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ENVIS Newsletter Vol. 19 (1)

National Bird of India

Common Name- Peacock**, Scientific Name-** *Pavo cristatus*

- ***Waterbird species status in natural wetland (Misserpur Ganga ghat) of district Haridwar, Uttarakhand, India***
- ***Ornithology in a riparian ecosystem: an insight from Ziro valley Arunachal Pradesh***

Birds: An integral part of our life and nature

A bird is defined as a warm blooded feathered vertebrate. Birds play a major role in all natural ecosystem as pollinators, pest control agent, carcass scavengers etc. Thus they are also economically important creatures that reflect the health of an ecosystem. Birds contribute to many ecosystem services, like

1. Provisioning services : e.g. guano for fertilizer
2. Regulating services: e.g. pollinating plants and dispersing seeds
3. Supporting services: e.g. nutrient cycling
4. Cultural services: e.g. Bird watching and hunting.

It is reported that in tropical forests birds disperse seeds of up to 92% of all tree and woody species. They pollinate 3-5% of more than 1,500 species of crop and medicinal plants. Insectivorous birds help in reducing insect pest damage and help in obtaining more crop and fruit yield.

According to the IUCN Red List 23% of the world's birds are threatened or near threatened. Decline in bird population is disrupting ecosystem processes in many ways. Therefore of late a responsible citizen science cult of observing birds has become more popular and in general it is called bird watching, while scientific experts on birds are known as "Ornithologist". Bird watching has become a popular past time and a scientific sport and it has vast potential in the wilderness of Indian Himalayan Region. It is developing as a skill and also a means of livelihood that also helps in conservation of birds.

The Green Skill Development Programme (GSDP) training course under ENVIS Centre on Himalayan Ecology has been regularly hosting training courses on bird watching for unemployed youth and has been able to generate livelihood opportunities to many youth who are serving as guides to tourists who come for bird watching.

Therefore we decided to dedicate one issue of ENVIS Newsletter to birds. This issue contains two articles dedicated to riparian and water birds. One study enumerates the native and migratory water birds sighted at Misserpur Ganga Ghat in Uttarakhand and the other study describes birds from riparian ecosystem of springs in Ziro valley, Arunachal Pradesh. Both studies resonate that bird diversity are indicators of a healthy ecosystem and they need to be studied in depth and conserved.

Let us join hands to save these beautiful colourful feathered creatures that wake us up to beautiful morning each day and inspire us to soar high in all our endeavors.

Presenting a colourful issue for a delightful reading. Your valuable suggestions are always welcome.

Paromita Ghosh
ENVIS, Coordinator

WATERBIRD SPECIES STATUS IN NATURAL WETLAND (MISSERPUR GANGA GHAT) OF DISTRICT HARIDWAR, UTTARAKHAND, INDIA

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ABSTRACT

Natural Wetlands are more supportive habitat to the waterbird species. A study was conducted (January 2020 to March 2022) at natural wetland (Misserpur Ganga Ghats) near Haridwar. We reported 38 waterbird species, out of these 21% was migrant species. In addition, four near threatened, one endangered and one vulnerable species (IUCN listed) were also reported. The present study emphasise on the natural wetland which supports the water migratory bird species.

Key words: Endangered, Ganga Ghat, migratory bird, natural wetland, water bird species

INTRODUCTION

Wetlands are one of the most productive ecosystems of our natural environment which supports a large diversity of bird species. A total of 1340 bird species with 38 endemic species have been recorded in India (Ali *et al.*, 1987; Grimmett *et al*., 2016, Praveen *et al*., 2016). Of the total, about 310 species are considered as wetland bird species (Kumar *et al*., 2005). Wetland birds are best indicators of the health of wetlands.

About 15.26 million hectares of land in India is considered as wetland (Prasad *et al*., 2002) and these wetlands support the existing and growth of various flora and fauna. The occurrence of waterbird species, migratory bird species and the value of these wetlands to the water birds have been mentioned by many researchers in their studies (Ghasemi, *et al*., 2012; Kaushik and Gupta, 2013; Shao *et al*., 2014; Bhatt *et al*., 2015; Saini *et al*., 2017; Arya *et al*., 2019). However, only some studies have been conducted in terai region wetland of Uttarakhand (Bhatt *et al*., 2015; Saini *et al*., 2017, Arya *et al*., 2019).

Globally, the change in land-use pattern and natural calamities has been identified as the reason for loss of biodiversity (Butchart *et al*., 2010, Sala *et al*., 2000) and wetland degradation. Indian wetlands are also impacted by land use change and natural calamities and their degradation rate is higher as compared to other countries' wetlands.

Studies have shown that wetlands provide an exclusive habitat for many residential water bird species and migratory water bird species (Ghasemi, *et al*., 2012; Shao *et al*., 2014; Bhatt, 2015; Saini *et al*., 2017; Arya *et al*., 2019; Wanna *et al*., 2020, Arya *et al*., 2020).

Many migratory water bird species migrate to India in winter as visitors through the different flyways. Presently, these wetlands are degrading through various anthropogenic activities therefore a periodic survey on wetland avian species is required to understand the health of wetland ecosystem. The present study (on the basis of presence/ absence of bird species) is providing a base line data on water bird species in wetland of Haridwar district, Uttarakhand.

MATERIAL AND METHODS

Study area:

The study was conducted between January 2020 and March 2022 in Missarpur natural wetland of Haridwar district in Uttarakhand. The Missarpur Ganga Ghat (natural wetland), is situated about 8 km away at the downstream from Bheemgoda Barrage (29°58′ N, 78°13′E, 249.7 masl). The Misserpur Ghat is characterized with rich and diverse vegetation cover across the wetland and some aquatic vegetation species (*Eichhornia crassipes, Typha elephantine, Ipomeafis-tulosa, and Potomageton pectinatus)* with *Dalbergia sissoo* tree species are dominant the study site (Fig. 1).

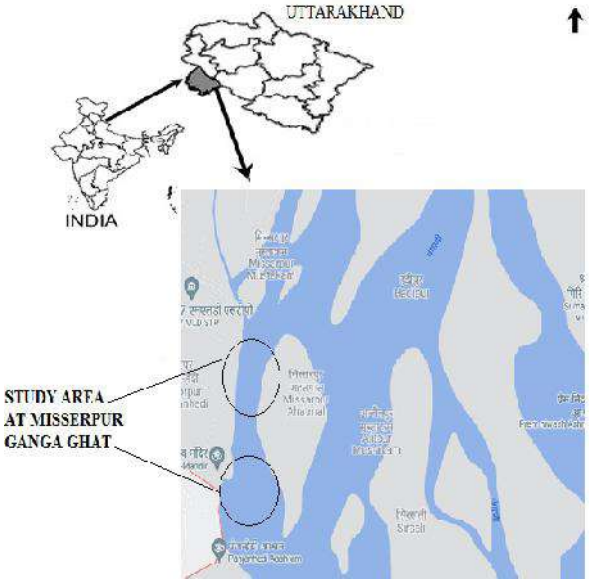


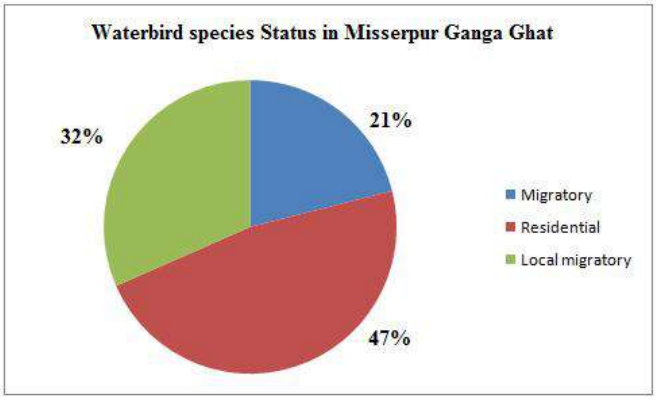
Fig. 1. The study area of waterbird survey at Misserpur Ganga Ghat

Waterbird survey:

The water bird survey was conducted in the study area. Line transects and point count methods (Bibby *et al*, 2000) were used to quantify the water bird diversity and abundance. The survey was done from October to March (morning 07:00 am to 11:00 am and evening 04:30 pm to 06:30 pm). All the avian records were collected by using camera (Model Canon SX60HS) and field guidebook (Grimmett *et al*. 2016) was used to identify the water bird species.

RESULT AND DISCUSSION

In this study, we recorded 38 waterbird species belonging to 14 families (Table 1). Duck species belonging to Anadiae family were dominant among the waterbird species. Out of these 21 percentages of Migrant species, 12 percentages of local migratory and 47 residential waterbird species were recorded (Fig. 2).



All the migratory bird species arrive in Misserpur Ghat wetland at end of November and stay till March. These species come from Central Asia, Temperate Eurasia, Western/ Southern Europe, Eastern Africa, and Poland.

Table 1. Checklist of waterbird species reported at Misserpur Ganga Ghat (Natural wetland) of Haridwar, Uttarakhand

S. No.	Common Name	Scientific Name	IUCN category	Status
Family: Anatidae				
1	Ruddy Shelduck	*Tadorna ferruginea*	LC	WV
2	Mallard	*Anas platyrhynchos*	LC	WV
3	Gadwall	*Anas strepera*	LC	WV
4	Indian Spot-billed Duck	*Anas poecilorhyncha*	LC	WV
5	Bar-headed Goose	*Anser indicus*	LC	WV
6	Northern Pintail	*Anus acuta*	LC	WV
7	Osprey	*Pandion haliaetus*	LC	WV
8	Black bellied tern	*Sterna aurantia*	VU	WV
Family: Anhingidae				
9	Indian Pond-Heron	*Ardeola grayii*	LC	
10	Striated Heron	*Butorides striata*	LC	
11	Black-crowned Night-Heron	*Nycticorax nycticorax*	LC	
12	Gray Heron	*Ardea cinerea*	LC	
13	Purple Heron	*Ardea purpurea*	LC	
Family: Ardeidae				
14	Intermediate Egret	*Ardea intermedia*	LC	
15	Cattle Egret	*Bubulcus ibis*	LC	
16	Little Egret	*Egretta garzetta*	LC	
17	Black-crowned Night-Heron	*Nycticorax nycticorax*	LC	
18	Great Egret	*Ardea alba*	LC	
Family: Burhinidae				
19	Eurasian thick-knee	*Burhinus oedicnemus*	LC	
20	Indian thick-knee	*Burhinus indicus*	LC	
21	Great thick-knee	*Esacus recurvirostris*	LC	
Family: Ciconiidae				
22	Asian Open bill	*Anastomus oscitans*	LC	
23	Woolly-necked Stork	*Ciconia episcopus*	NT	
24	Black-necked Stork	*Ephippiorhynchus asiaticus*	NT	
Family: Charadriidae				
25	River Lapwing	*Vanellus duvaucelii*	NT	
Family: Accipitridae				
26	Pallas's Fish-Eagle	*Haliaeatus leucoryphus*	EN	
27	Crested Serpent Eagle	*Spilornis cheela*	LC	
Family: Recurvirostridae				
28	Black-winged stilt	*Himantopus himantopus*	LC	
Family: Threskiornithidae				
29	Red-naped Ibis	*Pseudibis papillosa*	LC	
Family: Alcedinidae				
30	Lesser pied kingfisher	*Ceryle rudis*	LC	
31	White-breasted kingfisher	*Halcyon smyrnensis*	LC	

32	Crested Kingfisher	*Megaceryle lugubris*	LC	
Family: Laridae				
33	Pallas's Gull	*Ichthyaetus ichthyaetus*	LC	
Family: Scolopacidae				
34	Common sandpiper	*Actitis hypoleucos*	NT	
Family: Phalacrocoracidae				
35	Little cormorant	*Phalacrocorax nigra*	LC	
36	Great cormorant	*Phalacrocorax carbo*	LC	
Family: Rallidae				
37	Gray-headed Swamp hen	*Porphrio poliocephalus*	LC	
38	Eurasian Coot	*Fulica atra*	LC	

During the study period (2020 to 2022) we reported 04 more water bird species (Pallas's Fish-Eagle, Black bellied tern, Bar headed goose, and Spot billed duck) in the natural wetland. However, in a previous study (Saini *et al*., 2017) at Misserpur Ganga Ghat only 34 water bird species were reported. The study results indicate natural wetland supports the avian diversity and abundance due to rich food availability and fewer human anthropogenic activities. Our results support that natural wetlands are better habitats for water bird species as reported by Zhijun *et al*., 2004 and Tourenq *et al*., 2001).

In 2017 at Misserpur Ganga Ghat study area the Bar-headed Goose, *Anser indicus* species was recorded as reported seven years back. But in our study it was observed that the Bar-headed Goose which is passage migrant in this region was sighted in every survey during the study period (2020 to 2022), On the other hands, there was no new species reported while Five Near threatens namely River lapwing (*Vanellus duvaucelii),* Black-necked stork *(Ephippiorhynchus asiaticus),* Woolly-necked stork *(Ciconia episcopus),* and Black-headed ibis *(Threskiornis melanocephalus)*. One endangered Pallas's Fish-Eagle, and one vulnerable species Black bellied tern (*Sterna acuticauda*) categories as per IUCN red-list were also reported during survey (Fig. 3a & b).

Fig. 3. a. Black billed tern **b.** Fish Eagle

Natural wetlands are more supportive and attract to the water bird species thus, a water bird survey is required at regular interval to understand the residential water bird species status and water migrant bird species distribution in natural wetlands.

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ORNITHOLOGY IN A RIPARIAN ECOSYSTEM: AN INSIGHT FROM ZIRO VALLEY ARUNACHAL PRADESH

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Birds are a prevalent and beautiful creature; humans enjoy watching their vivid colours, the exuberance of their movements, and the sweetness of their songs. In addition to their magnificence, they play a crucial role in maintaining the ecosystem of the inhabited area. They are pollinators, nutrient recyclers, seed dispersers, and scavengers; they control pest populations, increasing the agricultural productivity. There are other additional benefits like they also show the, aesthetic, symbolic or spiritual value provided by birds which are difficult to commodify in economic or biophysical terms. Ornithological studies of different habitats have a slightly different approach as every habitat has different climatic and geographical conditions. Ornithology means identifying and counting birds and also deals with ecology, habitat and niche occupancy, feeding habits, evolution, behaviour etc. To understand the association of habitats and a species, data on natural history and population need to be collected via direct or indirect methods. The data can be interpreted by a mathematical or statistical explanation to explain the exact association. Simple environmental gradients like habitat, elevation location etc., are comparatively easy to collect. However complex environmental gradients like disturbances and anthropogenic hindrances are more challenging to characterize and can only be derived mathematically.

Springs have always been a highly diverse ecosystem near rough terrain or mountain range, making it more challenging to explore. Although they are very productive, it is the most threatened ecosystem on earth. It supports large arrays of aquatic wetlands and terrestrial species and assemblages at varying altitudes. As some springs it emerges from the low gradient sources and often have one or multiple sources, the water seep from shallow, unconfined aquifers it used to diffused to the wetland and make the wetland rich with minerals as it brings dissolved mineral with it which support many vegetation and flora. From a biogeographical perspective, springs often function as an island of habitat. The spring ecosystem ecology always remains the rarely studied and poorly explored topic, as it has many reasons, the main will be due to its geographic area of restriction. In recent decades all studies have recognized the threatened ecological condition of spring's ecosystem.

Springs have their geo-morphically distinctive microhabitats, which form through various physical processes. So in these microhabitats, there is a surface type known as a riparian zone (Fig. 1), which is divided into more subtypes such as Lower Riparian Zone (LRZ)and Middle Riparian Zone (MRZ), High Riparian Zone (HRZ) based on flood in a year.

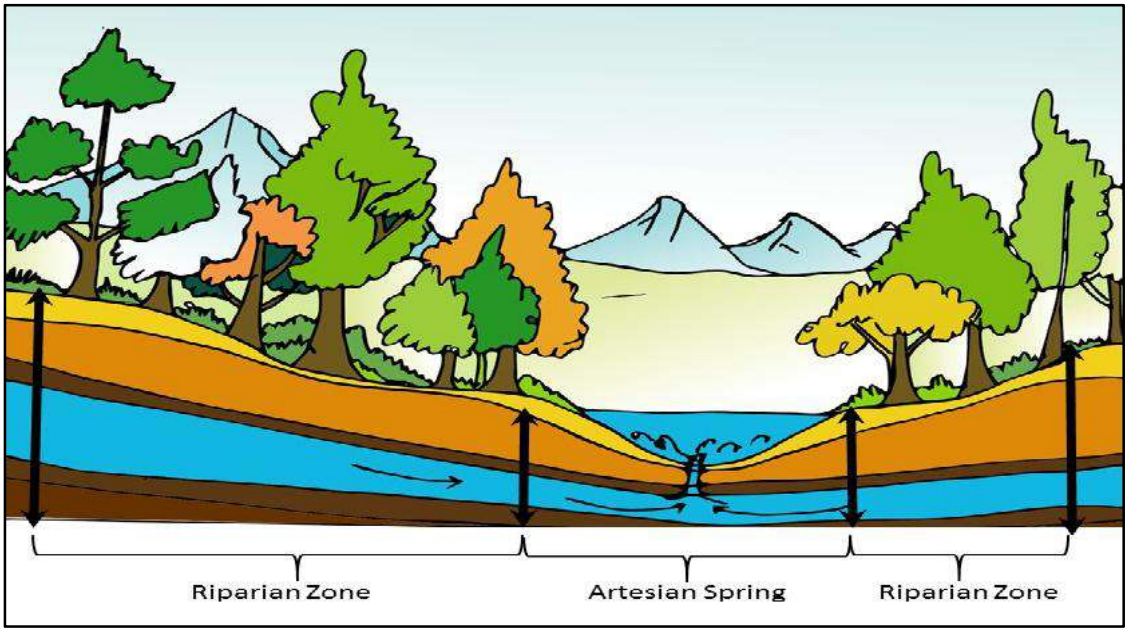

Fig. 1. Spring surface zones

So the LRZ may turn into a wetland. The relationship between these wetlands and birds shapes the ecosystem as the availability of food and shelter; the presence or absence of predators, and also, birds use these wetlands for breeding depending on their physical and biological attributes; birds also have daily and seasonal dependencies on wetlands for food and during the survey (Year 2021-22) of springs in the Lower Subansiri district of Zero Valley in Arunachal Pradesh, some birds were observed while collecting baseline data for the springs, which are enumerated in Table 1.

Table 1. List of the species found in the riparian zone (Sighted during Year 2021-22)

S. No	Order	Family	Scientific name	Common Name	Alternative Name(s)	IUCN Category	WPA Schedule	Feeding Habits
1	Coraciiformes	Alcedinidae	*Alcedo atthis* (Linnaeus,1758)	Common Kingfisher	Small Blue Kingfisher	LC	IV	P/I
2	Coraciiformes	Alcedinidae	*Halcyon smyrnensis* (Linnaeus,1758)	White-throated Kingfisher	White-breasted Kingfisher	LC	IV	P/I
3	Passeriformes	Certhiidae	*Certhia nipalensis* Blyth,1845	Rusty-flanked Treecreeper	Nepal Treecreeper	LC	IV	I
4	Passeriformes	Cettiidae	*Phyllergates cucullatus* (Temminck,1836)	Mountain Tailorbird	Golden-headed Tailorbird, Leafworker	LC	IV	I
5	Passeriformes	Cisticolidae	*Orthotomus sutorius* (Pennant,1769)	Common Tailorbird		LC	IV	I
6	Passeriformes	Corvidae	*Corvus macrorhynchos* Wagler, 1827	Large-billed Crow	[Jungle Crow, Indian Jungle Crow, Eastern Jungle Crow]	LC	IV	O
7	Passeriformes	Corvidae	*Corvus splendens* Vieillot,1817	House Crow		LC	IV	O

8	Passeriformes	Dicruridae	*Dicrurus aeneus* Vieillot,1817	Bronzed Drongo		LC	IV	I
9	Passeriformes	Dicruridae	*Dicrurus leucophaeus* Vieillot, 1817	Ashy Drongo	Grey Drongo	LC	IV	I
10	Passeriformes	Dicruridae	*Dicrurus macrocercus* Vieillot,1817	Black Drongo		LC	IV	I
11	Passeriformes	Hirundinidae	*Hirundo rustica* Linnaeus,1758	Barn Swallow	Common Swallow	LC	IV	I
12	Passeriformes	Motacillidae	*Motacilla alba* Linnaeus,1758	White Wagtail	Pied Wagtail	LC	IV	I
13	Passeriformes	Motacillidae	*Motacilla maderaspatensis* J.F. Gmelin,1789	White-browed Wagtail	Large Pied Wagtail	LC	IV	I
14	Passeriformes	Muscicapidae	*Niltava macgrigoriae* (E. Burton,1836)	Small Niltava		LC	IV	I
15	Passeriformes	Muscicapidae	*Phoenicurus frontalis* Vigors,1831	Blue-fronted Redstart		LC	IV	I
16	Passeriformes	Muscicapidae	*Phoenicurus fuliginosus* (Vigors, 1831)	Plumbeous Water Redstart	Plumbeous Redstart	LC	IV	I
17	Passeriformes	Muscicapidae	*Phoenicurus hodgsoni* (F. Moore, 1854)	Hodgson's Redstart		LC	IV	I
18	Passeriformes	Muscicapidae	*Phoenicurus leucocephalus* (Vigors,1831)	White-capped Redstart	River Chat, White-capped Water Redstart	LC	IV	I
19	Passeriformes	Muscicapidae	*Tarsiger rufilatus* (Hodgson,1845)	Himalayan Bush Robin	Himalayan Bluetail, Himalayan Red-flanked Bush Robin	LC	IV	I
20	Passeriformes	Paridae	*Parus monticolus* Vigors,1831	Green-backed Tit		LC	IV	I
21	Passeriformes	Passeridae	*Passer domesticus* (Linnaeus,1758)	House Sparrow		LC	IV	G
22	Passeriformes	Passeridae	*Passer montanus* (Linnaeus,1758)	Eurasian Tree Sparrow	Tree Sparrow	LC	IV	G
23	Passeriformes	Phylloscopidae	*Phylloscopus affinis* (Tickell, 1833)	Tickell's Leaf Warbler		LC	IV	I
24	Passeriformes	Phylloscopidae	*Phylloscopus fuscatus* (Blyth,1842)	Dusky Warbler	Dusky Leaf Warbler	LC	IV	I
25	Passeriformes	Pycnonotidae	*Hypsipetes leucocephalus* (J.F. Gmelin,1789)	Black Bulbul	Himalayan Black Bulbul	LC	IV	I/G

26	Passeriformes	Pycnonotidae	*Ixos mcclellandii* (Horsfield,1840)	Mountain Bulbul	Rufous-bellied Bulbul	LC	IV	I/F
27	Passeriformes	Pycnonotidae	*Pycnonotus cafer* (Linnaeus,1766)	Red-vented Bulbul		LC	IV	I/F
28	Passeriformes	Pycnonotidae	*Pycnonotus jocosus* (Linnaeus,1758)	Red-whiskered Bulbul		LC	IV	I/F

LC- Least Concern, IV- Schedule IV, F- Frugivorous, G- Grainivorous, I- Insectivorous, O- Omnivorous, P- Piscivorous

Some of the birds have also been photographed (Fig. 2). After looking into the details of these species, curiosity has been aroused to find the relationship between these birds and the spring ecosystem. Most of these birds are forest birds who may be visiting the springs for water, but a deep study into their natural history may reveal the exact species-ecosystem connection. The feeding habits of these birds shows that most of them are insectivorous and spring wetlands have abundant insects, their larvae and worms. The riparian zone have good vegetation as it provides both nutrition and water to plants. These plants give birds a home by providing the nesting space, which becomes evident by random encounters of nests in the riparian zone trees during our field visit.

A more in-depth study of the bird population in this habitat and other environmental parameters will address several questions about their relationship. There are two methods for censusing birds, i.e., point counts and line transects. In point count, data is acquired by staying at a particular spot for a period of time (often 5 to 10 minutes) and then moving to the next location. In line transact, the observer continually walks and records the data on either side of the track. But in this case, line transact is difficult due to difficult terrine. Another issue is that, as this is a noisy ecosystem, due to the sound of flowing water, birds' calls can't be appropriately heard; hence chance of sighting birds may reduce.

Ornithological studies in this ecosystem are obviously exciting, but there are significant gaps in our knowledge of birds present in this ecosystem and how they are their dependent on this unique ecosystem. A complete exploration of birds present in this ecosystem need to be studied. The impact of the physical and chemical parameters of the spring water quality on birds should be studied. Based on this information, proper steps can be taken to mitigate the threats to the diversity of riparian birds. Base line counts will come to be significantly valued when repeated in the future. They will show which species have declined in number and require additional management in this regard. If these sites prove essential for the species, then conservation and restoration of these sites are also required. Therefore, ornithological studies in a spring ecosystem will provide impetus to articulate research questions regarding several other aspects and find new dimensions of bird diversity and spring relations.

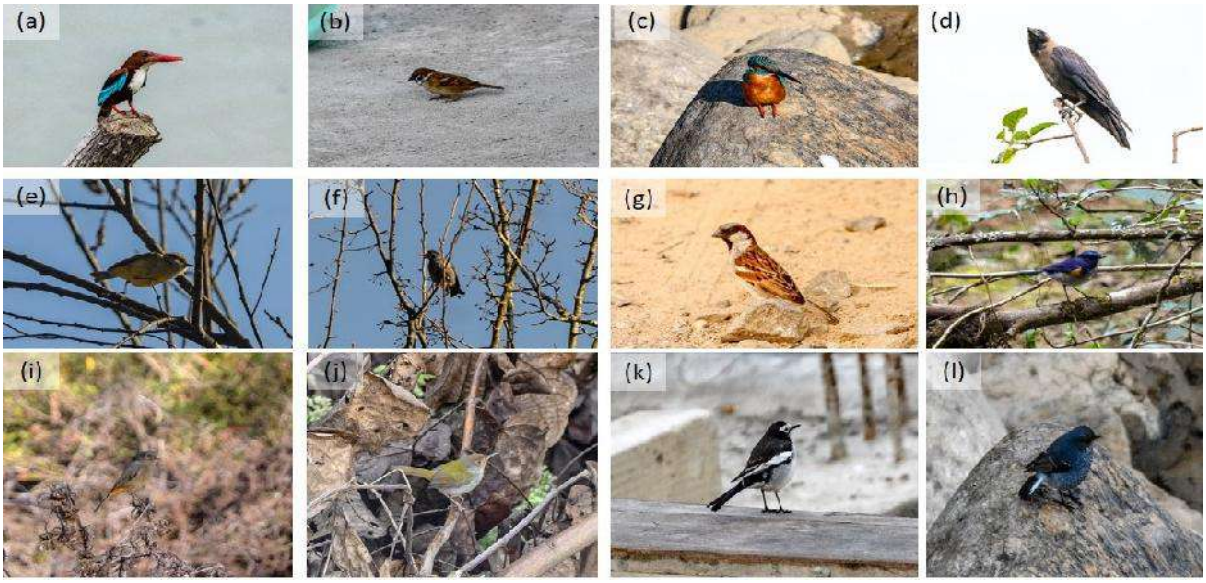

Fig. 2. Some Birds found in the riparian zone (a) White-throated Kingfisher, (b) Eurasian Tree Sparrow, (c) Common Kingfisher, (d) House Crow, (e) Tickell's Leaf Warbler, (f) Black Bulbul, (g) House Sparrow, (h) Himalayan Bush Robin, (i) Hodgson's Redstart, (k) White wagtail, (l) Plumbeous Water Redstart

STATE BIRDS OF INDIAN HIMALAYAN REGION

State- Jammu & Kashmir and Ladakh
Common Name- Black necked crane
Scientific Name- *Grus nigricollis*

State- Sikkim
Common Name- Blood pheasant
Scientific Name- *Ithaginis cruentus*

State- Uttarakhand
Common Name- Himalayan Monal
Scientific Name- *Lophophorus impejanus*

State- Himachal Pradesh
Common Name- Western Tragopan
Scientific Name- *Tragopan melanocephalus*

State- Arunachal Pradesh
Common Name- Great Hornbill
Scientific Name- *Buceros bicornis*

State- Nagaland
Common Name- Blyth's tragopan
Scientific Name- *Tragopan blythii*

State- Manipur and Mizoram
Common Name- Mrs. Hume's pheasant
Scientific Name- *Syrmaticus humiae*

State- Tripura
Common Name- Green imperial pheasant
Scientific Name- *Ducula aenea*

State- Meghalaya
Common Name- Hill Myna
Scientific Name- *Gracula religiosa*

About Newsletter

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State- Assam
Common Name- White winged wood duck
Scientific Name- *Asarcornis scutulata*

State- West Bengal
Common Name- White-throated kingfisher
Scientific Name- *Halcyon smyrnensis*

More details

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