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## Aquatic bird diversity in the Badwai Pond of Chittorgarh District of Rajasthan

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**Abstract-** Birds are the best indicator of environmental changes. The richness of bird diversity indicates the richness of habitat. Our survey was carried out to monitor aquatic bird diversity during the winter season when various migratory bird species arrive in Badwai pond. In this study, around 50 species were identified. Among these 3 species reported as threatened category, 5 species at the verge of threatened category and the rest come in a less concerned category. Identified species namely Bar-headed goose, Common Coot, Greater Flamingo, Common Pochard, Sarus crane, Eurasian Spoonbill, Black Ibis, etc. Some factors like climatic variability, the productivity of the environment, food availability, geographical status, habitat, invasive species, anthropogenic activity, etc. play an important role in species diversity and richness. The presence of different types of bird species depicts the richness of pond productivity. By taking some conservative steps this place can be developed as a better wetland.

**Key words:** Badwai, threatened, less concerned, richness, habitat, conservation

### INTRODUCTION

Birds that are ecologically dependent on wetlands are broadly defined as water birds.<sup>1</sup> These include various categories like seabirds, diving birds, shorebirds, waders, aquatic raptors, waterfowls, migratory birds, etc. Changes in their population, behavior, and reproductive ability are mostly used to study the long-term effects of habitat changes.<sup>2</sup> Birds that migrate from one habitat to another to breed and feed are called migratory birds. Some birds migrate during the breeding season; some migrate on the availability of food resources and some on the change of season.

Approximately 1300 species of bird are found in the Indian subcontinent, among these around 310 species are wetland-dependent birds found in India, and half of these

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are migratory birds.<sup>3</sup> Wetland birds contain about 10% of the globally threatened species and 20% of Asian threatened species.<sup>4</sup> Many species are close to extinction through disturbance or loss of their habitats, as well as through intensive searching pressure.<sup>5</sup> The majority of the wetland species within the Indian subcontinent are not unusual and a quarter (24%) is rare. Of which, 34 are globally threatened species, 34 are critically endangered and one is conservation structured.<sup>6</sup>

Chittorgarh is well known as a city of pride and honor and the best tourist destination in the country. There are many water bodies in the Chittorgarh district, out of which Badwai and Kishan Kareri ponds are very famous for their enriched habitat and biodiversity as many water bird species migrate here in different seasons. This is the first scientific study of the bird diversity at Badwai pond to understand the present status and the conservation measures that need to be done in future years.

**Study Area**



**Figure 1: GIS map of study area created by using google earth application**



**Figure 2: Camera picture of studied water body**

The studied water body Badwai pond is situated near Badwai village which comes in the Chittorgarh district. This pond is located on the boundary line of Udaipur and Chittorgarh district, which is about 65 km from Udaipur and about 70km from Chittorgarh at 24°29'34" N and 74°15' 06" E at the elevation of 481 m with a perimeter of around 2.41 km and surface area of around 0.36 km<sup>2</sup>. Rainwater is the main source of water for such vegetation and avian diversity. There is a man-made island in the

middle of the pond, on which various types of vegetation are there, which are used as food and as a residence by different bird species.

**MATERIALS & METHODS**

The study was carried out for a period of 4 months from December 2021 to March 2022. The data was collected by continuous observation and bird watching by walking on fixed routes. Almost all possible places were thoroughly searched for birds and birds were identified with the help of a colored field guide. The maximum number of aquatic birds were observed during the morning (7:00 am to 10:00 am) and evening (4:00 pm to 6:00 pm) hours. On most occasions, the pond and surrounding area were surveyed during the day hours. The birds were identified through naked eyes and with the help of binoculars (10 x 50) and digital cameras (Sony alpha 58) were used to capture the pictures of birds. The information like bird species, their behaviors, their numbers, and other activities was written down in a notebook. The status of birds as residential or migratory has been denoted by R and M respectively. Similarly, according to the red list category of the International Union for Conservation of Nature<sup>7</sup> (IUCN), the status of birds has also been denoted as vulnerable (VU), near threatened (NT), and least concerned (LC) category.

**RESULTS & DISCUSSION**

In the study total number of 52 aquatic bird species were identified which belong to 16 families. The species of family Phasianidae, Anatidae, Podicipididae, Pheonicopteridae, Ardeidae, Ciconiidae, Threskiornithidae, Pelecanidae, Cruidae, Burhinidae, Recurvirostridae, Charadriidae, Scolopacidae, Laridae, Aledinidae, Rallidae were found at the study site.

Nearly 250 species of birds are known to be highly dependent on freshwater habitats out of which a large proportion (60%) belongs to a single family Anatidae, which comprises ducks, geese, and swans.<sup>8</sup> Wading birds such as sandpipers (Scolopacidae), plovers (Charadriidae), herons and bitterns (Ardeidae), and another diverse assemblage of families are also associated with inland freshwater habitats.<sup>9</sup>

There are many trees around this pond and a man-made island right in the middle, on which these birds get shelter and utilize it as a perch site. Moreover, the factors such as food source availability, an abundance of

zooplankton, and phytoplankton in the water, amount of vegetation, natural habitat, predators, seasonal changes, less anthropogenic activities, etc. affect adequate bird diversity

in any waterbody, therefore this pond and the surrounding area fulfill all of these, hence the diversity of all these types of bird species is seen here.

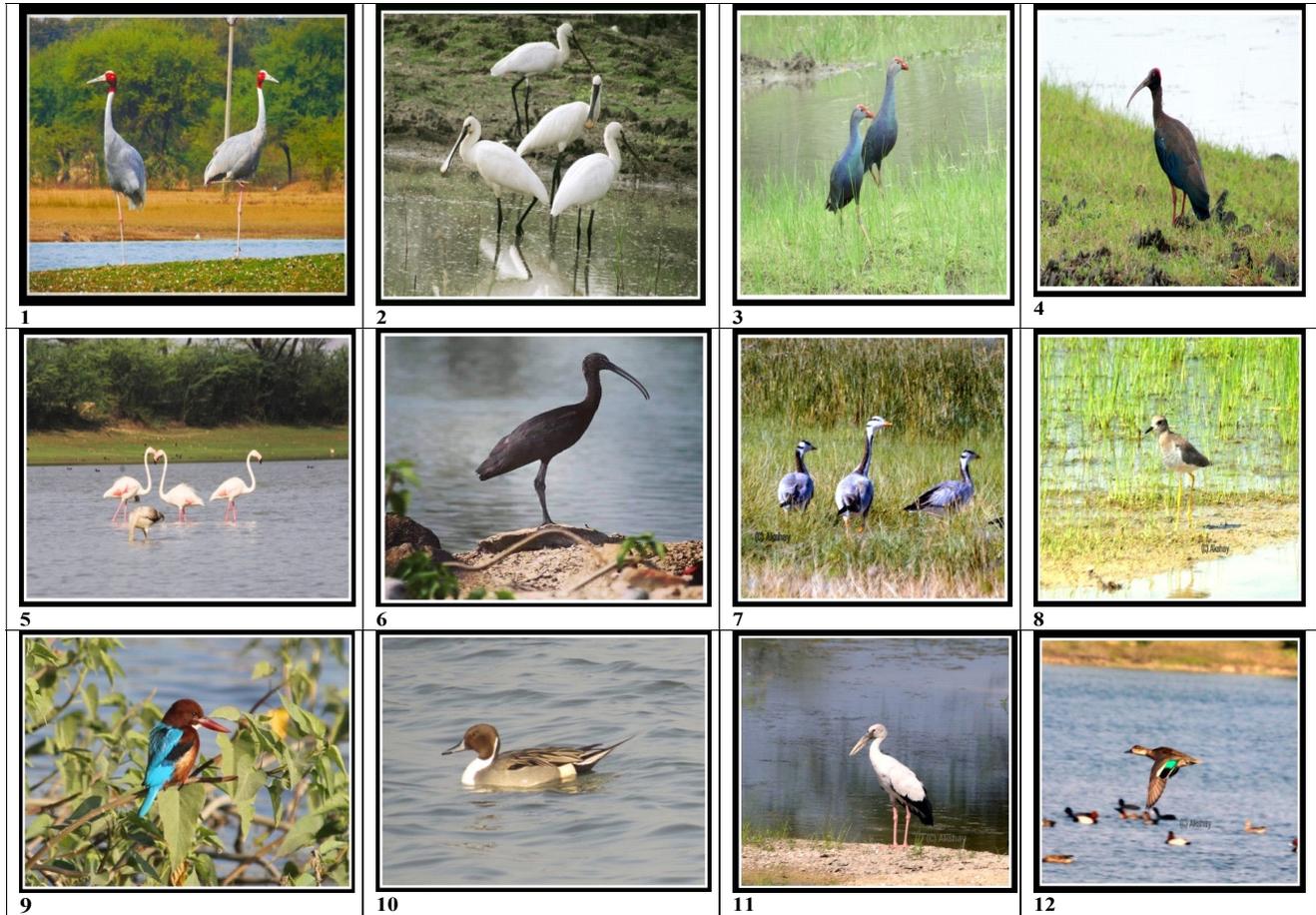


Figure 3:- 1. Sarus Crane; 2.Eurasian spoonbill; 3.Western Swamphen; 4. Red Naped Ibis; 5. Greater Flamingo; 6. Glossy Ibis; 7. Bar-headed Goose; 8. White Tailed Lapwing; 9. White Throated Kingfisher; 10.Pintail; 11. Asian Open bill; 12.Green Winged Hen

Table 1: Status of Identified Aquatic Bird at Badwai Pond

S.No.	Common Name	Scientific Name	Status (R/M)	IUCN Status (VU/NT/LC)
<b>Family 1:Phasianidae</b>				
1	Grey Francolin	<i>Francolinus pondicerianus</i>	R	LC
<b>Family 2:Anatidae</b>				
2	Bar-headed goose	<i>Anser indicus</i>	M	LC
3	Ruddy shelduck	<i>Tadorna ferruginea</i>	M	LC
4	Gadwall	<i>Anas strepera</i>	M	LC
5	Northern shoveler	<i>Anas clypeata</i>	M	LC
6	Northern Pintail	<i>Anas acuta</i>	M	LC
7	Common Teal	<i>Anas crecca</i>	M	LC
8	Eurasian Wigeon	<i>Anas penelope</i>	M	LC
9	Common Pochard	<i>Aythya ferina</i>	M	VU
10	Tufted Duck	<i>Aythya fuligula</i>	M	LC

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<b>Family 3: Podicipididae</b>				
11	Little Grebe	<i>Tachybaptus ruficollis</i>	R	LC
<b>Family 4: Pheonicopteridae</b>				
12	Greater Flamingo	<i>Phoenicopterus roseus</i>	M	LC
<b>Family 5: Ardeidae</b>				
13	Little Egret	<i>Egretta garzetta</i>	R	LC
14	Cattle Egret	<i>Bubulcus ibis</i>	M	LC
15	Intermediate Egret	<i>Mesophoyx intermedia</i>	R	LC
16	Great Egret	<i>Casmerodius albus</i>	M	LC
17	Indian Pond Heron	<i>Ardeola greyii</i>	R	LC
18	Grey Heron	<i>Ardea cineria</i>	R	LC
19	Purple Heron	<i>Ardea purpurea</i>	M	LC
<b>Family 6: Ciconiidae</b>				
20	Painted Stork	<i>Mycteria leucocephala</i>	M	NT
21	Asian Openbill	<i>Anastomus oscitans</i>	M	LC
22	Woolly Necked Stork	<i>Ciconia episcopus</i>	M	NT
<b>Family 7: Threskiornithidae</b>				
23	Glossy Ibis	<i>Plegadis falcinellus</i>	M	LC
24	Black Ibis	<i>Pseudibis papillosa</i>	M	LC
25	Black Headed Ibis	<i>Threskiornis melanocephalus</i>	M	NT
26	Eurasian Spoonbill	<i>Platalea leucorodia</i>	M	LC
<b>Family 8 : Pelecanidae</b>				
27	Great White Pelican	<i>Pelecanus onocrotalus</i>	M	LC
<b>Family 9: Gruidae</b>				
28	Sarus Crane	<i>Grus antigone</i>	R	VU
<b>Family 10: Burhinidae</b>				
29	Great Thicknee	<i>Esacus recurvirostris</i>	R	NT
<b>Family 11: Recurvirostridae</b>				
30	Black Winged Stilt	<i>Himantopus himantopus</i>	M	LC
<b>Family 12: Charadriidae</b>				
31	Little Ringed Plover	<i>Charadrius dubius</i>	M	LC
32	Kentish Plover	<i>Charadrius alexandrinus</i>	M	LC
33	Red Wattled Lapwing	<i>Vanellus indicus</i>	R	LC
34	Yellow Wattled Lapwing	<i>Vanellus malabaricus</i>	R	LC
35	White Tailed Lapwing	<i>Vanellus leucurus</i>	M	LC
<b>Family 13 : Scolopacidae</b>				
36	Common Snipe	<i>Gallinago gallinago</i>	M	LC
37	Black Tailed Godwit	<i>Limosa limosa</i>	M	NT
38	Spotted Redshank	<i>Tringa erythropus</i>	M	LC
39	Common Sandpiper	<i>Actitis hypoleucos</i>	M	LC
40	Marsh Sandpiper	<i>Tringa stagnatilis</i>	M	LC
41	Green Sandpiper	<i>Tringa ochropus</i>	M	LC
42	Wood Sandpiper	<i>Tringa glareola</i>	M	LC
43	Ruff	<i>Philomachus pugnax</i>	M	LC
44	Little Stint	<i>Calidris minuta</i>	M	LC
<b>Family 14: Laridae</b>				
45	River Tern	<i>Sterna aurantia</i>	R	VU
<b>Family 15: Alcedinidae</b>				
46	Common Kingfisher	<i>Alcedo atthis</i>	M	LC
47	White Breasted Kingfisher	<i>Halcyon smyrnensis</i>	R	LC
48	Pied Kingfisher	<i>Ceryle rudis</i>	R	LC
<b>Family 16: Rallidae</b>				
49	Common Moorhen	<i>Gallinula chloropus</i>	R	LC
50	White Breasted Waterhen	<i>Amaurornis peoenicurus</i>	R	LC
51	Common Coot	<i>Fulica atra</i>	R	LC
52	Grey Headed Swamphen	<i>Porphyrio poliocephalus</i>	R	LC

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