



## Ecological and behavioural adaptations of migratory birds in Nawabganj Bird Sanctuary, Unnao, Uttar Pradesh

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### Abstract

Nawabganj Bird Sanctuary, also known as Shaheed Chandra Shekhar Azad Bird Sanctuary, is an important wetland located in the Unnao district of Uttar Pradesh. In 2019, it was designated as a Ramsar site under the Ramsar Convention, indicating its importance at the international level. The sanctuary covers approx 224.6 hectares, it plays an important role in supporting a large number of bird species, especially those migrating along the Central Asian Flyway. During the current study, more than 150 bird species were observed, and overall data indicate that the sanctuary supports more than 220 resident and migratory species. The presence of globally endangered birds such as Pallas's fish-eagle and the Egyptian vulture further highlights its ecological importance. The study also describes some of the adaptations observed in these birds (the Asian openbill has a distinct opening in its beak that helps it eat mollusks efficiently). Many migratory species travel long distances crossing the Himalayan region to reach this wetland. It was observed that birds prefer specific areas within the sanctuary depending on food availability, depth of water and shelter about 43% of the recorded species depended primarily on aquatic habitats. Insectivorous birds formed the largest food group. Seasonal variation in species composition, feeding habits and nesting patterns was clearly noted during the study period. However, the sanctuary is currently facing challenges such as excessive growth of water hyacinth, human disturbance and alteration of natural water flow. In conclusion, this study provides essential baseline information that can help in effective conservation and management of this ecologically important wetland.

**Keywords:** Nawabganj bird sanctuary, migratory birds, ecological adaptations, behavioural ecology, Ramsar site, central Asian flyway, avian diversity

### Introduction

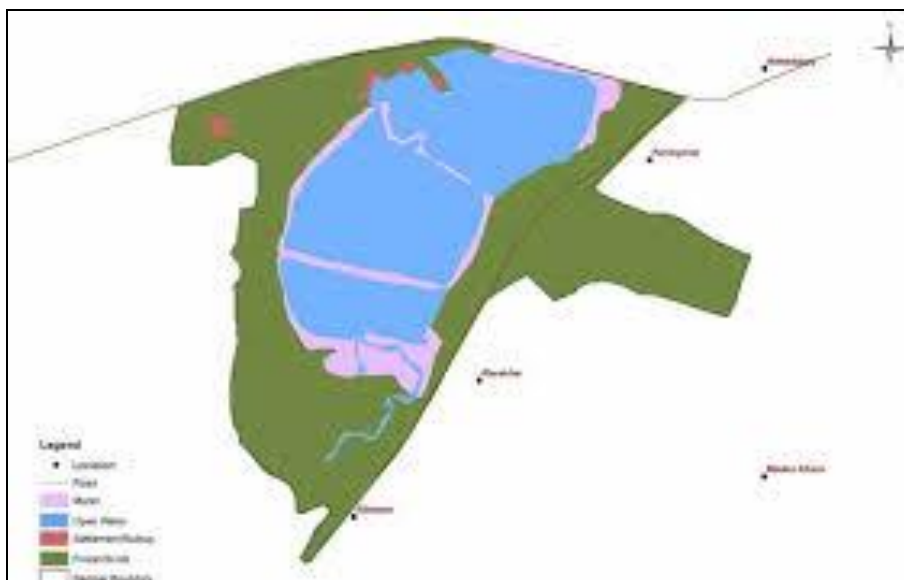
The Nawabganj Bird Sanctuary (NBS) is located at National Highway 25 in Tehseel Nawabganj, District Unnao. The distance between Nawabganj Bird Sanctuary and Lucknow is roughly 45 km at Kanpur-Lucknow National Highway. The Wild life Protection Law of 1972 allowed for the establishment of this bird sanctuary in 1984. The protection and conservation of residential and migratory bird species in the wild is the primary goal of NBS <sup>[1]</sup>. Additionally, wetlands serve as migration routes for both plants and animals. They aid in flood reduction, nutrient cycling, aquifer recharging, and increasing habitat for a variety of plant, animal, and invertebrate species, as well as supplying timber and other commercial goods. Additionally, they offer aquatic birds a good habitat for a variety of behaviors. Because it provides birds with food, shelter, and nesting materials as well as possible indicators of the beginning of favorable breeding conditions, the physical structure of vegetation is a crucial component of habitat. In turn, a wetland's overall ecological health can be inferred from the strength of its bird community structure <sup>[2]</sup>. Birds serve as excellent indicators of an ecosystem's environmental quality. Many bird species have specific habitat needs that vary with the seasons and exhibit different species compositions across various habitats. Birds that rely on wetlands for their ecological needs are referred to as waterbirds. Wetlands are among the most productive and biologically diverse ecosystems on the planet, yet they remain highly fragile and vulnerable <sup>[3]</sup>. People are drawn to wetlands by avifaunal richness, particularly water birds, which are also superb bioindicators and helpful models for

researching a range of environmental issues <sup>[4]</sup>. The study of Avifaunal biodiversity would be useful for further initiatives in studying the status of birds and its conservation.

### Materials & methods

The study was conducted at Nawabganj Bird Sanctuary (NBS) during December 2025 to February 2026. Nawabganj Bird Sanctuary (NBS) is situated in Tehseel Nawabganj of District Unnao at National Highway- 25. Nawabganj Bird Sanctuary is situated about 45 Km from Lucknow, at Lucknow-Kanpur National Highway (Fig.1). The Wild Animal Protection Act of 1972 allowed for the establishment of this sanctuary in 1984. NBS encompasses a 224.6 to 225 hectare area that serves as a breeding ground for numerous plant and animal populations.

The sanctuary is close to a canal that provides wildlife with a steady supply of water. "Moti Lake" has a considerable economic importance due to its beautiful attractiveness, which attracts tourists. The coordinates of NBS are 26° 34' N and 80° 40' E. The average annual rainfall is less than 1,000 mm, the temperature varies from 10 to 48 degrees Celsius, and the humidity is roughly 94%. Survey work was carried out seasonally during suitable time (in summer-morning: 6:00 am to 11:00 am, evening: 3:00 pm to 6:30 pm, in winter morning: 7:30 am to 11:00 am, evening: 3:30 pm to 5:30 pm). Observations were made along line transects with the aid of 10x50 binoculars and Nikon D3100 camera. The birds were recorded according to their status, feeding habit, seasonal visits and variety of habitat. Birds were monitored using "Line Transect" and "Point Count Methods" in a pre-defined area.



**Fig 1:** Map of study area (Source: Indian wetlands)

## Result & discussion

The Avifaunal assessment of NBS includes 224 species belonging to 20 orders and 60 families (Table 1). The order Passeriformes has maximum 95 species and the family with the maximum number of species is Accipitridae, with 17 species. Purple moorhen (29) and lesser whistling duck (12) are the most abundant residential species in the NBS. Sur Sarovar Bird Sanctuary is also a suitable territory for water birds. A study on bird composition, diversity and foraging guilds and agricultural landscapes from eastern U.P., India [5]. A case study of avifaunal diversity in managed urban ecosystem in Banaras Hindu University [6]. A study on composition and conservation status of avian species at Hastinapur Wildlife Sanctuary [7]. Food preference of birds showed that maximum species 32.59% were insectivorous

(73) followed by 18.75% omnivorous (42), 16.52% piscivorous (37), 8.48% vegetarian (19), 5.80% carnivorous (13), 5.36% granivorous (12), 3.13% frugivorous (7) and 8.48% (I/Fr, I/V, V/I, I/P) others (19) shown in Table 3. Diversity and percentage composition of avifauna based on food preference of birds shown in Fig. 4 and Fig. 5. A study on avifaunal diversity from two freshwater reservoirs in Rajkot, Gujarat [8]. A study on richness of avifauna at Gorewada International Bio Park, Nagpur, Central India [9]. A study on recovery of tropical rainforest avifauna in relation to vegetation succession following shifting cultivation in Mizoram, Northeast India [10]. The calculated diversity indices indicate that the NBS supports a high level of avian diversity with a relatively even distribution of species across habitats.

## Figures and tables

**Table 1:** List of Birds Reported from Nawabganj Bird Sanctuary

S. No.	Order/Family	Scientific Name	Common Name	Feeding Habit	Habitat	IUCN Status
1	Anseriformes / Anatidae	<i>Anser indicus</i>	Bar-headed Goose	Herbivorous	AH	LC
2	Anseriformes / Anatidae	<i>Anser anser</i>	Greylag Goose	Herbivorous	AH	LC
3	Anseriformes / Anatidae	<i>Anas acuta</i>	Northern Pintail	Omnivorous	AH	LC
4	Anseriformes / Anatidae	<i>Spatula querquedula</i>	Garganey	Omnivorous	AH	LC
5	Anseriformes / Anatidae	<i>Spatula clypeata</i>	Northern Shoveler	Omnivorous	AH	LC
6	Anseriformes / Anatidae	<i>Mareca strepera</i>	Gadwall	Omnivorous	AH	LC
7	Anseriformes / Anatidae	<i>Mareca falcata</i>	Falcated Duck	Omnivorous	AH	NT
8	Anseriformes / Anatidae	<i>Nettapus coromandelianus</i>	Cotton Teal	Omnivorous	AH	LC
9	Anseriformes / Anatidae	<i>Netta rufina</i>	Red-crested Pochard	Omnivorous	AH	LC
10	Anseriformes / Anatidae	<i>Fulica atra</i>	Coot	Omnivorous	AH	LC
11	Anseriformes / Anatidae	<i>Anas platyrhynchos</i>	Mallard	Omnivorous	AH	LC
12	Anseriformes / Anatidae	<i>Dendrocygna javanica</i>	Lesser Whistling Duck	Omnivorous	AH	LC
13	Gruiformes / Gruidae	<i>Grus antigone</i>	Sarus Crane	Omnivorous	AH	V
14	Ciconiiformes / Ciconiidae	<i>Mycteria leucocephala</i>	Painted Stork	Carnivorous	AH	NT
15	Ciconiiformes / Ciconiidae	<i>Ciconia episcopus</i>	Asian Woolly-necked Stork	Carnivorous	AH	VU
16	Ciconiiformes / Ciconiidae	<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	Carnivorous	AH	NT
17	Pelecaniformes / Threskiornithidae	<i>Threskiornis melanocephalus</i>	Black-headed Ibis	Omnivorous / carnivorous	AH	NT
18	Pelecaniformes / Threskiornithidae	<i>Pseudibis papillosa</i>	Red-naped Ibis	Omnivorous	TH	LC
19	Suliformes / Anhingidae	<i>Anhinga melanogaster</i>	Oriental Darter	Piscivorous	AH	NT
20	Pelecaniformes / Ardeidae	<i>Nycticorax nycticorax</i>	Black-crowned Night	Carnivorous	AH	LC

			Heron			
21	Pelecaniformes / Ardeidae	<i>Bubulcus ibis</i>	Eastern Cattle Egret	Carnivorous	TH	LC
22	Pelecaniformes / Ardeidae	<i>Ardea alba</i>	Great Egret	Piscivore	AH	LC
23	Pelecaniformes / Ardeidae	<i>Ardea intermedia</i>	Medium Egret	Piscivore	AH	LC
24	Pelecaniformes / Ardeidae	<i>Ardeola grayii</i>	Indian Pond Heron	Carnivore	AH	LC
25	Pelecaniformes / Ardeidae	<i>Egretta garzetta</i>	Little Egret	Carnivore	AH	LC
26	Pelecaniformes / Ardeidae	<i>Ardea cinerea</i>	Grey Heron	Piscivore	AH	LC
27	Pelecaniformes / Ardeidae	<i>Ardea purpurea</i>	Purple Heron	Piscivore	AH	LC
28	Pelecaniformes / Threskiornithidae	<i>Platalea leucorodia</i>	Eurasian Spoonbill	Carnivore	TH	LC
29	Gruiformes / Rallidae	<i>Porphyrio porphyrio</i>	Grey-headed Swamphen	Omnivorous	TH	LC
30	Charadriiformes / Jacanidae	<i>Hydrophasianus chirurgus</i>	Pheasant-tailed Jacana	Insectivore	TH	LC
31	Charadriiformes / Jacanidae	<i>Metopidius indicus</i>	Bronze-winged Jacana	Insectivore	TH	LC
32	Charadriiformes / Charadriidae	<i>Vanellus indicus</i>	Red-wattled Lapwing	Insectivore	AH	LC
33	Charadriiformes / Charadriidae	<i>Vanellus gregarius</i>	Sociable Lapwing	Insectivore	TH	CR
34	Charadriiformes / Charadriidae	<i>Vanellus vanellus</i>	Northern Lapwing	Insectivore	TH	NT
35	Charadriiformes / Charadriidae	<i>Vanellus malabaricus</i>	Yellow-wattled Lapwing	Insectivore	TH	LC
36	Charadriiformes / Charadriidae	<i>Vanellus leucurus</i>	White-tailed Lapwing	Insectivore	AH	LC
37	Charadriiformes / Charadriidae	<i>Vanellus cinereus</i>	Grey-headed Lapwing	Insectivore	AH	LC
38	Charadriiformes / Recurvirostridae	<i>Himantopus himantopus</i>	Black-winged Stilt	Carnivore	AH	LC
39	Charadriiformes / Recurvirostridae	<i>Recurvirostra avosetta</i>	Pied Avocet	Carnivore	AH	LC
40	Charadriiformes / Scolopacidae	<i>Limosa limosa</i>	Black-tailed Godwit	Carnivore	AH	NT
41	Charadriiformes / Scolopacidae	<i>Tringa ochropus</i>	Green Sandpiper	Carnivore	AH	LC
42	Charadriiformes / Scolopacidae	<i>Tringa stagnatilis</i>	Marsh Sandpiper	Carnivore	AH	LC
43	Charadriiformes / Scolopacidae	<i>Tringa glareola</i>	Wood Sandpiper	Carnivore	AH	LC
44	Charadriiformes / Scolopacidae	<i>Tringa nebularia</i>	Common Greenshank	Carnivore	AH	LC
45	Charadriiformes / Scolopacidae	<i>Tringa hypoleucos</i>	Common Sandpiper	Carnivore	AH	LC
46	Charadriiformes / Scolopacidae	<i>Philomachus pugnax</i>	Ruff	Omnivore	AH	LC
47	Charadriiformes / Scolopacidae	<i>Calidris temminckii</i>	Temminck's Stint	Carnivore	AH	LC
48	Charadriiformes / Scolopacidae	<i>Calidris minuta</i>	Little Stint	Carnivore	AH	LC
49	Charadriiformes / Scolopacidae	<i>Gallinago gallinago</i>	Common Snipe	Carnivore	TH	LC
50	Charadriiformes / Laridae	<i>Chroicocephalus brunnicephalus</i>	Brown-headed Gull	Carnivore	AH	LC
51	Podicipediformes / Podicipedidae	<i>Tachybaptus ruficollis</i>	Little Grebe	Piscivore	AH	LC
52	Ciconiiformes / Ciconiidae	<i>Anastomus oscitans</i>	Asian Openbill	Carnivore	AH	LC
53	Pelecaniformes / Threskiornithidae	<i>Plegadis falcinellus</i>	Glossy Ibis	Carnivore	AH	LC
54	Pelecaniformes / Ardeidae	<i>Ixobrychus cinnamomeus</i>	Cinnamon Bittern	Carnivore	AH	LC
55	Pelecaniformes / Ardeidae	<i>Ixobrychus sinensis</i>	Yellow Bittern	Carnivore	AH	LC
56	Pelecaniformes / Ardeidae	<i>Dupetor flavicollis</i>	Black Bittern	Carnivore	AH	LC
57	Gruiformes / Rallidae	<i>Amauornis akool</i>	Brown Crake	Omnivore	TH	LC
58	Gruiformes / Rallidae	<i>Zapornia pusilla</i>	Baillon's Crake	Omnivore	TH	LC
59	Gruiformes / Rallidae	<i>Gallinix cinerea</i>	Watercock	Omnivore	TH	LC
60	Gruiformes / Rallidae	<i>Amauornis phoenicurus</i>	White-breasted Waterhen	Omnivorous	AH	LC
61	Gruiformes / Rallidae	<i>Gallinula chloropus</i>	Common Moorhen	Omnivorous	AH	LC
62	Columbiformes / Columbidae	<i>Columba livia</i>	Rock Pigeon	Herbivorous	TH	LC
63	Columbiformes /	<i>Streptopelia decaocto</i>	Eurasian Collared Dove	Herbivorous	TH	LC

	Columbidae					
64	Columbiformes / Columbidae	<i>Streptopelia chinensis</i>	Spotted Dove	Herbivorous	TH	LC
65	Columbiformes / Columbidae	<i>Streptopelia senegalensis</i>	Laughing Dove	Herbivorous	TH	LC
66	Columbiformes / Columbidae	<i>Streptopelia tranquebarica</i>	Red Turtle Dove	Herbivorous	TH	LC
67	Columbiformes / Columbidae	<i>Streptopelia orientalis</i>	Oriental Turtle Dove	Herbivorous	TH	LC
68	Columbiformes / Columbidae	<i>Treron phoenicopterus</i>	Yellow-footed Green Pigeon	Frugivorous	TH	LC
69	Cuculiformes / Cuculidae	<i>Eudynamis scolopaceus</i>	Asian Koel	Omnivorous	TH	LC
70	Cuculiformes / Cuculidae	<i>Centropus sinensis</i>	Greater Coucal	Omnivorous	TH	LC
71	Cuculiformes / Cuculidae	<i>Hierococyx varius</i>	Common Hawk Cuckoo	Insectivorous	TH	LC
72	Cuculiformes / Cuculidae	<i>Cacomantis passerinus</i>	Grey-bellied Cuckoo	Insectivorous	TH	LC
73	Cuculiformes / Cuculidae	<i>Clamator jacobinus</i>	Pied Cuckoo	Insectivorous	TH	LC
74	Strigiformes / Strigidae	<i>Otus lettia</i>	Indian Scops Owl	Carnivorous	TH	LC
75	Strigiformes / Strigidae	<i>Athene brama</i>	Spotted Owl	Carnivorous	TH	LC
76	Strigiformes / Strigidae	<i>Glaucidium radiatum</i>	Jungle Owlet	Carnivorous	TH	LC
77	Strigiformes / Strigidae	<i>Ninox scutulata</i>	Brown Boobook	Carnivorous	TH	LC
78	Caprimulgiformes / Apodidae	<i>Apus affinis</i>	Little Swift	Insectivorous	TH	LC
79	Coraciiformes / Meropidae	<i>Merops philippinus</i>	Blue-tailed Bee-eater	Insectivorous	TH	LC
80	Coraciiformes / Meropidae	<i>Merops orientalis</i>	Asian Green Bee-eater	Insectivorous	TH	LC
81	Coraciiformes / Coraciidae	<i>Coracias benghalensis</i>	Indian Roller	Insectivorous	TH	LC
82	Coraciiformes / Alcedinidae	<i>Halcyon smyrnensis</i>	White-throated Kingfisher	Carnivorous	AH	LC
83	Coraciiformes / Alcedinidae	<i>Alcedo atthis</i>	Common Kingfisher	Piscivorous	AH	LC
84	Coraciiformes / Alcedinidae	<i>Pelargopsis capensis</i>	Stork-billed Kingfisher	Carnivorous	AH	LC
85	Coraciiformes / Alcedinidae	<i>Ceryle rudis</i>	Pied Kingfisher	Piscivorous	AH	LC
86	Bucerotiformes / Bucerotidae	<i>Ocyrceros birostris</i>	Indian Grey Hornbill	Omnivorous	TH	LC
87	Piciformes / Picidae	<i>Jynx torquilla</i>	Eurasian Wryneck	Insectivorous	TH	LC
88	Piciformes / Picidae	<i>Yungipicus nanus</i>	Brown-capped Pygmy Woodpecker	Insectivorous	TH	LC
89	Piciformes / Picidae	<i>Chrysocolaptes festivus</i>	White-naped Woodpecker	Insectivorous	TH	LC
90	Piciformes / Picidae	<i>Dinopium benghalense</i>	Black-rumped Flameback	Insectivorous	TH	LC
91	Piciformes / Picidae	<i>Leiopicus mahrattensis</i>	Yellow-crowned Woodpecker	Insectivorous	TH	LC
92	Piciformes / Ramphastidae	<i>Psilopogon zeylanicus</i>	Brown-headed Barbet	Frugivorous	TH	LC
93	Piciformes / Ramphastidae	<i>Psilopogon haemacephalus</i>	Coppersmith Barbet	Frugivorous	TH	LC
94	Falconiformes / Falconidae	<i>Falco peregrinus</i>	Peregrine Falcon	Carnivorous	TH	LC
95	Falconiformes / Falconidae	<i>Falco tinnunculus</i>	Eurasian Kestrel	Carnivorous	TH	LC
96	Accipitriformes / Accipitridae	<i>Aquila nipalensis</i>	Steppe Eagle	Carnivore	TH	Endangered
97	Accipitriformes / Accipitridae	<i>Clanga clanga</i>	Greater Spotted Eagle	Carnivore	AH	VU
98	Accipitriformes / Accipitridae	<i>Circus aeruginosus</i>	Western Marsh Harrier	Carnivore	TH	LC
99	Accipitriformes / Accipitridae	<i>Circus pygargus</i>	Montagu's Harrier	Carnivore	TH	LC
100	Accipitriformes / Accipitridae	<i>Milvus migrans</i>	Black Kite	Omnivore	TH	LC
101	Accipitriformes / Accipitridae	<i>Elanus caeruleus</i>	Black-winged Kite	Insectivore	TH	LC
102	Accipitriformes / Accipitridae	<i>Pernis ptilorhynchus</i>	Oriental Honey Buzzard	Carnivore	TH	LC
103	Accipitriformes / Accipitridae	<i>Spilornis cheela</i>	Crested Serpent Eagle	Carnivore	TH	LC
104	Accipitriformes / Accipitridae	<i>Circaetus gallicus</i>	Short-toed Snake Eagle	Carnivore	TH	LC
105	Accipitriformes / Accipitridae	<i>Hieraetus pennatus</i>	Booted Eagle	Omnivore	TH	LC
106	Accipitriformes / Accipitridae	<i>Aquila rapax</i>	Tawny Eagle	Piscivore	TH	VU

107	Accipitriformes / Accipitridae	<i>Haliaeetus leucoryphus</i>	Pallas's Fish Eagle	Carnivore	TH	EN
108	Accipitriformes / Accipitridae	<i>Aquila hastata</i>	Indian Spotted Eagle	Carnivore	TH	VU
109	Accipitriformes / Accipitridae	<i>Accipiter badius</i>	Shikra	Carnivore	AH	LC
110	Accipitriformes / Accipitridae	<i>Aquila fasciata</i>	Bonelli's Eagle	Scavenger	TH	LC
111	Accipitriformes / Accipitridae	<i>Neophron percnopterus</i>	Egyptian Vulture	Scavenger	TH	EN
112	Accipitriformes / Accipitridae	<i>Gyps bengalensis</i>	White-rumped Vulture	Piscivore	TH	CR
113	Accipitriformes / Pandionidae	<i>Pandion haliaetus</i>	Osprey	Omnivore	TH	LC
114	Galliformes / Phasianidae	<i>Francolinus pictus</i>	Painted Francolin	Omnivore	TH	LC
115	Galliformes / Phasianidae	<i>Francolinus pondicerianus</i>	Grey Francolin	Omnivore	AH	LC
116	Galliformes / Phasianidae	<i>Francolinus francolinus</i>	Black Francolin	Omnivore	TH	LC
117	Galliformes / Phasianidae	<i>Pavo cristatus</i>	Indian Peafowl	Omnivore	TH	LC
118	Charadriiformes / Burhinidae	<i>Burhinus indicus</i>	Indian Thick-knee	Carnivore	TH	LC
119	Charadriiformes / Glareolidae	<i>Glareola pratincola</i>	Collared Pratincole	Insectivore	AH	LC
120	Charadriiformes / Rostratulidae	<i>Rostratula benghalensis</i>	Greater Painted-snipe	Insectivore	AH	LC
121	Charadriiformes / Charadriidae	<i>Charadrius dubius</i>	Little Ringed Plover	Carnivore	AH	LC
122	Passeriformes / Alaudidae	<i>Mirafra erythroptera</i>	Indian Bushlark	Omnivore	TH	LC
123	Passeriformes / Alaudidae	<i>Eremopterix griseus</i>	Ashy-crowned Sparrow Lark	Omnivore	TH	LC
124	Passeriformes / Alaudidae	<i>Galerida cristata</i>	Crested Lark	Omnivore	TH	LC
125	Passeriformes / Hirundinidae	<i>Petrochelidon fluvicola</i>	Streak-throated Swallow	Insectivore	TH	LC
126	Passeriformes / Hirundinidae	<i>Riparia chinensis</i>	Grey-throated Martin	Insectivore	AH	LC
127	Passeriformes / Hirundinidae	<i>Hirundo rustica</i>	Barn Swallow	Insectivore	TH	LC
128	Passeriformes / Hirundinidae	<i>Hirundo smithii</i>	Wire-tailed Swallow	Insectivore	TH	LC
129	Passeriformes / Motacillidae	<i>Motacilla maderaspatensis</i>	White-browed Wagtail	Insectivore	AH	LC
130	Passeriformes / Motacillidae	<i>Motacilla alba</i>	White Wagtail	Insectivore	AH	LC
131	Passeriformes / Motacillidae	<i>Motacilla citreola</i>	Citrine Wagtail	Insectivore	AH	LC
132	Passeriformes / Motacillidae	<i>Motacilla flava</i>	Western Yellow Wagtail	Insectivore	AH	LC
133	Passeriformes / Motacillidae	<i>Motacilla cinerea</i>	Grey Wagtail	Insectivore	TH	LC
134	Passeriformes / Motacillidae	<i>Anthus rufulus</i>	Paddyfield Pipit	Omnivore	TH	LC
135	Passeriformes / Motacillidae	<i>Anthus hodgsoni</i>	Olive-backed Pipit	Insectivore	TH	LC
136	Passeriformes / Campephagidae	<i>Coracina macei</i>	Large Cuckooshrike	Insectivore	TH	LC
137	Passeriformes / Campephagidae	<i>Lalage melaschistos</i>	Black-winged Cuckooshrike	Insectivore	TH	LC
138	Passeriformes / Campephagidae	<i>Pericrocotus cinnamomeus</i>	Small Minivet	Insectivore	TH	LC
139	Passeriformes / Campephagidae	<i>Pericrocotus ethologus</i>	Long-tailed Minivet	Insectivore	TH	LC
140	Passeriformes / Campephagidae	<i>Tephrodornis pondicerianus</i>	Common Woodshrike	Insectivore	TH	LC
141	Passeriformes / Aegithinidae	<i>Aegithina tiphia</i>	Common Iora	Insectivore	TH	LC
142	Passeriformes / Laniidae	<i>Lanius excubitor</i>	Great Grey Shrike	Carnivore	TH	LC
143	Passeriformes / Laniidae	<i>Lanius schach</i>	Long-tailed Shrike	Carnivore	TH	LC
144	Passeriformes / Laniidae	<i>Lanius vittatus</i>	Bay-backed Shrike	Carnivore	TH	LC
145	Passeriformes / Laniidae	<i>Lanius cristatus</i>	Brown Shrike	Carnivore	TH	LC
146	Passeriformes / Oriolidae	<i>Oriolus kundoo</i>	Indian Golden Oriole	Omnivore	TH	LC

147	Passeriformes / Oriolidae	<i>Oriolus xanthornus</i>	Black-hooded Oriole	Omnivore	TH	LC
148	Passeriformes / Dicruridae	<i>Dicrurus macrocercus</i>	Black Drongo	Insectivore	TH	LC
149	Passeriformes / Dicruridae	<i>Dicrurus leucophaeus</i>	Ashy Drongo	Insectivore	TH	LC
150	Passeriformes / Dicruridae	<i>Dicrurus caerulescens</i>	White-bellied Drongo	Insectivore	TH	LC
151	Passeriformes / Rhipiduridae	<i>Rhipidura albicollis</i>	White-throated Fantail	Insectivore	TH	LC
152	Passeriformes / Rhipiduridae	<i>Rhipidura aureola</i>	White-browed Fantail	Insectivore	TH	LC
153	Passeriformes / Corvidae	<i>Corvus splendens</i>	House Crow	Omnivore	TH	LC
154	Passeriformes / Corvidae	<i>Corvus macrorhynchos</i>	Large-billed Crow	Omnivore	TH	LC
155	Passeriformes / Corvidae	<i>Dendrocitta vagabunda</i>	Rufous Treepie	Omnivore	TH	LC
156	Passeriformes / Paridae	<i>Parus cinereus</i>	Cinereous Tit	Omnivore	TH	LC
157	Passeriformes / Stenostiridae	<i>Culicicapa ceylonensis</i>	Grey-headed Canary-flycatcher	Insectivore	TH	LC
158	Passeriformes / Alaudidae	<i>Calandrella brachydactyla</i>	Greater Short-toed Lark	Omnivore	TH	LC
159	Passeriformes / Cisticolidae	<i>Cisticola juncidis</i>	Zitting Cisticola	Insectivore	TH	LC
160	Passeriformes / Cisticolidae	<i>Prinia socialis</i>	Ashy Prinia	Insectivore	TH	LC
161	Passeriformes / Cisticolidae	<i>Prinia inornata</i>	Plain Prinia	Insectivore	TH	LC
162	Passeriformes / Cisticolidae	<i>Prinia hodgsonii</i>	Grey-breasted Prinia	Insectivore	TH	LC
163	Passeriformes / Cisticolidae	<i>Prinia flaviventris</i>	Yellow-bellied Prinia	Insectivore	AH	LC
164	Passeriformes / Cisticolidae	<i>Orthotomus sutorius</i>	Common Tailorbird	Insectivore	TH	LC
165	Passeriformes / Acrocephalidae	<i>Acrocephalus stentoreus</i>	Clamorous Reed Warbler	Insectivore	TH	LC
166	Passeriformes / Acrocephalidae	<i>Acrocephalus dumetorum</i>	Blyth's Reed Warbler	Insectivore	TH	LC
167	Passeriformes / Acrocephalidae	<i>Acrocephalus agricola</i>	Paddyfield Warbler	Insectivore	TH	LC
168	Passeriformes / Acrocephalidae	<i>Acrocephalus melanopogon</i>	Moustached Warbler	Insectivore	TH	LC
169	Passeriformes / Locustellidae	<i>Megalurus palustris</i>	Striated Grassbird	Insectivore	TH	LC
170	Passeriformes / Hirundinidae	<i>Cecropis daurica</i>	Red-rumped Swallow	Insectivore	TH	LC
171	Passeriformes / Pycnonotidae	<i>Pycnonotus jocosus</i>	Red-whiskered Bulbul	Omnivore	TH	LC
172	Passeriformes / Pycnonotidae	<i>Pycnonotus cafer</i>	Red-vented Bulbul	Omnivore	TH	LC
173	Passeriformes / Phylloscopidae	<i>Phylloscopus collybita</i>	Common Chiffchaff	Insectivore	TH	LC
174	Passeriformes / Phylloscopidae	<i>Phylloscopus trochiloides</i>	Greenish Warbler	Insectivore	TH	LC
175	Passeriformes / Phylloscopidae	<i>Phylloscopus humei</i>	Hume's Warbler	Insectivore	TH	LC
176	Passeriformes / Phylloscopidae	<i>Phylloscopus griseolus</i>	Sulphur-bellied Warbler	Insectivore	TH	LC
177	Passeriformes / Phylloscopidae	<i>Phylloscopus affinis</i>	Tickell's Leaf Warbler	Insectivore	TH	LC
178	Passeriformes / Sylviidae	<i>Sylvia curruca</i>	Lesser Whitethroat	Insectivore	TH	LC
179	Passeriformes / Zosteropidae	<i>Zosterops palpebrosus</i>	Indian White-eye	Omnivore	TH	LC
180	Passeriformes / Timaliidae	<i>Turdoides striata</i>	Jungle Babbler	Omnivore	TH	LC
181	Passeriformes / Timaliidae	<i>Argya malcolmi</i>	Large Grey Babbler	Omnivore	TH	LC
182	Passeriformes / Timaliidae	<i>Argya earlei</i>	Striated Babbler	Omnivore	AH	LC
183	Passeriformes / Sittidae	<i>Sitta castanea</i>	Indian Nuthatch	Insectivore	TH	LC
184	Passeriformes / Sturnidae	<i>Sturnia pagodarum</i>	Brahminy Starling	Omnivore	TH	LC
185	Passeriformes / Sturnidae	<i>Sturnia malabarica</i>	Chestnut-tailed Starling	Omnivore	TH	LC
186	Passeriformes / Sturnidae	<i>Gracupica contra</i>	Indian Pied Starling	Omnivore	TH	LC
187	Passeriformes / Sturnidae	<i>Acridotheres ginginianus</i>	Bank Myna	Omnivore	TH	LC
188	Passeriformes / Sturnidae	<i>Acridotheres tristis</i>	Common Myna	Omnivore	TH	LC
189	Passeriformes / Turdidae	<i>Turdus unicolor</i>	Tickell's Thrush	Omnivore	TH	LC
190	Passeriformes / Turdidae	<i>Zoothera dauma</i>	Scaly Thrush	Omnivore	TH	LC
191	Passeriformes / Turdidae	<i>Geokichla citrina</i>	Orange-headed Thrush	Omnivore	TH	LC
192	Passeriformes / Muscicapidae	<i>Copsychus saularis</i>	Oriental Magpie Robin	Insectivore	TH	LC
193	Passeriformes / Muscicapidae	<i>Saxicoloides fulicatus</i>	Indian Robin	Insectivore	TH	LC
194	Passeriformes / Muscicapidae	<i>Luscinia svecica</i>	Bluethroat	Insectivore	TH	LC
195	Passeriformes /	<i>Monticola solitarius</i>	Blue Rock Thrush	Insectivore	TH	LC

	Muscicapidae					
196	Passeriformes / Muscicapidae	<i>Saxicola maurus</i>	Siberian Stonechat	Insectivore	TH	LC
197	Passeriformes / Muscicapidae	<i>Saxicola caprata</i>	Pied Bushchat	Insectivore	TH	LC
198	Passeriformes / Muscicapidae	<i>Oenanthe fusca</i>	Brown Rock Chat	Insectivore	TH	LC
199	Passeriformes / Muscicapidae	<i>Phoenicurus ochruros</i>	Black Redstart	Insectivore	TH	LC
200	Passeriformes / Muscicapidae	<i>Ficedula parva</i>	Red-breasted Flycatcher	Insectivore	TH	LC
201	Passeriformes / Muscicapidae	<i>Ficedula albicilla</i>	Taiga Flycatcher	Insectivore	TH	LC
202	Passeriformes / Muscicapidae	<i>Cyornis tickelliae</i>	Tickell's Blue Flycatcher	Insectivore	TH	LC
203	Passeriformes / Muscicapidae	<i>Eumyias thalassinus</i>	Verditer Flycatcher	Insectivore	TH	LC
204	Passeriformes / Muscicapidae	<i>Terpsiphone paradisi</i>	Indian Paradise Flycatcher	Insectivore	TH	LC
205	Passeriformes / Dicaeidae	<i>Dicaeum erythrorhynchos</i>	Pale-billed Flowerpecker	Frugivore	TH	LC
206	Passeriformes / Dicaeidae	<i>Dicaeum agile</i>	Thick-billed Flowerpecker	Frugivore	TH	LC
207	Passeriformes / Nectariniidae	<i>Cinnyris asiaticus</i>	Purple Sunbird	Nectarivore	TH	LC
208	Passeriformes / Chloropseidae	<i>Chloropsis jerdoni</i>	Jerdon's Leafbird	Frugivore	TH	LC
209	Passeriformes / Passeridae	<i>Passer domesticus</i>	House Sparrow	Omnivore	TH	LC
210	Passeriformes / Ploceidae	<i>Ploceus philippinus</i>	Baya Weaver	Granivore	TH	LC
211	Passeriformes / Estrildidae	<i>Lonchura punctulata</i>	Scaly-breasted Munia	Granivore	TH	LC
212	Passeriformes / Estrildidae	<i>Amandava amandava</i>	Red Avadavat	Granivore	TH	LC
213	Passeriformes / Estrildidae	<i>Euodice malabarica</i>	Indian Silverbill	Granivore	TH	LC
214	Passeriformes / Estrildidae	<i>Lonchura malabarica</i>	White-throated Munia	Granivore	TH	LC
215	Passeriformes / Fringillidae	<i>Carpodacus erythrinus</i>	Common Rosefinch	Omnivore	TH	LC
216	Psittaciformes / Psittaculidae	<i>Psittacula eupatria</i>	Alexandrine Parakeet	Frugivore	TH	NT
217	Psittaciformes / Psittaculidae	<i>Psittacula krameri</i>	Rose-ringed Parakeet	Frugivore	TH	LC
218	Psittaciformes / Psittaculidae	<i>Psittacula cyanocephala</i>	Plum-headed Parakeet	Frugivore	TH	LC
219	Upupiformes / Upupidae	<i>Upupa epops</i>	Common Hoopoe	Insectivore	TH	LC
220	Bucerotiformes / Bucerotidae	<i>Ocyrceros birostris</i>	Indian Grey Hornbill	Omnivore	TH	LC
221	Coraciiformes / Meropidae	<i>Merops orientalis</i>	Green Bee-eater	Insectivore	TH	LC
222	Coraciiformes / Coraciidae	<i>Coracias benghalensis</i>	Indian Roller	Insectivore	TH	LC
223	Columbiformes / Columbidae	<i>Streptopelia chinensis</i>	Spotted Dove	Insectivore	TH	LC
224	Passeriformes / Estrildidae	<i>Euodice malabarica</i>	Indian Silverbill	Granivore	TH	LC

Legend: LC = Least Concern, NT = Near Threatened, VU = Vulnerable, EN = Endangered, CR = Critically Endangered, AH= Aquatic Habitat, TH= Terrestrial Habitat

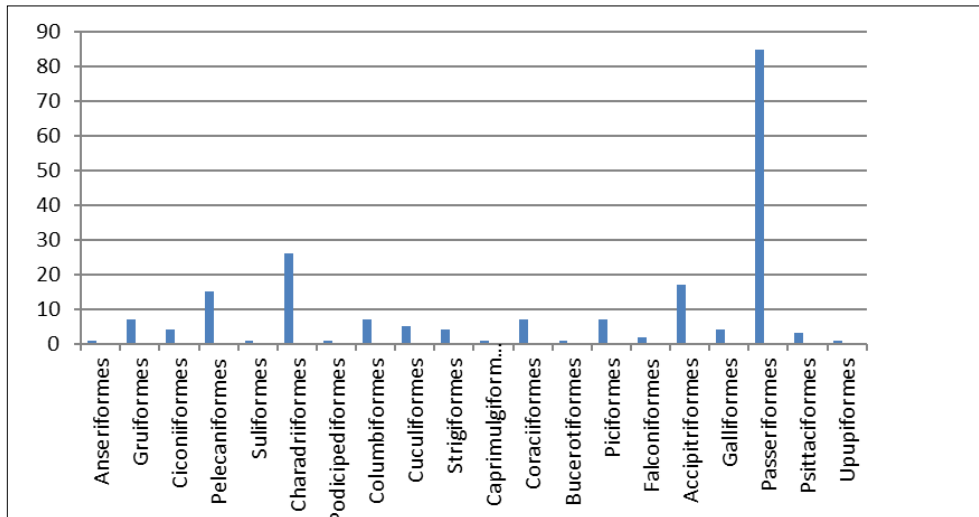
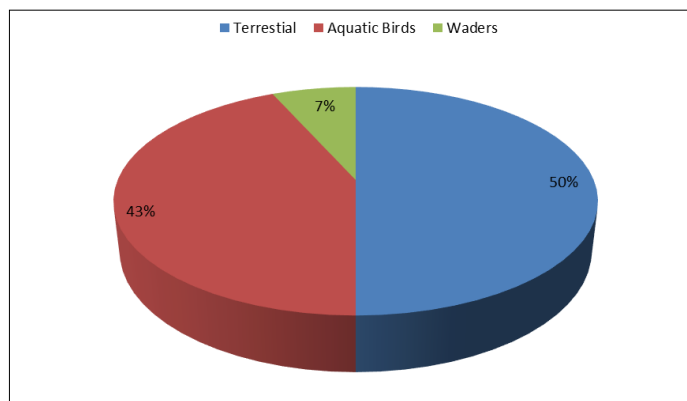


Fig 2: Order wise species composition of birds in NBS

**Table: 3** Birds of Nawabganj Bird Sanctuary According to Habitat

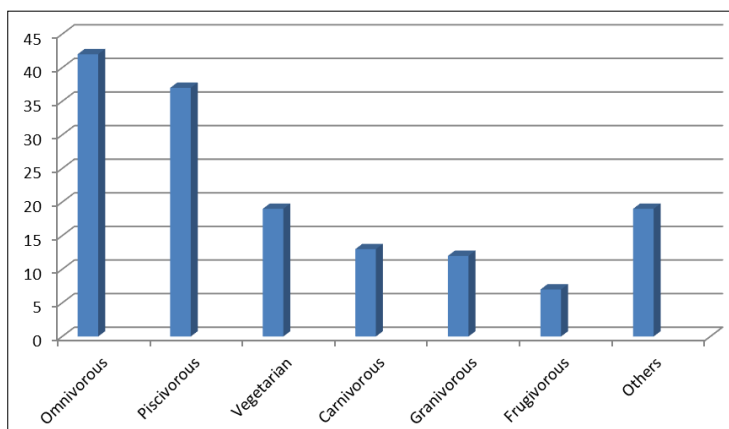
Habitat Category	Number of Species	Percentage of Total (224 Species)
Terrestrial Birds	112	50.00%
Aquatic Birds	97	43.30%
Waders	15	6.70%



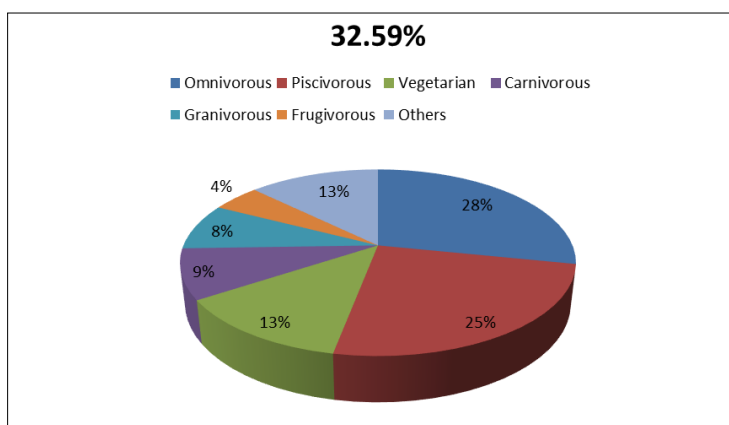
**Fig 3:** species composition of birds in NBS according to Habitat

**Table 4:** Birds of Nawabganj Bird Sanctuary According to Food Preference

Food Preference	Number of Species (Scaled to 224)	Percentage of Total
Insectivorous	73	32.59%
Omnivorous	42	18.75%
Piscivorous	37	16.52%
Vegetarian	19	8.48%
Carnivorous	13	5.80%
Granivorous	12	5.36%
Frugivorous	7	3.13%
Others	19	8.48%



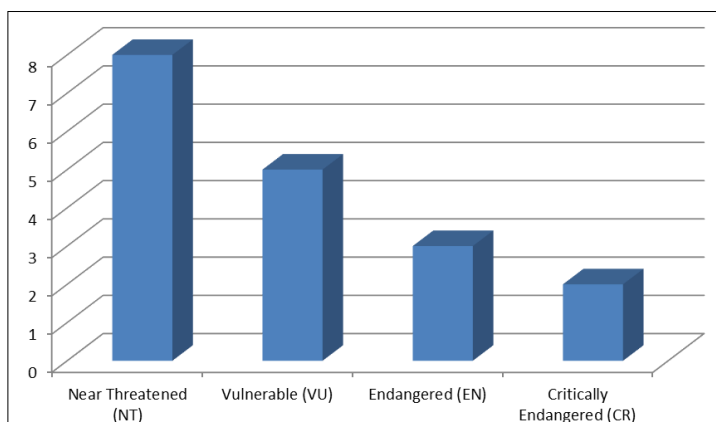
**Fig 4:** species composition of birds in NBS according to Food Preferences



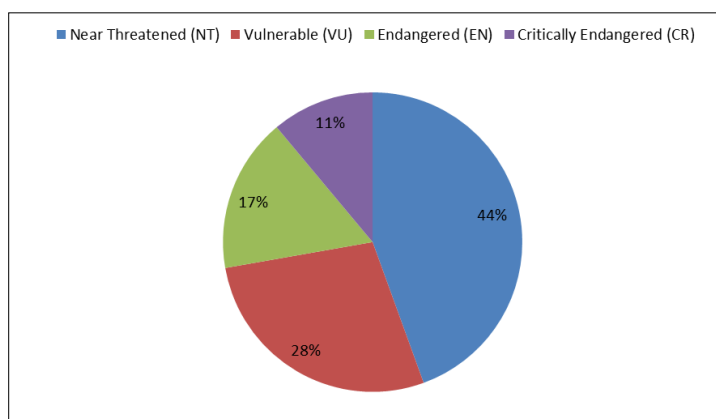
**Fig 5:** % composition of birds species in NBS according to Food Preferences

**Table 5:** Birds of Nawabganj Bird Sanctuary According to IUCN Status

IUCN Status	Number of Species	Percentage
Least Concern (LC)	206	91.96%
Near Threatened (NT)	8	3.57%
Vulnerable (VU)	5	2.23%
Endangered (EN)	3	1.34%
Critically Endangered (CR)	2	0.89%



**Fig 6:** species composition of birds in NBS according to IUCN Status



**Fig 7:** % composition of birds species in NBS according to IUCN Status

### Conclusion

This study establishes that Nawabganj Bird Sanctuary (NBS) supports a rich diversity of flora and fauna. As no published avifaunal checklist existed prior to this work, the findings provide a crucial baseline for future research and comparative studies. The preliminary survey highlights NBS as a significant biodiversity hub, and the baseline data generated will be essential for further investigation and conservation efforts. The results confirm that the sanctuary's current ecological status is favorable for sustaining bird populations. NBS serves as an important feeding and breeding ground for both migratory and resident birds, as well as supporting other faunal groups. A healthy bird population acts as a bioindicator of the wetland's ecological condition. The sanctuary's ecological value is closely tied to its floral and faunal diversity; future changes in species distribution, richness and abundance can be quantified to further assess this value and strengthen conservation initiatives.

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### Conflict of Interest Statement

The authors declare that they have no financial, personal, or professional conflicts of interest that could have influenced the research or the preparation of this manuscript. This study did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. The authors have no affiliation with the management authority of Nawabganj Bird Sanctuary (Uttar Pradesh Forest Department) that could be perceived as influencing the objectivity of the research.

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