



CONSERVATION STATUS OF AVIAN FAUNA AT GAJNER WILDLIFE SANCTUARY, BIKANER(RAJASTHAN)

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Abstract:

Gajner Wildlife Sanctuary, located in the Bikaner district of Rajasthan, India, is a significant ecological site renowned for its rich avian diversity. This research paper aims to explore the variety of bird species inhabiting the sanctuary, their ecological roles, conservation status, and the impact of environmental factors on their populations. The sanctuary serves as a critical refuge for migratory and resident birds, with notable species such as the Indian Courser, Black Ibis, and various waterfowl. This study utilizes field observations, bird surveys, and literature reviews to provide insights into the sanctuary's avifaunal richness and its role in sustaining avian populations in the arid region of Rajasthan.

The findings highlight the importance of Gajner Sanctuary as a habitat for avifauna and propose conservation strategies to protect these species.

Keywords: Avian diversity, conservation, migratory birds, species, status, habitat

Introduction

Birds are most beautiful creation of nature. Birds are warm blooded vertebrates belonging to phylum chordate and class Aves having pneumatic bones and presence of air bladder, splendor shape body with presence of wings which are covered with feather are adaptations which makes capable for flight. Migration is a part of bird's life cycle as well as part of biological clock.

Migratory birds are vital for ecosystem services, including pollination and pest control. Gajner Lake, a man-made reservoir within the sanctuary, serves as an oasis for migratory species escaping harsh winters in Central Asia

and Siberia. Despite its ecological importance, habitat degradation and human activities threaten this biodiversity hotspot.

This research paper aims to provide a thorough examination of the various bird species found within the sanctuary, their ecological roles, behavior patterns, and conservation status. By synthesizing existing literature and conducting field observations, this study sheds light on the importance of Gajner Sanctuary as a critical habitat for numerous bird species.

Study area

The Gajner wildlife sanctuary lies 33 Km, South West of Bikaner, Rajasthan, at 27°57` N latitude, 73°03` E longitude and at about 233 m above MSL altitude covering a total area of 38 Km² (Fig:1). The name Gajner sanctuary is derived from village Gajner. The palace and artificial lake were developed by Maharaja Gaj Singh Ji (18th century). The Gajner sanctuary having three fresh water bodies (Plate 1). First one is Gaj Sagar lake biggest lake which is used by wildlife and second is Chunda Sagar lake opposite from Gaj Sagar lake which is used by villagers and as well as animals, and third lake is Sajjan Sagar lakes (Fig: 2). The climate conditions of the study area is typically hot and arid, characterized by extreme high and low temperatures during summer and winter respectively. The annual rainfall varies between 200 to 400 mm. The minimum temperature varies between -1° to 5.6°C and the maximum temperature ranges between 40°C to 47.7°C. The sanctuary is covered with dense, scrub forest, xerophytes, thorny, herbs, shrubs, grasses stunted and sparse trees.



Fig. 1: Location map of the study area Gajner

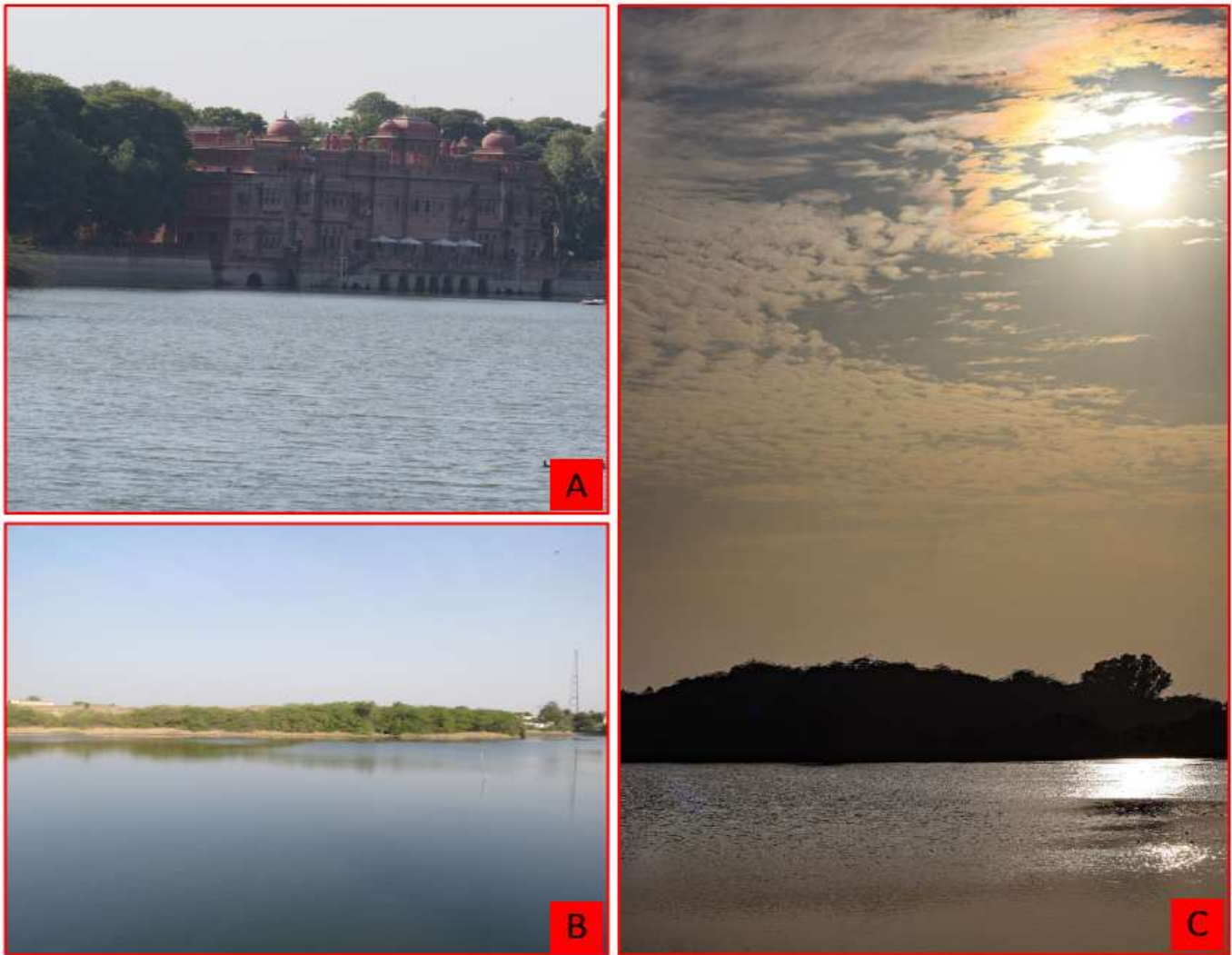


Plate 1: A- Gaj Sagar Lake B- Chunda Sagar Lake C- Sajjan Sagar Lake

Methods and methodology

To find out the distribution pattern, of avian fauna in and outside protected area of the Gajner wild life sanctuary, a survey was conducted from October 2024 to till March 2025. Four visits in a month and 6 visits during migration period. The birds were observed at early in morning when they start their day schedule activity from three lakes and nearby area. Observation was taken from sikaar posts without disturbing any wildlife. Canon 50HS digital camera, 10X50 binoculars(Nikon) and Sony handycam were used for the photography and videography of birds. The birds sighted during present investigations were identified and classified with the help of field guides, E-bird records and conservation reports.

Result and discussion

The Gajner Wildlife sanctuary harboring wide diversity of avian fauna. The following species of birds are observed during study period at study area. (Plate 2,3).

Table: 1 List of birds observed at study area

Sr. No.	Common Name	Scientific Name	I.U.C.N Status	Spotted At
1.	Asian Desert warbler	<i>Curruca nana</i>	LC	Outside Gaj Sagar Lake
2.	Asian koel	<i>Eudynamys scolopaceus</i>	LC	Outside Gaj Sagar Lake
3.	Bar-Headed Goose	<i>Anser indicus</i>	LC	Gaj Sagar Lake
4.	Black Catbird	<i>Melanoptila glabrirostris</i>	LC	Around Gaj sagar
5.	Black-Crowned Night Heron	<i>Nycticorax nycticorax</i>	LC	Gaj Sagar Lake
6.	Black-Headed Ibis	<i>Threskiornis melanocephalus</i>	NT	Chunda Sagar and Sajjan Sagar.
7.	Black-necked Grebe	<i>Podiceps nigricollis</i>	LC	Gaj Sagar Lake
8.	Black-winged Stilt	<i>Himantopus himantopus</i>	LC	Sajjan Sagar
9.	Blue-throated barbet	<i>Psilopogon asiaticus</i>	LC	Near Sabnam Mahal
10.	Cattle Egret	<i>Bubulcus ibis</i>	LC	Chunda Sagar Lake, Gaj Sagar
11.	Citrine Wagtail	<i>Motacilla citreola</i>	LC	Chunda Sagar Lake
12.	Common Babbler	<i>Turdoides caudata</i>	LC	Around Gajner Palace
13.	Common Crane	<i>Grus grus</i>	LC	Sajjan Sagar, Gaj Sagar
14.	Common House Martin	<i>Delichon arabicum</i>	LC	Around Gajner Palace
15.	Common Kingfisher	<i>Alcedo atthis</i>	LC	Gaj Sagar Lake
16.	Common Moorhen	<i>Gallinula chloropus</i>	LC	Chunda Sagar Lake, Gaj Sagar
17.	Common Pochard	<i>Aythya ferina</i>	VU	Gaj Sagar Lake
18.	Common Sandgrouse	<i>Pterocles exustus</i>	LC	Between Gaj sagar to Chunda sagar
19.	Common Snipe	<i>Gallinago gallinago</i>	LC	Near Sabnam Mahal
20.	Common tailorbird	<i>Orthotomus sutorius</i>	LC	Near Sabnam Mahal
21.	Common Teal	<i>Anas crecca</i>	LC	Gaj Sagar Lake
22.	Common woodshrike	<i>Tephrodornis pondicerianus</i>	LC	Near Sabnam Mahal
23.	Coppersmith Barbet	<i>Psilopogon haemacephalus</i>	LC	Near Sabnam Mahal
24.	Cream-coloured Courser	<i>Cursorius cursor</i>	UC	GWLS
25.	Curlew sandpiper	<i>Calidris ferruginea</i>	VU	Outside Gaj Sagar lake
26.	Demoiselle Crane	<i>Grus virgo</i>	LC	Sajjan Sagar, Gaj Sagar
27.	Egyptian Vulture	<i>Neophron percnopterus</i>	EN	GWLS

28.	Eurasian Coot	<i>Fulica atra</i>	LC	Chunda Sagar Lake, Gaj Sagar
29.	Eurasian hoopoe	<i>Upupa epops</i>	LC	Near Sabnam Mahal
30.	Eurasian Spoonbill	<i>Platalea leucorodia</i>	LC	Chunda Sagar Lake, Gaj Sagar Lake
31.	Eurasian Wigon	<i>Mareca Penelope</i>	LC	Chunda Sagar Lake, Gaj Sagar Lake
32.	Eurasian wryneck	<i>Jynx torquilla</i>	LC	Gaj Sagar to Chunda Sagar
33.	European Roller	<i>Coracias garrulous</i>	LC	Gaj Sagar to Chunda Sagar
34.	Gadwall	<i>Mareca strepera</i>	L.C	Gaj Sagar Lake
35.	Garganey	<i>Spatula querquedula</i>	LC	Gaj Sagar Lake
36.	Great tit	<i>Parus major</i>	LC	Near Sabnam Mahal
37.	Greater Cormorant	<i>Phalacrocorax carbo</i>	LC	Chunda Sagar Lake , Gaj Sagar Lake
38.	Greater Egret	<i>Casmerodius albus</i>	LC	Gaj Sagar Lake
39.	Green Sandpiper	<i>Tringa ochropus</i>	UC	Gaj Sagar Lake
40.	Grey Francolin	<i>Francolinus pondicerianus</i>	LC	Gaj Sagar Lake
41.	Grey Heron	<i>Ardea cinerea</i>	LC	Gaj Sagar Lake and Chunda Sagar Lake
42.	Grey Wagtail	<i>Motacilla cinerea</i>	LC	Gaj Sagar Lake
43.	Imperial Sandgrouse	<i>Pterocles orientalis</i>	LC	Gaj Sagar Lake
44.	Indian Cormorant	<i>Phalacrocoax fuscicollis</i>	LC	Chunda Sagar Lake, Gaj Sagar Lake
45.	Indian Courser	<i>Cursorius coromandelicus</i>	LC	Outside Gaj Sagar lake
46.	Indian Peafowl	<i>Pavo cristatus</i>	LC	Gaj Sagar Lake.
47.	Indian Pond-Heron	<i>Ardeola grayii</i>	LC	Gaj Sagar Lake, Chunda Sagar Lake and Sajjan Sagar Lake
48.	Indian Silverbill	<i>Lonchura malabarica</i>	LC	GWLS
49.	Indian Spotted Eagle	<i>Aquila hastate</i>	VU	Gaj Sagar Lake
50.	Indian Stonechat	<i>Saxicolamaurus indicus</i>	LC	Near Gajner Place Garden
51.	Indian Thick-knee	<i>Burhinus indicus</i>	LC	Sajjan Sagar Lake and Gaj Sagar Lake
52.	Indian Treepie	<i>Rufous treepie</i>	LC	Gaj Sagar Lake
53.	Jungle Babbler	<i>Turdoides striata</i>	LC	Around Gajner Palace
54.	Kentish Plover	<i>Charadrius alexandrines</i>	LC	Gaj Sagar Lake
55.	Knob-billed duck	<i>Sarkidiornis melanotos</i>	LC	Gaj Sagar Lake
56.	Laggar falcon	<i>Falco jugger</i>	UC	GWLS
57.	Lasser whitethroat	<i>Sylvia curruca</i>	LC	Near Sabnam Mahal

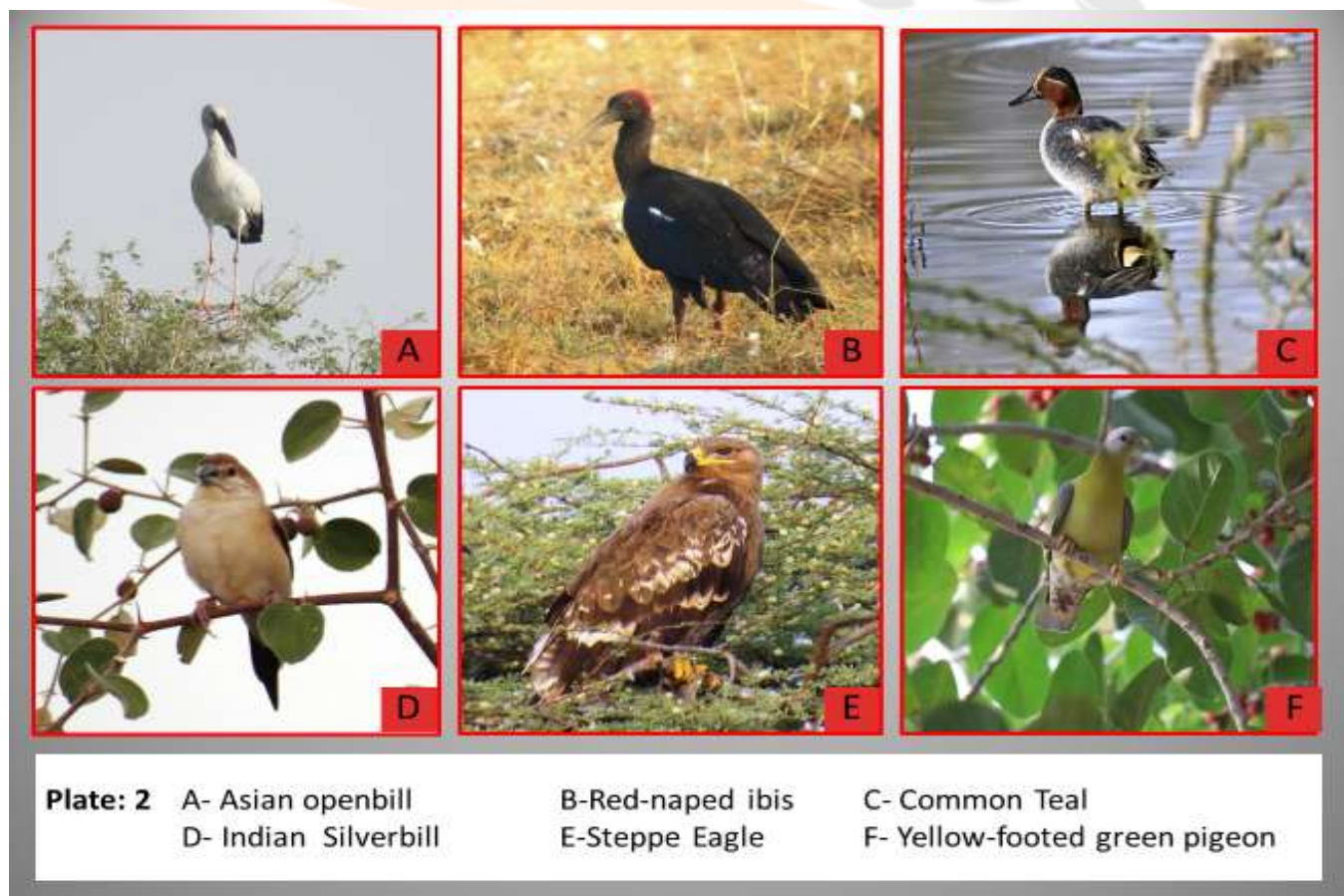
	(Hume's)			
58.	Lesser Pied Kingfisher	<i>Ceryle rudis</i>	LC	Gaj Sagar Lake
59.	Little Cormorant	<i>Phalacrocorax niger</i>	LC	Chunda Sagar Lake, Gaj Sagar
60.	Little Egret	<i>Egretta garzetta</i>	LC	Gaj Sagar
61.	Little Grebe	<i>Tachybaptus ruficollis</i>	LC	Chunda Sagar Lake, Gaj Sagar Lake
62.	Little Ringed Plover	<i>Charadrius dubius</i>	LC	Gaj Sagar Lake
63.	Little swift	<i>Apus affinis</i>	LC	Near Sabnam Mahal
64.	Long tailed shrike	<i>Lanius schach</i>	LC	Near Sajjan Sagar Lake
65.	Mallard	<i>Anas platyrhynchos</i>	L.C	Gaj Sagar Lake
66.	Marsh sandpiper	<i>Tringa stagnatilis</i>	LC	Gaj Sagar Lake
67.	Northern Lapwing	<i>Vanellus vanellus</i>	NT	Chunda Sagar, Gaj sagar
68.	Northern Pintail	<i>Anas acuta</i>	L.C	Gaj Sagar Lake
69.	Northern shoveler	<i>Spatula clypeata</i>	L.C	Gaj Sagar Lake
70.	Oriental darter	<i>Anhinga melanogaster</i>	LC	Gaj Sagar Lake
71.	Oriental Magpie-Robin	<i>Copsychus saularis</i>	LC	Near Sabnam Mahal
72.	Painted sandgrouse	<i>Pterocles indicus</i>	LC	Barren land of GWLS
73.	Painted stork	<i>Mycteria leucocephala</i>	LC	Gaj Sagar Lake
74.	Pheasant-tailed Jacana	<i>Hydrophasianus chirurgus</i>	LC	Gaj Sagar lake
75.	Pied Avocet	<i>Recurvirostra avosetta</i>	LC	Sajjan Sagar, Gaj Sagar Lake
76.	Plain Prinia	<i>Prinia inoranta</i>	LC	GWLS
77.	Red-crested Pochard	<i>Netta rufina</i>	LC	Gaj Sagar Lake
78.	Red-naped ibis	<i>Pseudibis papillosa</i>	LC	Gaj Sagar , Chunda Sagar and Sajjan Sagar Lake
79.	Red-wattled Lapwing	<i>Vanellus indicus</i>	LC	All Water bodies
80.	River tern	<i>Sterna aurantia</i>	NT	Gaj Sagar Lake
81.	Rosy Starling	<i>Pastor roseus</i>	LC	Near Sajjan Sagar
82.	Ruddy shelduck	<i>Tadorna ferruginea</i>	LC	Gaj Sagar Lake
83.	Rufous-fronted Prinia	<i>Prinia buchanani</i>	LC	Gaj Sagar to Chunda Sagar
84.	Sociable Lapwing	<i>Vanalus gregarius</i>	CR	Gaj Sagar Lake
85.	Spanish sparrow	<i>Passer hispaniolensis</i>	LC	Near Sajjan sagar Lake
86.	Spot-billed Duck	<i>Anas poecilorhyncha</i>	LC	South Part Of Gaj Sagar Lake
87.	Spotted sandgrouse	<i>Pterocles senegallus</i>	LC	Barren land of GWLS
88.	Striated Heron	<i>Butorides striata</i>	LC	Gaj Sagar Lake
89.	Tawny Pipit	<i>Anthus campestris</i>	LC	Chunda Sagar and Sajjan Sagar Lake
90.	Tufted duck	<i>Aythya fuligula</i>	LC	Gaj Sagar Lake
91.	White Stork	<i>Ciconia ciconia</i>	LC	Gaj Sagar Lake
92.	White wagtail	<i>Motacilla alba</i>	LC	Gaj Sagar Lake
93.	White-breasted Kingfisher	<i>Halcyon smyrnensis</i>	LC	Gaj Sagar Lake

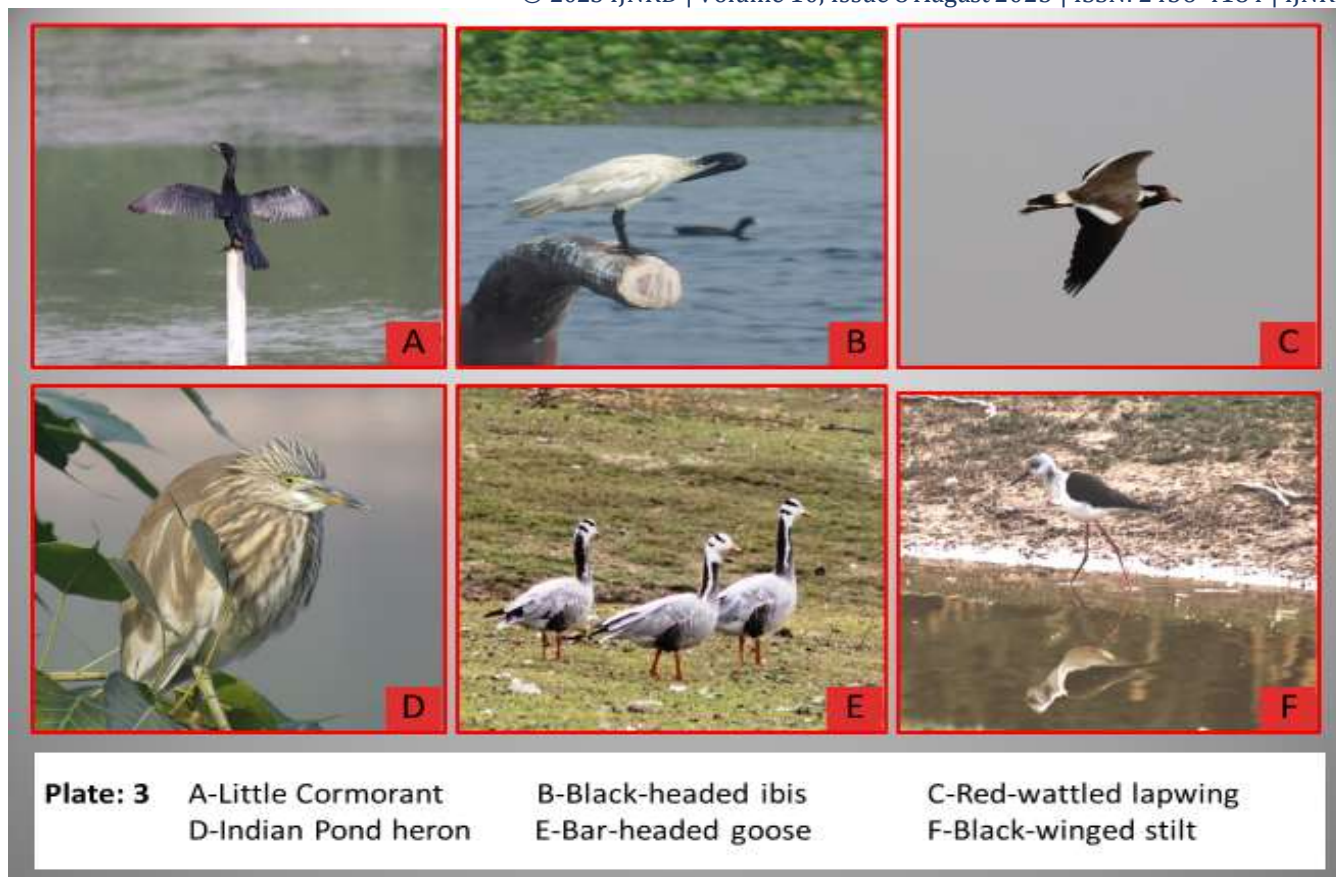
94.	White-eared bulbul	<i>Pycnonotus leucotis</i>	LC	Near Sajjan Sagar Lake
95.	Wire-tailed swallow	<i>Hirundo smithii</i>	LC	Gaj Sagar to Chunda Sagar Lake
96.	Yellow-eyed pigeon	<i>Columba eversmanni</i>	VU	Around Gajner Palace
97.	Yellow-footed Green Pigeon	<i>Treron phoenicopterus</i>	LC	Gaj Sagar Lake
98.	Yellow-wattled Lapwing	<i>Vanellus malabaricus</i>	LC	Gaj Sagar , Chunda Sagar , Sajjan Sagar Lake

I.U.C.N. Status: LC = Least Concern VU = Vulnerable UC = Uncommon
 NT = Near threatened CR= Critically Endangered EN=Endangered

A total of 98 bird species were observed during the survey period in the study area out of which many migrated from other places to here. The bird species belonged to various IUCN statuses, highlighting the importance of the region for bird conservation. The maximum number of bird species 67 was reported from Gaj Sagar lake as it is guarded area and least disturbed area for birds, while from Chunda Sagar lake 22 species was reported and from Sajjan Sagar lake only 14 species of birds were reported as this waterbody has high human interference and other activities.

The presence of critically endangered and endangered species highlights the need for urgent conservation action to protect these species and their habitats. The study area provides critical habitat for many bird species, and conservation efforts should focus on protecting and managing these habitats.





Threats to Avian Fauna

The bird's species in Gajner Sanctuary face numerous threats that impact their conservation status:

- 1. Habitat Destruction:** Pollution, agricultural expansion, and urban development exacerbate habitat loss and degradation, negatively impacting wetlands and nesting areas crucial for these birds.
- 2. Climate Change:** Changes in weather patterns can disrupt migration routes and timing, causing mismatches between the availability of food resources and the breeding cycle of migratory species.
- 3. Human Disturbance:** Increased human activity, including tourism and local community practices, can lead to disturbances during critical breeding and feeding periods, affecting the survival rates of these birds.
- 4. Water Management Issues:** Changes in water availability, from both natural and human-induced factors, can lead to inadequate wetland conditions that affect food availability for migrating species.

Conservation action

To prevent declining bird population (resident and migratory avian fauna) following conservation action should be implemented.

- 1. Habitat conservation** – Protect and restore the natural habitat and shrub land or grass land at around GWLS.
- 2. Reduce human impact in sanctuary** – Minimize human or (tourist) disturbance in sensitive zones of study area.
- 3. Limiting infrastructure development** - Carefully plan and execute infra structure project with the help of ecologist and ornithologist to minimize harm to faunal, floral and avian diversity near and around study area.
- 4. Community Engagement** - Involve local communities in conservation effort through educational awareness.
- 5. Research and Monitoring** – Continuously monitor bird population and conduct research to better understand the impact of industrial and human disturbance or climate change.

References

1. Ali Salim, Ripley and S. Dillon 1987. Compact handbook of the birds of India and Pakistan. Bombay Natural History Society.
2. Bhandari, M.M. (1990). Flora of the Indian Desert (2nd ed.). MPS Repros, Jodhpur.
3. Bissa, U.S. (1999): "Some observation on Ecology and Ethology of Migratory birds Imperial Sandgrouse at Gajner Wildlife Sanctuary, Bikaner". M. Phil dissertation submitted to M.D.S. University Ajmer Raj.
4. Bissa, U.S. (2002): "Ecology and Ethology of Migratory birds Imperial Sandgrouse at Gajner Wildlife Sanctuary, Bikaner". A Ph.D. thesis submitted to M.D.S. University Ajmer Raj.
5. Chouhan, Y. 1994. Some observation on migratory birds at Gajner wild life sanctuary. M.Phil. Dissertation, Dungar College, Bikaner.
6. Fuller, R.J., Gough, S.J., Marchant, J.H. (1995). Bird populations in new Lowland woods: Landscape, Design and management perspectives. In: The Ecology of Woodland Creation, (Ferris-Kaan, R., ed.) pp. 163-182. London: John Wiley and Sons Ltd.
7. Gill, F. and Wright, M. (2006). Birds of World: Recommended English Names. Princeton NJ: Princeton University Press, Version 2.2 generated on 2009-08-25.
8. Glorious Gajner in "Son of the soil Maharaja Ganga Singh Ji" Ed. By Y.P.Singh, Surya Prakashan Mandir, Bikaner, pp 250-325.
9. IUCN (2016). The IUCN Red list of threatened species. Version 2016-3. <http://www.iucnredlist.org>.
10. Khatri A.K. (2023): "Migratory Birds in Chunda Sagar Gajner Bikaner". IJRBAT, special Issue (XII) Nov 2023: 123-126, e-ISSN 2347-517X.
11. Khatri A.K, Bissa D.S, Ranga K.K 2024: "Diversity of zooplankton after winter rain fall at Chunda Sagar Lake, Gajner Wildlife Sanctuary Bikaner, Raj". IJARESM, ISSN: 2455-6211, Volume 12, Issue 6, June 2024.
12. Ojha, G.S.H.C. 1939. History of Bikaner State. Vaidik Yantralaya, Ajmer (India) pp. 51- 52. Ojha, P.R. and Kumar, A. 1992. The Gajner Desert Wildlife Sanctuary Bikaner, 'Cheetal' pp. 25-37.
13. Singh, Y. 1991. Some Socio ecological studies on wild boar, *Sus scrofa* at Gajner Sanctuary, Bikaner. A dissertation, Dungar College (Autonomous), Bikaner.
14. Survey Report, Status survey of Migratory Birds and key wildlife in Bikaner district, Rajasthan 2021.
15. Swami, M. 1991. Some observation of drinking and water hole sharing behavior of mammals at Gajner Sanctuary, Bikaner. A dissertation, Dungar College (Autonomous), Bikaner.

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