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Water Bird Count 2017 in Wetlands of Nepal

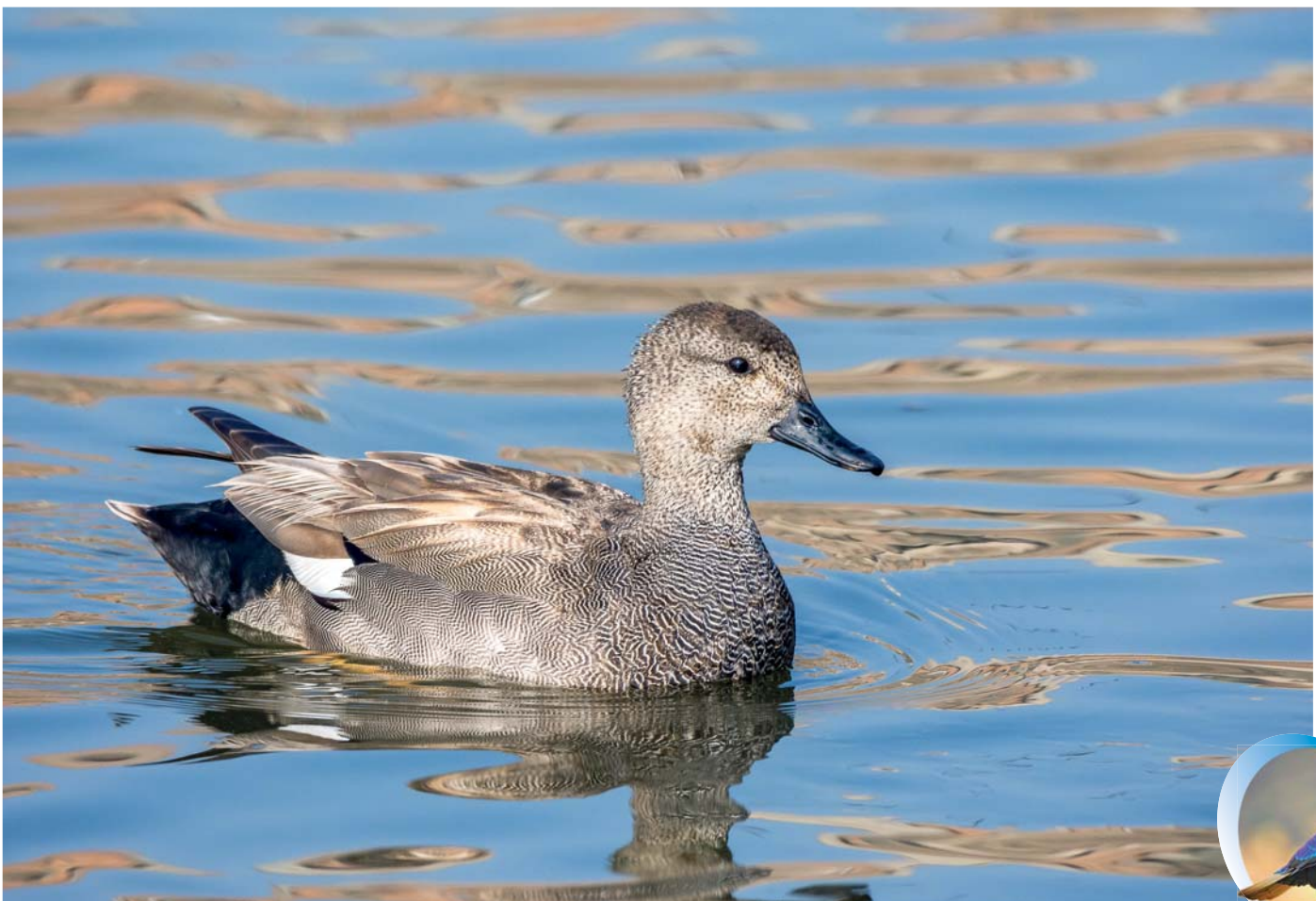
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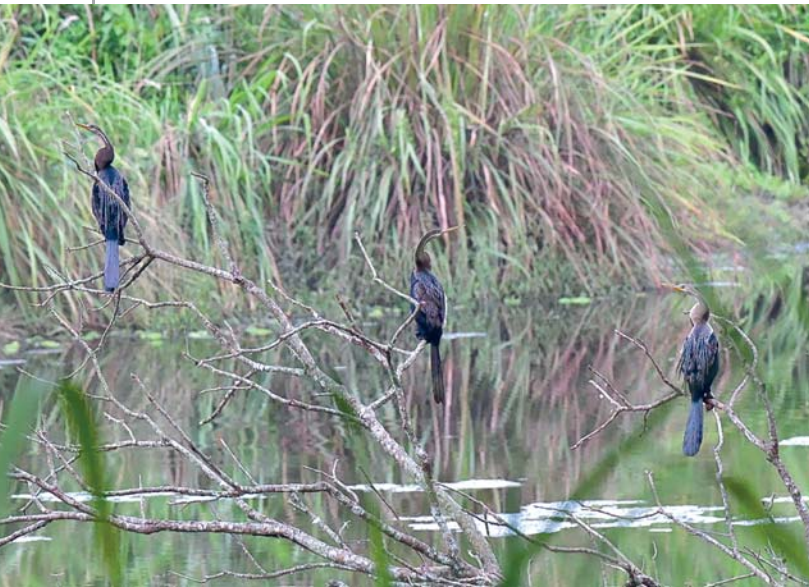
Introduction

Wetlands are the invaluable components of environment, ecology, resource potential and biodiversity. Nepal's wetlands cover about five percentage of Nepal's land area and have several wetland ecosystems of global significance, including 20 of 27 globally recognized freshwater wetland types. Nepal ratified Ramsar

Convention on Wetlands of International Importance especially for its Waterfowl Habitat on 17 December 1987. Till date ten wetland sites of Nepal have been included in Ramsar list covering total area of 60,561 hectares.

Water birds, both migratory and non-migratory, are important components of the biodiversity of wetland throughout the world





Oriental Darter by Rajendra Gurung

(Davidson and Delany, 2000). Wetlands are productive ecosystems that are ideal for migratory waterfowl and other vertebrate fauna (Acharya 2002; WBC 2006). Wetland birds comprise significant portion of avian fauna of Nepal. Wetlands in Nepal are rich in biological diversity and are known to regularly support more than 20,000 waterfowl during the peak period between December-February.

Distribution and extent of wetland birds in Nepal

A total of 886 species of birds has been reliably recorded in Nepal (BCN and DNPWC 2018). Of these nearly 200 species of birds are

considered to be heavily dependent on wetland habitats (Bhandari 1998) of these wetland-dependent species, about 187 are known to be dependent on the wetlands of the Terai (Thapa 2006). Some waterfowl, such as grebes, have adapted to wetlands to such an extent that their survival as individual species depends on the availability of certain types of wetlands within their geographic range. Other species, such as the Northern Pintail use wetlands only during some parts of their lives. Of the wetland birds of Nepal 12 species are globally threatened which use the wetland as primary and secondary habitat and 44 species are threatened on a national level (BCN 2011 and Baral 2009). Among the threatened birds of Nepal 25% wetland birds are the most threatened group in Nepal (Inskipp et. al 2016).

The first internationally coordinated water bird count was organized in January 1967 and now it passed 50 years become a vital source of information for the conservation and management of wetlands and water birds around the world. The water bird count in Nepal started in 1987 and for 2017 it was conducted from 7 to 22 January.

Water Bird Count Sites and Method

Water bird count was conducted in the major lakes and water bodies from following districts of Nepal: Bardia (Karnali bridge to Hattisar, Karnali bridge to Dhaultapurghat, Badhaiya Tal Kaski (Neureni Tal, Fewa Tal, Gunde Tal, Kathmandu (Taudaha), Kanchanpur (Rani Tal, Baba Tal, Kalkitch Tal), Kailali (Chamraiha Tal, Ghor Tal, Ghodaghodi Tal, Jamnehata Tal, Koilahi Tal, Laukabhauka Tal, Naini Tal, Nukuli Tal, Puraina Tal) Morang (Urlabari, Betana Belbari,), Sunsari (Tarhara, Barju Tal) –Udayapur –Saptari (Koshi Tapu), Kapilvastu (Jagdishpur Tal, Karja Tal) Rupandehi (Gaidahawa Tal, Gajedi Tal,) and Chitwan (Divyanagar, Sawari Bridge, Bhandara Fish Farm, Katnar-Rapti- Saurahaghat, Bishajari Tal, Lami Tal, Janakauli CF).

Water Bird Count Sites in Nepal

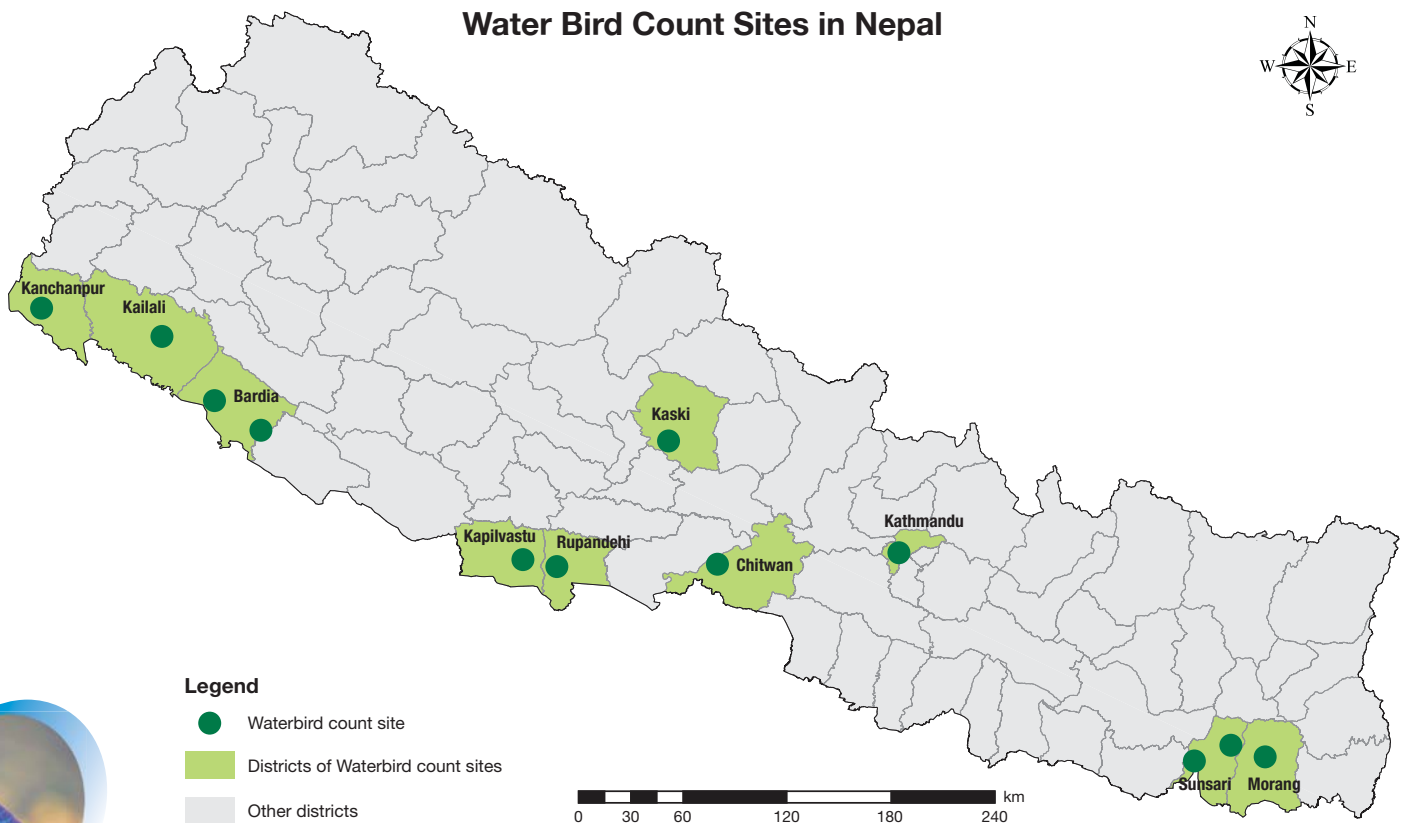


Figure 1: Water bird count sites

Local NGOs, bird watchers, conservationist, media person, community people, local conservation groups and BCN staff and members voluntarily conducted a series of bird counts between 7 to 22 January 2017 on their respective sites. Population estimates are derived from number of count for individual species whereas for species diversity Shannon index of general diversity was used to compare the diversity of different wetland birds (Odum 1971; Yadav *et al.* 1987).

Shannon index of general diversity H

$$H = -\sum (n_i/N) \log(n_i/N)$$

Or

$$-\sum P_i \log P_i$$

Where n_i = importance value for each species

N = total of important values

P_i = importance probability for each species = n_i/N

Relative diversity (J)

$$J = H / H_{max}$$

J is relative diversity

The relative abundance (%) of bird species was determined using the following expression: $n/N \times 100$ (where n is the number of a particular captured bird species and N is the total number captured of all species) (Zakaria *et al.*, 2009).

Result

A total of 51379 individuals of 87 species of birds representing 17 orders and 7 families were recorded from the sites. Of all, family Anatidae dominated the list with 20 species. It represents 58.7% of the total number of water bird species surviving under the wetland condition at different sites. Family Ardeidae (13 species), Scolopacidae (12 species), Charadriidae (8 species), Laridae and Rallidae (6 species), Ciconiidae (5 species), Phalacrocoracidae, Gruidae, Jacanidae, Podicipedidae (3 species), Recurvirostridae

and Threskiornithidae with 2 species each while Ibidorhynchidae, Glareolidae, Rostratulidae and Anhingidae had only one species each.

Highest numbers of birds were observed from Jagdispur (23363; 45.74%) followed by Koshi Tappu (8540; 16.62%) and minimum was recorded in Chamraiha Tal (19; 0.03%). Lesser Whistling Duck (*D. javanica*; 15.18%), Common Coot *Fulica atra* (12.32%) and Red-crested Pochard *Netta rufina* (8%) were three most abundant water bird species while Baillon's Crake *Recurvirostra avosetta*, Black-headed Gull *Chroicocephalus ridibundus*, Falcated Duck *Anas falcata*, Eurasian Bittern *Botaurus stellaris*, Lesser Black-backed Gull *Larus fuscus*, Yellow Bittern *Ixobrychus sinensis*, Black-bellied Tern *Sterna acuticauda*, Tufted Pochard *Aythya fuligala*, Pintail Snipe *Gallinago stenura*, Northern Lapwing *Vanellus vanellus* and Indian River Tern *Sterna aurantia* were the rarest water bird species accounting 0.0019% each (Table 1).

A total of 5 globally threatened and 19 nationally threatened bird species occurred in the study sites. Four vulnerable bird species like Sarus Crane *Antigone antigone*, Common Pochard *Aythya ferina*, Asian Woolly-necked Stork *Ciconia episcopus* and Lesser Adjutant *Leptoptilos javanicus*, one Endangered bird species Black-bellied Tern *Sterna acuticauda* was recorded under globally threatened category. Similarly, seven Near threatened species like Great Cormorant *Phalacrocorax carbo*, Greylag Goose *Anser anser*, Ruddy Shelduck *Tadorna ferruginea*, Black-headed Ibis *Threskiornis melanocephalus*, River Lapwing *Vanellus duvaucelii*, Northern Lapwing *Vanellus vanellus* and Little Pratincole *Glareola lactea*, seven Vulnerable bird species like Yellow-wattled Lapwing *Vanellus malabaricus*, Cotton Pygmy-goose *Nettapus coromandelianus*, Asian Openbill *Anastomus oscitans*, Black Stork *Ciconia nigra*, Pheasant-tailed Jacana *Hydrophasianus chirurgus*, Black-headed Gull *Larus ridibundus*, Brown-headed Gull *Larus brunnicephalus* and four Endangered bird species like African Comb Duck *Sarkidiornis melanotos*, Painted Stork *Mycteria leucocephala*, Black Bittern *Ixobrychus flavicollis*, and Eurasian Bittern *Botaurus stellaris*, one Critically Endangered bird species River Tern *Sterna aurantia* were recorded under nationally threatened category from study sites.

Table 1: Status of Wetland Birds

English name	Scientific Name	Number	Relative Abundance (%)	Presence in Site
SULIFORMES				
Phalacrocoracidae				
Little Cormorant	<i>Microcarbo niger</i>	891	1.7221	1,4,5,6,7,10,11,12,13,14,16,18,19,20,21,22,23,25,26,27,28,29,32,33,35
Great Cormorant	<i>Phalacrocorax carbo</i>	3545	6.8516	4,5,6,7,9,10,11,12,13,14,16,17,18,19,20,21,22,23,24,25,26,28,29,30,32,33,35,37,38,39
Anhingidae				
Oriental Darter	<i>Anhinga melanogaster</i>	94	0.1816	5,7,13,16,17,18,19,21,23,25,26,27,28,30,32,33,34,35,39
GRUIFORMES				
Gruidae				
Common Crane	<i>Grus grus</i>	158	0.3053	9,26
Sarus Crane	<i>Antigone antigone</i>	24	0.0463	4,16,29
Rallidae				
Ruddy-breasted Crake	<i>Zapornia fusca</i>	5	0.0096	13,27,28
Baillon's Crake	<i>Zapornia pusilla</i>	1	0.0019	11



White-breasted Waterhen	<i>Amaurornis phoenicurus</i>	57	0.1101	4,5,7,10,12,13,14,16,18,22,23,25,26,27,28,32,33,35
Common Coot	<i>Fulica atra</i>	6376	12.3233	4,5,10,12,13,14,16,20,24,26,27,29,31,33,35,38
Common Moorhen	<i>Gallinula chloropus</i>	1687	3.2605	1,4,5,10,11,12,13,15,16,19,20,21,24,26,27,29,31,33,34,35,39
Purple Swamphen	<i>Porphyriop orphyrio</i>	791	1.5288	4,5,10,16,20,24,27,34
ANSERIFORMES				
Anatidae				
Northern Pintail	<i>Anas acuta</i>	1483	2.8663	4,5,10,16,23,26,33
Northern Shoveler	<i>Spatula clypeata</i>	313	0.6049	4,5,10,16,24
Bar-headed Goose	<i>Anser indicus</i>	79	0.1526	16,23,26
Indian Spot-billed Duck	<i>Anas poecilorhyncha</i>	112	0.2164	13,16,26
Garganey	<i>Spatula querquedula</i>	4	0.0077	5
Common Teal	<i>Anas crecca</i>	3419	6.6081	4, 5,10,15,16,21,24,26,38,
Falcatid Duck	<i>Mareca falcata</i>	1	0.0019	24
Eurasian Wigeon	<i>Mareca penelope</i>	1425	2.7542	4,5,10,13,16,23,24,26,38
Greylag Goose	<i>Anser anser</i>	5	0.0096	10,16
Mallard	<i>Anas platyrhynchos</i>	1640	3.1697	4,5,10,16,21,22,23,24,26,38
Gadwall	<i>Mareca strepera</i>	2480	4.7932	4,5,10,13,16,20,21,22,23,24,26,29,3,35,37,38
Common Pochard	<i>Aythya ferina</i>	1085	2.097	4, 5,10,16
Tufted Duck	<i>Aythya fuligula</i>	127	0.2454	10,16,20,38
Ferruginous Duck	<i>Aythya nyroca</i>	244	0.4715	4,5,10,13,16,24,29,31,33,38
Lesser Whistling-duck	<i>Dendrocygna javanica</i>	7858	15.1877	4,5,6,10,11,12,13,16,20,24,26,27,28,29,33,37,40
Goosander	<i>Mergus merganser</i>	284	0.5489	4,10,21,22,26
Red-crested Pochard	<i>Netta rufina</i>	4113	7.9495	4,10,13,16,20,23,26,28,29,35,
Cotton Pygmy-goose	<i>Nettapus coromandelianus</i>	372	0.7189	13,24
African Comb Duck	<i>Sarkidiornis melanotos</i>	6	0.0115	5
Ruddy Shelduck	<i>Tadorna ferruginea</i>	5120	9.8958	4,10,16,18,21,22,23,26,28,35,38
OTIDIFORMES				
Threskiornithidae				
Red-naped Ibis	<i>Pseudibis papillosa</i>	253	0.4889	19
Black-headed Ibis	<i>Threskiornis melanocephalus</i>	121	0.2338	4,6,9,11,12,14,16,18,20,22,25,26,27,28,32,35
Ciconiidae				
Asian Openbill	<i>Anastomus oscitans</i>	289	0.5585	4,6,7,11,12,16,18,20,21,23,26,27,28,29,33,35
Asian Woollyneck	<i>Ciconia episcopus</i>	37	0.0715	4,10,12,13,14,21,22,23,25,28,32
Black Stork	<i>Ciconia nigra</i>	78	0.1507	4,9,10,14,21,22,23,26
Lesser Adjutant	<i>Leptoptilos javanicus</i>	84	0.1623	9,11,12,16,18,20,26,29,35,39
Painted Stork	<i>Mycteria leucocephala</i>	8	0.0154	4,28
PODICIPEDIFORMES				
Podicipedidae				
Great Crested Grebe	<i>Podiceps cristatus</i>	58	0.1121	1,10,16,26,33,
Black-necked Grebe	<i>Podiceps nigricollis</i>	3	0.0057	10,
Little Grebe	<i>Tachybaptus ruficollis</i>	103	0.199	4,5,10,11,12,13,15,16,20,21,24,29,31,33
PELECANIFORMES				
Ardeidae				
Grey Heron	<i>Ardea cinerea</i>	221	0.4271	4,6,7,8,10,11,13,14,16,17,21,23,25,26,28,29,32,33,35,39
Purple Heron	<i>Ardea purpurea</i>	53	0.1024	4,5,11,12,13,14,16,26,27,28,29,33,39



Indian Pond-heron	<i>Ardeola grayii</i>	772	1.4921	3,4,5,6,7,9,10,11,12,13,14,15,16,17,18,20,21,22,23,25,26,27,28,29,30,31,32,33,34,35,36,37,39
Great White Egret	<i>Ardea alba</i>	159	0.3073	4,7,10,11,12,14,16,17,21,23,25,26,28,29,32,33,35,39
Cinnamon Bittern	<i>Ixobrychus cinnamomeus</i>	7	0.0135	26,28
Black-crowned Night-heron	<i>Nycticorax nycticorax</i>	137	0.2647	7,10,24,26,38,
Eurasian Bittern	<i>Botaurus stellaris</i>	1	0.0019	4,
Cattle Egret	<i>Bubulcus ibis</i>	1172	2.2652	3,4, 5,6,9,10,11,24,26,35,37
Green-backed Heron	<i>Butorides striata</i>	14	0.027	23,26,35
Intermediate Egret	<i>Ardea intermedia</i>	339	0.6552	4,5,7,10,12,14,15,16,17,18,19,20,21,23,24,25,26,27,28,29,31,32,33,35,39
Little Egret	<i>Egretta garzetta</i>	803	1.552	3,4,5,6,7,9,10,11,12,14,16,21,22,23,24,25,26,28,29,32,33,35,36,39
Black Bittern	<i>Ixobrychus flavicollis</i>	2	0.0038	26
Yellow Bittern	<i>Ixobrychus sinensis</i>	1	0.0019	26
CHARADRIIFORMES				
Jacaniidae				
Bronze-winged Jacana	<i>Metopidius indicus</i>	759	1.4669	4,5,10,11,12,13,14,16,20,23,25,26,27,28,29,31,33,34,35,39
Pheasant-tailed Jacana	<i>Hydrophasianus chirurgus</i>	19	0.0367	4,16,26
Rostratulidae				
Greater Painted-snipe	<i>Rostratula benghalensis</i>	2	0.0038	10
Laridae				
Black-headed Gull	<i>Larus ridibundus</i>	1	0.0019	10
Pallas's Gull	<i>Larus ichthyaetus</i>	9	0.0173	26
Brown-headed Gull	<i>Larus brunnicephalus</i>	28	0.0541	16,26
Lesser Black-backed Gull	<i>Larus fuscus</i>	1	0.0019	26
Black-bellied Tern	<i>Sterna acuticauda</i>	12	0.0231	26
River Tern	<i>Sterna aurantia</i>	1	0.0019	26
Scolopacidae				
Dunlin	<i>Calidris alpina</i>	8	0.0154	26
Little Stint	<i>Calidris minuta</i>	20	0.0386	7,21,22,23,26,35
Temminck's Stint	<i>Calidris temminckii</i>	139	0.2686	2,11,16,21,26,35
Pintail Snipe	<i>Gallinago stenura</i>	1	0.0019	23,35
Common Snipe	<i>Gallinago gallinago</i>	20	0.0386	2,10,26,35
Jack Snipe	<i>Lymnocyrtus minimus</i>	2	0.0038	10
Wood Sandpiper	<i>Tringa glareola</i>	94	0.1816	8,13,14,25,26,28,30,32,33
Green Sandpiper	<i>Tringa ochropus</i>	70	0.1352	1,2,4,5,6,7,10,11,12,18,21,22,23,26,27,31,35,36,39
Marsh Sandpiper	<i>Tringa stagnatilis</i>	3	0.0057	4
Common Sandpiper	<i>Actitis hypoleucos</i>	180	0.3479	2,4,7,10,11,14,16,18,21,22,23,25,26,35,36
Common Greenshank	<i>Tringa nebularia</i>	402	0.7769	2,4,7,8,14,16,17,18,21,22,23,25,26,28,30,33,35,39
Common Redshank	<i>Tringa totanus</i>	27	0.0521	4,10,21,22,23,35
Charadriidae				
Red-wattled Lapwing	<i>Vanellus indicus</i>	213	0.4116	8,10,11,16,18,20,21,23,26,27,28,29,30,35
Kentish Plover	<i>Charadrius alexandrinus</i>	47	0.0908	21,26
Little Ringed Plover	<i>Charadrius dubius</i>	124	0.2396	4,7,8,9,10,11,14,16,17,21,22,23,25,26,33,35,36



Pacific Golden Plover	<i>Pluvialis fulva</i>	13	0.0251	5,9
River Lapwing	<i>Vanellus duvaucelii</i>	157	0.3034	14,18,21,22,23,25,28,30,35,36,39
Yellow-wattled Lapwing	<i>Vanellus malabaricus</i>	28	0.0541	26
Grey-headed Lapwing	<i>Vanellus cinereus</i>	230	0.4445	2,4,16,19,26
Northern Lapwing	<i>Vanellus vanellus</i>	1	0.0019	2
Glareolidae				
Little Pratincole	<i>Glareola lactea</i>	245	0.4735	21,22,26,35
Recurvirostridae				
Pied Avocet	<i>Recurvirostra avosetta</i>	2	0.0038	4
Black-winged Stilt	<i>Himantopus himantopus</i>	4	0.0077	4
Ibidorhynchidae				
Ibisbill	<i>Ibidorhyncha struthersii</i>	3	0.1627	36
Grand Total		51379		

Key to the sites codes

SN	Sites
1	Baba Tal
2	Bagmati
3	Bagmati & Taudah
4	Baidhaya Tal
5	Barju Tal
6	Betana Belbari
7	Bhandara Fish Farm, Chitwan
8	Chamraiha Tal
9	Divyanagar, Chitwan
10	Fewa Tal
11	Gaidahawa Tal
12	Gajeditaal
13	Ghodaghodi Tal
14	Ghor Tal
15	Gunde Tal, Kaski
16	Jagdispur
17	Jamnehata Tal
18	Janakauli CF, Chitwan
19	Kalkitch Tal

20	Karja Tal
21	Karnali Bridge to Hattisar, Geruwa
22	Karnali Bridge-Dhaulapurghat
23	Katnar-Rapti- Saurahaghat
24	Khaste Tal, Kaski
25	Koilahi Tal
26	Koshi Tappu
27	Lami Tal
28	Laukabhauka Tal
29	Lumbini
30	Naini Tal
31	Neureni Tal, Kaski
32	Nukuli Tal
33	Puraina Tal
34	Rani Tal
35	Saurahaghat to Kajare
36	Sawari Bridge, Chitwan
37	Tarhara
38	Taudah
39	Bishazari Tal, Chitwan
40	Urlabari



Species Diversity

The estimated Shannon index shows more or less comparative species diversity for the area of Bagmati (H=1.170; Hmax =1.945), Bhandara Fish Farm (H=2.130; Hmax= 2.995), Chamraiha Tal (H=1.499; Hmax=1.791), Ghor Tal (H=2.221; Hmax= 2.833), Gunde Tal (H=1.884; Hmax= 1.945) Kalkitch Tal (H=1.514; Hmax= 1.945), Janakauli CF (H=2.467, Hmax=2.772), Neureni Tal (H=1.382; Hmax= 1.945), Nukuli Tal (H= 2.142; Hmax 2.639) and Sawari Bridge (H=1.556; Hmax= 1.945) .The maximum species diversity was observed for Koshi Tappu followed by Jagdishpur representing value (Hmax=4.025 and 3.761).Less species diversity was observed for Urlabari (Hmax=0). The relative diversity was measure highest in Gunde Tal (J=0.968) whereas less in Khaste Tal (J=0.314)



Mallard by Pratap Gurung

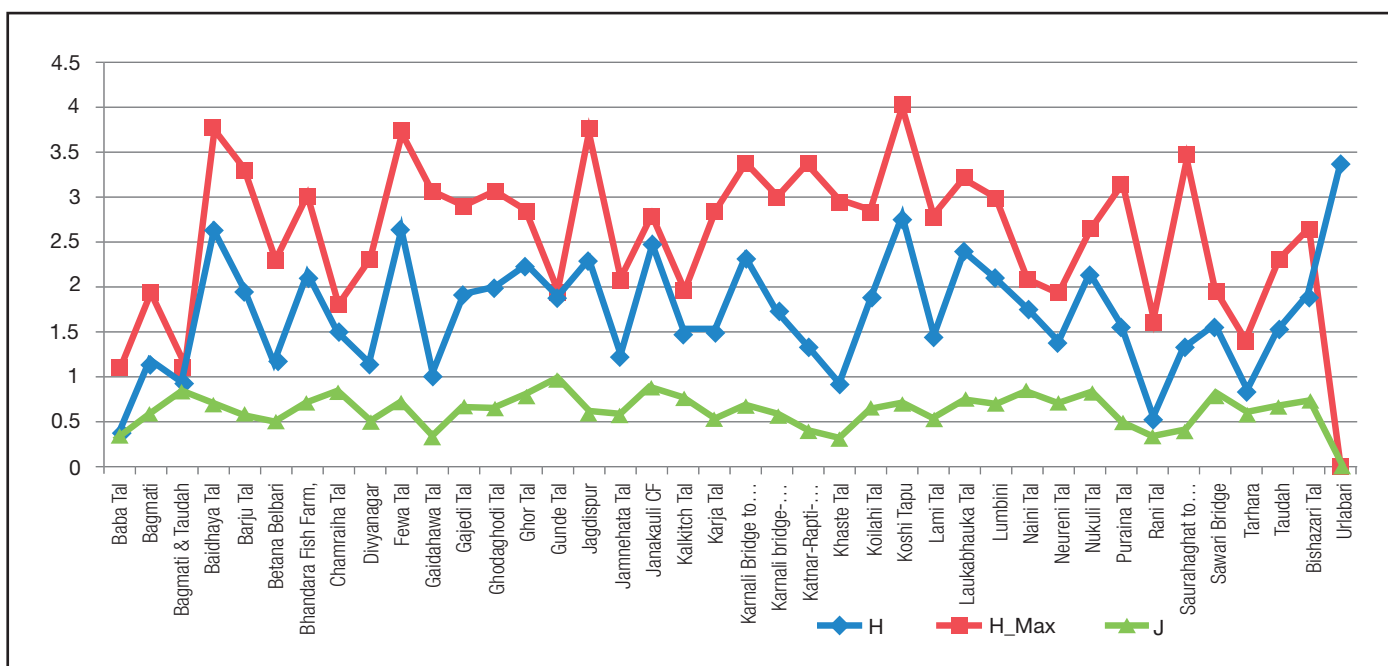


Figure 2: Species Diversity of Wetland Birds

Discussion

The top five sites that represent higher bird diversity and abundance were Jagdishpur, Koshi Tappu, Barju Tal, Fewa Tal and Katnar-Rapti-Saurahghat. This may be due to difference in peculiarities of its habitat, diversity of vegetation and have relatively low human disturbance. Similarly, Gunde Tal, Naini Tal, Baba Tal and Chamraiha Tal was noted with less diversity and abundance. The capturing of high numbers of Lesser Whistling Duck *Dendrocygna javanica*, Common Coot *Fulica atra*, Red-crested Pochard *Netta rufina*, Ruddy Shelduck *Tadorna ferruginea*, Great Cormorant *Phalacrocorax carbo*, Common Teal *Anas crecca* and Gadwall *Mareca strepera* could be due to the occurrence of variety of habitats that provides diverse food for these birds. Beside this Common Moorhen *Gallinula chloropus*, Mallard *Anas platyrhynchos*, Northern Pintail *Anas acuta*, Eurasian Wigeon *Mareca penelope*, Cattle Egret *Bubulcus ibis* and Common Pochard *Aythya ferina* were also captured in good numbers. This might be due to occurrence of suitable foraging habitats for them, such as open water, lake edges, wet grasses and small ditches in the dry land.

Wetlands are highly important habitat for wide array of water birds and their importance depends on size, diversity of vegetation water quality, food resources and topography. Wetlands biodiversity in

Nepal and wetland birds face a wide range of threats in Nepal (IUCN Nepal 2004). The growing pressure on wetland due to habitat loss, degradation and fragmentation, overgrazing and overexploitation, sedimentation, eutrophication, pollution created by domestic sewage, solid and industrial waste, use of pesticide and fertilizers, large scale fishing, dam/ barrage construction tourism/recreation and climate change has poses threat to the wetland birds. For the sustainable resource management and survival of water birds and wildlife these issues should be addressed and implemented in a better way. Furthermore, Jagdishpur, Koshi Tappu, Ghodaghodi, Badhaya Tal, Fewa Tal, Geruwa, Dhaulatpur Ghat, Gajedi Tal are most important wetlands as it supports several globally and nationally threatened species.

Conclusion

It is extremely vital to monitor the status, relative abundance and diversity of wetland-dependent birds to examine population trends and thus identify and highlight the main grounds of species decline due to growing pressure from anthropogenic activities. Moreover, the species like Lesser Whistling Duck *Dendrocygna javanica*, Ruddy Shelduck *Tadorna ferruginea*, Red-crested Pochard *Netta rufina*, Northern Pintail *Anas acuta*, Mallard *Anas platyrhynchos*, Great Cormorant *Phalacrocorax carbo*,



Gadwall *Mareca strepera*, Eurasian Wigeon *Mareca penelope*, Common Pochard *Aythya ferina*, Cattle Egret *Bubulcus ibis*, Common Teal *Anas crecca* and Common Coot *Fulica atra* in high numbers (accounting more than thousand counts) significantly showed that these wetlands are very important habitat for them.

Contributors of Water bird count in Nepal

National Coordinator for Water bird count in Nepal is Dr Hem Sagar Baral. At Eastern Nepal Koshi Camp, Koshi Bird Society, Koshi Bird Observatory and Koshi tappu Wildlife Reserve contributed. The survey at the wetlands of Chitwan and Narayani River were led by Bird Education Society and Tiger Tops, Tharu Village and Chitwan National Park. Lumbini and Kapilvastu area were surveyed by BCN staff and Lumbini Buddha Garden. Bardia National Park, BCN staff, NTNC and Bardia Nature Conservation Club were involved to count the bird in the wetlands at Bardia. Bird Conservation Network led the bird count at Ghodaghodi Lake Area. Pokhara Bird Society, Institute of Forestry and Tiger Mountain Pokhara Lodge were involved to count the bird in the wetlands around Pokhara. Taudaha lake bird count was led by BCN and Friends of Birds. BCN staff counted the bird at the wetlands around Shuklaphanta National Park and Udaypur.



Black-winged Stilt by Jyotendra Jyu Thakuri

Acknowledgments

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**‘चरलाई चार’
अभियानमा सहकार्य गरौं ।**

a BCN initiative to save Nepal's endangered birds.
PLEDGE AND DONATE TODAY

Note on nesting behavior of Globally Threatened Lesser Adjutant *Leptotilos javanicus* in Sarlahi, Nepal

Santosh Bajagain¹ and Aavas Pradhan²

Introduction

A nest is a special construction in which the eggs and young develop. Found in many animals, nests help the parents meet the needs of their young ones (N. Collias and Collias 1976). Nest-building behavior stimulates a partner giving signal about the reproductive condition of specific individual (Collias, 1964). Nests are therefore very relevant to the science of ecology as nests provide clues to real and significant ecological relationships. A nest may indicate parental quality, experience or genetic quality (Heisler *et al.*, 1987), and females could benefit from mating with good nest-building males. However, if nest building is costly (energy and predation), only individuals in good condition (strong physical condition or high ability to defend the nest) should be able to build large nests (Zahavi, 1987).

The Lesser Adjutant Stork is a massive, heavy-bodied stork, standing 110–120 cm tall. This stork is glossy metallic blue-black above, white below, with sparse hair like feathers on the nearly naked, reddish yellow head and neck (Hancock *et al.*, 1992). The sexes have identical plumages. However, the males are noticeably taller and heavier, with a more massive bill. The Lesser Adjutant Stork usually nests near water bodies. It is a semi-colonial or colonial breeder. The study and observation of Lesser Adjutant Stork has been done in eastern and western Nepal, but no breeding and nesting behavior has previously been documented from Sarlahi district.

Study Area

The study was focused in the selected location i.e. Janakinagar of Haripur Municipality, Murtiya of Bharathawa Municipality and Nadiman Lake and its periphery of Chandranagar rural municipality. The topography is flat with the landscape composed principally of crop fields, natural wetlands and marshlands along with human settlements nearby. The main crops of the region are rice (July–November) and wheat (November–April), plus barley, maize, sugarcane, fruit, and vegetables. The region consists of scattered cotton tree *Bombax ceiba* and other vegetation supporting Asian Openbill *Anastomus oscitans*, Red Naped Ibis *Pseudibis papillosa*, Lesser Whistling Duck *Dendrocygna javanica*, Common Moorhen *Gallinula chloropus*, Red Wattled Lapwing *Vanellus indicus*, Pied Kingfisher *Ceryle rudis* and Indian Pond Heron *Ardeola grayii* with nesting and foraging sites.

Methods

Data on the nesting and foraging behavior of Lesser Adjutant were consistently collected from road transect survey through direct visual observations as well as from indirect methods such as interviewing villagers and the owner of houses located near the nesting tree and feeding sites. Direct visual observations were made using a pair of 8x40 Olympus binoculars and Garmin GPSMAP 64s. Sites of possible occurrence, such as agricultural

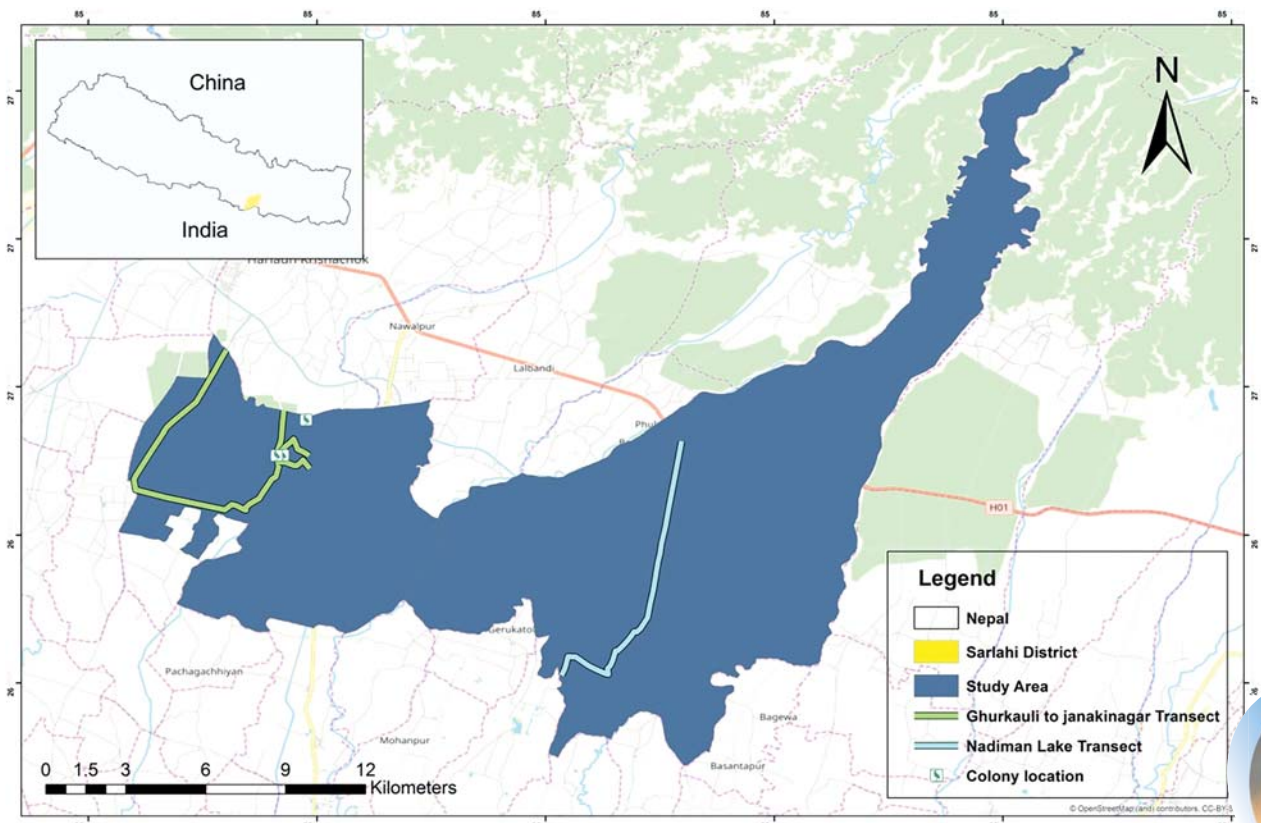


Figure. Map of Study Area





Lesser Adjutant by Rajeev Tiwary

land, marshy areas and open grounds near the forest were thoroughly scanned to identify the nesting and roosting sites. Continuous observations of Lesser Adjutant were carried out on 23 June to 1 July 2018 in first visit and 4 to 8 August 2018 in second visit.

Results

Three different breeding colonies were identified in Janakinagar. Species were sighted at Murtiya and Nadiman but no nest were recorded there. During first visit Lesser Adjutant were found building nests and copulating with a total of 19 adults. But later on August we recorded 3 nesting colonies with 23 nests and 39 adults during the field visit in Janakinagar. It was observed that the stork prefers trees like *Bombax ceiba* and *Adina cordifolia* for building nest. The storks were found using twigs and branches of *Syzygium cumini*, *Chleichera oleosa* and *lantana camera* as nesting materials.

Conclusion

The study concludes that Nadiman Lake and its periphery and Murtiya were frequently used as foraging sites where as Janakinagar with abundant number of preferred tree species such as *Bombax ceiba* and *Adina cordifolia* has been suitable nesting site of the Lesser Adjutant. The exciting number of 23 nests indicates the existence of a breeding population of storks in Janakinagar.

Acknowledgement

We would like to acknowledge Bird Conservation Nepal and Carol Inskipp for their continuous motivation and guidance. We are indebted to Area Forest Office, Janakinagar for providing valuable information and also helping to reach the local community. We would also like to express our special gratitude to Mr. Bikram Singh Thakuri for technical support with Geographical Information System.

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Do Kathmandu's Grey-backed Shrikes Breed in Helambu or Tibet?

Arend van Riessen

Introduction

Last May I tried to be funny with a Wanted poster on Facebook for the Grey-backed Shrike that just had left my garden the night before and would be on its way to its breeding area. The poster informs that the police were looking for it in Helambu. This article will show why the police never found it. They were looking in the wrong place!

The article is part of a larger set of shrike findings that I am writing about. I took this part out because I like to timely inform friends and students that they can contribute to science through related follow-up studies.

The Grey-backed Shrikes in Kathmandu

The Grey-backed Shrike is a migratory bird that completely vacates its breeding areas (above 2200m) and generally winters between 500 and 2200m. In summer it breeds across the whole Himalayas and the mountains of Eastern Tibet/Western Sichuan, and winters in the Himalayas and South-east Asia below 2200m. In Kathmandu Valley, the Grey-backed Shrike is a winter visitor and a passage migrant, that also frequents gardens.

The pattern of Grey-backed Shrike records from across the Kathmandu Valley is largely the same as those described in *The Birds of the Bagmati and Taudaha Area, 2003-2016* (Arend van Riessen, 2017). The majority of wintering Grey-backed Shrikes:

- Arrive between 15 and 25 September (the first records between 11 and 21 September),
- Occupy winter territories (dislocating Long-tailed Shrikes) between 25 September and 5 October,
- Maintain their winter territories between October and April, and
- Leave between 1 and 10 May (last records between 2 and 14 May).

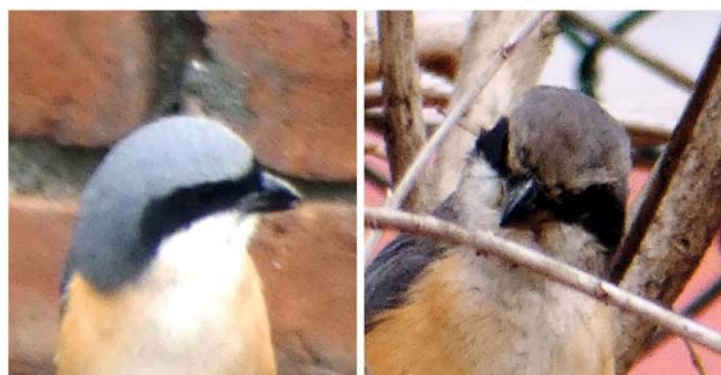
The chart below also shows passage migration peaks in September-October and to a much lesser degree in April-May, which indicate that also birds move through Kathmandu to and from other, lower altitude locations. It is possible that some birds arrive here in October and leave in April, but those form at most a minority.

A Departure in May is Too Late for Breeding in the Himalayas

The recorded migration windows (mid-September and early May) do not seem to fit the patterns described for Grey-backed Shrikes from the Himalayas in international literature, which state October-April as the wintering period and a start of breeding from mid-April onwards. Presently the most comprehensive and authoritative publication on shrikes in the world, *The True Shrikes of the World*, by E.N.Panov, 2011, lists Eck & Martens 1995

Wanted

Grey-backed Shrike that escaped a Sainbu garden in the night of 4th and 5th May



The police is now looking around the villages of Helambu for a shrike that is 25cm long and weighs about 50 gram. When last seen it was wearing black wrap-around sunglasses, a grey cap and mantle and what seemed like a white shirt with rufous flanks. It is reportedly dangerous to insects, lizards and young birds.

(Towards an Ornithology of the Himalayas: Systematics, Ecology and Vocalizations Of Nepal Birds, Jochen Martens & Siegfried Eck, Bonner Zoologische Monographien, Nr. 38, 1995) as the first and only available study that has tried to establish seasonal patterns for Grey-backed Shrikes in Nepal and South Asia in general. That study found that in Nepal's mountains, Grey-backed Shrike pairs already occupy territories in April: "on 22 April many pairs were seen in rose bushes between Jomsom and Tukche (Mustang)". Eck & Martens 1995 therefore considered the Grey-backed Shrike records in Kathmandu of 17-18 April as "certainly late winter visitors or migrants". More recent data (Spiereburg (2005), Inskipp C. et al (2016), the author's own records and those of others on e.g. eBird), also show the correctness of Martens & Eck's statement that in the Nepal, Sikkim and Bhutan Himalayas the Grey-backed Shrikes are present in breeding areas between 2500-3800m from mid-April onwards and that at least some can be found there till October. But they contradict that an April record in Kathmandu is "late".

So why would the majority of Kathmandu's wintering Grey-backed Shrikes stay till early May, three weeks after breeding has started across the Himalayas? Grey-backed Shrikes moving in May to Himalayan areas like Langtang or Helambu, just north of Kathmandu, would be at a considerable disadvantage. The window for establishing all the territories is normally very short. E.g. the Grey-backed Shrikes' winter territories in the Bagmati-Taudaha Area of Kathmandu valley are all settled within 5-10 days. After that it is very difficult to fight your way in. So in Nepal's high Himalayas, probably hardly if any territory will be left for birds arriving after 25 April. It is therefore unlikely that the Kathmandu contingent of Grey-backed Shrikes breed in the 2500–3500m Himalayan breeding zone. They would arrive too late.



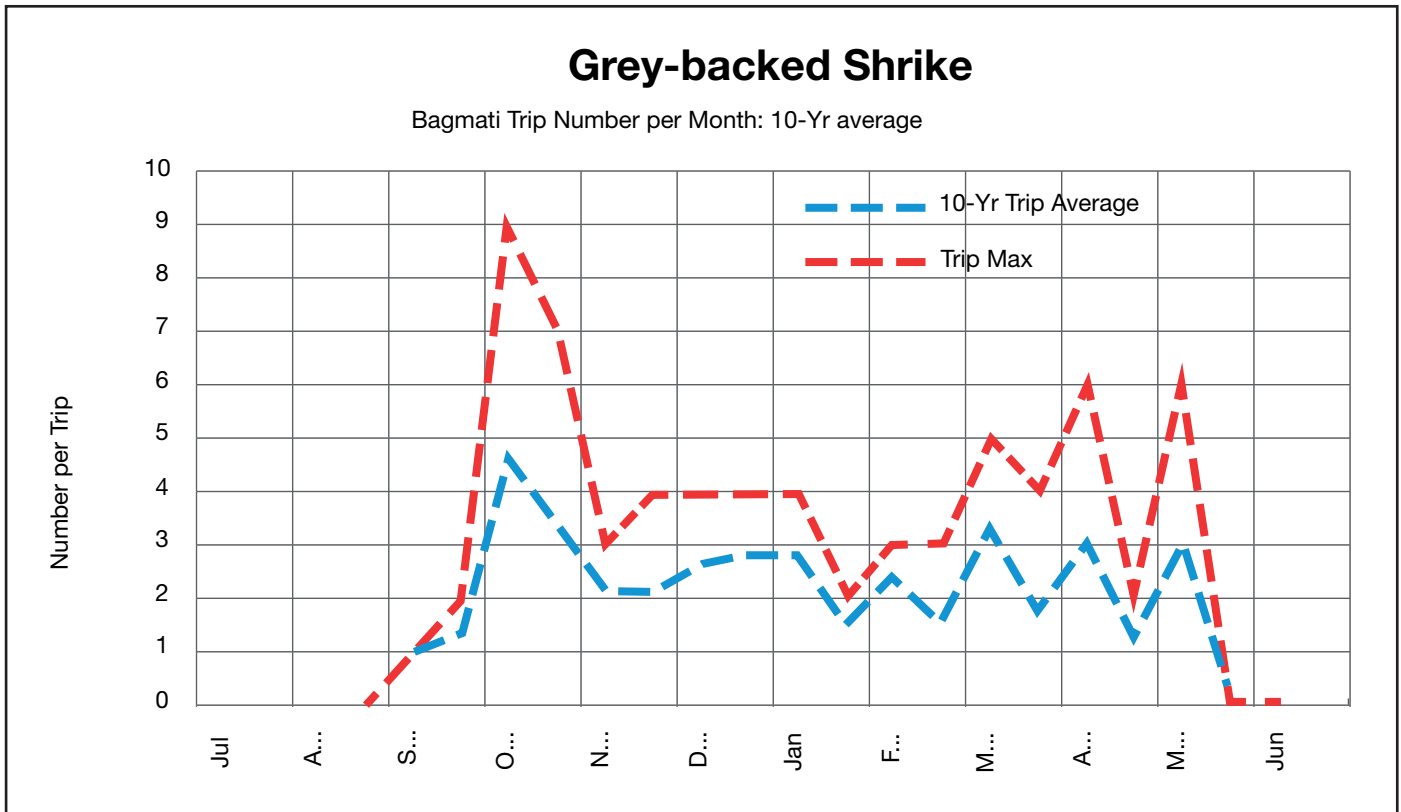


Figure 1. Average Number of Grey-backed Shrikes per Bagmati-Taudaha Trip 2003-2013

Do They Summer in Tibet Then?

If their breeding area is somewhere else, one has to consider the areas where shrikes can still find territories after 10 May. The table below, based on data from various sources, shows that only in Tibet and far-northern Qing Hai the first spring Grey-backed Shrike records are from May onwards. For these areas, the last summer records are also August-September (not October), and this would allow them to arrive in Kathmandu by mid-September.

There are two reasons why southern Tibet is the more likely destination rather than Qing Hai or Sichuan. The first spring records for Lhasa (eBird) are always around the 15th May, while the first Grey-backed Shrike records for Qing Hai are normally around 8 May (around 2 May in the Sichuan mountains). A shrike can migrate 200-300km per night (Hall-Karlsson K.S.S. & Fransson T., 2008), probably 100-150km for longer trips. So if the shrikes of Saibu Hill leave Kathmandu around 7 May, they can be in Lhasa (650km straight line, but probably 1000km as the shrike flies) before the 15th, which is in time, while they would only arrive in Qing Hai (probably 2500km as the shrike flies) after 22 May, which is two weeks too late. So southern Tibet is their most likely destination. Some of the shrikes that were commonly found in Tibet's Yarlung/ Tsang Po/ Brahmaputra valley by the author during a visit in July 2009, might actually winter in Kathmandu Valley. They might have been the Grey-backed friends from the readers' own gardens.

The reasons that Kathmandu's wintering Grey-backed Shrikes migrate later than April can be because a) breeding is not possible yet in their breeding area in April, e.g. due to frost or b) the migration route crosses altitudes of around 5000m asl at least once and might be still too hostile and cold in April, especially if the bird along the way needs stocking up on prey like insects and lizards. April weather data for the Himalayan valleys below 3800m, show that the Himalayan breeders do not have such obstacles.

You Can Help Solve More Mysteries

I am quite sure about the Tibet hypothesis, but still love to be proven wrong, so please share your contradicting thoughts and data. There are more mysteries to uncover and I also love to know in more detail what is going on, so more study is needed. For both purposes, field work is needed and I list here two examples: a) Where do the Helambu Grey-backed Shrikes winter?; b) Does the late departure of Grey-backed Shrikes delay the breeding season for Long-tailed Shrikes?

- **Sep-Oct (and may be Apr-May) transect monitoring at about 2000m asl.** The Tibetan Grey-backed Shrikes seem to winter below 1500m from September to May. In the upper wintering range, 1500-2200m, Grey-backed Shrikes are only recorded between October and April. Are these the Himalayan breeders? Can we find out by intensive monitoring in September-October and April-May at higher wintering areas (1500-2200m)?
- **Jan-Jun monitoring of Long-tailed Shrike in Grey-backed Shrike-less areas of Kathmandu valley.** The Grey-backed Shrikes in Kathmandu often displace Long-tailed Shrikes from those birds' winter territories, and their presence in spring seems to delay the breeding by Long-tailed Shrikes (see my Bagmati and Taudaha book and the article in progress). Can we find out for Kathmandu areas without Grey-backed Shrikes when the Long-tailed Shrikes start breeding and whether they can have double broods? Such areas can be found in agricultural areas without gardens and less houses and trees. Most of our birding sites are either too wooded (no shrikes) or too ideal for Grey-backed Shrikes, but some of the urban birding transects might do, like the one along Nakkhu Khola that we walk twice a year.

Interested thesis students and birders can contact me at arendvanriessen@gmail.com



Table 1. Grey-backed Shrike Seasons by Region (literature and eBird data)

Altitude	Location	Summer	Winter	Source
>3000 m	Mustang& Langtang, West Nepal	18 Apr – 15Oct	-	Eck & Martens, eBird
	Bhutan	15 Apr -7Oct	-	Spierenburg 2005, eBird
	Lhasa, China	15 May-30Sep	-	eBird
2500-3000m	Rara & Humla, West Nepal	7 Apr -30Sep	-	eBird, van Riessen data
	Langtang, Mustang, Central Nepal	15 Apr – 7Oct	-	Eck & Martens, eBird
	Solukhumbu, East Nepal	>21 Apr		eBird
	Bhutan, Sikkim, Arunachal	21 Apr –Oct/Nov	Rare	Spierenburg 2005, eBird
	Qing Hai, China	8 May -31Aug	-	eBird
	Sichuan Mountains	Early May	-	eBird
2200-2500m	Solukhumbu, Nepal	(no data)	2Dec	Van Riessen data
	Bhutan	Resident	Resident	Spierenburg 2005, eBird
1500-2200m	Nepal		Oct-Mar	eBird
	Bhutan	-	Rare	Spierenburg 2005, eBird
<1500m	Kathmandu	-	15 Sep-10 May	van Riessen 2016
	Bhutan	-	Oct-Apr	Spierenburg 2005, eBird
0-1000m	Chitwan, Koshi (West/East Nepal)	-	Oct-April	eBird
	Assam, India		?Oct-early May	eBird (no Sep data)



Grey-backed Shrike by Arend Van Riessen

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News

Membership

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Chungba Sherpa, a renowned tourism businessman and a keen nature lover has joined BCN as a Patron. Mr. Sherpa currently runs Khumbu resort and enjoys bird and wildlife photography.

Umang Jung Thapa, a banker, birder and a well-known bird and wildlife photographer has joined BCN as a Patron. Mr. Thapa is also a management consultant and currently serving as Executive Council Member of BCN.

Basant Raj Mishra, Executive Chairman of Temple Tiger Group of Companies has joined BCN as a Patron. Mr. Mishra is currently involved in Temple Tiger Green Resort and recently awarded with Life Time Membership Award by Pacific Asia Travel Association (PATA) for his excellent service to tourism industry.

Life Members

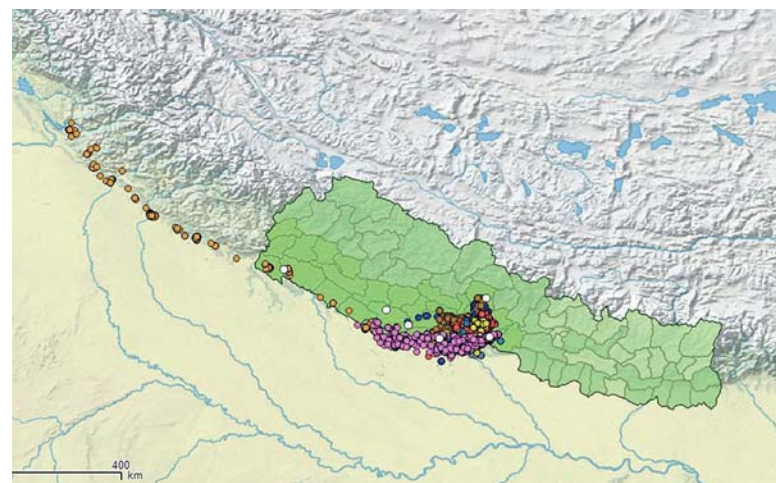
SN	Names	Affiliation/Profession
1	Purna Man Shrestha	Resources Himalaya
2	Chetan Oli	Park Ranger
3	Yadav Ghimire	Friends of Nature
4	Ram Raj Gurung	Tourism Professional
5	Raju Acharya	Friends of Nature
6	Prabik Shrestha	Student
7	Bishal Ghimire	DoFSC
8	Ganesh Sharma	Nature Lover
9	Yam Kumari Gurung	Nature Lover/ Photographer
10	Abdullah Miya	Journalist
11	Bhumika Sigdel	Student
12	Ram Chandra Kandel	DNPWC
13	Utasv Jung Thapa	Nature Photographer/Nepal Army
14	Ganga Shah	Lecturer
15	Anu Ram Chaudhary	Tourism Professional
16	Prem Prasad Khanal	DFO, Kavre
17	Bishnu Shrestha	DNPWC
18	Hari Basnet	SMCRF
19	Bijay Raj Karki	Tourism Professional
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24	Ram Chandra Karki	Tourism Professional
25	Shyam Kumar Tamang Gole	Tourism Professional
26	Romnath Aryal	Nature Lover
27	Binod Joshi	Tourism Professional
28	Bed Kumar Dhakal	DNPWC
29	Amar Raj Limbu	Nature Lover/Photographer

30	Arjun Kurmi	Nature Lover/ Green Youth Lumbini
31	Birkha Bahadur Rokaya	Nature Lover
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44	Raju Mahato	Tourism Professional
45	Sudhan Lamsal	CBAPU Member
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47	Nutan Jung Karki	Student
48	Yam Bahadur Mahato	BCN Staff
49	Dr. Prem Bahadur Budha	TU / BCN EC Member
50	Sanjeev Uprety	Writer/ Nature Lover
51	Archana Thapa	Writer

Programme/Project Update

Monitoring of Satellite Tagged Captive Released and Wild White-rumped Vulture

Seventeen free-ranging White-rumped Vultures (11 wild and 6 released) were fitted with satellite transmitters providing valuable data on their movements and favorite locations. Eleven tagged wild birds are still alive and several are breeding locally and up to 100km from the trapping site. Non breeding wild tagged birds are regularly crossing into India visiting their favored foraging sites and returning back, but one adult wanderer visited Himachal Pradesh in January, came all the way back to the area of Nepal in February,



but has now returned again through western Nepal, Uttarakhand, Himachal Pradesh (a very similar route to previously) and gone on further west to Jammu and Kashmir and close to the Pakistan border. This is about 1100km far away from the release site; Pithauli, Nepal. Most of the vultures spend their time in provisional vulture safe zone west from the release site but interestingly, one individual travelled about 185km east and returned back to release site. One key finding from this work is the number of locations of birds across the border in Uttar Pradesh (UP), India, and this has prompted some excellent transboundary linkages, with locations being visited by the Bombay Natural History Society (BNHS) and UP Forest Department team, and discovering new feeding sites and potential breeding sites that were not previously known from the area. Within Nepal, the ground truthing team discovered some new breeding colonies and important foraging sites while following these tagged vultures.

Alternative Energy Promotion at Bardia National Park

Thirty households of Kareliya User Committee were supported to install biogas and toilet facility. The biogas supporting program is helping to reduce the use of firewood, improve people's health. Till date total 120 households in 3 different communities (Asaregadi CFUG, Karelia CFUG, Bhada CFUG) have been supported for biogas installation.



Solar pump Installation and Pond Construction at Kareliya, Bardia

BCN supported the group of Kareliya User Committee with solar pump, and also materials required to construct the pond to enhance the daily lives of community group for fish farming and easy access of water for wildlife and birds,.

Donation

BCN welcomes all kinds of support from individuals and institutions. You can even help us by providing us your camera, binocular, telescope, scientific equipment etc. Further more, we will also be grateful if any one provides educational materials for our library. All support will be duly acknowledged.



BirdLife International is a global conservation federation with a worldwide network of Partner organizations, Representatives and committed individuals.

BirdLife International seeks to conserve all bird species on earth and their habitats and, through this, it works for the world's biological diversity. It recognizes that the problems affecting birds, their habitats and our global environment are linked inseparably with social, economic and cultural factors and that these can only be resolved if human societies function in an ecologically sustainable manner and if the needs, welfare and aspirations of people form a part of all conservation action.

Birds provide BirdLife International with a uniquely valuable focus: they are sensitive indicators of biological richness and environmental trends and fulfil many key ecological functions; they contribute greatly to our understanding of natural processes; they are an important economic resource; and they have inspired and delighted people of many cultures for centuries, which makes them excellent ambassadors for the promotion of conservation awareness and international collaboration.

BirdLife International pursues a programme of:

- Scientific research and analysis to identify and monitor worldwide the most threatened bird species and the most critical sites for the conservation of avian diversity;
- Advocacy and policy development to promote the conservation of birds and biodiversity through sustainability in the use of all natural resources;
- Field action and country conservation programmes, ranging from community-based land-use and management projects to species recovery programmes benefiting both wildlife and humans;
- Network and capacity building to expand and strengthen the global partnership of conservation organizations and to promote worldwide interest in the conservation of birds and the wider environment.

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Suchit Basnet, Yub Raj Basnet

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The newsletter is produced quarterly for members of Bird Conservation Nepal. The aim of the newsletter is to inform BCN members on the recent development of ornithology in Nepal and any other relevant news on birds. It is circulated to all members free of cost. The individual annual membership is NRs. 500 for any SAARC nationals and US\$ 15.00 for others to join as Friends of BCN.

Those who would like to donate to or be a member of BCN can do so by a direct bank transfer, to the bank details below, or via cheque. Cheques should be made payable to Bird Conservation Nepal and sent to the address below.

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**Bird
Conservation
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Established in 1982, Bird Conservation Nepal (BCN) is the leading organisation in Nepal, focussing on conservation of birds, their habitats and sites. It seeks to promote interest in birds among the general public, encourage research on birds, identify major threats to birds' continued survival. As a result, BCN is the foremost scientific authority providing accurate information on birds and their habitats throughout Nepal. We provide scientific data and expertise on birds for the Government of Nepal (GoN) through the Department of National Parks and Wildlife Conservation (DNPWC) and work closely in birds and biodiversity conservation throughout the country.

BCN is a membership-based organisation with a founding President, patrons, life members, ordinary members, friends of BCN and active supporters. Our membership provides strength to the society and is drawn from people of all walks of life from students, professionals and conservationists. Our members act collectively to set the organisation's strategic agenda.

We are committed to showing the value of birds and their special relationship with people. As such, we strongly advocate the need for peoples' participation as future stewards to attain long-term conservation goal.

As the Nepalese partner of BirdLife International, a network of more than 120 organisations around the world, BCN also works on a worldwide agenda to conserve the world's birds and their habitats.

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