

COMPOSITION AND CONSERVATION STATUS OF AVIAN SPECIES AT HASTINAPUR WILDLIFE SANCTUARY, UTTAR PRADESH, INDIA

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Being conspicuous elements of the ecosystem, birds are the most suitable biological indicators for monitoring the health of an ecosystem (Gregory et al. 2003). In contrast to chemical or radiological monitoring of environmental health, a simple bird survey (Biological monitoring) can tell, simply and directly, the condition of living systems in a landscape of interest. Such knowledge is more direct and more integrative than information merely about a site's contamination status (U.S. EPA. 2002). To assess the distribution and conservation status, occasional and random point count sampling for birds was conducted during the summer of 2010 (March to May) at Hastinapur Wildlife Sanctuary, Uttar Pradesh, India. The observations were made simultaneously with Otter and Gharial surveys under the sponsorship of WWF-India. Findings suggested that the mosaic of habitats of the Hastinapur Wildlife Sanctuary holds a good variety of avifauna. In addition to the earlier checklist of 186 avian species (Riyaz 2000; Tanveer 2000; Islam & Rahmani

2004), anecdotal references on the occurrence of White-tailed Bushchat *Saxicola leucura*, Finn's Baya *Ploceus benghalensis*, Tawny Eagle *Aquila rapax* and Crested Honey Buzzard *Pernis ptilorhynchus* were reported from the area (Rai 1982, 1983). This study appended the earlier records with 15 new bird species for the area.

Study Area: Hastinapur Wildlife Sanctuary forms 2073km² area of the upper Gangetic plain, the flat alluvial region formed by the deposition of silt by Ganga River between 28°46'–29°35'N and 77°30'–78°30'E (Fig. 1). According to Rodgers & Panwar's (1988) biogeographic classification, Hastinapur Wildlife Sanctuary falls in the upper Gangetic plain (7A) and represents the Gangetic grassland biome. The alluvial region comprises the Khola (elevated alluvial deposition, parallel to the western bank of river Ganga), Khadar (low lying sandy bed of the ever shifting river Ganga on either bank) and Boodhi Ganga (belt of swamps and marshes between Khola and Khadar, which are fed by river Ganga), a more or less permanent feature of ravines. But now marshy swamps have been drained or are in the process like Boodhi Ganga (Aftab 2010; Khan 2010). The vegetation occupied only 17% of the Sanctuary area which comprised tall wet grasslands (35.3%), short wet grasslands (23.5%), dry scrub grasslands (29.4%) and plantations (11.8%) (Khan et al. 2003). The remaining 83% of the Sanctuary area was under cultivation and a township which resulted in considerable human disturbance (Khan et al. 2003;



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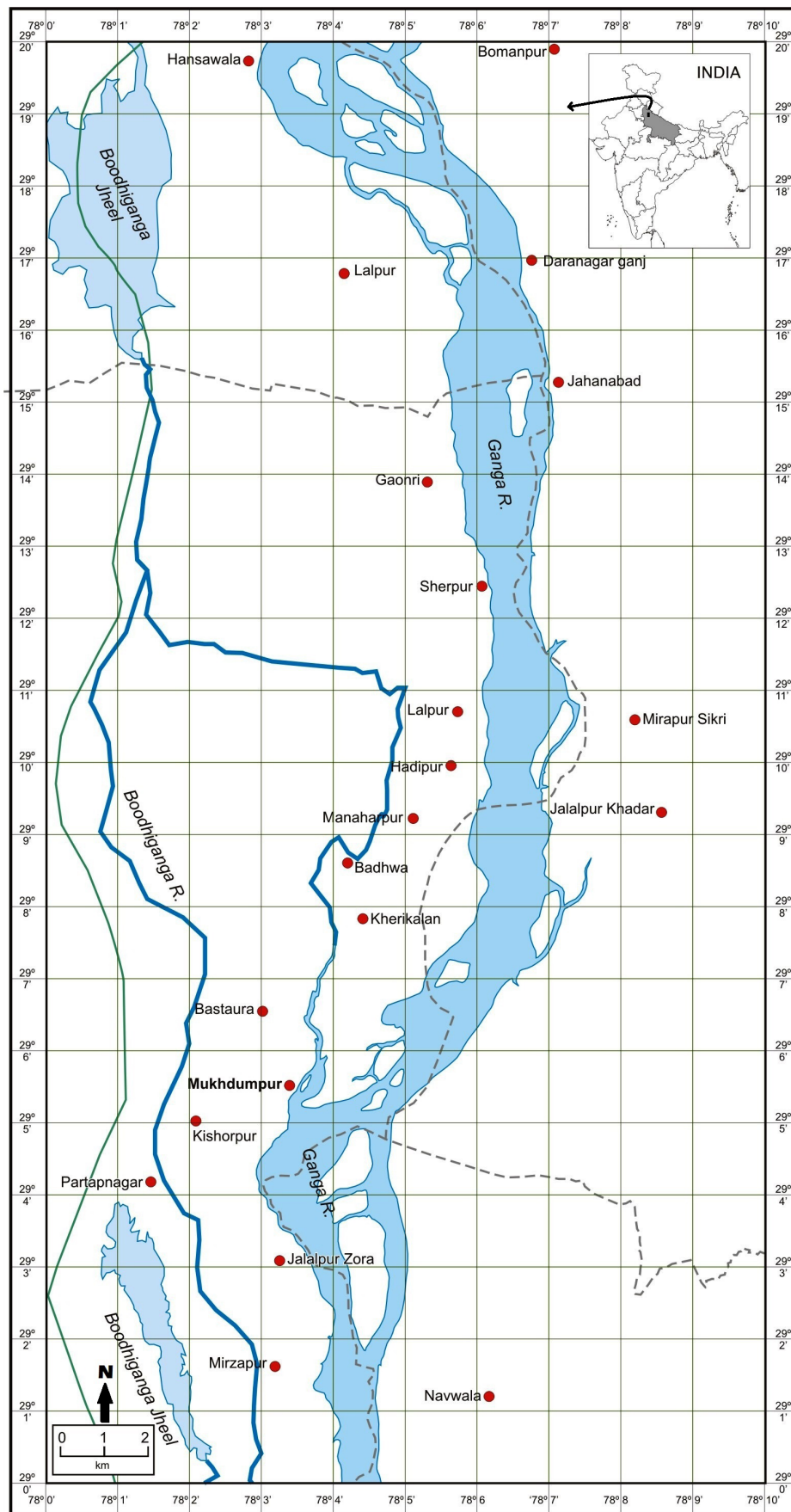


Figure 1. Location map of Hastinapur Wildlife Sanctuary India

Agarwal 2009; Khan 2010).

Materials and Methods: The study was conducted from March to May 2010 at Hastinapur Wildlife Sanctuary. Equal numbers of vantage points were randomly chosen with at least 250m separation in different habitats of the Sanctuary. At each point on the terrestrial habitat, bird species were recorded within a close circle of 30m radius for a time duration of 20 minutes using binoculars (7×35) as an optical support while for river and wetlands open radius circular plots were laid. Authentic field guides on Indian birds were used for the purpose of identification (Ali & Ripley 1987; Grimmett et al. 1999; Kazmierczak 2000). Relative abundance was assessed in terms of the following four categories (i) Abundant (species observed on 75–100 % of visits), Common (species observed on 50–74 % of visits), Uncommon (species observed on 25–49 % of visits) and Rare (species observed at < 24% of visits). The Sanctuary was divided into four different habitat types namely Khola, Khadar, river Ganga and Boodhi Ganga. On the basis of usage of available habitats, species distribution was categorized into four types. Species using only one habitat type were categorized into clumped with only 25% of available habitat usage, species found in two habitat types were labeled as clumped distribution with 50% of available habitat usage, similarly species with a usage of three habitat types were categorized into random distribution with 75% of available habitat use while the species using all the four available habitats were categorized into random distribution with 100% usage of available habitats. The nomenclature of birds follows Manakadan & Pittie (2004).

Results and Discussion: A total of 117 avian species belonging to 44 families were recorded during the course of the study. Among the recorded avian species, 111 species were Least Concern, three and two species were Near Threatened and Vulnerable categories, respectively, while one species was from Endangered category as per the IUCN Red List of Threatened Species (Table 1). Fifteen species namely Bluethroat *Luscinia svecica*, Indian Chat *Cercomela fusca*, Comb Duck *Sarkidiornis melanotos*, Common Pochard *Aythya ferina*, Cotton Teal *Nettapus coromandelianus*, Curlew Sandpiper *Calidris ferruginea*, Demoiselle Crane *Grus virgo*, Gadwall *Anas strepera*, Gull Billed Tern *Gelochelidon nilotica*, Indian Shag *Phalacrocorax fuscicollis*, Mallard *Anas platyrhynchos*, Pallas's Gull *Larus ichthyaetus*, Pied Avocet *Recurvirostra avosetta*, Small Pratincole *Glareola lactea* and White-breasted Waterhen *Amaurornis phoenicurus* were reported for the first time from the area. Out of 117 recorded species, 25 were abundant and 57 species

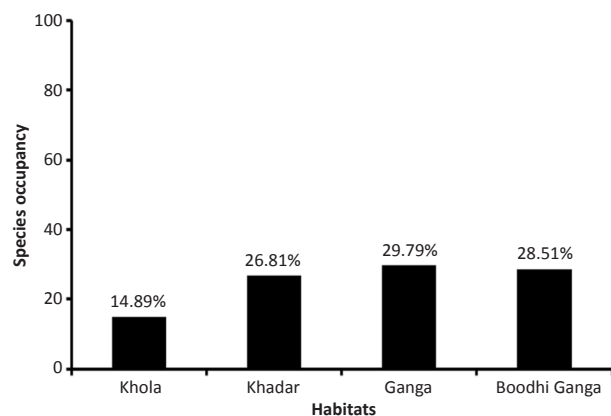


Figure 2. Habitat wise percent species occupancy at Hastinapur Wildlife Sanctuary, India

were common while 26 species of birds were assessed uncommon and the remaining nine species were rare (Table 1). The maximum bird species were recorded from river Ganga (Fig. 2, 29.79%) followed by Boodhi Ganga (28.51%) while 26.81% of bird species were recorded from Khadar and the least percentage of bird species was recorded from Khola (14.89%). A highly clumped distribution was recorded for 43 species, i.e., with only 25% usage of the available habitats, 38 bird species showed aggregated distribution with 50% available habitat usage, and 75% usage of available habitats was recorded in the case of 28 bird species which was considered as random distribution, while 8 species were found widely dispersed with 100% usage of available habitats (Fig. 3). Although Khola provides refuge to the wild fauna of the Sanctuary, the results indicated that due to high pressure from agriculture and other human disturbances, it is avoided by birds. Until the 1950s, Khola was a continuous belt of land 36.4km (Murti & Singh 1961) in length but due to disturbances the area has become fragmented, being converted into a series of small hillocks of sandy loam, with heights ranging from 20–40 m (Khan 2010). Despite being a protected area, locals in the vicinity of the Sanctuary are heavily dependent on the forest produce (Khan et al. 2003). The Sanctuary harbors the unique riparian habitat along River Ganga, the national river of India and it also has historical values. There is an urgent need to prevent encroachment of the wildlife assets of the Sanctuary, and awareness and education programmes are also recommended.

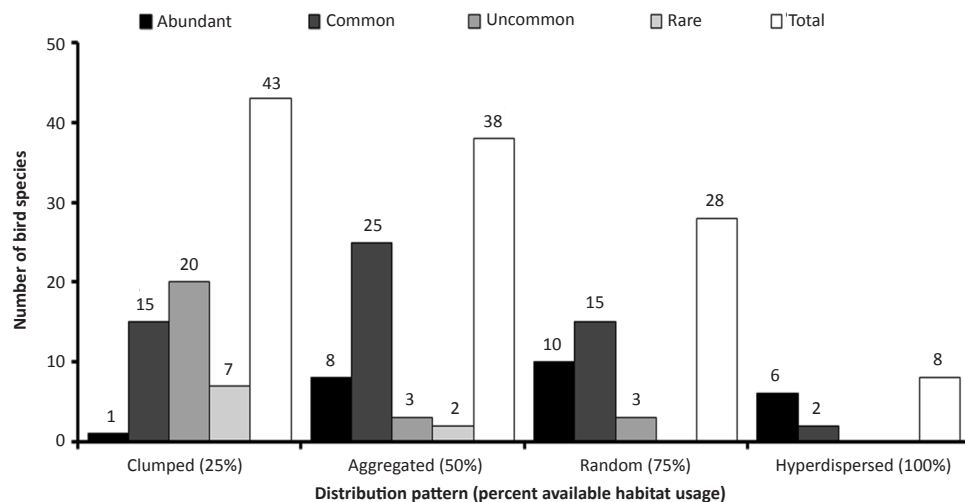


Figure 3. Distribution pattern of avian species with respect to habitat availability at Hastinapur Wildlife Sanctuary, India

Table 1. Systematic checklist of birds recorded from the Hastinapur Wildlife Sanctuary

	Common name	Scientific name	IUCN Status	Local status	Habitat used			
Family: Podicipedidae								
1	Little Grebe	<i>Tachybaptus ruficollis</i>	LC	C			RG	BG
Family: Phalacrocoracidae								
2	Indian Shag	<i>Phalacrocorax fuscicollis</i>	LC	Uc			RG	
3	Little Cormorant	<i>Phalacrocorax niger</i>	LC	C			RG	BG
Family: Anhingidae								
4	Darter	<i>Anhinga melanogaster</i>	NT	Uc				BG
Family: Ardeidae								
5	Purple Heron	<i>Ardea purpurea</i>	LC	C			RG	BG
6	Indian Pond Heron	<i>Ardeola grayii</i>	LC	Ab			RG	BG
7	Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	LC	Uc				BG
8	Cattle Egret	<i>Bubulcus ibis</i>	LC	Ab		Kh	RG	BG
9	Large Egret	<i>Casmerodius albus</i>	LC	C			RG	BG
10	Median Egret	<i>Mesophoyx intermedia</i>	LC	C			RG	BG
11	Little Egret	<i>Egretta garzetta</i>	LC	C			RG	BG
Family: Ciconiidae								
12	Painted Stork	<i>Mycteria leucocephala</i>	NT	Uc			RG	
13	Asian Openbill-Stork	<i>Anastomus oscitans</i>	LC	C			RG	
14	White-necked Stork	<i>Ciconia episcopus</i>	LC	Uc		Kh	RG	BG
Family: Threskiornithidae								
15	Black Ibis	<i>Pseudibis papillosa</i>	LC	Uc			RG	
16	Eurasian Spoonbill	<i>Platalea leucorodia</i>	LC	Uc			RG	
Family: Anatidea								
17	Bar-headed Goose	<i>Anser indicus</i>	LC	C		Kh	RG	BG
18	Lesser Whistling Duck	<i>Dendrocygna javanica</i>	LC	C			RG	
19	Comb Duck	<i>Sarkidiornis melanotos</i>	LC	R			RG	
20	Cotton Teal	<i>Nettapus coromandelianus</i>	LC	Uc			RG	
21	Gadwall	<i>Anas strepera</i>	LC	C			RG	

	Common name	Scientific name	IUCN Status	Local status	Habitat used			
22	Mallard	<i>Anas platyrhynchos</i>	LC	Uc			RG	
23	Spot-billed Duck	<i>Anas poecilorhyncha</i>	LC	C			RG	BG
24	Northern Shoveller	<i>Anas clypeata</i>	LC	C			RG	
25	Brahminy Shelduck	<i>Tadorna ferruginea</i>	LC	C			RG	
26	Northern Pintail	<i>Anas acuta</i>	LC	C			RG	
27	Garganey	<i>Anas querquedula</i>	LC	C			RG	
28	Common Pochard	<i>Aythya ferina</i>	LC	C			RG	
Family: Accipitridae								
29	Black-shouldered Kite	<i>Elanus caeruleus</i>	LC	C		Kh	RG	BG
30	Black Kite	<i>Milvus migrans</i>	LC	Ab	Ko	Kh	RG	BG
31	Shikra	<i>Accipiter badius</i>	LC	C	Ko	Kh		BG
32	Western Marsh Harrier	<i>Circus aeruginosus</i>	LC	C			RG	BG
33	Short-toed Snake Eagle	<i>Circaetus gallicus</i>	LC	R			RG	
34	White-eyed Buzzard	<i>Butastur teesa</i>	LC	R			RG	
35	Egyptian Vulture	<i>Neophron percnopterus</i>	EN	R			RG	BG
Family: Phasianidae								
36	Grey Francolin	<i>Francolinus pondicerianus</i>	LC	C	Ko	Kh		BG
37	Indian Peafowl	<i>Pavo cristatus</i>	LC	C	Ko	Kh		BG
Family: Gruidae								
38	Sarus Crane	<i>Grus antigone</i>	VU	Uc			RG	
39	Demoiselle Crane	<i>Grus virgo</i>	LC	R			RG	
Family: Raliidae								
40	Purple Moorhen	<i>Porphyrio porphyrio</i>	LC	C		Kh	RG	BG
41	Common Moorhen	<i>Gallinula chloropus</i>	LC	Ab		Kh	RG	BG
42	White-breasted Waterhen	<i>Amaurornis phoenicurus</i>	LC	Ab		Kh	RG	BG
43	Common Coot	<i>Fulica atra</i>	LC	C			RG	
Family: Jacanidae								
44	Pheasant-tailed Jacana	<i>Hydrophasianus chirurgus</i>	LC	Uc			RG	
45	Bronze-winged Jacana	<i>Metopidius indicus</i>	LC	Uc			RG	BG
Family: Recurvirostridae								
46	Black-winged Stilt	<i>Himantopus himantopus</i>	LC	C			RG	BG
47	Pied Avocet	<i>Recurvirostra avosetta</i>	LC	Uc			RG	
Family: Burhinidae								
48	Great Stone Plover	<i>Esacus recurvirostris</i>	LC	R			RG	
Family: Glareolidae								
49	Small Pratincole	<i>Glareola lactea</i>	LC	Uc			RG	
Family: Charadriidae								
50	Red-wattled Lapwing	<i>Vanellus indicus</i>	LC	Ab	Ko	Kh	RG	BG
51	River Lapwing	<i>Vanellus duvaucelii</i>	LC	R			RG	BG
52	Little Ringed Plover	<i>Charadrius dubius</i>	LC	C			RG	BG
Family: Scolopacidae								
53	Common Greenshank	<i>Tringa nebularia</i>	LC	C			RG	
54	Common Sandpiper	<i>Actitis hypoleucos</i>	LC	Ab			RG	BG
55	Green Sandpiper	<i>Tringa ochropus</i>	LC	Ab			RG	BG
56	Curlew Sandpiper	<i>Calidris ferruginea</i>	LC	Uc			RG	

	Common name	Scientific name	IUCN Status	Local status	Habitat used			
Family: Laridae								
57	Pallas's Gull	<i>Larus ichthyaeetus</i>	LC	Uc			RG	
58	Gull Billed Tern	<i>Gelochelidon nilotica</i>	LC	C			RG	
59	River Tern	<i>Sterna aurantia</i>	LC	Uc			RG	
60	Black-bellied Tern	<i>Sterna acuticauda</i>	NT	R			RG	
Family: Rynchopidae								
61	Indian Skimmer	<i>Rynchops albicollis</i>	VU	R			RG	
Family: Columbidae								
62	Yellow-legged Green Pigeon	<i>Treron phoenicoptera</i>	LC	C	Ko	Kh		BG
63	Blue Rock Pigeon	<i>Columba livia</i>	LC	Ab	Ko	Kh	RG	BG
64	Eurasian Collared Dove	<i>Streptopelia decaocto</i>	LC	Ab	Ko	Kh		BG
65	Spotted Dove	<i>Streptopelia chinensis</i>	LC	Ab	Ko	Kh		
66	Little Brown Dove	<i>Streptopelia senegalensis</i>	LC	Ab	Ko	Kh		
Family: Psittacidae								
67	Rose-ringed Parakeet	<i>Psittacula krameri</i>	LC	Ab	Ko	Kh		BG
Family: Cuculidae								
68	Asian Koel	<i>Eudynamys scolopacea</i>	LC	Ab	Ko	Kh		BG
69	Greater Coucal	<i>Centropus sinensis</i>	LC	Ab	Ko	Kh		BG
Family: Strigidae								
70	Spotted Owlet	<i>Athene brama</i>	LC	C	Ko			BG
Family: Apodidae								
71	House Swift	<i>Apus affinis</i>	LC	Ab	Ko	Kh	RG	BG
Family: Alcedinidae								
72	Lesser Pied Kingfisher	<i>Ceryle rudis</i>	LC	C			RG	BG
73	White-breasted Kingfisher	<i>Halcyon smyrnensis</i>	LC	Ab			RG	BG
Family: Meropidae								
74	Small Bee-eater	<i>Merops orientalis</i>	LC	Ab		Kh		BG
75	Blue-tailed Bee-eater	<i>Merops philippinus</i>	LC	C		Kh		BG
Family: Coraciidae								
76	Indian Roller	<i>Coracias benghalensis</i>	LC	C		Kh		BG
Family: Upupidae								
77	Common Hoopoe	<i>Upupa epops</i>	LC	C	Ko	Kh		
Family-Bucerotidae								
78	Indian Grey Hornbill	<i>Ocyrceros birostris</i>	LC	C	Ko	Kh		BG
Family: Capitonidae								
79	Coppersmith Barbet	<i>Megalaima haemacephala</i>	LC	C	Ko	Kh		
Family: Alaudidae								
80	Ashy-crowned Sparrow Lark	<i>Eremopterix grisea</i>	LC	C		Kh		BG
81	Common Crested Lark	<i>Galerida cristata</i>	LC	C		Kh		BG
82	Indian Short-toed Lark	<i>Calandrella raytal</i>	LC	C		Kh		
Family: Hirundinidae								
83	Plain Martin	<i>Riparia paludicola</i>	LC	Uc		Kh		
84	Wire-tailed Swallow	<i>Hirundo smithii</i>	LC	C		Kh	RG	
Family: Laniidae								
85	Rufous-backed Shrike	<i>Lanius schach</i>	LC	C		Kh		BG

	Common name	Scientific name	IUCN Status	Local status	Habitat used			
Family: Dicruridae								
86	Black Drongo	<i>Dicrurus macrocercus</i>	LC	Ab	Ko	Kh		BG
Family: Sturnidae								
87	Asian Pied Starling	<i>Sturnus contra</i>	LC	C	Ko	Kh	RG	BG
88	Common Myna	<i>Acridotheres tristis</i>	LC	Ab	Ko	Kh	RG	BG
89	Bank Myna	<i>Acridotheres ginginianus</i>	LC	C	Ko	Kh	RG	BG
Family: Corvidae								
90	Indian Treepie	<i>Dendrocitta vagabunda</i>	LC	C	Ko	Kh		
91	House Crow	<i>Corvus splendens</i>	LC	Ab	Ko	Kh	RG	BG
92	Jungle Crow	<i>Corvus macrorhynchos</i>	LC	Uc		Kh		
Family: Pycnonotidae								
93	Red-vented Bulbul	<i>Pycnonotus cafer</i>	LC	Ab	Ko	Kh		BG
Family: Timaliinae								
94	Common Babbler	<i>Turdoides caudatus</i>	LC	C	Ko	Kh		
95	Striated Babbler	<i>Turdoides earlei</i>	LC	Uc	Ko	Kh		
96	Large Grey Babbler	<i>Turdoides malcolmi</i>	LC	C	Ko	Kh		
97	Jungle Babbler	<i>Turdoides striatus</i>	LC	Ab	Ko	Kh		
Family: Sylviinae								
98	Plain Prinia	<i>Prinia inornata</i>	LC	C		Kh	RG	BG
99	Yellow-bellied Prinia	<i>Prinia flaviventris</i>	LC	Uc		Kh		
100	Jungle Prinia	<i>Prinia sylvatica</i>	LC	Uc		Kh	RG	BG
101	Ashy Prinia	<i>Prinia socialis</i>	LC	C				BG
Family: Turdinae								
102	Oriental Magpie Robin	<i>Copsychus saularis</i>	LC	Ab	Ko	Kh		BG
103	Bluethroat	<i>Luscinia svecica</i>	LC	C	Ko	Kh		
104	Common Stonechat	<i>Saxicola torquata</i>	LC	C		Kh		
105	Pied Bushchat	<i>Saxicola caprata</i>	LC	C		Kh		
106	Indian Robin	<i>Saxicoloides fulicata</i>	LC	Ab		Kh		
107	Indian Chat	<i>Cercomela fusca</i>	LC	Uc		Kh		
Family: Motacillidae								
108	Paddyfield Pipit	<i>Anthus rufulus</i>	LC	Uc		Kh		BG
109	Tawny Pipit	<i>Anthus campestris</i>	LC	C		Kh		BG
110	Citrine Wagtail	<i>Motacilla citreola</i>	LC	Uc		Kh	RG	BG
111	White Wagtail	<i>Motacilla alba</i>	LC	C		Kh	RG	BG
112	Large Pied Wagtail	<i>Motacilla maderaspatensis</i>	LC	C		Kh	RG	BG
Family: Nectariniidae								
113	Purple Sunbird	<i>Nectarinia asiatica</i>	LC	C	Ko	Kh		BG
Family-Passerinae								
114	House Sparrow	<i>Passer domesticus</i>	LC	C	Ko	Kh		BG
Family: Ploceinae								
115	Baya Weaver	<i>Ploceus philippinus</i>	LC	C	Ko	Kh		BG
Family: Estrildidae								
116	Red Munia	<i>Amandava amandava</i>	LC	Uc				BG
117	White-throated Munia	<i>Lonchura malabarica</i>	LC	C	Ko	Kh		BG

Habitat: Ko - Khola; Kh - Khadar; RG - River Ganga; BG - Boodhi Ganga. IUCN Status: EN - Endangered; LC - Least Concern; VU - Vulnerable; NT - Near Threatened. Local Status: Ab - Abundant; C - Common; Uc - Uncommon; R - Rare.

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