

Ornithological Survey of Dharan Forests IBA, Eastern Lowland Nepal

By
Yub Raj Basnet
Jivan Sapkota



Final report submitted to
Oriental Bird Club (UK)



Bird Conservation Nepal
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SUMMARY

Dharan Forests IBA is an unprotected Important Bird Areas (IBA) in Nepal. The area is mainly located at plains and Siwalik Hills of the Sunsari and Morang districts. The forest is tropical evergreen mixed type dominated by Sal *Shorea robusta*. An exploration of bird diversity was done in the area from May 2007 to March 2008. Total four visits were done during the study period one in each season. Species discovery curve was calculated using Mackinnon list, with twenty species in each list. Altogether 72 lists were prepared, 18 in each survey.

A total of 197 bird species were recorded from the area. Among them 143 were resident, 45 were winter visitors and nine were summer visitors. Among the observed species ten were nationally threatened species including one globally threatened species, i.e. Lesser Adjutant *Leptoptilos javanicus*. Two nesting sites of Lesser Adjutant were explored from the IBA, one at Santi Community Forest, Tarahara and another at Singhadevi Community Forest, Bhawne. A total of 31 bird species were biome restricted species. Seven species were confirmed breeding. Total nine sites were very important for bird community in the IBA.

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INTRODUCTION

Background

Nepal has an exceptionally rich and diverse avifauna. Two important factors determining such diverse avifauna are Nepal's varied topography and climate. The varied physiographic zones of Nepal have facilitated the country's high diversity of fauna and flora. In Nepal 863 species of birds are recorded (Bird Conservation Nepal 2008). A total of 33 species is considered globally threatened (BirdLife International 2008, IUCN 2007) and 133 species (15%) have been identified as nationally threatened. Furthermore, 72 species are thought to be nationally critically threatened or endangered (Baral and Inskipp 2004). In addition 11 species are considered extinct in Nepal (Inskipp and Inskipp 1991). As many as 78 species (59% of the total threatened) depend on forests (Baral and Inskipp 2004). BirdLife International and Bird Conservation Nepal have identified 27 Important Bird Areas (IBAs) in Nepal. The Dharan Forests Area is one of 12 IBAs that are unprotected (Baral and Inskipp 2005).

Dharan Forest area lies in the Eastern Himalayas Endemic Bird Area (Stattersfield *et al.*, 1998). Local users now manage some of the forests as community forest and large part of the forest area is national forest managed directly by the Department of Forests. The forests of Dharan mainly comprise tropical evergreen forest type. Most of the forest area is situated in the plain and foothills of Morang and Sunsari district.

Dharan Forests IBA area is a home for many important species. Globally threatened bird species White-rumped Vulture *Gyps bengalensis*, Slender-billed Vulture *G. tenuirostris* and Lesser Adjutant Stork *Leptoptilus javanicus* are recorded in the area (Baral and Inskipp 2005, BirdLife International 2001). Similarly, nationally endangered species Asian Fairy Bluebird *Irena puella* is very rare in Nepal and recorded from that area (Chaudhary 1997). Yellow-vented Warbler *Phylloscopus cantator* is also recorded from the area. This is a restricted range species as well as nationally threatened bird (Baral and Inskipp 2004, 2005). Furthermore, Jerdon's Baza *Aviceda jerdoni*, a rare summer visitor to Dharan forest that possibly breeds, was recorded in Nepal for the first time from this area (Basnet *et al.* 1999).

There are large areas of tropical forests that are likely to support significant populations of species characteristic of the Indo-Chinese Tropical Moist Forest and Indo-Malayan Tropical Dry Zone biomes (Baral and Inskipp 2005). Forest areas of Dharan Forest are contiguously surrounded by village areas inhabited by caste groups such as Tharus, Rai, Limbu, Chhetri, Brahman and Tamang. As in other parts of Nepal local people of the Dharan Forests IBA are also heavily dependent on forest resources for fuel wood, fodder and timber.

There are few bird survey records from the IBA, especially in the west. So considering the potential importance of the area nationally as well as internationally for birds, this study is a baseline survey for the area.

Objectives

The general objective of this study is to make an inventory of avian diversity in the Dharan forests IBA.

The specific objectives are:

1. to determine the avian diversity in Dharan forests IBA; and
2. to assess the richness of birds in the area.

STUDY AREA

Location

The Dharan Forest is named after a small town Dharan which is located in the northern part of the forest in Sunsari and Morang district under the Koshi administrative zone in east Nepal. The area lies between 26°37' N and 26°48' N latitude and 87°10'E and 87°37' E longitude. The Dharan Forest area covers approximately 50,000 hectares at altitudes ranging from 100m to 1300m asl (Baral and Inskipp 2005). The area is easily accessible by road. Map of the study area is shown in figure 1.

This study was conducted in the forest areas of Dharan Forest in Morang and Sunsari districts at the altitude 100m-600m, where the forest area covers approximately 40,000 hectares. Some of the forests are recently developed as community forest. More than 75 forest user groups are benefitting from forest resources in the Dharan Forest IBA.

Climate

The Dharan forest area has a tropical climate. The summer monsoon starts from mid June, reaches its peak in July and continues to late September. The total mean annual precipitation was approximately 2100 mm from 1967 to 2006 at Tarahara, the nearest meteorological station from the study area. The average monthly rainfall of 700 mm was recorded in July.

The annual mean temperature recorded at Tarahara is 20.7°C with an annual range of mean monthly temperature of 8.6°C in January and 34.0°C in May. However, the mean maximum temperature ranges from 20.1°C in January to 34.6°C in April. The monthly minimum temperature ranges from 9.2°C in January to 21.5°C in August.

The mean monthly relative humidity varies from 53% in April to 92% in July and August, indicating a dry atmosphere in the pre-monsoon season and a moist atmosphere during the monsoon season.

Biological diversity

Flora

The principal vegetation of the area comprises tropical evergreen forest. The tropical evergreen forest is characterized by dense vegetation with large sized trees and comparatively warm and heavy rainfall during summer. The community forests are mainly dominated by mature Sal *Shorea robusta*. The associated species with Sal are Karma *Adina cardifolia*, Amla *Embllica officinalis*, Hade *Lagerstroemia parviflora*, Bel *Aegle marmelos*, Simal *Bombax ceiba*, Rajbrikshya *Cassia fistula* and Saaj *Terminalia alata*. Common vegetation of the area is shown in appendix.

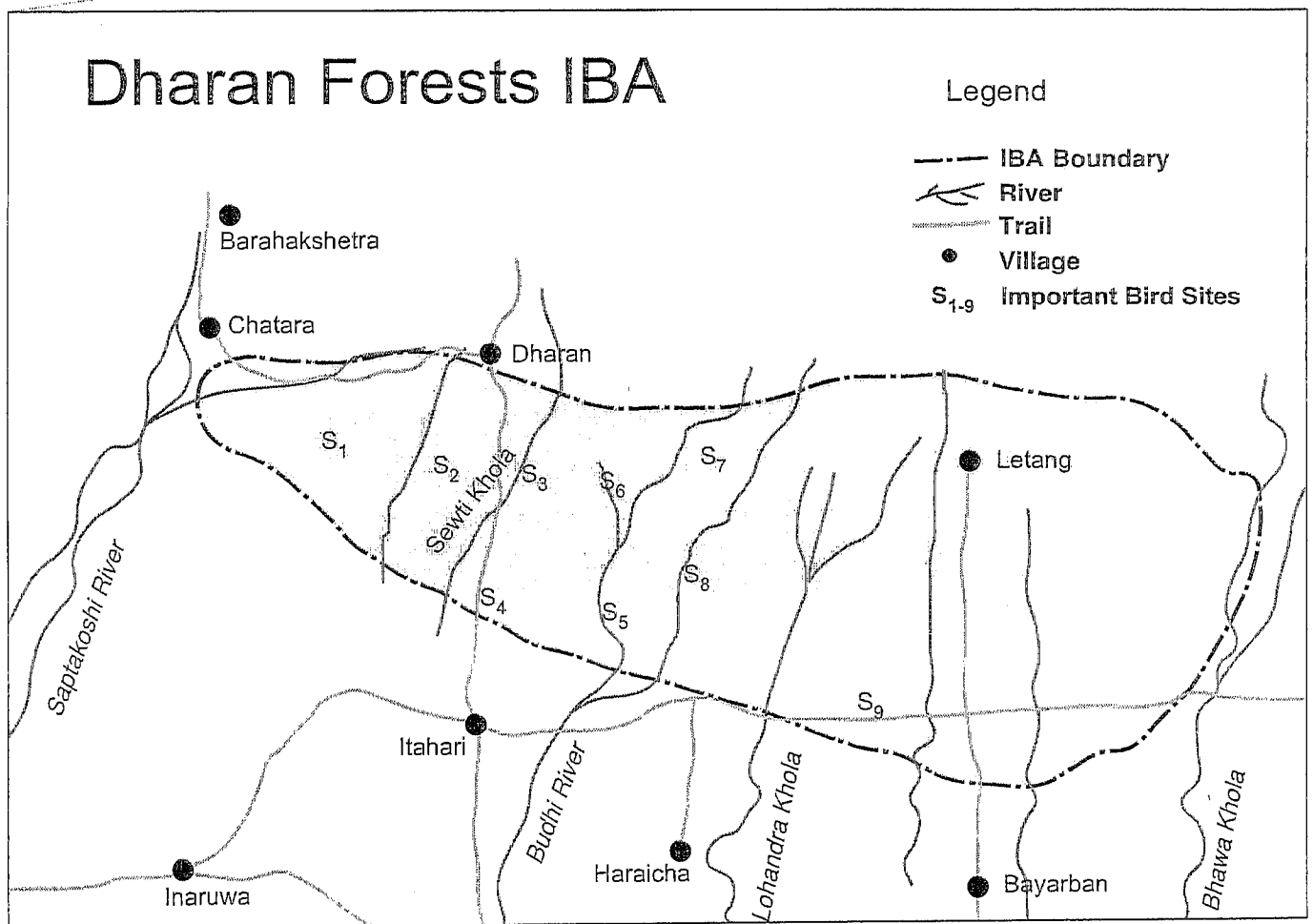
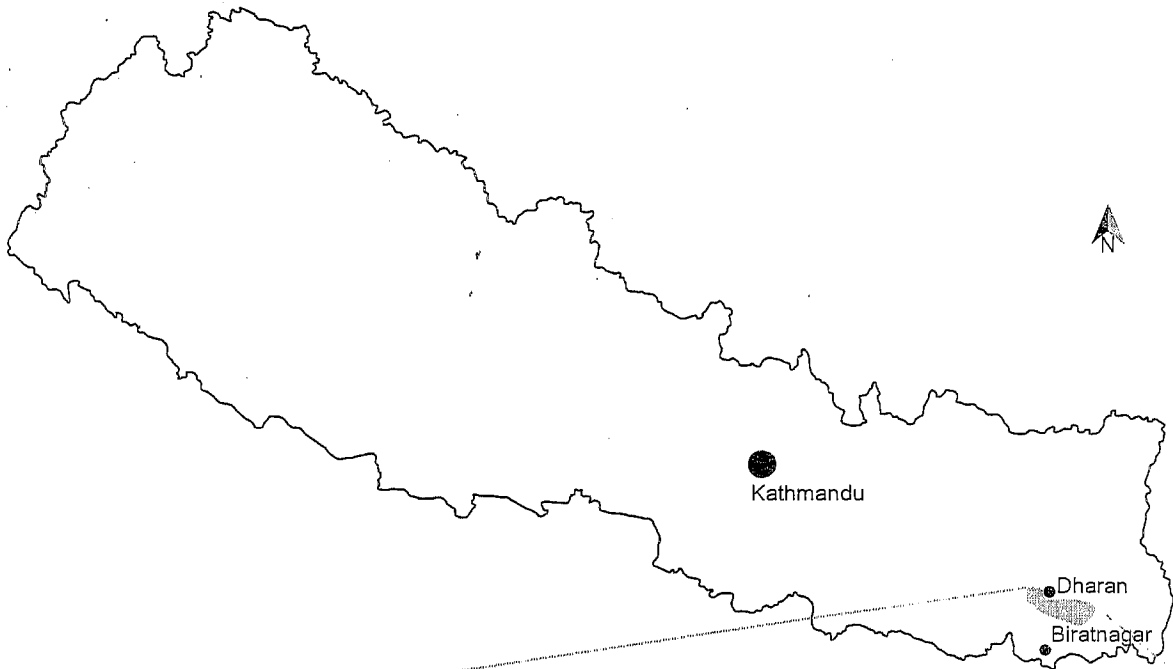
Fauna

Wild mammals found in the area are Spotted Deer *Axis axis*, Barking Deer *Muntiacus muntjak*, Wild Boar *Sus scrofa*, Jungle Cat *Felis chaus*, Common Langur *Semnopithecus entellus*, Indian Hare *Lepus nigricolis*, Rhesus Monkey *Macaca mulatta*, Black Giant Squirrel *Ratufa bicolor* and Northern Palm Squirrel *Funambulus palmarum*. Asiatic Wild Elephant *Elephas maximus* regularly visits the forests.

Socio-economic aspect

Dharan and Itahari are the major towns located north and south of the forests respectively. Koshi Highway connects the two towns. Furthermore, six north-south graveled roads bisect the forests. Similarly, eight seasonal streams run north to south through the forests. Rice *Oryza sativa*, wheat, corn and millet are the major crops in the area, whereas mustard *Brassica campestris*, potato *Solanum tuberosum*, legumes and sugarcane *Saccharum spp.* are grown as minor crops. Livestock is a major component of the agricultural system in the area. The main livestock are cattle, goat, buffalo, pig and poultry. In addition to farming, harvesting of forest products is the further occupation of the local people.

Figure 1 Map of the Study Area



MATERIAL AND METHODS

Bird survey

Extensive bird surveys in forest areas of Dharan Forest IBA were carried out four times, first in pre-monsoon (May 2007), second in post-monsoon (October 2007), third in the winter season (January 2008) and fourth in the spring season (March 2008) to obtain many residential birds during their breeding season as well as migratory birds in Dharan Forest. Observations were carried out in different community forests as well as the national forest of the Morang and Sunsari districts. Birds were recorded in Sal forest, mixed forest, bushes, bamboo clumps, grasslands and streams. Most of the birds were observed by direct observation method. Calls were also noted of certain shy and skulking species such as Black Francolin *Francolinus francolinus*, Indian Cuckoo *Cuculus micropterus*, Asian Koel *Eudynamys scolopacea*, and Red Jungle Fowl *Gallus gallus*. Bird sounds were also used to detect or identify the bird species. Mackinnon's species richness counting method (Mackinnon and Phillips, 1993) was followed to determine the species-richness of the area.

Species richness counting method

1. Each new species is recorded until a list of 20 is reached.
2. Then a new list (number 2) is started and another 20 species is recorded. Each list must contain 20 different species, but subsequent lists can include species previously listed. During the survey much care was taken not to repeat same species in the same list, but it was listed in subsequent lists.
3. Then list number 3 is recorded.
4. Ideally lists are repeatedly recorded until no new species are recorded.
5. A final running species total is obtained by extracting the number of species in list 2 that are not in list 1 and so on throughout all the recorded for that area.

The observed birds were identified following handbooks Grimmett *et al.* (1998, 2000). A bird list was compiled by careful recording of all the birds observed. The bird list followed the systematic order in Inskipp *et al.* (1996).

First field survey

A total of eight days was spent in the study area from 11th May to 18th May 2007 for the first phase of the study. A total of 18 lists were made during the period.

Second field survey

Second survey was done from 19th October to 31st October 2007. A total of 18 new lists were made. These are considered list number 19 to 36.

Third field survey

Third survey was done from 8th January to 21st January 2008 for the third phase of the study. A total of 18 lists were made during the period. These are considered list number 37 to 54

Fourth field survey

Fourth survey was done from 23th March to 31st March 2008. A total of 18 new lists were made. These are considered list number 55 to 72.

Data analysis

A species discovery curve was plotted using Mackinnon's species-richness counting method (Bibby *et al.* 2000). The species were classified taxonomically. The threatened status of the observed birds were identified with the help of key books, i.e. The State of Nepal's birds 2004 (Baral and Inskipp 2004) and the Red List of Threatened Species (IUCN 2007).

RESULTS AND DISCUSSION

Bird Survey

A total of 72 bird lists was prepared between May 2007 and March 2008. The first survey was made in pre-monsoon season. A total of 102 bird species was recorded in 18 bird lists of the first field visit including four nationally threatened species. The second survey was made in the post-monsoon season. A total of 121 bird species was recorded in 18 bird lists of second field visit including five nationally threatened species. The third survey was made in the winter season. A total of 127 bird species was recorded in 18 bird lists of third field visit including five nationally threatened species. The fourth survey was made in the spring season. A total of 136 bird species was recorded in 18 bird lists of fourth field visit including seven nationally threatened species. The number of species recorded in each season and the total cumulative species is shown in Table 1.

Table 1 Field survey period and observed species

Survey	Time period (Date)	Total Observed species	Threatened species	Cumulative species
First	May 2007	102	4	102
Second	October 2007	121	5	136
Third	January 2008	127	5	164
Fourth	March 2008	136	7	197

Among the 121 species recorded during second survey 34 species were not recorded during first field visit. Thus cumulative species was reached 136. Similarly, 28 species and 33 species were new for third and fourth visit respectively. Therefore a total of 197 bird species were recorded from the Dharan Forests IBA. The number of running species according to list number as well as survey and the species discovery curve are shown in table 2 and figure 2 respectively. As the curve is still rising and relatively steeply this indicates that with more fieldwork it is very likely that more species will be found. Winter and spring seasons are important to find out more new species. During the survey, few unclear observations were made due to very short glance which are omitted in this report. This might obtain in further survey.

Table 2: List number and running species

First survey		Second survey		Third survey		Forth survey	
List number	Running species	List number	Running species	List number	Running species	List number	Running species
1	20	19	107	37	139	55	166
2	35	20	110	38	141	56	170
3	45	21	110	39	142	57	173
4	53	22	111	40	143	58	175
5	57	23	114	41	145	59	176
6	63	24	116	42	146	60	178
7	74	25	119	43	148	61	178
8	78	26	121	44	148	62	181
9	81	27	123	45	150	63	183
10	84	28	126	46	151	64	185
11	86	29	126	47	153	65	186
12	88	30	129	48	155	66	187
13	91	31	131	49	155	67	188
14	93	32	132	50	156	68	191
15	95	33	132	51	158	69	193
16	99	34	133	52	161	70	194
17	101	35	135	53	162	71	195
18	102	36	136	54	164	72	197

During the survey 58 species were recorded in all seasons. Mostly they were residential and common species. Likewise 41 species were recorded in three seasons. Similarly, 33 species were recorded in two seasons and 65 species were recorded in only one season. Most of them were migratory and few were rare for the area. Species occurrence according to season is shown in Table 3.

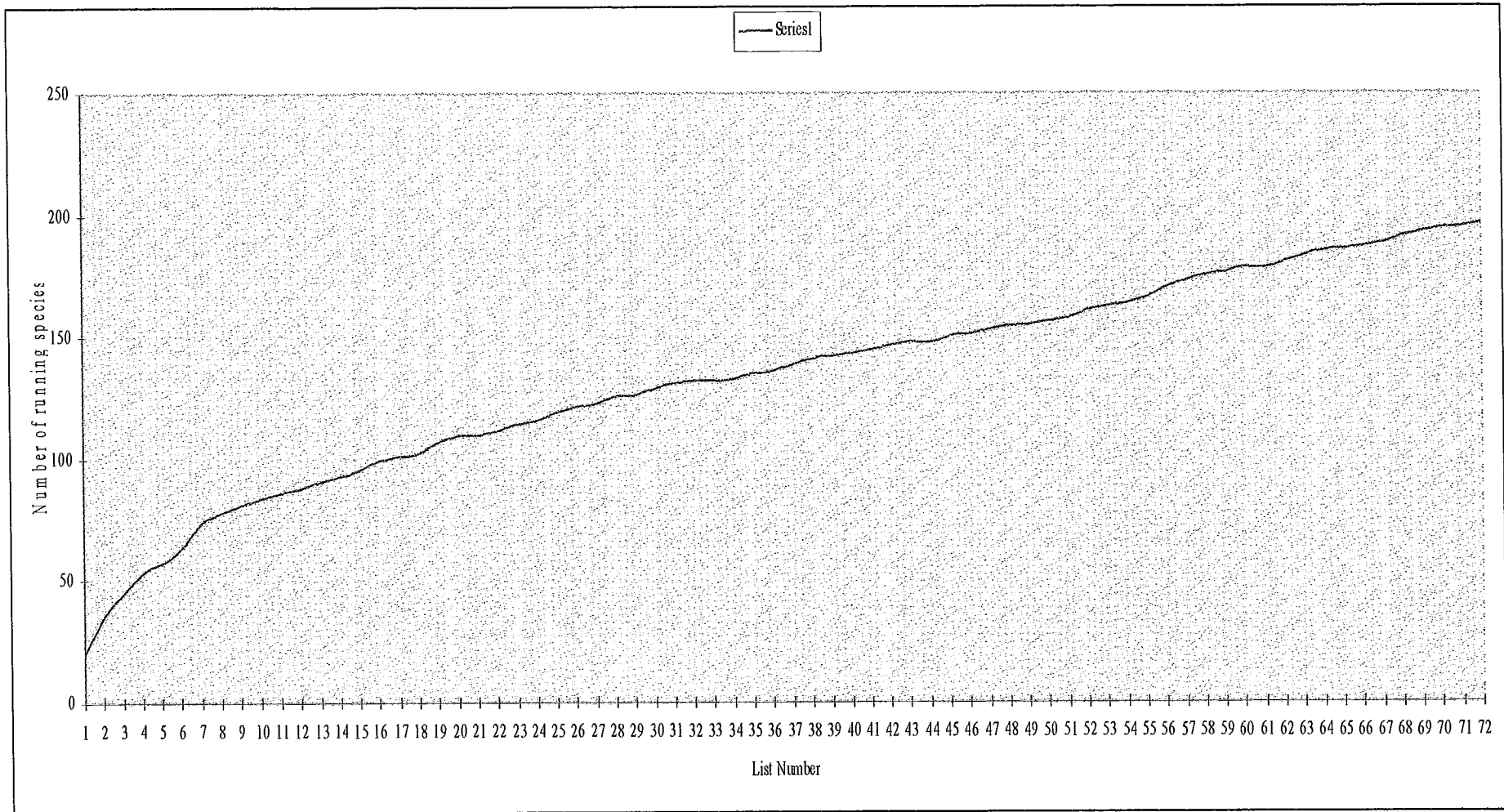


Figure 2 Species discovery curve

Bird diversity

Thus, a total of 197 species belonging to 14 orders and 45 families was recorded from the Dharan Forests area. Among them 143 species were residents, 45 species were winter visitors and 9 were summer visitors. The list of birds according to species occurrence in each survey is shown in table 3 along with order and family.

Table 3 List of birds according to field survey

S.N	Common Name	Scientific Name	Surveys			
			1 st	2 nd	3 rd	4 th
	Order: GALLIFORMES					
	Family: Phasianidae					
1	Black Francolin	<i>Francolinus francolinus</i>	+			
2	Common Quail	<i>Coturnix coturnix</i>		+		
3	Red Junglefowl	<i>Gallus gallus</i>	+	+	+	+
4	Indian Peafowl	<i>Pavo cristatus</i>			+	+
	ANSERIFORMES					
	Dendrocygnidae					
5	Lesser Whistling Duck	<i>Dendrocygna javanica</i>	+		+	+
	PICIFORMES					
	Picidae					
6	Grey-capped Pygmy Woodpecker	<i>Dendrocopos canicapillus</i>	+	+	+	+
7	Fulvous-breasted Woodpecker	<i>Dendrocopos macei</i>	+	+		
8	Yellow-crowned Woodpecker	<i>Dendrocopos mahrattensis</i>			+	
9	Rufous Woodpecker	<i>Celeus brachyurus</i>	+	+	+	+
10	Lesser Yellownape	<i>Picus chlorolopus</i>	+	+	+	+
11	Greater Yellownape	<i>Picus flavinucha</i>	+	+	+	+
12	Streak-throated Woodpecker	<i>Picus xanthopygaeus</i>			+	
13	Grey-headed Woodpecker	<i>Picus canus</i>	+	+	+	+
14	Himalayan Flameback	<i>Dinopium shorti</i>	+	+	+	+
15	Greater Flameback	<i>Chrysocolaptes lucidus</i>	+	+	+	
	Megalaimidae					
16	Lineated Barbet	<i>Megalaima lineata</i>	+	+	+	+
17	Blue-throated Barbet	<i>Megalaima asiatica</i>	+	+	+	+
	BUCEROTIFORMES					
	Bucerotidae					
18	Oriental Pied Hornbill	<i>Anthracoceros albirostris</i>	+	+	+	+
	UPUPIFORMES					
	Upupidae					

19	Common Hoopoe	<i>Upupa epops</i>		+	+	+
	CORACIIFORMES					
	Coraciidae					
20	Indian Roller	<i>Coracias benghalensis</i>	+	+	+	+
21	Dollarbird	<i>Eurystomus orientalis</i>	+	+		
	Alcedinidae					
22	Common Kingfisher	<i>Alcedo atthis</i>				+
	Dacelonidae					
23	White-throated Kingfisher	<i>Halcyon smyrnensis</i>	+	+	+	+
	Meropidae					
24	Blue-bearded Bee-eater	<i>Nyctornis athertoni</i>	+	+	+	
25	Green Bee-eater	<i>Merops orientalis</i>	+	+	+	
26	Chestnut-headed Bee-eater	<i>Merops leschenaulti</i>			+	+
	CUCULIFORMES					
	Cuculidae					
27	Common Hawk Cuckoo	<i>Hierococcyx varius</i>	+	+	+	+
28	Indian Cuckoo	<i>Cuculus micropterus</i>	+			+
29	Eurasian Cuckoo	<i>Cuculus canorus</i>		+		+
30	Oriental Cuckoo	<i>Cuculus saturatus</i>				+
31	Banded Bay Cuckoo	<i>Cacomantis sonneratii</i>			+	
32	Grey-bellied Cuckoo	<i>Cacomantis passerinus</i>	+			
33	Asian Koel	<i>Eudynamis scolopacea</i>	+	+		+
34	Green-billed Malkoha	<i>Phaenicophaeus tristis</i>	+	+		+
	Centropodidae					
35	Greater Coucal	<i>Centropus sinensis</i>	+	+	+	+
	PSITTACIFORMES					
	Psittacidae					
36	Alexandrine Parakeet	<i>Psittacula eupatria</i>	+	+	+	
37	Rose-ringed Parakeet	<i>Psittacula krameri</i>	+	+	+	+
38	Plum-headed Parakeet	<i>Psittacula cyanocephala</i>	+	+	+	+
39	Red-breasted Parakeet	<i>Psittacula alexandri</i>				+
	APODIFORMES					
	Apodidae					
40	Silver-backed Needletail	<i>Hirundapus cochinchinensis</i>	+			
41	Asian Palm Swift	<i>Cypsiurus balasiensis</i>	+	+		+
42	House Swift	<i>Apus affinis</i>	+	+	+	
	Hemiprocnidae					
43	Crested Treeswift	<i>Hemiprogne coronata</i>			+	+
	STRIGIFORMES					

	Strigidae					
44	Oriental Scops Owl	<i>Otus sunia</i>	+			
45	Brown Fish Owl	<i>Ketupa zeylonensis</i>	+	+		+
46	Jungle Owlet	<i>Glaucidium radiatum</i>		+	+	+
47	Spotted Owlet	<i>Athene brama</i>	+	+	+	
	Caprimulgidae					
48	Large-tailed Nightjer	<i>Caprimulgus macrurus</i>		+		
	COLUMBIFORMES					
	Columbidae					
49	Oriental Turtle Dove	<i>Streptopelia orientalis</i>	+	+	+	+
50	Spotted Dove	<i>Streptopelia chinensis</i>	+	+	+	+
51	Red Collared Dove	<i>Streptopelia tranquebarica</i>	+	+		+
52	Eurasian Collared Dove	<i>Streptopelia decaocto</i>	+	+	+	
53	Emerald Dove	<i>Chalcophaps indica</i>	+			+
54	Yellow-footed Green Pigeon	<i>Treron phoenicoptera</i>			+	
55	Wedge-tailed Green Pigeon	<i>Treron sphenura</i>				+
	GRUIFORMES					
	Rallidae					
56	White-breasted Waterhen	<i>Amaurornis phoenicurus</i>	+	+	+	+
57	Common Moorhen	<i>Gallinula chloropus</i>	+		+	+
	CICONIFORMES					
	Scolopacidae					
58	Marsh Sandpiper	<i>Tringa stagnatilis</i>			+	
59	Green Sandpiper	<i>Tringa ochropus</i>			+	+
60	Common Sandpiper	<i>Actitis hypoleucos</i>		+		
	Jacanidae					
61	Bronze-winged Jacana	<i>Metopidius indicus</i>	+	+	+	+
	Burhinidae					
62	Eurasian Thick-knee	<i>Burhinus oedicephalus</i>	+	+		+
	Charadriidae					
63	Red-wattled Lapwing	<i>Vanellus indicus</i>	+	+	+	+
	Accipitridae					
64	Osprey	<i>Pandion haliaetus</i>	+		+	+
65	Jerdon's Baza	<i>Aviceda jerdoni</i>				+
66	Black Baza	<i>Aviceda leuphotes</i>	+			+
67	Black Kite	<i>Milvus migrans</i>	+	+		+
68	Grey-headed Fish Eagle	<i>Ichthyophaga ichthyaetus</i>				+
69	Crested Serpent Eagle	<i>Spilornis cheela</i>	+	+	+	+
70	Crested Goshawk	<i>Accipiter trivirgatus</i>				+

71	Shikra	<i>Accipiter badius</i>	+	+		+
72	Besra	<i>Accipiter virgatus</i>	+			
73	Eurasian Sparrowhawk	<i>Accipiter nisus</i>			+	
74	Common Buzzard	<i>Buteo buteo</i>		+		+
75	Black Eagle	<i>Ictinaetus malayensis</i>	+	+	+	
76	Steppe Eagle	<i>Aquila nipalensis</i>		+	+	
77	Mountain Hawk Eagle	<i>Spizaetus nipalensis</i>	+			+
	Falconidae					
78	Collared Falconet	<i>Microhierax caerulescens</i>	+	+	+	+
79	Common Kestrel	<i>Falco tinnunculus</i>	+	+	+	
80	Red-necked Falcon	<i>Falco chicquera</i>		+		
81	Amur Falcon	<i>Falco amurensis</i>		+		
	Podicipedidae					
82	Little Grebe	<i>Tachybaptus ruficollis</i>	+	+	+	
	Phalacrocoracidae					
83	Little Cormorant	<i>Phalacrocorax niger</i>	+	+	+	+
	Ardeidae					
84	Little Egret	<i>Egretta garzetta</i>		+	+	+
85	Intermediate Egret	<i>Mesophoyx intermedia</i>		+	+	+
86	Cattle Egret	<i>Bubulcus ibis</i>	+	+	+	+
87	Indian Pond Heron	<i>Ardeola grayii</i>	+	+	+	+
	Threskiornithidae					
88	Black Ibis	<i>Pseudibis papillosa</i>	+	+	+	+
	Ciconiidae					
89	Asian Openbill	<i>Anastomus oscitans</i>			+	
90	Black Stork	<i>Ciconia nigra</i>		+	+	+
91	Lesser Adjutant	<i>Leptoptilos javanicus</i>	+	+	+	+
	PASSERIFORMES					
	Irenidae					
92	Golden-fronted Leafbird	<i>Chloropsis aurifrons</i>	+	+	+	+
	Laniidae					
93	Rufous-tailed Shrike	<i>Lanius isabellinus</i>				+
94	Brown Shrike	<i>Lanius cristatus</i>		+	+	
95	Long-tailed Shrike	<i>Lanius schach</i>		+	+	
96	Grey-backed Shrike	<i>Lanius tephronotus</i>			+	
	Corvidae					
97	Red-billed Blue Magpie	<i>Urocissa erythrorhyncha</i>				+
98	Rufous Treepie	<i>Dendrocitta vagabunda</i>	+	+	+	+
99	House Crow	<i>Corvus splendens</i>	+	+		

100	Large-billed Crow	<i>Corvus macrorhynchos</i>	+	+	+	+
101	Ashy Woodswallow	<i>Artamus fuscus</i>	+	+		+
102	Eurasian Golden Oriole	<i>Oriolus oriolus</i>		+		+
103	Slender-billed Oriole	<i>Oriolus tenuirostris</i>		+	+	
104	Black-hooded Oriole	<i>Oriolus xanthornus</i>	+	+	+	+
105	Maroon Oriole	<i>Oriolus traillii</i>			+	
106	Large Cuckooshrike	<i>Coracina macei</i>	+	+	+	+
107	Black-winged Cuckooshrike	<i>Coracina melaschistos</i>		+	+	+
108	Rosy Minivet	<i>Pericrocotus roseus</i>		+		+
109	Small Minivet	<i>Pericrocotus cinnamomeus</i>	+	+	+	+
110	Long-tailed Minivet	<i>Pericrocotus ethologus</i>	+		+	+
111	Scarlet Minivet	<i>Pericrocotus flammeus</i>	+	+	+	+
112	Bar-winged Flycatcher-shrike	<i>Hemipus picatus</i>				+
113	White-browed Fantail	<i>Rhipidura aureola</i>			+	
114	Black Drongo	<i>Dicrurus macrocercus</i>	+	+	+	+
115	Ashy Drongo	<i>Dicrurus leucophaeus</i>	+	+	+	+
116	White-bellied Drongo	<i>Dicrurus caerulescens</i>	+	+	+	+
117	Crow-billed Drongo	<i>Dicrurus annectans</i>	+	+		+
118	Bronzed Drongo	<i>Dicrurus aeneus</i>	+	+	+	+
119	Lesser Racket-tailed Drongo	<i>Dicrurus remifer</i>	+	+	+	
120	Spangled Drongo	<i>Dicrurus hottentottus</i>	+	+	+	+
121	Greater Racket-tailed Drongo	<i>Dicrurus paradiseus</i>	+	+	+	+
122	Black-naped Monarch	<i>Hypothymis azurea</i>		+	+	+
123	Common Iora	<i>Aegithina tiphia</i>	+	+		+
124	Large Woodshrike	<i>Tephrodornis gularis</i>	+	+	+	+
125	Common Woodshrike	<i>Tephrodornis pondicerianus</i>	+	+	+	
	Muscipapidae					
126	Blue-capped Rock Thrush	<i>Monticola cinclorhynchus</i>				+
127	Blue Rock Thrush	<i>Monticola solitarius</i>		+	+	+
128	Blue Whistling Thrush	<i>Myophonus caeruleus</i>			+	
129	Orange-headed Thrush	<i>Zoothera citrina</i>		+		
130	Scaly Thrush	<i>Turdus ruficollis</i>		+	+	
131	Red-throated Flycatcher	<i>Ficedula (parva) albicilla</i>		+	+	+
132	Verditer Flycatcher	<i>Eumyias thalassina</i>			+	
133	Pale-chinned Flycatcher	<i>Cyornis poliogenys</i>	+	+		
134	Tickell's Blue Flycatcher	<i>Cyornis tickelliae</i>				+
135	Grey-headed Canary Flycatcher	<i>Culicicapa ceylonensis</i>		+	+	
136	Siberian Rubythroat	<i>Luscinia calliope</i>				+
137	Oriental Magpie Robin	<i>Copsychus saularis</i>	+	+	+	+

138	White-rumped Shama	<i>Copsychus malabaricus</i>	+	+	+	+
139	Black Redstart	<i>Phoenicurus ochruros</i>			+	+
140	White-capped Water Redstart	<i>Chaimarrornis leucocephalus</i>		+	+	
141	Common Stonechat	<i>Saxicola torquata</i>				+
142	Pied Bushchat	<i>Saxicola caprata</i>			+	
143	Grey Bushchat	<i>Saxicola ferrea</i>				+
	Sturnidae					
144	Spot-winged Starling	<i>Saroglossa spiloptera</i>				+
145	Chestnut-tailed Starling	<i>Sturnus malabaricus</i>	+	+	+	+
146	Asian Pied Starling	<i>Sturnus contra</i>				+
147	Common Myna	<i>Acridotheres tristis</i>	+	+	+	+
148	Jungle Myna	<i>Acridotheres fuscus</i>				+
149	Hill Myna	<i>Gracula religiosa</i>	+	+	+	+
	Sittidae					
150	Chestnut-bellied Nuthatch	<i>Sitta castanea</i>	+	+	+	+
151	Velvet-fronted Nuthatch	<i>Sitta frontalis</i>		+	+	+
152	Wallcreeper	<i>Tichodroma muraria</i>			+	
	Paridae					
153	Great Tit	<i>Parus major</i>	+	+	+	+
	Hirundinidae					
154	Red-rumped Swallow	<i>Hirundo daurica</i>			+	+
	Pycnonotidae					
155	Black-crested Bulbul	<i>Pycnonotus melanicterus</i>	+	+	+	+
156	Himalayan Bulbul	<i>Pycnonotus leucogenys</i>	+	+	+	+
157	Red-vented Bulbul	<i>Pycnonotus cafer</i>	+	+	+	+
158	Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>	+	+	+	+
	Cisticolidae					
159	Zitting Cisticola	<i>Cisticola juncidis</i>	+	+		
160	Grey-breasted Prinia	<i>Prinia hodgsonii</i>	+		+	+
	Zosteropidae					
161	Oriental White-eye	<i>Zosterops palpebrosus</i>	+			
	Sylviidae					
162	Aberrant Bush Warbler	<i>Cettia flavolivacea</i>				+
163	Paddyfield Warbler	<i>Acrocephalus agricola</i>		+		
164	Blyth's Reed Warbler	<i>Acrocephalus dumetorum</i>				+
165	Common Tailorbird	<i>Orthotomus sutorius</i>	+	+	+	+
166	Common Chiffchaff	<i>Phylloscopus collybita</i>			+	
167	Greenish Warbler	<i>Phylloscopus trochiloides</i>		+	+	
168	Dusky Warbler	<i>Phylloscopus fuscatus</i>			+	

169	Tickell's leaf Warbler	<i>Phylloscopus affinis</i>		+	+	+
170	Sulphur-bellied Warbler	<i>Phylloscopus griseolus</i>			+	+
171	Lemon-rumped Warbler	<i>Phylloscopus chloronotus</i>			+	
172	Grey-hooded Warbler	<i>Seicercus xanthoschistos</i>		+	+	
173	Yellow-bellied Warbler	<i>Abroscopus superciliaris</i>			+	
174	Abbott's Babbler	<i>Malacocincla abbotti</i>	*	*	*	+
175	Puff-throated Babbler	<i>Pellorneum ruficeps</i>	+	+	+	+
176	Striped Tit Babbler	<i>Macronous gularis</i>	+	+	+	+
177	Jungle Babbler	<i>Turdoides striatus</i>	+	+	+	+
178	Lesser Whitethroat	<i>Sylvia curruca</i>		+		
	Alaudidae					
179	Ashy-crowned Sparrow Lark	<i>Eremopterix grisea</i>				+
180	Sand Lark	<i>Calandrella raytal</i>				+
	Nectariniidae					
181	Purple Sunbird	<i>Nectarinia asiatica</i>			+	+
182	Crimson Sunbird	<i>Aethopyga siparaja</i>			+	+
183	Green-tailed Sunbird	<i>Aethopyga nipalensis</i>				+
	Passeridae					
184	House Sparrow	<i>Passer domesticus</i>	+	+	+	
185	Chestnut-shouldered Petronia	<i>Petronia xanthocollis</i>				+
186	White Wagtail	<i>Motacilla alba</i>		+	+	
187	White-browed Wagtail	<i>Motacilla maderaspatensis</i>		+		+
188	Yellow Wagtail	<i>Motacilla flava</i>				+
189	Grey Wagtail	<i>Motacilla cinerea</i>				+
190	Richard's Pipit	<i>Anthus richardi</i>			+	
191	Paddyfield Pipit	<i>Anthus rufulus</i>	+	+	+	
192	Tree Pipit	<i>Anthus trivialis</i>				+
193	Olive-backed Pipit	<i>Anthus hodgsoni</i>				+
194	Baya Weaver	<i>Ploceus philippinus</i>				+
195	White-rumped Munia	<i>Lonchura striata</i>				+
196	Scaly-breasted Munia	<i>Lonchura punctulata</i>				+
	Fringillidae					
197	Crested Bunting	<i>Melophus lathami</i>				+

+ Present

*Song recorded which was confirmed in last visit

Threatened species

Four nationally threatened species were observed during first survey including one globally threatened species, Lesser Adjutant. Similarly, five, five and seven nationally threatened species were observed during the second, third and fourth survey respectively including the same globally threatened species. Among them three species were observed in all four seasons and one species was recorded in the three seasons and six species were recorded in only one season. Thus, a total of 10 nationally threatened species (three critical, two endangered and five vulnerable) were observed from the Dharan forests IBA. This constitutes 5.1% of the species observed during the survey and 7.5% of Nepal's nationally threatened birds. The list of threatened species recorded during the survey is shown in table 4 and figure 1.

Table 4 List of nationally threatened birds recorded in the study area

No	Common Name	Category	Location	Habitat
1	Abbott's Babbler	Critical	Site 1, 3, 5, 8	Dense mixed forest
2	Jerdon's Baza	Critical	Site 1	Dense mixed forest
3	Red-necked Falcon	Critical	Site 6	Open forest
4	Grey-headed Fish Eagle	Endangered	Site 3	Dense mixed forest
5	Lesser Adjutant Stork*	Endangered	Site 4, 9	Agro-forest
6	Red Junglefowl	Vulnerable	Site 1, 2, 3, 5, 8	Dense mixed forest
7	Silver-backed Needletail	Vulnerable	Site 8	Sal forest
8	Asian Openbill	Vulnerable	Site 9	Wetland of Betana
9	Black Stork+	Vulnerable	Site 5	Forest near stream
10	Hill Myna	Vulnerable	Site 3, 5, 7	Mixed forest

* Globally threatened species

+ nationally protected species

Among the nationally threatened species Abbott's Babbler was recorded in Kalabajar forest (site 1), Panbara forest (site 3), Budikhola watershed (site 5) and Kerabari forest area (site 8). Although the bird was conformed in last visit after close observation along its call, it was noticed frequently from first visit. The bird is critically endangered in the nationally threatened category.

Another nationally threatened species Jerdon's Baza was observed in Kalabajar forest (site 1) near by Sardu khola south from Dharan. Probably this critically endangered species is summer visitor and only observed from the area in Nepal.

A pair of Red-necked Falcon was seen over the Budhi khola upstream (site 6) near Yangshila VDC on 18th October. Similarly, one Grey-headed Fish Eagle was observed in Panbara forest (site 3) south from Pancha Kanya VDC on 31st March.

Globally threatened species (category Vulnerable) Lesser Adjutant was observed in all four seasons. Two nesting colonies were found from the Dharan Forests IBA one at Santi Community Forest, (site 4) Hasposha VDC, Tarahara (26°42'N & 87°16'E) and another from Singhadevi Community Forest, (site 9) Dagihat VDC, Bhawnne (26°39'N & 87°27'E).

Calls of Red Junglefowl were frequently noted in both seasons from Kalabajar forest (site 1), fireline at Sewti west (site 2), Panbara forest (site 3), Riverine forest of Budhikola (site 5) and Kerabari forests (site 8) of Sunsari and Morang districts.

One individual of Asian Openbill was recorded from Betana Pokhari, (site 9) wetland of Belbari VDC on 10th January 2008 and one individual of Black Stork was observed Budi khola (site 5) near Sunderpur VDC on 18th January 2008.

A pair of Silver-backed Needletail was soaring above the Sal forest (site 8) near Kerabari VDC on 16th May. Many flocks of Hill Mynas were recorded in all four seasons frequently from Janta community forests (site 7), Riverine forests (site 5) and Panbara forests (site 3) (Table 4).

Although the forest of the Dharan Forests IBA is large and mature type, we could not record Great Hornbill *Buceros bicornis* from the area. This globally near threatened species was recorded twice at Raja Rani Community Forest which is contiguous with Dharan forest (Basnet *et al*, 2005). But we recorded 26 individuals Oriental Pied Hornbill *Anthracoceros albirostris* in a flock on 20th January 2008 at riverine forest of Banchauri.

Biome restricted species

Dharan forests IBA supports five types of biome-restricted species. Among the observed species thirty one species (15.74% of the total species) recorded were biome-restricted species. Among them, four were Eurasian high montane biome species, one was Sino-Himalayan Temperate forest biome species, nine were Sino-Himalayan Subtropical forest biome species,

three were Indo-Chinese Topical moist forest biome species, and fourteen were Indo-Malayan Tropical Dry zone biome species. Bird species according to the biome where they were recorded are shown in table 5.

Table 5 Bird species according to biome

S N	Name of Species	Biome
1	Wall Creeper	Eurasian high montane
2	Grey-backed Shrike	Eurasian high montane
3	Tickell's Leaf Warbler	Eurasian high montane
4	Sulphur-billed Warbler	Eurasian high montane
5	Aberrant Bush Warbler	Sino-Himalayan Temperate forest
6	Blue-throated Barbet	Sino-Himalayan Subtropical forest
7	Slender-billed Oriole	Sino-Himalayan Subtropical forest
8	Maroon Oriole	Sino-Himalayan Subtropical forest
9	Black-winged Cuckooshrike	Sino-Himalayan Subtropical forest
10	Rosy Minivet	Sino-Himalayan Subtropical forest
11	Blue-capped Rock Thrush	Sino-Himalayan Subtropical forest
12	Spot-winged Starling	Sino-Himalayan Subtropical forest
13	Himalayan Bulbul	Sino-Himalayan Subtropical forest
14	Grey-hooded Warbler	Sino-Himalayan Subtropical forest
15	Himalayan Flameback	Indo-Chinese Topical moist forest
16	Pale-chinned Flycatcher	Indo-Chinese Topical moist forest
17	Crow-billed Drongo	Indo-Chinese Topical moist forest
18	Indian Peafowl	Indo-Malayan Tropical Dry zone
19	Yellow-crowned Woodpecker	Indo-Malayan Tropical Dry zone
20	Lineated Barbet	Indo-Malayan Tropical Dry zone
21	Plum-headed Parakeet	Indo-Malayan Tropical Dry zone
22	Red-necked Falcon	Indo-Malayan Tropical Dry zone
23	Yellow-footed Green Pigeon	Indo-Malayan Tropical Dry zone
24	Small Minivet	Indo-Malayan Tropical Dry zone
25	Ashy Woodswallow	Indo-Malayan Tropical Dry zone
26	White-bellied Drongo	Indo-Malayan Tropical Dry zone
27	White-browed Fantail	Indo-Malayan Tropical Dry zone
28	Common Woodshrike	Indo-Malayan Tropical Dry zone
29	Chestnut-tailed Starling	Indo-Malayan Tropical Dry zone
30	Jungle Babbler	Indo-Malayan Tropical Dry zone
31	Ashy-crowned Sparrow Lark	Indo-Malayan Tropical Dry zone

Breeding birds

We have noticed many breeding activities during field visit. Even though May (first field visit) is considered post breeding period for most of the species, we observed few breeding activities. On 13th May 2007 Chestnut-bellied Nuthatch were observed feeding to their chicks. Similarly, on 14th May 2007 Oriental White-eye was feeding to their chicks. Active nest of Dollar bird and Common myna were also observed on 16th May 2007.

On 28th October 2007 (Second field visit) seven active nests of Lesser Adjutant were recorded along with their chicks in the nesting tree of Simal at Santi Community Forest, Tarahara, Sunsari. During third visit a total of 26 individuals of Lesser Adjutant were recorded in the nesting site of Tarahara. Similarly, a new nesting colony of Lesser Adjutant was explored from Singhadevi Community Forest, Bhawnne, Morang. Five nests were located in that colony.

On 27th March 2008 Jungle Babblers were observed carrying nest material in mixed Sal forest near Sewti Khola (Stream). On 28th March 2008 a pair of Crested Goshawk was recorded in a nest.

Bronze-winged Jacana was also recorded along with their chicks in Betana Dam.

Important bird sites

All together nine site were found very important for bird community. They are shown in figure 1 as important bird sites. Characteristic features of habitat and species of the site are as follows:

Site 1: Kalabanjar community forest:-

The site is located western part of the IBA near Kalabanjar village and found mixed Sal dominated forest with moist environment due to rich water resources. Nationally threatened species Abbott's Babbler and Jerdon's Baza were recorded there. Nest of Crested Goshawk was also recorded in this site. Biome restricted species Grey-backed Shrike, Aberrant Bush Warbler, Blue-throated Barbet, White-browed Fantail and Jungle Babbler were recorded in the site.

Site 2: National forest Sewti west fireline:-

The site is located western part of the Dharan-Itahari highway near Sewti Khola and found Sal dominated forest. Nationally threatened species Red Junglefowl was regularly recorded there. Biome restricted species Grey-backed Shrike, Sulphur-billed Warbler, Blue-throated Barbet, Himalayan Flameback, Pale-chinned Flycatcher, White-bellied Drongo, Common Woodshrike and Jungle Babbler were recorded in the site. Furthermore, Five individuals of Spotted Deer were recorded in this site. Hunting of the deer species is very high in this IBA.

Site 3: Panbara community forest, Pachkanya:-

The site is located south from Panbara village, eastern part of the Sunsari district. Forest is mixed Sal dominated forest type. Nationally threatened species Abbott's Babbler and Grey-headed Fish Eagle were recorded there. Biome restricted species Indian Peafowl, Grey-hooded Warbler, Blue-throated Barbet and Jungle Babbler were recorded in the site.

Site 4: Lesser Adjutant Nesting colony, Tarahara:-

The site is located in Santi community forest near Tarahara village. Forest is much degraded in the site. Few mature Simal and Karma trees are found here which provides nesting and rusting sites for globally threatened Lesser Adjutant species. Biome restricted species Grey-backed Shrike, Plum-headed Parakeet, Blue-throated Barbet, Ashy Woodswallow, Chestnut-tailed Starling and Jungle Babbler were recorded in the site. Barking Deer was also recorded in dense bushes in this site.

Site 5: Riverine forest of Budhikhola watershed:-

The site is located southern part of the IBA at border of Sunsari and Morang district. Forest is riverine and regenerated Sal dominated forest type. Nationally threatened species Abbott's Babbler and Black Stork were recorded there. Biome restricted species Spot-winged Starling, Aberrant Bush Warbler, Lineated Barbet, Chestnut-tailed Starling and Jungle Babbler were recorded in the site. Barking Deer and Indian Hare were also recorded in this site

Site 6: Budikhola upstream, Yangshila:-

The site is located northern part of the site 5 which is a tribute of Budhikhola. Forest is found mixed type. Nationally threatened species Red-necked Falcon which is very rare in status was recorded in the site. Biome restricted species Grey-backed Shrike, Slender-billed Oriole, Blue-throated Barbet, Plum-headed Parakeet, Ashy-crowned Sparrow Lark and Jungle Babbler were recorded in the site.

Site 7: Janta Community forest, churia hills, Kerabari-8:-

The site is located in Janta community forest in the churia hills northern part of the IBA. Forest is found mixed type. Nationally threatened species Hill Myna was recorded in the site. Biome restricted species Tickell's Leaf Warbler, Spot-winged Starling, Himalayan Bulbul, Yellow-footed Green Pigeon, Blue-capped Rock Thrush, Crow-billed Drongo, Blue-throated Barbet, Lineated Barbet, White-bellied Drongo and Wall Creeper were recorded in the site.

Site 8: Sal forests of Kerabari:-

The site is located near Kerabari village in Morang district. Forest is found Sal dominated type. Nationally threatened species Abbott's Babbler, Silver-backed Needletail, Red Junglefowl and Hill Myna were recorded in the site. Biome restricted species Common Woodshrike, Black-winged Cuckooshrike, Chestnut-tailed Starling, Himalayan Flameback, Yellow-crowned Woodpecker, Maroon Oriole, Blue-throated Barbet, Lineated Barbet, White-bellied Drongo, Rosy Minivet and Small Minivet were recorded in the site.

Site 9: Betana wetland and Lesser Adjutant nesting colony, Bhawnne:-

The site is located near east-west highway. Forest is found mixed type. Nationally threatened species Asian Openbill was recorded in the Betana wetland where more than 500 individuals of Lesser Whistling Duck can be seen in winter. Bronze-winged Jacana breeds in this wetland. A nesting colony of Lesser Adjutant was also recorded at Bhawnne which is just two kilometer east from the Betana wetland. Biome restricted species Tickell's Leaf Warbler, Grey-backed Shrike, Himalayan Flameback, Blue-throated Barbet, Lineated Barbet, White-bellied Drongo and Jungle Babbler were recorded in the site.

Threats

- Local people are heavily dependent on forest resources which affect the bird ecology.
- Use of vehicle inside the forest to collect the timber was also noticed. In some of the places we observed recently the cutting down of large green trees for illegal trading, especially in Morang area.
- Stream and its dry open grassy embankments which run through the forest as well as agricultural lands provide good habitat for grassland species as well as stream dwellers like Eurasian Thick-knee. Activities like excessive mining of cobbles, stones and removal of woody debris from these streams and grasslands are also destroying the habitat of aquatic and grassland species.
- On 11th January 2008 at 8:30am we observed a very long track of freshly dropped red blood nearby Kalabanjar village, Sunsari where we had seen four Spotted Deer (one male and three female). Later we confirmed that local people hunted one deer on that day. According to local people they regularly hunt wild mammals (ie Spotted Deer, Barking Deer and Wild Boar). Their hunting hobby may harm birds in future or affecting from sound of guns.

CONCLUSION

Dharan Forests IBA is one of the unprotected IBAs in Nepal. The forest is tropical evergreen mixed type dominated by Sal. A total of 197 bird species was recorded from the Dharan forests area. Among them 143 species were residents, 45 species were winter visitors and nine were summer visitors. Total nine sites were recorded very important for bird communities. A total of 10 nationally threatened species including one globally threatened Lesser Adjutant which breeds in site 4 and site 9. Total 31 species were biome restricted species. Furthermore, seven species were confirmed breeding. The shape of the graph of Mackinnon's lists clearly indicates that more species are very likely to found with more survey work.

RECOMMENDATION

- Most of the forest users and community forest management committee such as Shanti Community Forest, Kalabanjar Community Forest and Janta Community Forests are unaware about importance of birds and biodiversity. Conservation awareness programme for forest management committee and school students could help them to understand the importance of birds and biodiversity along with its need of future generation. To increase the interest about benefit of biogas to the local people would be useful to reduce their dependency in forest resources. Kalabanjar forests area, Sunsari is heavily affected by local hunters. So, awareness programme to the local people along with local leaders and stake holders could be effective.
- Local people of Morang and Sunsari are heavily dependent on forest resources due to their very low economic status. Thus, income generation programme such as fire brigade development for fuel, training for juice production like *Marmelos* may increase their living status which could help to conserve the birds and biodiversity.
- This survey has covered four important seasons during field visits. But each visit is relatively short period and the IBA area is comparatively very large. Thus, many important areas especially Siwalik belt could not covered except Janta Community Forest during the visit. The curve is still rising and relatively steeply this indicates that with more fieldwork it is very likely that more species will be found. Therefore, we recommend a follow up programme for the IBA.
- As the IBA is home for many residential as well as winter visitor species winter season would be likely to be most productive. This season is also post breeding season for globally threatened species Lesser Adjutant which breeds in the IBA. Spring season is also good for bird survey when many species give call during their breeding time.

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Appendix Trees and woody vegetation of study area.

S. No.	Scientific Name	Local Name	Family
1	<i>Acacia catechu</i>	Khayar	Leguminosae
2	<i>Acacia pennata</i>	Arari	Leguminosae
3	<i>Adina cardifolia</i>	Karma	Rubiaceae
4	<i>Aegle marmelos</i>	Bel	Rutaceae
5	<i>Anthocephalus chinensis</i>	Kadam	Rubiaceae
6	<i>Antidesma acidum</i>	Archal	Euphorbiaceae
7	<i>Artocarpus lakoocha</i>	Badhar	Moraceae
8	<i>Asltonia scholaris</i>	Chhatiwan	Apocynaceae
9	<i>Azadirachta indica</i>	Nim	Meliaceae
10	<i>Bauhinia purpurea</i>	Tanki	Leguminosae
11	<i>Bauhinia vahlii</i>	Bhorla	Leguminosae
12	<i>Bombax ceiba</i>	Simal	Bombacaceae
13	<i>Butea minor</i>	Bhuletro	Leguminosae
14	<i>Butea monosperma</i>	Palas	Leguminosae
15	<i>Callicarpa arborea</i>	Kharane	Verbenaceae
16	<i>Careya arborea</i>	Kumbhi	Lecythidaceae
17	<i>Cassia fistula</i>	Rajbrikshya	Leguminosae
18	<i>Celtis australis</i>	Khari	Ulmaceae
19	<i>Citrus medica</i>	Bimiro	Rutaceae
20	<i>Colebrookea oppositifolia</i>	Dhasure	Labiatae
21	<i>Cornus oblonga</i>	Latikath	Cornaceae
22	<i>Dalbergia latifolia</i>	Satisal	Leguminosae
23	<i>Dalbergia sissoo</i>	Sisaw	Leguminosae
24	<i>Dillenia indica</i>	Kumbi	Dilleniaceae
25	<i>Dillenia pentagyna</i>	Tatari	Dilleniaceae
26	<i>Duabanga grandiflora</i>	Lampate	Lythraceae
27	<i>Ficus benghalensis</i>	Bar	Moraceae
28	<i>Ficus carica</i>	Nebaro	Moraceae
29	<i>Ficus hispida</i>	Khasre	Moraceae
30	<i>Ficus lacor</i>	Kabhro	Moraceae
31	<i>Ficus neriifolia</i>	Dudhilo	Moraceae
32	<i>Ficus racemosa</i>	Dumri	Moraceae

33	<i>Ficus religiosa</i>	Pipal	Moraceae
34	<i>Ficus semicordata</i>	Khanyu	Moraceae
35	<i>Garuga pinnata</i>	Dabdabe	Burseraceae
36	<i>Gmelina arborea</i>	Khamari	Verbenaceae
37	<i>Grewia elastica</i>	Shylphushre	Tilaceae
38	<i>Lagerstroemia parviflora</i>	Bot dhayaro	Lythraceae
39	<i>Lannea coromendelica</i>	Hallunde	Anacardiaceae
40	<i>Leea macrophylla</i>	Galeni	Leeaceae
41	<i>Maesa chisia</i>	Bilaune	Myrsinaceae
42	<i>Magnifera indica</i>	Amp	Anacardiaceae
43	<i>Mallotus philippensis</i>	Sindhure	Euphorbiaceae
44	<i>Mimosa rubicaulis</i>	Arharikanda	Leguminosae
45	<i>Morus rubra</i>	Kimbu	Moraceae
46	<i>Nyctanthes arbor-tristis</i>	Parijat	Oleaceae
47	<i>Origanum vulgare</i>	Sajwan	Labiatae
48	<i>Phyllanthus emblica</i>	Amala	Euphorbiaceae
49	<i>Pilea symmeria</i>	Kamle	Urticaceae
50	<i>Premna integrifolia</i>	Gidari	Verbenaceae
51	<i>Salix tetrasperma</i>	Bains	Salicaceae
52	<i>Sapindus mukorossi</i>	Rittha	Sapindaceae
53	<i>Sapium insigne</i>	Khirro	Euphorbiaceae
54	<i>Semecarpus anacardium</i>	Bhalayo	Anacardiaceae
55	<i>Shorea robusta</i>	Sal	Dipterocarpaceae
56	<i>Spatholobus parviflorus</i>	Debrelahara	Leguminosae
57	<i>Syzygium cumini</i>	Jamun	Myrtaceae
58	<i>Tamarindus indica</i>	Imli	Leguminosae
59	<i>Terminalia alata</i>	Saj	Combretaceae
60	<i>Terminalia bellirica</i>	Barro	Combretaceae
61	<i>Terminalia chebula</i>	Harro	Combretaceae
62	<i>Trewia nudiflora</i>	Pithari	Euphorbiaceae
63	<i>Vitex negundo</i>	Simali	Verbenaceae
64	<i>Woodfordia fruticosa</i>	Dhanero	Lythraceae
65	<i>Zizypus mauritiana</i>	Bayar	Rhamnaceae