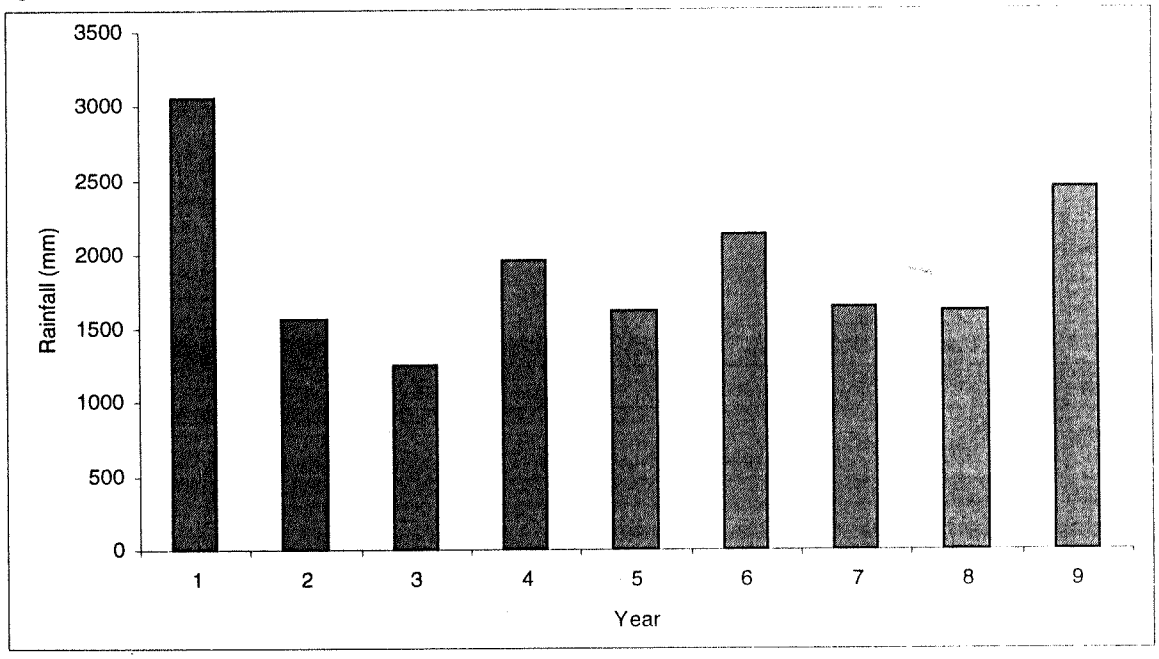
(Source: HMG/Dept. of Hydrology and Meteorology).

Figure 3: Monthly variations in average monthly rainfall (mm) for the year 1990-1998 recorded at Mahendranagar.



(Source: HMG/Dept. of Hydrology and Meteorology).

Figure 4: Total annual rainfall (mm) for the year 1990-1998 recorded at Mahendranagar.



(1=1990....9=1998)

(Source: HMG/Dept. of Hydrology and Meteorology).

2.4 Flora

According to R.P. Choudhary (1998) reserve is comprised of mainly Sal forest. The other vegetation type includes Khair-Sisso forest, Grassland and Marsh Vegetation.

a. Sal-Forest:

Sal *(Shorea robusta)* forest is predominant and mixed with *Terminalia alata, Bombax ceiba, Lagerstroemia parviflora, Mallotus philippinensis* etc.

b. Khair-Sisso Forest:

Khair *(Acacia catechu)* and Sisso *(Dalbergia sissoo)* are dominant along the river side areas. Interion to this type of forest are found decidous riverine species as *Bombax ceiba, Holarrhena pubescence, Grewia disperma* etc.

c. Grassland (Phanta):

The reserve was established largely on account of grassland (locally known as phantas). The main grass species includes *Imperata cylindrica* and *Heteropogon contortus* which are extensively used for thatching by local people.

d. Marsh Vegetation:

On wetlands such as Rani Tal, Shikari Tal, dense grasses are predominant - *Phragmites karka* and *Saccharum spontaneum.*

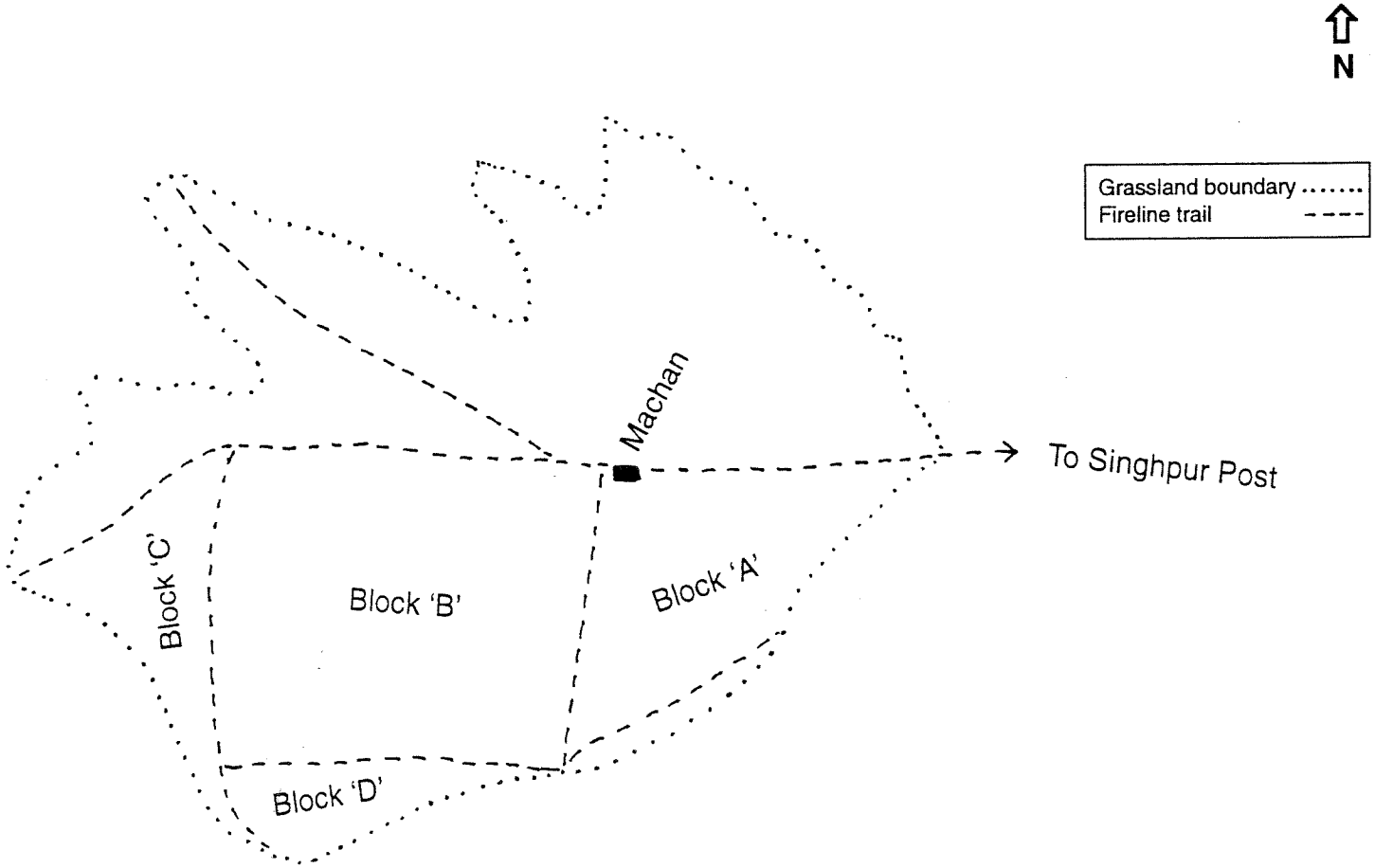
2.5 Fauna

The reserve provides prime habitat for Swamp Deer *(Cervus duvaucelli).* The species is endangered and is found in herds of thousand in reserve. The reserve serves as resting station of about 30 transit wild Elephants *(Elephas maximus)* and home to three to five, which are rarely seen, but seems to leave a constant trail of destruction in their wake (Velde, 1997). About 32 Royal Bengal Tiger *(Panthera tigris)* inhabit Sukla, their main prey is usually Spotted Deer *(Axis axis)* which lives in Sukla extensive Sal *(Shorea robusta)* forest. The other ungulate includes Hog Deer *(Axis porcinus),* Barking Deer *(Muntiacus muntjak),* Blue bull *(Boselaphus tragocamelus)* and Wild Boar *(Sus scrofa)* (Bhatt and Shrestha, 1977). Among other Mammals, Monkey *(Macaca mulata)* and Porcupine *(Hystrix indica)* are common.

A total of 268 species of birds has been recorded in the reserve (Inskipp, 1982). The reserve supports the largest population of the endangered Bengal Florican *(Houbaropsis bengalensis)* in Nepal. Many grassland birds commonly seen includes Swamp Francolin *(Francolin gularis)*, Grass Owl *(Tyto capensis)*, Large Grass Wabler *(Graminicola bengalensis)*. The other birds which inhabit Suklaphanta are Sarus Crane *(Grus antigone)*, Oriental Pied Hornbill *(Anthracocerus coronatus)*, Giant Hornbill *(Buceros bicornis)*, Rose ringed Parakeet *(Psittacula krameri)* and common Pea Fowl *(Pavo cristatus)* (Schaff *et al.*, 1977).

A large number of fresh water fish are found in rivers, lakes and ponds of the reserve. Bhatta and Shrestha (1977) recorded 21 fish species from the area. Notable among them are Sahar *(Tor tor)*, Rahu *(Labeo rohita)* and Chenga *(Chana gachua)*.

Figure 5: Detailed map of Suklaphanta grassland showing study blocks



Modified from Inskipp & Inskipp (1983)

Not in scale

3. METHODOLOGY

Bengal Florican (*Houbaropsis bengalensis*) is one out of 150 lekking species of birds reported by Johnsgard (1994). The males collect in communal display arenas called leks. These may be attended by males for much of the breeding season and much of the day, although females may attend them only briefly to mate. Peak numbers of males of lekking species occur just before egg laying and often just after dawn (Sutherland, 1997). As Bengal Floricans are most active in the early mornings and evenings (Ali and Ripley, 1969); observation was carried out mainly in the early mornings (06:30-10:00) and late afternoon (16:30-19:00). No observation was done in the afternoon.

Important Florican habitats were visited during the breeding season of the Florican when the territorial males were easily seen during their aerial display. As had been proved by earlier studies, bustards are very territorial during breeding season (Ali and Rahamani, 1982-84; Sankaran and Rahamani, 1986; Manakadan and Rahamani, 1986). Thus, the location of a territory, *i.e.* display site of a male, was the identification of an individual male Florican. As hens were not easy to locate; the population estimate is based on the assumption of equal sex ratio. Survey was carried out on four sites: Suklaphanta, Singhpur, Karaiya phanta and Haraiya phanta. The most extensive of these; Suklaphanta was the focus for the survey. Suklaphanta was divided into four blocks, considering fireline as a border of the blocks. Observation was done with binocular (10x50) from the Machan for over viewing the grassland, generally with minimal disturbance to Floricans. The number of Floricans seen, their sexes, activity, time, weather and time spent in each area were noted together with general impression of habitat.

Since, there was overlapping of territories probably because of the end of breeding season, we relied on the least count for computing population. The highest number of Floricans recorded within short span of time in greater spatial distribution within them was referred as the least count.

Group discussions were held among park officials, game scouts and local people for gathering information about the presence of Bengal Florican in the sites other than previously studied.

4. RESULT & DISCUSSION

4.1 Population status

During the present study, total 12 Floricans (10 adult males/2 sub-adults) were recorded. The highest number of Floricans recorded within short span of time, in greater spatial distribution within them was referred as the least count. The highest number of males recorded at a place was six. Only two males had distinct territories. One in block 'A' and other in Block 'C'. Other males wandered from one block to another. Most of our counts were birds in flight or displaying. Whilst in flying, the frequency of two males was the highest. On few occasions, four males were seen in flight. Female Floricans could not be recorded in this study because of the unusual height of the grass and elusive behaviour of the female. Presence of sub-adults implied that breeding was more or less successful. Taking into accounts of the circumstances, we could assume that population there had remained stable. Details of all Floricans recorded are given in table 1.

Table 1: Details of Bengal Florican observations at Suklaphanta, 2000.

Date	Time	Male	Female	Sub-adult	Activity	Least count
May 6	07:05	1	-	-	Foraging in block 'A'	
	08:25	1	-	-	Displaying in block 'D'	
	08:30	6	-	-	Feeding, chasing, standing in block 'B'	
	08:32	2	-	-	Chasing in block 'B'	10
May 8	07:10	1	-	-	Feeding in block 'C'	
	08:00	3	-	-	Displaying in block 'C'	
	08:55	2	-	2	In flight in block 'C'	7
May 9	06:31	-	-	2	In flight in block 'D'	
	08:49	2	-	-	In flight, came from block 'D'	
	18:41	4	-	-	Displaying in block 'C'	
	17:47	1	-	-	Displaying in block 'B'	9
May 10	07:17	2	-	-	Displaying in block 'B'	
	07:29	1	-	-	Displaying in block 'C'	
	07:30	1	-	-	Standing in block 'D'	
	17:30	1	-	-	Standing in block 'A'	
	18:26	2	-	-	In flight in block 'C'	
	18:31	2	-	-	Displaying in block 'C'	9
May 12	06:41	1	-	-	Displaying in block 'A'	
	07:06	1	-	-	Displaying in block 'C'	
	08:44	2	-	-	In flight in block 'B'	
	09:05	4	-	-	In flight in block 'C'	
	17:15	-	-	2	In flight in block 'D'	8
Total		**10**	**0**	**2**		**12**

Table 2: Site surveyed, search efforts and Florican recorded in RSWR.

Site	Search efforts			Florican recorded		
	Days	No. of visits	Total time spent (Hrs.)	Male	Female	Sub-adult
Suklaphanta	6	11	33	10	-	2
Singhpur phanta	2	4	12	-	-	-
Karaiya phanta	1	2	3	2 (Report)	-	-
Haraiya phanta	1	2	4	-	-	-
Total	**10**	**19**	**52**	**10**	**-**	**2**

Suklaphanta:

Suklaphanta is the prime habitat of Bengal Florican. During the present study, ten adult males and two sub-adults were recorded in Suklaphanta. Inskipp and Inskipp (1983) recorded 13 males and Weaver (1991) recorded 11 males. We might have over looked few adult males because the grass was tall enough to impede the sighting of Florican in the ground. Encroachment of grassland by *Grewia* spp. was severe.

Karaiya phanta:

During the present study, no Floricans were recorded from Karaiya phanta. While discussing with park officials and game scouts, presence of Bengal Florican was verified. Two males on display were reported from Karaiya phanta by one park official. Weaver (1991) recorded three adult males from this area. Our visits to Karaiya phanta was brief. So, time and height of grass were constraints for recording Florican during this study. In one occasion, two males flew south east from Suklaphanta over the trees in the direction of Karaiya phanta. So we also strongly suspect that Karaiya phanta holds few number of birds. The phanta was overgrazed by domestic cattle and tall grasses were dominant which left little room for suitable habitat required by Floricans.

Haraiya phanta:

It lies in the north-east direction of Rani Tal. The phanta can serve additional habitat for Bengal Florican because the abundance of *Imperata cylindrica* was high and grass was not so tall. This grassland was heavily grazed by domestic livestock. We visited twice but couldn't record any Florican. If managed well, Bengal Floricans could colonise in this phanta.

Singhpur phanta:

The abundance of *Imperata cylindrica*, the most favoured grass species of Bengal Florican was less in this phanta. The phanta was mainly dominated by *Saccharum spontaneum*. Due

to high organic nutrients, lack of disturbance and pre-monsoon shower, there was unusual growth of grass in this year. The height of grass exceeded more than one meter in the first week of May. Though it lies in the vicinity of Suklaphanta, the chance of colonization by Bengal Florican in this phanta is meagre.

4.2 Threats to Florican

Three factors: uncontrolled fire, predators and invasion of saplings were recorded as major threats to Floricans. As Suklaphanta is away from the neighbouring human settlement, thatch is not harvested from this phanta. So, in the dry season, there was outbreak of fire. Due to this reason, controlled burning by park management was not observed. In the first week of May, some patch of grassland was burning. This ultimately had adverse effect as burning of grassland coincided with breeding period of Florican.

We frequently encountered three to four Jackals (*Canis aureus*) and good number of wild boar (*Sus scrofa*) at Suklaphanta. On May 6, 2000; we recorded six Jackals wandering in the grassland. As we reckoned the high density of these predators, the chance of preying on chicks and egg of Florican was also greater.

The advance succession of grassland was yet another threat. Grass species were gradually replaced by shrub species. *Grewia* spp. was the menace to Suklaphanta. Due to invasion of saplings and tall grasses, the density of preferred grass species of Florican was diminishing.

4.3 Awareness about Florican

Most of the game scouts, elephant care takers and local people didn't have any knowledge about Bengal Florican. We were surprised to hear that they had never seen the Florican. So, most of the people we came across during our project were not aware about this species. Few game scouts and elephant care takers had chance to gain some knowledge about this bird and moreover witnessed the bird in wilderness.

Table 3: Bengal Floricans recorded at RSWR over two decades.

Source	Adult male	Sub-adult	Female	Total
Inskipp & Inskipp, 1983	12	1	2	**15**
Weaver, 1991	14 (including sub-adult)	-	3	**17**
Present study, 2000	10	2	-	**12**

The recorded population of twelve Floricans was lesser than previous studies. While going through the results of previous studies, it can be concluded that population of Bengal Florican is slowly dwindling rather than being maintained. If the population of this site remains constant also, it possesses serious threats to Floricans in the long run because of inbreeding. Hitherto, there is no evidence that Bengal Floricans are migratory. So, gene exchange between population and recolonization of deserted sites will be unlikely. Furthermore, we don't have any idea about the viable population required for a long term survival. So, maintaining the healthy population at all present habitat is the most crucial conservation strategy for this species.

Annual harvesting of grass and prescribed burning at the beginning of the dry season are the most important and vital management strategies for maintaining grassland habitat. Grass burning benefits the birds by opening up areas suitable for use as display grounds and the species certainly shows a liking for areas which have been recently burned (Baker, 1912, cited in Inskipp and Inskipp, 1983). Also, it has been suggested that regular burning or heavy grazing in Nepal actually encourages the growth of *Imperata cylindrica*, the fire resistant species, at the expense of taller grasses (Dinerstein, 1979). Even though, the long term ecological effects of controlled burning of grasslands are poorly understood, it has beneficial effects in this species. At Suklaphanta, grass is not harvested and prone to deliberate or accidental fires. They have detrimental effect on Florican reproduction.

The habitat alteration in Suklaphanta is mainly by the invasion of saplings of tree and shrub species. *Grewia* spp. is more abundant in the grassland and at the fringe of grassland and forest, saplings of trees. To reverse the succession, the management fell some trees which were present in the northern side of Suklaphanta. And weeding of *Grewia* spp. is most warranted. Phantas lying in the neighbourhood of human settlement are suffering from harmful anthropogenic activities. Mainly Haraiya phanta and Karaiya phanta lost the suitable habitat by overgrazing. If the present trend continues, then it is likely that few Floricans present in the area will disappear soon because this bird can't tolerate the slightest disturbance. These two phantas serve as adjunct habitat to boost the population if properly managed.

The population of Dudwa National park flourished well from only two in 1982 to at least 40 in 1990 (Inskipp and Inskipp, 1983; Rahamani, Narayan, Rosalind, Sankaran and Ganguli,

1991). This is probably due to the effective management of grassland at this site. So, we have to learn more about grassland management from this site.

A number of Florican predators have been reported (Mukherjee, 1981), but two brought to our attention were the Jackal (*Canis aureus*) and wild boar (*Sus scrofa*). Inskipp and Inskipp (1983) had not reported these predators on the main grassland at Suklaphanta, suggests the low density of predators. But active conservation of habitat and prey species lead to over growth of these predators over past two decades.

5. CONCLUSION & RECOMMENDATIONS

During 10 days intensive survey of Bengal Floricans, total of 12 Floricans (10 adult males/2 sub-adults) were recorded in Royal Suklaphanta Wildlife Reserve. No female Floricans were recorded. Based on the present survey, probably no more than 30 Floricans remain in RSWR. Out of four phantas surveyed, Floricans were recorded only from Suklaphanta. Three factors: uncontrolled fire, predators and invasion of saplings were major threats to Florican. Local people were not aware of this elusive bird. Proper maintenance of grassland habitat and awareness campaigns are some strategies to be employed for long term survival of this species.

It is recommended that:

1. For proper maintenance of grassland, thatch grasses should be harvested before breeding season and prescribed burning of grassland should be done. All grassland management practices should be done two or three months prior or after the breeding season.
2. Grasslands in the vicinity of human settlement are overgrazed and disturbed by anthropogenic activities. So, control on these activities should be done.
3. Invasion of saplings and tall grasses should be checked. Weeding of *Grewia* spp. should be done immediately.
4. As wild boar (*Sus scrofa*) and Jackal (*Canis aureus*) are not endangered species, their population should be controlled.
5. From the existing Machan (watchtower), observation in the southern part of Suklaphanta is difficult. So, one Machan should be erected in the southern part for overviewing Floricans easily in that region.
6. People were not aware about this species. So, whenever possible, people should be informed about different aspects of Florican behaviour.
7. Very little is known about the ecology of Bengal Florican outside the breeding season. So, advance research like radiotelemetry should be used to study the movement of Floricans outside the breeding season.
8. Healthy population of wild ungulates, to some extent, helps in maintaining grassland habitat. And interaction of Bengal Florican with other grassland species should be studied.
9. Yearly monitoring of Florican population in all prime habitat should be done.

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