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continued on the back inside cover

Cover: Emperor Tamarin *Saguinus imperator*: a look into a better world through the mustache lens – mixed media illustration. © Maya Santhanakrishnan.

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ARTICLE

Waterbird diversity of Saman Wetland Complex in Uttar Pradesh: a crucial site for the India's National Action Plan on migratory birds

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Abstract: The Saman Wetland Complex is formed by five major wetlands present in Etawah and Mainpuri districts of Uttar Pradesh. The habitat is majorly a wetland system with scrub vegetation along the edges and surrounded by agricultural fields; attracting a diverse group of bird species. These wetlands are an ideal habitat for Sarus Crane and are also Important Bird Areas. In the past two decades, the anthropogenic activities have deteriorated the habitat and wetlands no longer support the earlier congregation of birds. The study conducted during 2020–2021 provides baseline information on the present status of the Saman wetland complex, waterbird diversity, threats faced by the wetlands & waterbirds, and suggests future management/ conservation strategies.

Keywords: Bird species, Etawah, habitat, IBA, Saman Bird Sanctuary, Sarsai Nawar, Sarus Crane, wetlands.

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INTRODUCTION

Birds with nearly 10,787 species (252 families and 40 orders) are found on Earth, ranging from the poles to the equator (Praveen et al. 2020). Birds are an important component of any ecosystem that not only provide inestimable ecosystem functioning services like scavenging, preying, act as insects and pest control agents, plant pollinators, and seed dispersal but also as indicators for the evaluation of habitat quality of any particular area or region. Avifaunal diversity and documentation of any region are important in understanding the diversity and distribution of species over a certain area and time (Colin et al. 2000; Peterson et al. 2000).

There are a total of 1,306 bird species found in India that contribute to approximately 12.5% of the world's avifauna. India's biogeographic location, heterogeneity of physical features, and eco-climatic variations make it a rich biodiversity country (Praveen et al. 2018).

Uttar Pradesh (UP) is one of the largest states in India occupying an area of 2,40,972 km^2. Biologically, it is very rich and varied having 31 Important Bird Areas (IBAs; BirdLife International 2022) with more than 500 species being reported from the state. The state has six 'Critically Endangered', five 'Endangered', 16 'Vulnerable', and 23 'Near Threatened' bird species (Rahmani et al. 2016).

Out of the 31 IBAs in UP, 24 are wetlands ecosystems. Wetland ecosystems attract a high number of bird species providing adequate food supply and habitats in the form of aquatic vegetations, fishes, crustaceans, and reeds along the edges of the waterbodies respectively. Saman Jheel along with its satellite wetlands (Sauj, Sarsai Nawar, Kurra Zheel, and Kuddaiyya Marshland in Mainpuri and Etawah districts) makes a wetland complex that has been designated as IBAs (Image 1). The region attracts large congregations of waterbirds during the winter season besides having residential birds. According to Rahmani et al. (2016), more than 1,500 Common Teal *Anas crecca*, 6,000–10,000 Northern Pintail *Anas acuta*, 30,000 Lesser Whistling-duck *Dendrocygna javanica*, and 200 Great White Pelican *Pelecanus onocrotalus* were recorded in the area during a survey in January 2001. Many of these species occur in far greater numbers than their 1% biogeographic population threshold determined by Wetlands International (2012) and thus in 2019 the Saman Bird Sanctuary and Sarsai Nawar were declared Ramsar Sites. Saman wetland, and other jheels like Lakh-Bahosi used to be an important habitat for the Siberian Crane *Leucogeranus leucogeranus* in the state (Rahmani et al. 2016).

Being important as a wintering site for many migrants with more than 1% biogeographic population threshold, the area still lacks proper documentation of avifaunal diversity. Further, many anthropogenic activities have deteriorated the habitat in the last two decades. During the present study, we tried to record the current status of waterbird diversity, their population, and existing threats in the Saman Wetland Complex with special emphasis to create baseline data for the area.

Study Area

1. **Saman wetland** (27.0230 °N; 79.1900 °E) is located in the upper Gangetic Plains, near Saman village in the Mainpuri district of Uttar Pradesh. It was declared a Bird Sanctuary in 1990. The sanctuary is an oxbow lake, that depends completely upon rainfall for its water. The total area of the sanctuary is 525 ha and approximately 75% of the area is underwater. There is no representative forest type available but reeds along with scattered *Prosopis juliflora* are present within the sanctuary. Other hydrophytic vegetation includes *Nelumbo, Cyperus*, *Phragmites*, and *Typha*.
2. **Kurra Zheel** (27.0156 N; 79.0897 E) is located near Hajipura village in Kurra, Mainpuri district. Karhal-Kishni road divides the wetland into two parts.
3. **Sarsai Nawar Lake** (26.9659 °N; 79.2479 °E) is a monsoon-fed natural depression. The lake is important because it is the roosting area of Sarus Crane in the region.
4. **Sauj Lake** (27.027 °N; 79.1424 °E) lies beside the Karhal-Kishni main road, just before Saman Bird Sanctuary. The lake is a shallow depression in the landscape.
5. **Kudaiyya marshland** (26.9929 °N; 78.9924 °E) is situated along the Karhal-Kishni highway in the Mainpuri district. It is formed by the flooding of a natural depression (Rahmani et al. 2016).

The wetland complex experiences three distinct seasons, viz., summer (March–June), monsoon (July–October), and winter (November–February). The average rainfall in the area is 500–900 mm. The temperature varies 4–48 ^{0}C.

METHODS

Surveys were carried out in all the wetlands from January 2020–November 2021 to monitor the waterbird diversity, population status, and threats to the birds and their habitat. We covered three winters season ensuring two visits per season. Waterbirds were surveyed using

the total count method (Bibby et al. 1992). The number of birds in large flocks was generally estimated by mentally dividing the congregation into small groups of 5–100 depending upon the size of the flock. Birds were counted that were present within appx. 500 m distance from the observer. In the case of a large waterbody, simultaneous counts were taken with multiple observers. Landbirds were also recorded opportunistically whenever encountered in a wetland or flying over. No other standard methods or efforts were taken to count landbirds.

Birds were observed during mornings, beginning at sunrise and evening hours till sunset depending upon the high activity hours of roosting and foraging. Therefore, twice a day data was collected for the same sites to check the birds' movements and congregation. In the case of bird identification confirmation, Grimmett et al. (2011) was used. Threats and disturbances to the wetlands were recorded based on the observations during the survey as well as information obtained from the local people, bird watchers, and forest department staff.

Data analysis

A detailed checklist of recorded birds was made following BirdLife International (2021) nomenclature. All the recorded species were classified based on the conservation status provided in the IUCN Red List of Threatened Species (IUCN 2021).

We calculated species richness referring to the number of species in the wetland and Shannon-Wiener index which takes into account both species richness and their evenness (how evenly individuals are distributed among different species). We also calculated the relative diversity (RDi) of families using the following formula (Torre-Cuadros et al. 2007; Samson et al. 2018):

$$RDi = \frac{\text{Number of bird species in a family}}{\text{Total number of species}} \times 100$$

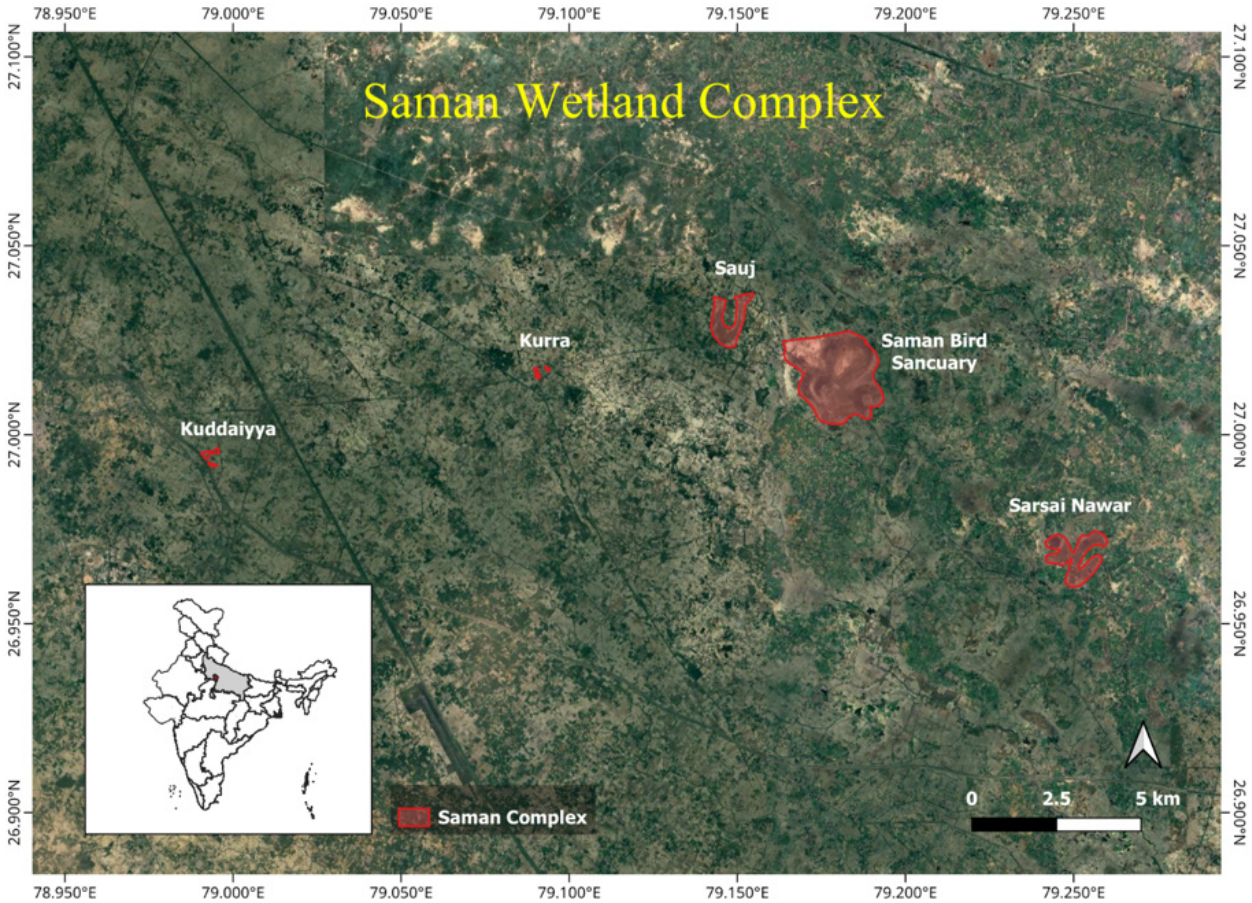

Image 1. Map of the of Saman Wetland Complex, Mainpuri district, Uttar Pradesh, India.

RESULTS

During the present study in Saman Wetland Complex, a total of 126 species of birds under 18 orders and 41 families were recorded (Annexure I). Out of the 126 species of birds, 70 species were waterbirds. Among these species, 34 were migratory waterbirds and 36 species were residents. Family Anatidae had a maximum number of species (n = 17) followed by Scolopacidae (n = 12). The maximum count of the waterbirds in a single day recorded at Saman Bird Sanctuary (Saman BS) was 8,210 birds in January 2020, followed by Sarsai Nawar (5,309 birds) in the same month. As globally order Passeriformes has a higher number of species than all others put together, this order represents the highest number of species (n = 34) in the study area, followed by Charadriiformes (n = 20 species) and Anseriforms (n = 17) (Figure 1). However, passeriforms are relatively scarce in the study areas.

Eighteen species belong to the various threatened categories of IUCN. Among the threatened waterbird species, two 'Vulnerable' species which are Common Pochard *Aythya ferina* & Sarus Crane, and eight 'Near Threatened' species were recorded during the study period (Table 1).

The maximum diversity of waterbirds was recorded at Sarsai Nawar (63 species) followed by Saman BS (52 species) and the lowest diversity was observed at Kuddaiyya Marshland with 30 species (Figure 2).

Among the landbirds, 58 species were recorded at Saman Wetland Complex. Maximum diversity was observed at Sarsai Nawar followed by Saman BS. Among them, Egyptian Vulture *Neophron percnopterus* and Steppe Eagle *Aquila nipalensis* are categorised as 'Endangered' according to IUCN while Greater Spotted Eagle *Clanga clanga*, Indian Spotted Eagle *Clanga hastata*, and Tawny Eagle are listed as 'Vulnerable'. Shannon Diversity Index was highest in the Kurra Jheel, which suggests that Kurra Jheel harbours a high diversity of species in a community and Saman BS the lowest (Table 2). Kurra is surrounded by villages and many birds that live around human settlements are present around the wetland and the congregation of waterbirds is very low. This might be the reason for the high diversity index of Kurra. The species richness index was found to be highest in Sarsai Nawar and lowest in Kuddaiya Marshland.

The family Anatidae had the highest RDi (13.49) with 17 species followed by Scolopacidae (9.52) with 12 species (Table 3).

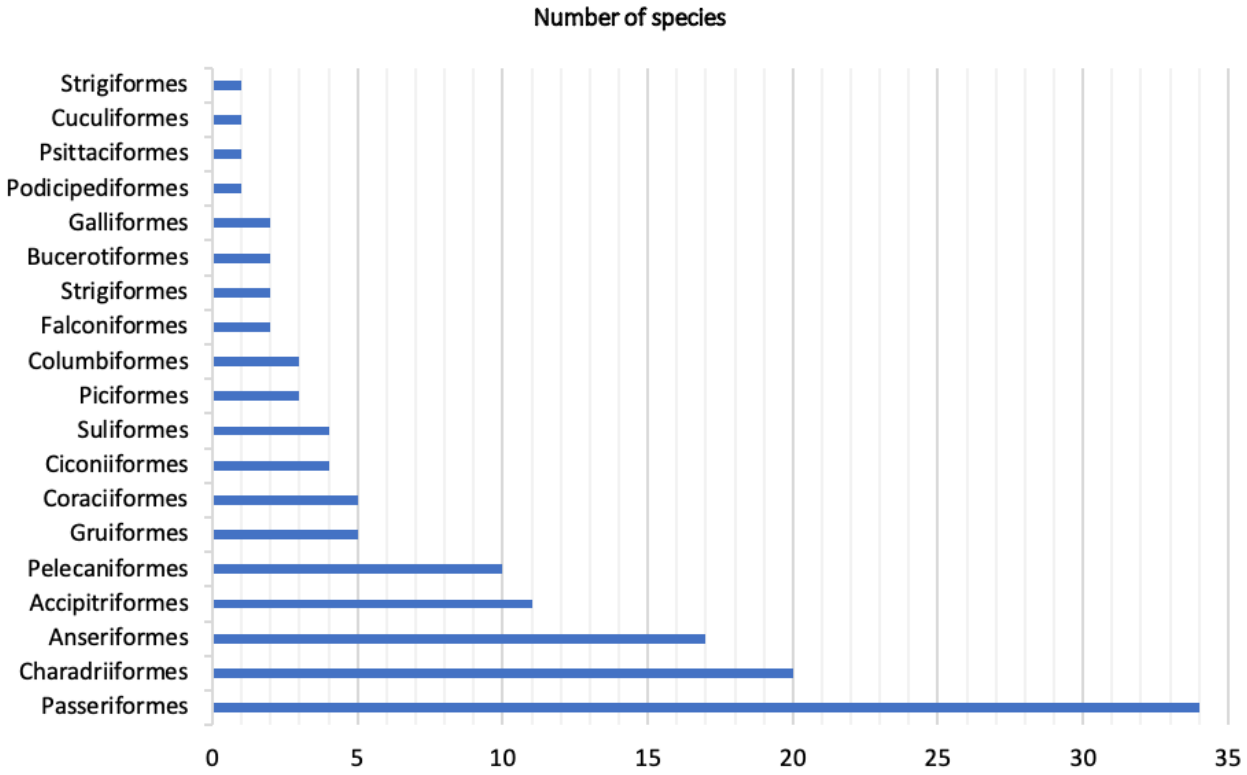

Figure 1. Order-wise count of bird species at Saman Wetland Complex.

Table 1. List of threatened bird species reported from Saman Wetland Complex.

	Common name	Scientific name	Family	IUCN status
1	Egyptian Vulture	*Neophron percnopterus*	Accipitridae	EN
2	Steppe Eagle	*Aquila nipalensis*	Accipitridae	EN
3	Common Pochard	*Aythya ferina*	Anatidae	VU
4	Sarus Crane	*Antigone antigone*	Gruidae	VU
5	Indian Spotted Eagle	*Clanga hastata*	Accipitridae	VU
6	Greater Spotted Eagle	*Clanga clanga*	Accipitridae	VU
7	Tawny Eagle	*Aquila rapax*	Accipitridae	VU
8	Red-necked Falcon	*Falco chicquera*	Falconidae	NT
9	Asian Woollyneck	*Ciconia episcopus*	Ciconiidae	NT
10	Black-headed Ibis	*Threskiornis melanocephalus*	Threskiornithidae	NT
11	Black-necked Stork	*Ephippiorhynchus asiaticus*	Ciconiidae	NT
12	Black-tailed Godwit	*Limosa limosa*	Scolopacidae	NT
13	Bonelli's Eagle	*Aquila fasciata*	Accipitridae	NT
14	Eurasian Curlew	*Numenius arquata*	Scolopacidae	NT
15	Ferruginous Duck	*Aythya nyroca*	Anatidae	NT
16	Indian Grey Hornbill	*Ocyceros birostris*	Bucerotidae	NT
17	Oriental Darter	*Anhinga melanogaster*	Anhingidae	NT
18	Painted Stork	*Mycteria leucocephala*	Ciconiidae	NT

Threats faced by the wetlands

During the survey, it was noticed that the Saman Wetland Complex is facing various problems due to anthropogenic activities around the wetlands and losing its ecological values. One of the major threats is an agricultural expansion on the edge of wetlands. As a result, wetlands are losing their area and thus, today unable to hold the large congregations as they used to. During summer as these wetlands become almost dry, villagers carry out agricultural practices in the wetland area. The use of chemical fertilisers and pesticides put nutrients load into the wetlands through agricultural runoff in addition to sewage from the adjoining villages. This causes water pollution and the growth of species like water hyacinth, *Ipomoea*, and *Typha*. Eutrophication in Kurra and Kuddaiyya is so high that hardly any open water surface is available for the waterbirds.

The interactions with the local people revealed other threats such as siltation which has reduced the water holding capacity of wetlands. People also responded positively about the bird capturing practices for meat purposes. This was also evident by the survey team at Saman BS. There is still dispute on the land compensation and therefore locals have a negative approach towards the Saman BS. Other threats and disturbances observed during the survey were the collection of lotus tubers and grasses from the wetland, grazing by livestock within the wetland area, free-ranging dogs, disposal of solid waste and construction debris in the wetland.

DISCUSSION

Saman Wetland Complex is included in the list of priority wetlands under India's National Action Plan for Conservation of Migratory Birds and their Habitats along Central Asian Flyway (CAF NAP). These wetlands are also defined as IBAs as they supported or were thought to support congregations of more than 20,000 waterbirds regularly. However, it is hardly the scene in the present date. In this region, wetlands are facing immense anthropological pressure. Major areas of the wetlands are reclaimed or destroyed for agricultural expansion and human settlements (Sundar 2006; Maurya & Kumar 2014). Pesticides and fertilizers are mixing into the wetland through agricultural runoff from the surrounding areas. Thus, all the wetlands are facing the threat of pesticide deposition, which may lead to the depletion of insects thereby leading to the disappearance of insectivorous birds.). All the wetlands are surrounded by villages which put grazing pressure on the areas near the wetlands. Grazing results in temporary modification of habitat and disturbance to birds (Jha 2015). Sundar & Choudhury (2005) documented the mortality of Sarus

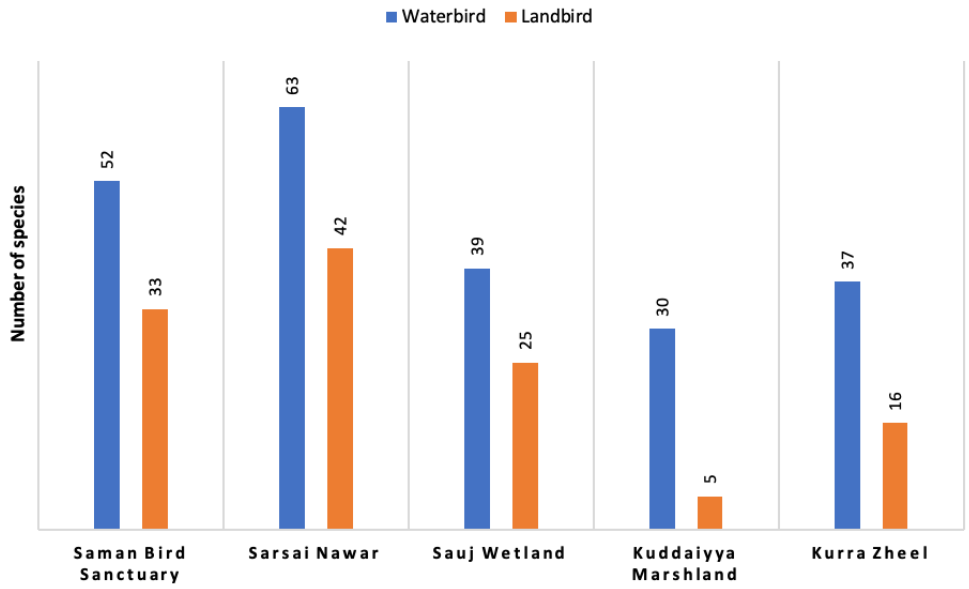

Figure 2. Avian diversity at Saman Wetland Complex.

Table 2. Shannon diversity index and species richness index of Saman Wetland Complex.

Wetland	Shannon diversity index	Species richness index
Sarsai Nawar	2.539	105
Saman BS	1.911	87
Sauj	2.012	64
Kurra	3.009	53
Kuddaiyya	2.591	35

Crane due to collision to high tension electric wires in the Saman wetland complex. As per the study, nearly 1% of the total population died because of electrocution each year. However, such a case was not recorded during the study period. Poaching is also reported in all the wetlands on a minor scale.

The present study recorded the presence of 126 species of birds from the Saman Wetland Complex. Out of the 126 reported species, seven species fall under the threatened categories by the IUCN Red List. The availability of varied habitat types of this region, like wetland shallow area, reed beds and agricultural fields attract many species of resident and migratory birds. Saman Wetland Complex is one of the ideal habitats for the Sarus Crane in India. About 73% of the Sarus population of Uttar Pradesh is found in four districts namely Mainpuri, Etawah, Etah, and Aligarh while Mainpuri has the highest number of counts (Maurya & Kumar 2014). Sarsai Nawar lake, a Ramsar site is a roosting site for the largest flock of Sarus Crane in India.

Based on earlier records, Kurra jheel was known to support more than 20,000 migratory waterbirds, but the current scenario is not the same. In a survey in 2008–2009 by BNHS, the count was not even 500 birds (Rahmani et al. 2016). In the present study, the maximum bird count was just 307 in November 2021. Thus, IBA status of Kurra is now questionable.

Notable observations

- In February 2020, a huge congregation of Wagtails, mainly Western Yellow Wagtail *Motacilla flava* and Citrine Wagtail *Motacilla citreola* were recorded during dusk. Most probably it was a roosting population that settled in the agricultural field near the wetland.

- Murmuration of Rosy Starling *Pastor roseus* was observed in November 2021 at Saman BS.

- An opportunistic sighting of four individuals of Steppe Eagle was recorded while passing through the Saman BS in February 2020.

- Two nests of Black-necked Stork in Saman BS and one in Sarsai Nawar were observed in November 2021

CONCLUSION

Kuddaiya marshlands and Kurra are highly degraded due to anthropogenic activities and beyond restoration. Both have lost huge wetland areas and what remains now is just ponds. On the other hand,

Table 3. Relative diversity (RDi) of bird families recorded during the survey in Saman Wetland Complex.

	Family	Number of species	RDi
1	Anatidae	17	13.49206349
2	Scolopacidae	12	9.523809524
3	Accipitridae	11	8.73015873
4	Ardeidae	8	6.349206349
5	Muscicapidae	7	5.555555556
6	Motacillidae	5	3.968253968
7	Ciconiidae	4	3.174603175
8	Charadriidae	4	3.174603175
9	Estrildidae	4	3.174603175
10	Rallidae	4	3.174603175
11	Phalacrocoracidae	3	2.380952381
12	Columbidae	3	2.380952381
13	Corvidae	3	2.380952381
14	Cisticolidae	3	2.380952381
15	Sturnidae	3	2.380952381
16	Alcedinidae	3	2.380952381
17	Falconidae	2	1.587301587
18	Threskiornithidae	2	1.587301587
19	Phasianidae	2	1.587301587
20	Jacanidae	2	1.587301587
21	Ramphastidae	2	1.587301587
22	Passeridae	2	1.587301587
23	Timaliidae	2	1.587301587
24	Anhingidae	1	0.793650794
25	Gruidae	1	0.793650794
26	Podicipedidae	1	0.793650794
27	Recurvirostridae	1	0.793650794
28	Glareolidae	1	0.793650794
29	Psittacidae	1	0.793650794
30	Cuculidae	1	0.793650794
31	Tytonidae	1	0.793650794
32	Upupidae	1	0.793650794
33	Coraciidae	1	0.793650794
34	Meropidae	1	0.793650794
35	Bucerotidae	1	0.793650794
36	Picidae	1	0.793650794
37	Dicruridae	1	0.793650794
38	Alaudidae	1	0.793650794
39	Pycnonotidae	1	0.793650794
40	Sylviidae	1	0.793650794
41	Ploceidae	1	0.793650794

Sauj still holds a considerable number of birds. Effective conservation efforts such as desilting of the lake, community conservation etc. can bring back the glory of this wetland. Saman BS and Sarsai Nawar are rich in diversity and support large congregations of migratory waterbirds. Both wetlands also support nesting habitats for resident birds including the threatened Sarus Crane and Black-necked Stork. Conservation measures are an absolute necessity to improve the habitat condition. With the coordinated efforts of local people and the forest department, bird tourism can flourish and will be helpful for the economic upliftment of people.

Based on the present study, it was felt that considerable detailed studies pertaining to various aspects of avian ecology in Saman Wetland Complex need to be conducted. Landscapes are facing habitat alterations due to urbanisation. Therefore, there is a need to conduct an intensive study to monitor the population dynamics of avifauna at the landscape level, dominated by human settlements and agricultural practices along with the drivers of habitat alteration. De-siltation of wetlands and removal of invasive aquatic plants are needed to be done with a scientific approach. The present study is expected to form baseline information for future studies on various aspects of avian ecology in the region and emphasizes the need of long-term qualitative and quantitative study in the area.

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Annexure I. List of species with its highest number recorded during the survey in Saman Wetland Complex along with its IUCN Red List status.

	Common name	Scientific name	IUCN Red List status	Saman Bird Sanctuary	Sarsai Nawar	Sauj Wetland	Kuddaiyya Marshland	Kurra Zheel
Order: Galliformes								
Family Phasianidae (Megapods, Partridges, Pheasants)								
1	Grey Francolin	*Francolinus pondicerianus*	LC	4	2	2	-	-
2	Indian Peafowl	*Pavo cristatus*	LC	-	2	-	-	5
Order: Anseriformes								
Family Anatidae (Whistling-Ducks, Swans, Geese and Ducks)								
3	Bar-headed Goose	*Anser indicus*	LC	-	4	-	-	-
4	Comb Duck	*Sarkidiornis melanotos*	LC	1	100	11	-	42
5	Common Pochard	*Aythya ferina*	VU	-	2000	-	-	-
6	Common Teal	*Anas crecca*	LC	70	34	-	10	-
7	Cotton Pygmy-goose	*Nettapus coromandelianus*	LC	1	-	-	-	-
8	Eurasian Wigeon	*Mareca penelope*	LC	4	50	-	8	-
9	Ferruginous Duck	*Aythya nyroca*	NT	19	10	-	14	-
10	Gadwall	*Mareca strepera*	LC	1000	300	-	35	-
11	Garganey	*Spatula querquedula*	LC	-	200	-	-	-
12	Greylag Goose	*Anser anser*	LC	60	64	1	-	-
13	Indian Spot-billed Duck	*Anas poecilorhyncha*	LC	-	1	-	-	-
14	Lesser Whistling-duck	*Dendrocygna javanica*	LC	500	150	100	117	150
15	Mallard	*Anas platyrhynchos*	LC	-	10	-	-	-
16	Northern Pintail	*Anas acuta*	LC	125	2000	200	2	-
17	Northern Shoveler	*Spatula clypeata*	LC	20	300	-	28	-
18	Tufted Duck	*Aythya fuligula*	LC	5	1	-	1	-
19	Red-crested Pochard	*Netta rufina*	LC	20	6	50	16	-
Order: Podicipediformes								
Family Podicipedidae (Grebes)								
20	Little Grebe	*Tachybaptus ruficollis*	LC	17	25	6	3	3
Order: Ciconiiformes								
Family Ciconiidae (Storks)								
21	Asian Woollyneck	*Ciconia episcopus*	NT	2	4	-	1	-
22	Black-necked Stork	*Ephippiorhynchus asiaticus*	NT	2	3	1	2	-
23	Painted Stork	*Mycteria leucocephala*	NT	5	16	4	-	6
24	Asian Openbill	*Anastomus oscitans*	LC	10	5	49	1	-
Order: Pelecaniformes								
Family Threskiornithidae (Ibises and spoonbills)								
25	Black-headed Ibis	*Threskiornis melanocephalus*	NT	60	68	5	-	8
26	Eurasian Spoonbill	*Platalea leucorodia*	LC	-	13	-	17	1
Family Ardeidae (Bitterns and Herons)								
27	Black-crowned Night-Heron	*Nycticorax nycticorax*	LC	-	-	1	-	1
28	Grey Heron	*Ardea cinerea*	LC	12	10	2	1	2
29	Indian Pond Heron	*Ardeola grayii*	LC	18	50	5	-	52
30	Purple Heron	*Ardea purpurea*	LC	6	5	3	1	9
31	Cattle Egret	*Bubulcus ibis*	LC	11	30	1	-	2
32	Great Egret	*Ardea alba*	LC	6	25	2	-	6

	Common name	Scientific name	IUCN Red List status	Saman Bird Sanctuary	Sarsai Nawar	Sauj Wetland	Kuddaiyya Marshland	Kurra Zheel
33	Intermediate Egret	*Ardea intermedia*	LC	4	15	2	-	9
34	Little Egret	*Egretta garzetta*	LC	4	6	1	-	35
Order: Suliformes								
Family Anhingidae (Anhingas)								
35	Oriental Darter	*Anhinga melanogaster*	NT	14	25	5	6	6
Family Phalacrocoracidae (Cormorants)								
36	Great Cormorant	*Phalacrocorax carbo*	LC	6	-	-	2	2
37	Indian Cormorant	*Phalacrocorax fuscicollis*	LC	22	2	-	-	5
38	Small Cormorant	*Microcarbo niger*	LC	62	50	25	17	24
Order: Falconiformes								
Family Falconidae (Falcons)								
39	Peregrine Falcon	*Falco peregrinus*	LC	-	1	-	-	-
40	Red-necked Falcon	*Falco chicquera*	NT	-	-	1	-	-
Order: Accipitriformes								
Family Accipitridae (Osprey, Hawks, Eagles, Harriers, Vultures)								
41	Bonelli's Eagle	*Aquila fasciata*	NT	2	3	-	-	-
42	Osprey	*Pandion haliaetus*	LC	-	1	-	-	-
43	Steppe Eagle	*Aquila nipalensis*	EN	-	1	-	-	-
44	Tawny Eagle	*Aquila rapax*	VU	-	1	-	-	-
45	Western Marsh Harrier	*Circus aeruginosus*	LC	5	2	-	1	2
46	Greater Spotted Eagle	*Clanga clanga*	VU	-	1	-	1	-
47	Indian Spotted Eagle	*Clanga hastata*	VU	-	1	1	-	-
48	Black Kite	*Milvus migrans*	LC	-	-	-	-	1
49	Black-winged Kite	*Elanus caeruleus*	LC	1	2	1	-	-
50	Long-legged Buzzard	*Buteo rufinus*	LC	-	-	1	-	-
51	Egyptian Vulture	*Neophron percnopterus*	EN	2	1	2	1	2
Order: Gruiformes								
Family Rallidae (Rails, Crakes, Gallinules and Coots)								
52	Common Coot	*Fulica atra*	LC	3000	500	40	12	20
53	Common Moorhen	*Gallinula chloropus*	LC	22	62	2	-	30
54	White-breasted Waterhen	*Amaurornis phoenicurus*	LC	17	2	1	-	2
55	Purple Swamphen	*Porphyrio porphyrio*	LC	19	39	7	7	50
Family Gruidae (Cranes)								
56	Sarus Crane	*Antigone antigone*	VU	22	232	16	8	5
Order: Charadriiformes								
Family Charadriidae (Plovers and Lapwings)								
57	White-tailed Lapwing	*Vanellus leucurus*	LC	7	10	8	3	-
58	Grey-headed Lapwing	*Vanellus cinereus*	LC	5	-	-	-	-
59	Red-wattled Lapwing	*Vanellus indicus*	LC	38	30	15	4	10
60	Little Ringed Plover	*Charadrius dubius*	LC	-	1	-	-	-
Family Recurvirostridae (Stilts and Avocets)								
61	Black-winged Stilt	*Himantopus himantopus*	LC	26	150	30	-	6
Family Jacanidae (Jacanas)								
62	Bronze-winged Jacana	*Metopidius indicus*	LC	17	40	7	-	40
63	Pheasant-tailed Jacana	*Hydrophasianus chirurgus*	LC	4	20	21	-	-

	Common name	Scientific name	IUCN Red List status	Saman Bird Sanctuary	Sarsai Nawar	Sauj Wetland	Kuddaiyya Marshland	Kurra Zheel
Family Scolopacidae (Snipes, Curlews and Sandpipers)								
64	Common Redshank	*Tringa totanus*	LC	30	50	8	3	2
65	Common Sandpiper	*Actitis hypoleucos*	LC	2	-	4	2	1
66	Common Snipe	*Gallinago gallinago*	LC	4	-	-	-	-
67	Green Sandpiper	*Tringa ochropus*	LC	1	5	7	3	-
68	Marsh Sandpiper	*Tringa stagnatilis*	LC	-	15	-	-	-
69	Wood sandpiper	*Tringa glareola*	LC	1	38	2	-	-
70	Eurasian Curlew	*Numenius arquata*	NT	5	-	-	-	-
71	Black-tailed Godwit	*Limosa limosa*	NT	-	25	-	-	-
72	Temminck's Stint	*Calidris temminckii*	LC	-	2	-	-	-
73	Ruff	*Calidris pugnax*	LC	239	23	-	-	-
74	Little Stint	*Calidris minuta*	LC	2	1	-	-	-
75	Common Greenshank	*Tringa nebularia*	LC	-	1	-	-	1
Family Glareolidae (Prantincoles and Coursers)								
76	Little Pratincole	*Glareola lactea*	LC	-	13	-	-	-
Order: Columbiformes								
Family Columbidae (Pigeons and Doves)								
77	Eurasian Collared Dove	*Streptopelia decaocto*	LC	5	4	2	-	-
78	Laughing Dove	*Streptopelia senegalensis*	LC	-	1	-	-	-
79	Rock Dove	*Columba livia*	LC	6	50	5	6	-
Order: Psittaciformes								
Family Psittacidae (Parrots and Hanging Parrots)								
80	Rose-ringed Parakeet	*Psittacula krameri*	LC	2	3	-	-	1
Order: Cuculiformes								
Family Cuculidae (Cuckoos, Malkohas and Coucals)								
81	Greater Coucal	*Centropus sinensis*	LC	1	1	1	-	1
Order: Strigiformes								
Family Tytonidae (Barn Owls); Strigidae (Typical Owls)								
82	Spotted Owlet	*Athene brama*	LC	3	-	-	-	-
Order: Bucerotiformes								
Family Upupidae (Hoopoes)								
83	Common Hoopoe	*Upupa epops*	LC	2	2	-	-	-
Family Bucerotidae (Hornbills)								
84	Indian Grey Hornbill	*Ocyceros birostris*	NT	1	2	-	-	-
Order: Coraciiformes								
Family Coraciidae (Rollers)								
85	Indian Roller	*Coracias benghalensis*	LC	1	-	2	-	1
Family Alcedinidae (Kingfisher)								
86	Common Kingfisher	*Alcedo atthis*	LC	1	2	1	-	-
87	Pied Kingfisher	*Ceryle rudis*	LC	-	2	2	2	-
88	White-breasted Kingfisher	*Halcyon smyrnensis*	LC	8	9	3	-	2
Family Meropidae (Bee-Eaters)								
89	Green Bee-eater	*Merops orientalis*	LC	1	2	-	-	-

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Order: Piciformes								
Family Ramphastidae (Barbets)								
90	Brown-headed Barbet	*Psilopogon zeylanicus*	LC	1	-	-	-	-
91	Coppersmith Barbet	*Psilopogon haemacephalus*	LC	-	1	-	-	-
Family Picidae (Wryneck, Piculets and Woodpeckers)								
92	Eurasian Wryneck	*Jynx torquilla*	LC	-	1	1	-	-
Order: Passeriformes								
Family Dicruridae (Drongos)								
93	Black Drongo	*Dicrurus macrocercus*	LC	24	18	25	-	1
Family Corvidae (Crows)								
94	House Crow	*Corvus splendens*	LC	1	50	2	2	30
95	Large-billed Crow	*Corvus macrorhynchos*	LC	2	4	2	-	2
96	Rufous Treepie	*Dendrocitta vagabunda*	LC	1	2	-	-	-
Family Alaudidae (Larks)								
97	Oriental Skylark	*Alauda gulgula*	LC	-	1	-	-	-
Family Pycnonotidae (Bulbuls)								
98	Red-vented Bulbul	*Pycnonotus cafer*	LC	-	-	-	-	1
Family Cisticolidae (Cisticolas, Prinias and Allies)								
99	Ashy Prinia	*Prinia socialis*	LC	7	1	1	1	-
100	plain Prinia	*Prinia inornate*	LC	6	3	1	1	-
101	Common Tailorbird	*Orthotomus sutorius*	LC	2	-	-	-	-
Family Sylviidae (Warblers)								
102	Lesser Whitethroat	*Sylvia curruca*	LC	-	-	1	-	-
Family Timaliidae (Babblers)								
103	Jungle Babbler	*Turdoides striata*	LC	-	4	5	-	-
104	Large Grey Babbler	*Argya malcolmi*	LC	-	8	2	-	-
Family Sturnidae (Starlings and Mynas)								
105	Asian Pied Starling	*Gracupica contra*	LC	65	50	12	-	22
106	Common Myna	*Acridotheres tristis*	LC	1	2	3	-	4
107	Bank Myna	*Acridotheres ginginianus*	LC	1	-	-	-	-
Family Muscicapidae (Chats and Old World Flycatcher)								
108	Bluethroat	*Luscinia svecica*	LC	4	1	-	-	-
109	Brown Rockchat	*Oenanthe fusca*	LC	2	1	-	-	-
110	Common Stonechat	*Saxicola torquatus*	LC	-	1	-	-	-
111	Pied Bushchat	*Saxicola caprata*	LC	6	1	1	-	-
112	Indian Robin	*Saxicoloides fulicatus*	LC	1	1	2	-	-
113	Desert Wheatear	*Oenanthe deserti*	LC	-	1	-	-	-
114	Oriental magpie Robin	*Copsychus saularis*	LC	1	1	1	-	-
Family Passeridae (Sparrows, Petronias and Snowfinches)								
115	Chestnut-shouldered Bush-sparrow	*Gymnoris xanthocollis*	LC	-	-	2	-	1
116	House Sparrow	*Passer domesticus*	LC	-	-	-	-	30
Family Ploceidae (Weavers)								
117	Black-breasted Weaver	*Ploceus benghalensis*	LC	7	1	-	-	-

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Family Estrildidae (Avadavats and Munias)								
118	Scaly-breasted Munia	*Lonchura punctulata*	LC	-	1	-	-	-
119	Tricoloured Munia	*Lonchura malacca*	LC	-	1	-	-	-
120	Red Avadavat	*Amandava amandava*	LC	3	1	-	-	-
121	Indian Silverbill	*Euodice malabarica*	LC	1	1	-	-	1
Family Motacillidae (Pipits and Wagtails)								
122	White-browed Wagtail	*Motacilla maderaspatensis*	LC	-	-	-	-	2
123	Western Yellow Wagtail	*Motacilla flava*	LC	1	15	1	-	10
124	White Wagtail	*Motacilla alba*	LC	-	-	-	-	6
125	Citrine Wagtail	*Motacilla citreola*	LC	2	3	22	-	1
126	Paddyfield Pipit	*Anthus rufulus*	LC	-	2	-	-	2

LC—Least Concern | NT—Near Threatened | VU—Vulnerable | EN—Endangered.

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