Int. J. Sci. R. Tech., 2025 2(12)
A Multidisciplinary peer-reviewed Journal
www.ijsrtjournal.com [ISSN: 2394-7063]

Original Article

Migratory Birds of Sambhar Lake and their Conservation Status

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ABSTRACT

The saline lakes of the Indian Thar Desert are ecologically significant and contribute in commercial salt production. They are unique ecosystem with diverse ecological conditions. Sambhar Lake, the largest saline playa, in Rajasthan is considered as Ramsar site. The biodiversity of lake and its surrounding area is abundant. Sambhar Lake is site of international significance for the conservation of birds and considered as Important Bird Area (IBA). The unique bacteria and algae thriving in the lake contribute to its vibrant water hues and play a crucial role in maintaining the ecosystem that supports the seasonal waterfowl population. The population of migratory birds at Sambhar Lake has increased by 15 times due to favourable environmental conditions in 2025. The predominant species included lesser Flamingos, Greater Flamingos, Northern Shoveller, Green-winged teals, and Little Stints. The increase in bird population is a result of abundant rainfall and consistent water levels in the lake region, providing optimal habitat for migrating birds.

Keywords: Migratory birds, saline lake, aquatic ecosystem, important bird area

INTRODUCTION

Rajasthan, a state in India, is endowed with an abundance of desert with water bodies including perennial and seasonal rivers, wetlands, ponds, and saline lakes. Wetland areas are vital for numerous bird species, providing necessary environments for activities such as breeding, nesting, feeding, and nurturing their young (Kleijn et al., 2014). Wetlands rank as the second most productive ecosystems, following tropical rainforests (Ekhande 2012). A wetland ecosystem situated in a region with consistently high temperatures, particularly in the arid and semi-arid zones of Rajasthan, plays a vital role in mitigating water-related issues and preserving ecological harmony. (Singh et al., 2025). Rajasthan's Sambhar lake wetland is a key environment for both resident and migratory birds, contributing significantly to the region's avian diversity. According to the Ramsar Convention on Wetlands (1971), its mission is to promote the conservation and responsible use of wetlands at both local and national levels, along with international collaboration, to support sustainable development globally (Rahman et al., 2022). The research indicated that most bird species in the Sambhar lake wetland are categorized as Least Concern. Nevertheless, the presence of Near Threatened and Vulnerable species underscores the necessity for targeted conservation initiatives, as highlighted by the IUCN Red List (IUCN 2025). The Indian subcontinent hosts around 1,340 species of birds, making up more than 13% of the world's avian diversity (Sivaperuman and Gokulkrishnan, 2022). According to the Ramsar Convention from 1975, species that are ecologically reliant on wetlands are termed waterfowl or aquatic birds. Migratory birds, including the Lessor flamingo, Greater flamingo, Northern Shovelers, Green winged teals, and little stints demonstrate the wetland's critical role as a stopover and wintering site along major migration pathways. Unfortunately, it has been noted that these essential ecosystems are continuously facing degradation due to local human activities.

MATERIAL AND METHOD

The current research encompassed the compilation and synthesis of available secondary information, alongside the acquisition of primary information using proper techniques and conforming to recognized methodologies. The key strategies to be adopted in this current undertaking include: Macro-

Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

level strategy: Initial desk study: gathering and organizing secondary data from multiple sources. This exercise aimed to gather published articles related to different environmental components and variables. The scientific literature detailing various aspects of wetland biodiversity and avifauna, including species descriptions, was gathered and organized.

Study area

Saline wetlands in Rajasthan play an important role in economic as well as ecosystem services. India's largest saline wetland, Sambhar Lake (26° 52′ to 27° 02′ N; 74° 54′–75° 14′ E) in Rajasthan is considered for its highly pure salt for centuries (Kaushik and Raza 2019). Sambhar Lake present in the arid region lies adjacent to the Aravalli hills (on the east) in the Districts of Nagaur, Jaipur and Ajmer (Kaushik and Raza 2019). The Sambhar Lake is a shallow depression, it is rain fed, and receives water from a large catchment area of about 471km^2. The lake is fed by ephemeral streams like Mendha, Kharian, Rupnagar, and Khandel forming a large catchment area (Kumari 2021). Mendha which comes in from the north and the Rupangargh which falls into the lake from the south. The Sambhar Salt Lake is prime visiting ground for flamingo, falcon and other winter avifauna migrant which comes annually from Easr Asian, Central Asian and East African flyways (Bhatia et al., 2021). The lake provides unique climatic conditions and food availability for flocks of migratory birds. It was declared as Ramsar site on 23 March 1990 (Bairwa et al., 2021). The wetland ecosystem is currently facing severe threats for its existence due to anthropogenic pressure, illegal salt extraction and infrastructure development nearby lake area (Naik and Sharma 2022). That may severely affect the winter congregation of flamingo and other avian migrants and also threats to faunal diversity of the lake. The study reveals that the Sambhar Lake with increasing anthropogenic activities has become unsuitable for flamingos. There is a great need for developing an integrated conservation strategy for this important wetland to revive its status and lost glory.

Table: 1 IBA Site – Sambhar lake

IBA Site Code	: IN-RJ-16	Area	19000 ha
State	: Rajasthan	Altitude	360 msl
District	: Nagaur, Jaipur, Ajmer	Rainfall	540 mm
Coordinates	: 26° 56' 60" N, 75° 04' 00" E	Temperature	10°C to 33°C
		Biogeographic Zone	Semi-arid
Ownership	: State	Habitats	Freshwater Swamp

RESULT AND DISCUSSION

The literature review and secondary data analysis show that approximately 100,000 water birds, chiefly flamingos, flock to this lake in winter. The majority are concentrated in the saltpan area, as some water still exists in the natural wetland. The Asian Waterfowl Census 2025 (AWC) carried out a study at Sambhar Lake in collaboration with the Bombay Natural History Society (BNHS), Wetlands International South Asia and local volunteers. The Asian Waterbird Census in Sambhar for 2025 noted a remarkable 15-fold surge in migratory birds, totalling 104,993 individuals. The AWC 2025 reported 37 species compared to 2024.

Table: 2 Check list of waterfowl at Sambhar Salt Lake (AWC 2025)

S. No	Name of Species	No.
1	Bar-headed Goose	212
2	Black-crowned Night Heron	3
3	Black-tailed Godwit	5
4	Black-winged Stilt	225
5	Common Pochard	7
6	Common Sandpiper	9
7	Eurasian Coot	135
8	Eurasian Moorthen	30

9	Eurasian Spoonbill	57
10	Eurasian Wigeon	68
11	Ferruginous Duck	4
12	Gadwalil	28
13	GrayHeron	12
14	Gray-headed Swamphen	9
15	Graylag Goose	16
16	Great Cormorant	5
17	Great Egret	1
18	Greater Flamingo	18180
19	Great white pelican	92
20	Green winged Teal	1457
21	Indian Pond Heron	1
22	Indian Robin	3
23	Indian Spot Billed Duck	26
24	Lessor Flaming	78000
25	Knob billed Duck	4
26	Little-Grebe	107
27	Little stint	764
28	Lesser Whistiling Duck	7
29	Little ringed plover	315
30	Marsh Sandpiper	53
31	Northern Pintail	234
32	NothenShoveler	4436
33	Pied Avocet	227
34	Red Crested Pochard	12
35	Ruddy Sheiduck	26
36	Ruff	221
37	White wagtail	2
	Total	104993

A study conducted in Oct 2025 by forest department of Rajasthan (Gothwal and Roy, 2025) in the western part of lake and reported 19 species of waterfowl. They include 6 species of winter migrant and 13 species of local water birds. Sambhar Lake is known for its strong appeal to carnivorous birds, outpacing the numbers of both herbivorous and omnivorous species. From 1994 to 1997, researchers identified 70 different bird species at the lake: 46 were carnivores, 8 were herbivores, and 16 were omnivores. In 2003, among the 51-bird species observed, 36 were carnivorous, while 4 were herbivores and 11 were omnivores. By 2013, 30 out of 43 species recorded were carnivores, along with 4 herbivores and 9 omnivores. Fast forward to 2019, and from 28 species noted, 21 were carnivores, 4 herbivores, and 3 omnivores. In 2020, there were 32 species in total, including 26 carnivores, 2 herbivores, and 4 omnivores. By 2021, of the 41 species documented, 28 were carnivorous, 4 were herbivorous, and 9 were omnivorous. The lake continues to be a preferred spot for carnivorous birds

Table 2: Check List of avifauna observed in Sambhar Lake. Partially Migrant (PM), Resident (R), Migrant (M), Vagrant (V), Least Concern (LC), Near Threatened (NT), Vulnerable (VU), Endangered (EN)

S. No	Common Name	Species	Distribution	IUCN Status (2024)
1	Northern Shoveler	*Spatula clypeata*	PM	LC
2	Pied avocet	*Recurvirostra avosetta*	PM	LC
3	Pallass Gull	*Lartus ichthyaetus*	PM	LC
4	Grey wagtail	*Motacilla cinerea*	PM	LC

5	Gadwall	*Mareca strepera*	PM	LC
6	Common sandpiper	*Actitis hypoleucus*	PM	LC
7	Little cormorant	*Microcarbo niger*	LR	LC
8	Black winged stilt	*Himantopus himantopus*	LR	LC
9	Red wattled lapwing	*Vanellus indicus*	LR	LC
10	Small Prantincole	*Glareola lactea*	LR	LC
11	Cattle Egret	*Bubulus ibis*	LR	LC
12	Little Egret	*Egretta garzetta*	LR	LC
13	Great Egret	*Ardea alba*	LR	LC
14	Intermediate Egret	*Ardea intermedia*	LR	LC
15	Streak-throated swallow	*Petrochelidon fluvicola*	LR	LC
16	Wire-tailed swallow	*Hirundo smithi*	LR	LC
17	Green winged teals	*Anas crecca*	V	LC
18	Little stints	*Calidris minuta*	V	LC
19	Lessor flamingo	Phoenicopterus minor	M	NT
20	Greater flamingo	Phoenicopterus ruber	M	LC

REFERENCE

1. Kleijn D et al., (2014) Waterbirds increase more rapidly in Ramsar-designated wetlands than in unprotected wetlands. Journal of Applied Ecology, 51(2):289–298.
2. Ekhande A et al., (2012) Study of birds of Yashawant Lake with respect to densities, species richness and Shannon-Weiner indices and its correlation with lake dynamics, European Journal of Zoological Research. 1 (1):6-15.
3. Singh R et al., (2025) A comprehensive analysis of water quality index in a wetland ecosystem supporting drinking water to major cities in Rajasthan, India. Journal of Cleaner Production, 5; 487: 144593.
4. Rahman Q et al., (2022) Medicinal waterbirds in the traditional healthcare system: an assessment of biodiversity–cultural linkages in Eastern Khyber Pakhtunkhwa, Pakistan. Journal of Ethnobiology and Ethnomedicine, 27; 18(1):57.
5. IUCN (International Union for Conservation of Nature). (2025) The IUCN red list of Threatened Species.
6. Sivaperuman C and Gokulakrishnan G (2022) Diversity and species abundance of bird communities in Great Nicobar Biosphere Reserve, India. In faunal ecology and conservation of the great Nicobar biosphere reserve (pp. 287-318). Singapore: Springer Nature Singapore.
7. Kaushik G and Raza K (2019) Potential of novel Dunaliella salina from sambhar Salt Lake, India, for bioremediation of hexavalent chromium from aqueous effluents: an optimized green approach. Ecotoxicology Environmental Safety. 30; 180:430–438.
8. Kumari CG (2021) Taxonomic identification of some species of birds and water quality analysis of sambhar Salt Lake.
9. Bhatia N et al., (2021). Bird-area water- bodies dataset (BAWD) and predictive AI model for Avian Botulism Outbreak (AVI-BoT). arXiv:2105.00924
10. Naik R and Sharma L (2021) Spatio-temporal modelling for the evaluation of an altered Indian saline Ramsar site and its drivers for ecosystem management and restoration. Plose one, 16(7): e0248543.
11. Bairwa HK et al., (2021) Evaluation of UV-B protection efficiency of mycosporine like amino acid extracted from the cyanobacteria Anabaenopsis sp. SLCyA isolated from a hypersaline lake. Bioresource Technology Reports, 15:100749.
12. Naik R and Sharma LK (2022) Monitoring migratory birds of India's largest shallow saline Ramsar site (Sambhar Lake) using geospatial data for wetland restoration. Wetlands Ecology and Management, 30 (3):477-96.

HOW TO CITE: Jagdish Prasad*, Migratory Birds of Sambhar Lake and their Conservation Status, Int. J. Sci. R. Tech., 2025, 2 (12), 13-16. https://doi.org/10.5281/zenodo.17774862