

Avian Richness, Assemblages and Migration Connectivity of Geese Species with Habitat Suitability in Wetlands of the Punjab, Pakistan

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ABSTRACT

Understanding the species assemblages and migration connectivity of geese species is crucial for their conservation and management. It helps identify important stopover sites, breeding grounds, and wintering areas, allowing for targeted conservation efforts and the preservation of key habitats along their migratory routes. This study was designed to investigate the avian richness and habitat suitability of geese species at wetlands of Punjab, Pakistan. The surveys were conducted from October 2020 to March 2021 and October 2021 to March 2022 on monthly basis using point count method. Five species of geese were recorded at the wetlands including bar-headed goose *Anser indicus*, with the highest number of individuals (2,701 at eleven sites) followed by greylag goose *Anser anser* (1,224 at nine sites), cotton pygmy-geese *Nettapus coromandelianus* (74 at eleven sites), greater white-fronted goose *Anser albifrons* (46 at five sites) and lesser white-fronted goose *Anser erythropus* (seven at three sites). Overall, 175 species were recorded at the study sites belonging to 13 orders and 39 families. According to the IUCN red list, 148 species were least concern, 16 were near threatened and 11 were threatened (vulnerable (06), endangered (04) and critically endangered (01)). Habitat suitability index was used to rank the suitability of geese species at various sites from highly suitable to least suitable. Marala Headworks was found to be at the top as per habitat suitability score for all geese species, followed by Chashma, Taunsa and Bajwat. Even if these sites are suitable, they fall short of being highly suitable. Thus, maintenance of these locations must be given top priority in order to conserve the goose species that rely on them.

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Authors' Contribution

GR and ZA conceptualized the study. GR, ZA and RA conducted the field visits. GR, AA and ZA assembled and analyzed the dataset. GR and RA drafted the manuscript. AA and ZA reviewed and improved the manuscript.

Key words

Avian richness, Species assemblages, Migration, Geese, Habitat suitability, Conservation

INTRODUCTION

Wetlands play a vital role in ecosystems, offering numerous ecological and economic advantages. As an individual ecosystem, they vary in species diversity, geology, landscape exposure, and climate. They are influenced and regulated by their surroundings, including water sources and atmospheric conditions (Bhowmik, 2022). Wetlands are vital for biodiversity, hosting numerous bird species, but human-driven habitat changes harm wetland avifauna (Htay et al., 2023). The Province Punjab, Pakistan, is a region that is rich in wetland ecosystems, which provide vital habitats for a diverse range of avian

species, including geese (Haider et al., 2022). Wetlands in Punjab, such as the Indus River Floodplain, offer abundant food resources and nesting sites for geese, making them important areas for the conservation of these species. There are several species of geese that can be found in Punjab's wetlands, including the bar-headed goose, greylag goose, and bean goose. These species are known to migrate from Siberia to Punjab during the winter months, where they can be found in large flocks (Liu et al., 2017). However, the geese populations that migrate to Punjab's wetlands during the winter months are likely breeding in the Arctic regions of Russia, Mongolia, and China. These geese rely on the wetlands in Punjab as a key stopover site during their long-distance migrations, where they feed and rest before continuing their journey (Köppen et al., 2010).

Avian richness, species assemblages and migration connectivity play significant roles in the behavior and ecology of geese species. Geese are known for their impressive long-distance migrations and their tendency to form large flocks and exhibit spatial aggregation (Aikens et al., 2022). This behavior serves several purposes, including protection from predators, improved foraging efficiency, and social interactions (Varpe and Bauer, 2022). Geese often form large flocks during migration, breeding,

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and wintering periods. The degree of interaction and connectivity between different populations or geographic locations during migration, geese species exhibit varying levels of migration connectivity, depending on their migratory strategies and ecological requirements (Clausen *et al.*, 2018; Wilson *et al.*, 2022). These species may travel thousands of kilometers and encounter various stopover sites along their migration routes, where they interact with other populations (Gesicki and Bingman, 2022). The variety of Pakistan's wetlands represents the Indus River's course from the high mountains to the sea, as well as the whole range of wetland habitats (Balwan and Kour, 2021). Moreover, the Indus Flyway is an important migration path for water birds such as ducks, cranes, shorebirds and geese (Chapman *et al.*, 2014).

Several factors can influence the migration connectivity of geese species. For instance, the availability of suitable breeding, wintering, and stopover habitats can affect the connectivity between different populations (Fattorini *et al.*, 2023). Geese's movement patterns can be influenced by the quality and accessibility of habitats that meet their needs for feeding, resting, and breeding (Faaborg *et al.*, 2010). Sometimes, physical barriers, such as mountain ranges, large bodies of water, or unsuitable habitats, can limit migration connectivity. Favorable conditions may promote the congregation of different populations at specific stopover sites or wintering areas (Lei *et al.*, 2019). Furthermore, seasonal bird monitoring is critical for detecting dynamic bird migration in specific habitats (Sethy *et al.*, 2015). Wetland avifauna species are virtuous ecological markers that indicate the status of wetlands, and they serve as a source of uniting forces across nations all over the world through migration (Stephenson *et al.*, 2020).

Enormous number of the world's bar-headed geese (*Anser indicus*) and the greylag goose (*Anser anser*) yearly migrate from Siberia to their wintering areas in Pakistan and India (Köppen *et al.*, 2010), while greater white-fronted goose (*Anser albifrons*) and lesser white-fronted goose (*Anser erythrotopus*) are infrequent winter visitors in Pakistan. The habitat suitability of these species is largely determined by the availability of suitable wetland habitats that provide sufficient food resources, shelter, and nesting sites (Mishra *et al.*, 2020). The conservation of wetland habitats in Punjab is crucial for maintaining the migratory connectivity and habitat suitability of geese population. Efforts to conserve wetland habitats in Punjab, including habitat restoration, pollution control, and the establishment of protected areas, can help to support the abundance and diversity of geese and other avian species in the region (Altat *et al.*, 2018).

The information about the habitat suitability and

their latest population status in Punjab's wetlands lacks in published literature. The research was planned to study the avian richness of thirty wetlands, species assemblages and habitat suitability of geese species at wetlands of Punjab. This study adds latest information about the recent status of geese along with other avian species in the selected wetlands.

MATERIALS AND METHODS

Punjab (31.1704° N, 72.7097° E) is the north-eastern province of Pakistan (Sidra *et al.*, 2022). Thirty wetlands of Punjab were selected for the current study as highlighted in Figure 1. The field surveys were conducted from October 2020 to March 2021 and October 2021 to March 2022 on monthly basis. The point count method was used during field surveys (Verner, 1985). Fifteen minutes were spent at each point to observe the species. Garmin GPS map 76CSx, Harrier 65mm ED Spotting Scope, camera (Nikon p-900) and binoculars (Bushnell power view, 60 X 90 m) were used during the surveys. A field guide by Grimmett *et al.* (2008) was used for the bird identification.

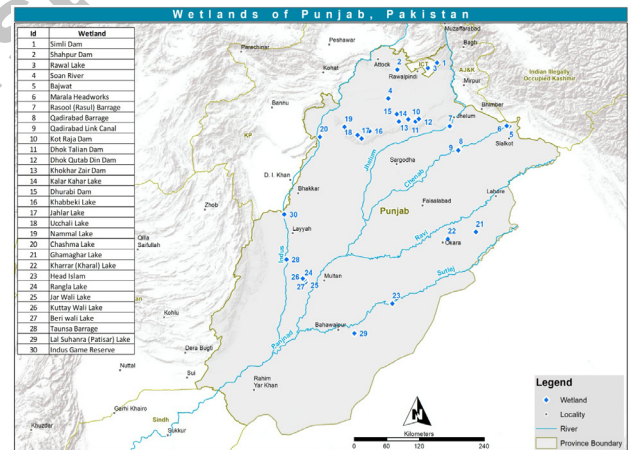


Fig. 1. Map showing selected wetlands in Punjab, Pakistan.

Data analysis

To analyze the data, different indices were employed including Shannon wiener, Simpson index and species evenness using the following formulas.

Shannon wiener index (H') = $\sum [p_i \ln p_i]$ (Shannon, 1948)

where p_i is proportion of the species relative to the total number of the species \ln , and p_i is natural logarithm of p_i .

Simpson index (D) = $1 - \sum n(n-1) / N(N-1)$ (Simpson, 1949).

where n is total number of individuals of a particular species, N is total number of individuals of all species.

Species evenness (E) = $H'/\ln(S)$ (Peet, 1974)
where S is species richness.

Habitat suitability index (HSI)

During the field surveys, many physical and ecological variables were recorded including geographical location (based on their occurrence), food availability, hunting pressure, predation pressure, waste/pollution, climatic changes (temperature and precipitation), habitat destruction, water quality, breeding and roosting sites and fishing activities. HSI of each site was calculated using the following formula:

$HSI = (SI1 \times SI2 \times SI3 \times SI4 \times SI5 \times SI6 \times SI7 \times SI8 \times SI9 \times SI10)^{1/10}$ (Hess and Bay, 2000).

where SI is suitability indicator.

The overall HSI score ranges from 0 (least suitable) to 1 (highly suitable). The score categorization is given in Table I (Ahmad *et al.*, 2022).

Table I. HSI score categorization.

Category	HSI score	Suitability
Poor	< 0.50	Least suitable
Below average	0.50 - 0.59	
Average	0.60 - 0.69	Less suitable
Good	0.70 - 0.79	Moderately suitable
Excellent	> 0.8	Highly suitable

RESULTS

Habitat suitability of geese species

Five geese species were recorded from the wetlands including bar-headed goose (*Anser indicus*), greylag goose (*Anser anser*), greater white-fronted goose (*Anser albifrons*), cotton pygmy-goose (*Nettapus coromandelianus*) and lesser white-fronted goose (*Anser erythropus*). Bar-headed goose has the highest number of individuals (2,701 at eleven sites) followed by greylag goose (1,224 at nine sites), cotton pygmy-goose (74 at eleven sites), greater white-fronted goose (46 at five sites) and lesser white-fronted goose (seven at four sites).

The habitat suitability index was based on the factors given in section 2.2. Bar-headed geese were found at eleven sites and out of these, Marala Headworks and Taunsa were moderately suitable with 0.71 and 0.65 HSI score respectively followed by Chashma (0.60) which is less suitable for the species. The other sites including Bajwat, Qadirabad Barrage, Indus game reserve, Rawal lake, Shahpur dam, Soan River, Simli Dam, Qadirabad Link Canal were least suitable with values 0.49, 0.46, 0.46,

0.45, 0.44, 0.44, 0.43 and 0.28, respectively (Fig. 2A).

Greylag goose was found at nine sites and none of the sites qualified for highly suitable or moderately suitable. Among nine sites, Marala Headworks and Chashma had the highest scores (0.69) followed by Taunsa and Bajwat (0.68) (Fig. 2). As shown in Figure 2B, six sites including Chashma, Taunsa, Bajwat, Indus game reserve and Qadirabad Barrage fell under the category of less suitable as per cumulative score of selected suitability parameters. Rest of the sites had worse situation and were found to be least suitable for the species.

Greater white-fronted goose were observed at five sites and among these five sites, Marala Headworks had the highest scores (0.68) followed by Chashma, Bajwat (0.67) and Taunsa (0.65) (Fig. 2C), which fell under the category of less suitable (Fig. 2). The remaining sites had worse state and were deemed to be least suitable for the species.

Lesser white-fronted goose were recorded at four sites and none of the sites meet the requirements of being highly suitable or moderately suitable. Among these four sites, Marala Headworks had the highest scores (0.67) followed by Chashma (0.63) and Bajwat (0.61) (Fig. 2). These sites were classified as less suitable while Qadirabad link canal was categorized as least suitable with score of 0.32 (Fig. 2D).

Cotton pygmy-goose were found at eleven sites and out of these, Marala Headworks was highly suitable (0.80) followed by Chashma (0.77), Qadirabad Barrage (0.77), Bajwat (0.74), Taunsa (0.73) and Indus game reserve (0.71), which qualified for moderately suitable category. Rasul barrage and Simli Dam were less suitable with 0.68 and 0.64 scores while Head Islam, Ghamaghar lake, Qadirabad Link Canal and Jar Wali Lake were least suitable with 0.52, 0.39, 0.32 and 0.28 score, respectively (Fig. 2E).

Bird species composition

A total of 175 species of 13 orders and 39 families were recorded from thirty wetlands in Punjab, Pakistan during field surveys (Supplementary Table S1). Order Charadriiformes has the highest diversity (48 species) followed by Passeriformes (33 species), Anseriformes (25 species), Pelecaniformes (18 species), Gruiformes (13 species), Accipitriformes (12 species), Ciconiiformes (7 species), Coraciiformes (5 species), Falconiformes (4 species), Podicipediformes (4 species), Suliformes (4 species), Phoenicopteriformes (2 species), and Bucerotiformes (1 species). Anatidae, Scolopacidae, Ardeidae, Laridae and Rallidae were the leading families with 26, 18, 14, 12 and 11 species, respectively.

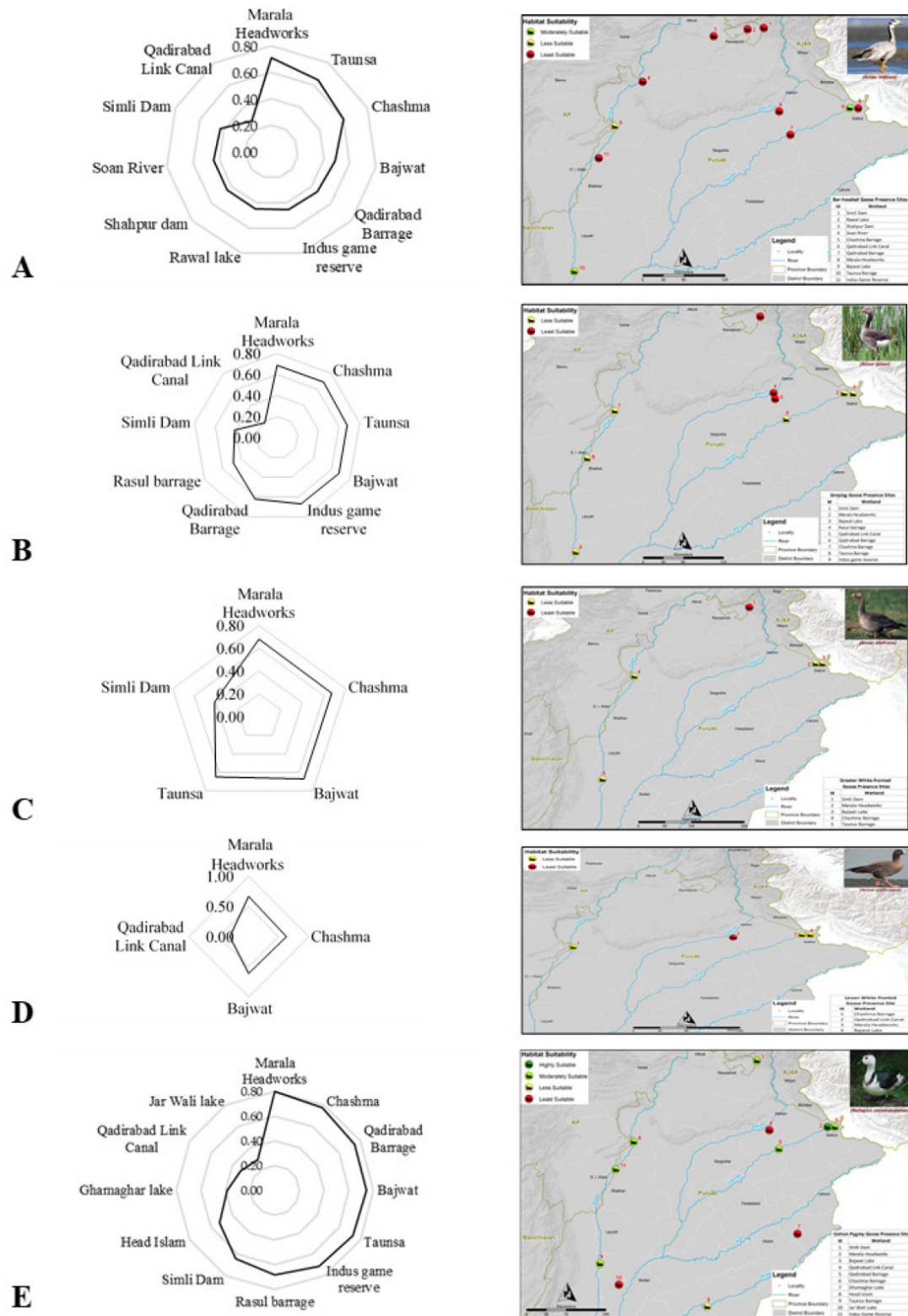


Fig. 2. Habitat suitability score (left) and map showing site suitability (right) of bar headed goose (A), greylag goose (B), greater white-fronted goose (C), lesser white-fronted goose (D) and cotton pygmy goose (E).

Table II. Species occurrence categorization in the study area.

Occurrence	Number of species
Winter migrant	84
Year-round residents	62
Passage migrants	14
Vagrant	8
Summer breeder	7

Out of total bird species, 48% were winter migrants, 35% were year-round residents, 8% were passage migrants, 5% were vagrant and 4% were summer breeder

(Table II). According to the IUCN red list, 148 species were least concern while 16 were near threatened, eleven were threatened (Table III). The population of 30 species is growing while the trend for 76 species is declining. Moreover, population trend of 37 species is stable while for 32 species it is still unknown as per IUCN. At the species level, common coot (*Fulica atra*), little cormorant (*Phalacrocorax niger*), house crow (*Corvus splendens*), common pochard (*Aythya ferina*) and mallard (*Anas platyrhynchos*) were most abundant at these sites cumulatively with 72,171, 20,829, 11,105, 10,971 and 10,811 number of individuals respectively having relative abundance of 22.75, 6.56, 3.50, 3.45 and 3.40, respectively (Table III).

Table III. Avian richness, diversity and abundance at different wetlands in Punjab, Pakistan.

S. No	Sites	Species richness	Number of individuals	Simpson index	Shannon wiener	Species evenness
1	Chashma	138	30,360	0.90	3.16	0.64
2	Jahlar	82	3,484	0.92	3.15	0.71
3	Khabakki	99	4,255	0.88	3.15	0.68
4	Taunsa	160	6,283	0.94	3.95	0.77
5	Uchalli	100	23,536	0.77	2.39	0.51
6	Bajwat	161	20,399	0.94	3.66	0.71
7	Baeri wali lake	83	868	0.98	4.10	0.92
8	Dhok Kutab Din dam	74	928	0.89	3.28	0.76
9	Dhok Talian Dam	80	924	0.97	3.85	0.88
10	Dhurabi Dam	92	1,505	0.94	3.65	0.80
11	Ghamaghar lake	122	1,088	0.98	4.27	0.88
12	Head Islam	141	1,176	0.94	3.71	0.74
13	Indus game reserve	168	18,400	0.95	3.77	0.73
14	Jar Wali lake	113	1,781	0.97	4.13	0.87
15	Kalar Kahar lake	119	12,988	0.94	3.59	0.75
16	Kharral lake	97	324	0.98	4.22	0.92
17	Khokhar Zair dam	81	6,981	0.96	3.61	0.82
18	Kot Raja dam	94	6,295	0.96	3.55	0.77
19	Kutty Wali lake	92	1,039	0.97	4.04	0.89
20	Lal Suhanra lake	97	1,273	0.96	3.97	0.86
21	Marala headworks	167	35,552	0.94	3.74	0.72
22	Nammal lake	109	21,310	0.89	3.29	0.69
23	Qadirabad barrage	146	22,364	0.91	3.39	0.68
24	Qadirabad link canal	147	11,450	0.96	3.90	0.77
25	Rangla lake	108	9,085	0.95	3.66	0.78
26	Rasul barrage	127	15,827	0.92	3.37	0.69
27	Rawal lake	119	15,575	0.91	3.33	0.69
28	Shahpur dam	102	14,529	0.90	3.08	0.66
29	Simli dam	166	14,607	0.97	3.44	0.67
30	Soan river	111	12,908	0.92	3.25	0.69

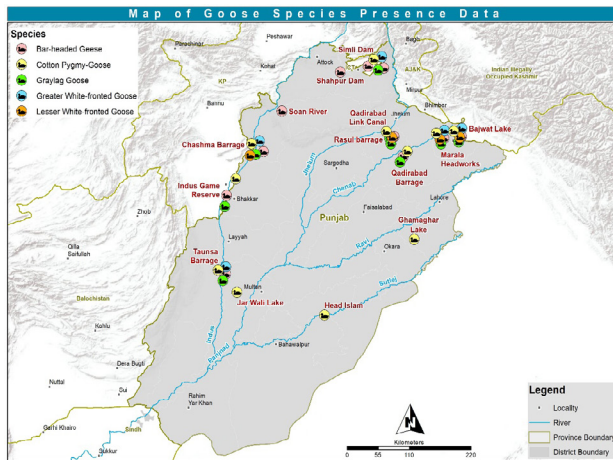


Fig. 3. Occurrence of geese in the wetlands of Punjab, Pakistan.

Birds diversity, richness and abundance

The maximum number of species were observed at Indus game reserve (168) followed by Marala headworks (167), Simli dam (166), Bajwat (161) and Taunsa (160). Moreover, the maximum number of individuals were recorded at Marala headworks (35,552) followed by Chashma, Uchalli, Qadirabad Barrage and Nammal lake with 30,360, 23,536, 22,364 and 21,310 number of individuals, respectively. The abundance details for each site and species are given in [Supplementary Table SII](#). The species diversity fluctuated among sites with maximum Shannon wiener value of 4.28 (Ghamaghar lake) to minimum 2.39 (Uchalli lake). The Shannon wiener diversity of Ghamaghar lake (4.27) was followed by Kharral lake, Jar wali lake and Baeri wali lake with 4.22, 4.13 and 4.10 H' values respectively. The species evenness was found to be 0.92 for Baeri wali Lake and Kharral Lake while 0.89 for Kutty Wali Lake and 0.88 for Ghamaghar lake ([Table III](#)).

The value of Simpson's index was 0.98 for three sites namely Kharral Lake, Baeri wali Lake and Ghamaghar lake, while the value was 0.97 for six sites including Kutty Wali Lake, Dhok Talian Dam, Taunsa, and Jar wali lake. The minimum value of this index was 0.77 for Uchalli lake ([Table I](#)).

DISCUSSION

Geese migration and habitat suitability

Three flyways including West Asian-Eastern African Flyway, the Central Asian Flyway and the East Asian-Australasian Flyway encompass the geese migration across Asia ([Boere and Stroud, 2006](#)). Pakistan is one of the

countries covered by Central Asian Flyway. This flyway is defined by the a wide (200-400 km) barrier of Himalayas. Moreover, the waterbird migration from northern breeding sites to the Indian subcontinent for the winter is impeded by the Himalayas. The bar-headed goose and greylag goose are the only two populations of geese that routinely winter on the Indian subcontinent and number in the thousands ([Takekawa *et al.*, 2017](#)). Little is known about the migration of these species but there are evidences that greylag goose is frequently found in relatively small flocks of tens to low thousands, typically in the same wintering habitats as the bar-headed goose. Various migration routes are described for Bar-headed goose and one of them includes Ravi and Chenab River ([Köppen *et al.*, 2010](#)). The current study provides the evidence ([Fig. 3](#)) as these species were found in the wetlands nearby Chenab and Ravi River.

In the current study, these two species shared eight sites including Chashma, Taunsa, Bajwat, Indus game reserve, Marala Headworks, Qadirabad Barrage, Qadirabad link canal and Simli dam. Although these species coexisted at these sites but the habitat suitability score were different for these species at the study sites because of their response to each studied factor; such as, predation and hunting pressure etc. For example, it is reported in literature that bar-headed geese are killed ruthlessly in this region ([Khan and Ali, 2014](#)) and similar observations were made during current research. One of the main reasons behind their ruthless killings is the large number of individuals that visit the sites. Marala headworks is the main site where these species stop during their migration and unfortunately get killed by the hunters. While there are no such reports and observations for other geese species.

Bar-headed goose was the most abundant among geese species in the selected wetlands, inhabiting eleven sites with maximum (1,148) individuals at Marala headworks. [Bhatti *et al.* \(2019\)](#) recorded 1,710 individuals of this species between year 2000 and 2001 in same area. The presence of this species was reported at Taunsa barrage by [Haider *et al.* \(2022\)](#) and [Köppen *et al.* \(2010\)](#) and in the current study 19 individuals of bar-headed goose were recorded at the same site. A total of 44 individuals of greylag goose were recorded at Chashma in this study while [Ali and Akhtar \(2005\)](#) observed 37 individuals.

Little information is available about the migration pattern of greater white-fronted goose, lesser white-fronted goose and cotton pygmy-goose and there are only a few published records of their presence in Pakistan. Lesser white-fronted goose is vulnerable according to IUCN and it was reported at Banjosa lake of Poonch district Azad Jammu and Kashmir in 2009 ([Nazir *et al.*, 2018](#)).

Avian richness and assemblages

A total of 175 species of 13 orders and 39 families were recorded from thirty wetlands in Punjab, Pakistan during field surveys. The maximum number of species were observed at Indus game reserve followed by Marala headworks, Simli dam, Bajwat and Taunsa. Moreover, the maximum number of individuals were recorded at Marala headworks followed by Chashma, Uchalli, Qadirabad Barrage and Nammal lake.

In the current study, 100 species with 23,536 number of individuals were recorded at Uchalli wetland while 133 species with 18,331 individuals were recorded by [Kazam et al. \(2022\)](#) between 2020 to 2021. Moreover, 47 species with 25,361 individuals were recorded from 2011 to 2013 at the same site ([Dauda et al., 2017](#)). From October 2015 to September 2016, [Ashraf et al. \(2019\)](#) observed 36 bird species and 13,342 individuals at the same location. [Arshad \(2014\)](#) recorded 1,139 individuals belonging to eleven bird species in 2010 and 18,606 individuals belonging to 34 bird species in 2011. In 2007, [Arshad \(2011\)](#) documented 40 avian species while in 2003, [Ali and Akhtar \(2005\)](#) recorded 103 avian species with 1,591 individuals at Uchalli Lake.

As part of this study, 99 species with 4,255 individuals were observed at Khabbaki lake while 92 bird species having 3,053 individuals were recorded by [Kazam et al. \(2022\)](#). [Arshad \(2011\)](#) documented 39 species while [Ali \(2011\)](#) observed 37 birds' species of 428 individuals in 2006. [Ali and Akhtar \(2005\)](#), recorded 91 bird species of 1,246 individuals in 2003 at this lake.

At Jahlar lake 82 species with 3,484 individuals were recorded in this study while in another study, 88 bird species and 2,394 individuals were recorded at the same site ([Kazam et al., 2022](#)). [Arshad \(2011\)](#) reported 41 avian species in 2007, [Ali and Akhtar \(2005\)](#) recorded 53 species with 370 individuals in 2003. [Ali et al. \(2011\)](#) observed 47 species with 2,275 individuals in 2006 at this lake.

At Taunsa, 160 species with 6,283 individuals were recorded in this study while 50 species having 10,845 individuals were observed in 2019 to 2020 ([Haider et al., 2022](#)), 171 species with 58,598 individuals were recorded between 2009 to 2011 ([Bibi et al., 2013](#)). The annual bird population trends at Taunsa were observed from 2008 to 2014 and a decreasing trend of 14 bird species and an increasing trend of 157 bird species was reported ([Bibi et al., 2016](#)).

At Kallar Kahar lake 119 species were recorded in this study while [Rais et al. \(2011\)](#) observed 86 species from 2008 to 2009 and 91 species with 1,246 individuals were recorded by [Ali and Akhtar \(2005\)](#). Moreover, at Chashma, 138 species with 30,360 individuals, at Nammal lake, 109 species with 21,310 individuals were recorded

in this study while 126 species of 71,008 individuals and 115 species with 1,726 individuals were recorded at these respective sites ([Ali and Akhtar, 2005](#)). At Bajwat lake, 161 species were recorded in this study while 110 species were sighted ([Bhinder et al., 2015](#)).

Threats

Illegal hunting can be considered as the main threat to these species. In addition, attack by the stray dogs on these species was also witnessed during the study. Moreover, predation, trapping, over hunting, shooting, use of pesticides, habitat loss, pollution, infrastructure developments and anthropogenic activities are major threats to avifauna and the observations are in accordance with different previous studies ([Umar et al., 2018](#); [Robinson et al., 1995](#); [Grimmett et al., 2008](#); [Ghalib et al., 2008](#)).

CONCLUSIONS

Five geese species were recorded from the wetlands including bar-headed goose, greylag goose, greater white-fronted goose, cotton pygmy-goose and lesser white-fronted goose. Among five geese species found at the wetlands of Punjab, Marala Headworks was found to be the most suitable site (specific category varies with the species) for all the species, followed by Chashma, Taunsa and Bajwat. Moreover, the avian diversity of wetlands in Punjab varies from rich (Ghamaghar lake) to moderate (Uchalli lake) according to Shannon wiener diversity index. The maximum number of species were observed at Indus game reserve followed by Marala headworks and Simli dam. Moreover, the maximum number of individuals were recorded at Marala headworks followed by Uchalli and Chashma.

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Ethical statement

No species was harmed during the current study.

Supplementary material

There is supplementary material associated with this article. Access the material online at: <https://dx.doi.org/10.17582/journal.pjz/20230724085011>

Statement of conflict of interest

The authors have declared no conflict of interest.

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Online First Article



Supplementary Material

Avian Richness, Assemblages and Migration Connectivity of Geese Species with Habitat Suitability in Wetlands of the Punjab, Pakistan

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Supplementary Table SI. List of species recorded at wetlands of Punjab, Pakistan.

S. No.	Order/Family	Species	IUCN status*	Trend	Occurrence**
Order: Passeriformes					
1	Family: Cisticolidae	Ashy Prinia <i>Prinia socialis</i>	LC	Stable	YRR
2		Striated Prinia <i>Prinia crinigera</i>	LC	Stable	YRR
3		Yellow-bellied Prinia <i>Prinia flaviventris</i>	LC	Decreasing	YRR
4		Zitting Cisticola <i>Cisticola juncidis</i>	LC	Increasing	YRR
5		Plain Prinia <i>Prinia inornata</i>	LC	Stable	YRR
6		Graceful Prinia <i>Prinia gracilis</i>	LC	Stable	YRR
7		Rufous-fronted Prinia <i>Prinia buehneri</i>	LC	Stable	YRR
8	Family: Sturnidae	Common Myna <i>Acrideros tristis</i>	LC	Increasing	YRR
9		Bank Myna <i>Acrideros ginginianus</i>	LC	Increasing	YRR
10	Family: Hirundinidae	Barn Swallow <i>Hirundo rustica</i>	LC	Decreasing	WM
11	Family: Laniidae	Bay-backed Shrike <i>Lanius vittatus</i>	LC	Stable	YRR
12		Rufous-tailed Shrike <i>Lanius isabellinus</i>	LC	Unknown	WM
13	Family: Dicruridae	Black Drongo <i>Dicrurus macrocercus</i>	LC	Unknown	YRR
14	Family: Motacillidae	White-browed Wagtail <i>Motacilla maderaspatensis</i>	LC	Stable	YRR
15		Yellow Wagtail <i>Motacilla flava</i>	LC	Decreasing	PM
16		White Wagtail <i>Motacilla alba</i>	LC	Stable	WM
17		Citrine Wagtail <i>Motacilla citreola</i>	LC	Increasing	WM
18		Water Pipit <i>Anthus spinoletta</i>	LC	Stable	WM
19	Family: Hirundinidae	Wire-tailed Swallow <i>Hirundo smithii</i>	LC	Increasing	SB
20		Streaked-throated Swallow <i>Hirundo fluvicola</i>	LC	Increasing	YRR

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Order/Family	Species	IUCN status*	Trend	Occurrence**
Family: Acrocephalidae	Clamorous Reed Warbler <i>Acrocephalus stentoreus</i>	LC	Stable	WM
Family: Muscicapidae	Blue Throat <i>Luscinia svecica</i>	LC	Stable	WM
	Common Stonechat <i>Saxicola torquatus</i>	LC	Stable	PM
	Indian Robin <i>Copsychus fulicatus</i>	LC	Stable	YRR
Family: Leiothrichidae	Common Babbler <i>Turdoides caudatus</i>	LC	Stable	YRR
Family: Phylloscopidae	Common Chiffchaff <i>Phylloscopus collybita</i>	LC	Increasing	WM
Family: Alaudidae	Crested Lark <i>Galerida cristata</i>	LC	Decreasing	YRR
Family: Corvidae	House Crow <i>Corvus splendens</i>	LC	Stable	YRR
Family: Passeridae	House Sparrow <i>Passer domesticus</i>	LC	Decreasing	YRR
Family: Muscicapidae	Pied Bushchat <i>Saxicola caprata</i>	LC	Stable	YRR
Family: Pycnonotidae	Red-vented Bulbul <i>Pycnonotus cafer</i>	LC	Increasing	YRR
Family: Pellorneidae	Rufous-vented Prinia <i>Prinia burnesii</i>	NT	Decreasing	YRR
Family: Pycnonotidae	White-eared Bulbul <i>Pycnonotus leucotis</i>	LC	Decreasing	YRR
Order: Anseriformes				
Family: Anatidae	Gadwall <i>Anas strepera</i>	LC	Increasing	WM
	Garganey <i>Anas querquedula</i>	LC	Decreasing	WM
	Bar-headed Goose <i>Anser indicus</i>	LC	Decreasing	WM
	Common Teal <i>Anas crecca</i>	LC	Unknown	WM
	Cotton Pygmy- Goose <i>Nettapus coromandelianus</i>	LC	Stable	WM
	Common Shelduck <i>Tadorna tadorna</i>	LC	Increasing	WM
	Comb Duck <i>Sarkidiornis melanotos</i>	LC	Decreasing	WM
	Eurasian Wigeon <i>Anas penelope</i>	LC	Decreasing	WM
	Common Pochard <i>Aythya ferina</i>	VU	Decreasing	WM
	Falcated Duck <i>Anas falcata</i>	NT	Decreasing	V
	Common Merganser <i>Mergus merganser</i>	LC	Increasing	PM
	Greater White-fronted Goose <i>Anser albifrons</i>	LC	Unknown	WM
	Common Goldeneye <i>Bucephala clangula</i>	LC	Stable	WM
	Greylag Goose <i>Anser anser</i>	LC	Increasing	WM
	Lesser Whistling Duck <i>Dendrocygna javanica</i>	LC	Decreasing	SB
	Lesser White-fronted Goose <i>Anser erythropus</i>	VU	Decreasing	V
	Northern Pintail <i>Anas acuta</i>	LC	Decreasing	WM
	Northern Shoveler <i>Anas clypeata</i>	LC	Decreasing	WM
	Mallard <i>Anas platyrhynchos</i>	LC	Increasing	WM
	Marbled Duck <i>Marmaronetta angustirostris</i>	VU	Decreasing	WM
	Red-crested Pochard <i>Netta rufina</i>	LC	Unknown	WM
	Ruddy Shelduck <i>Tadorna ferruginea</i>	LC	Unknown	WM
	Tufted Duck <i>Aythya fuligula</i>	LC	Stable	WM
	White-headed Duck <i>Oxyura leucocephala</i>	EN	Decreasing	WM
	Spot-billed Duck <i>Anas poecilorhyncha</i>	LC	Decreasing	WM
Order: Charadriiformes				
Family: Laridae	Black-bellied Tern <i>Sterna acuticauda</i>	EN	Decreasing	WM
	Indian Skimmer <i>Rynchops albicollis</i>	VU	Decreasing	SB
	Pallas's Gull <i>Larus ichthyaetus</i>	LC	Increasing	WM
	River Tern <i>Sterna aurantia</i>	NT	Decreasing	YRR

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Order/Family	Species	IUCN status*	Trend	Occurrence**
Family: Scolopaciidae	Little Tern <i>Sterna albifrons</i>	LC	Decreasing	SB
	White-winged Tern <i>Chlidonias leucopterus</i>	LC	Stable	V
	Whiskered Tern <i>Chlidonias hybridus</i>	LC	Stable	PM
	Gull-billed Tern <i>Gelochelidon nilotica</i>	LC	Decreasing	WM
	Common Tern <i>Sterna hirundo</i>	LC	Unknown	SB
	Brown-headed Gull <i>Larus brunnicephalus</i>	LC	Stable	WM
	Caspian Gull <i>Larus cachinnans</i>	LC	Increasing	WM
	Black-headed Gull <i>Larus ridibundus</i>	LC	Unknown	WM
	Black-tailed Godwit <i>Limosa limosa</i>	NT	Decreasing	WM
	Common Redshank <i>Tringa totanus</i>	LC	Unknown	WM
	Marsh Sandpiper <i>Tringa stagnatilis</i>	LC	Decreasing	WM
	Curlew Sandpiper <i>Calidris ferruginea</i>	NT	Decreasing	PM
	Green Sandpiper <i>Tringa ochropus</i>	LC	Increasing	WM
	Ruff <i>Philomachus pugnax</i>	LC	Decreasing	PM
	Wood Sandpiper <i>Tringa glareola</i>	LC	Stable	WM
	Spotted Redshank <i>Tringa erythropus</i>	LC	Stable	WM
	Red-necked Phalarope <i>Phalaropus lobatus</i>	LC	Decreasing	WM
	Jack Snipe <i>Lymnocyrtus minimus</i>	LC	Stable	WM
	Ruddy Turnstone <i>Arenaria interpres</i>	LC	Decreasing	WM
	Eurasian Curlew <i>Numenius arquata</i>	NT	Decreasing	WM
	Dunlin <i>Calidris alpina</i>	LC	Decreasing	WM
	Temminck's Stint <i>Calidris temminckii</i>	LC	Unknown	WM
	Little Stint <i>Calidris minuta</i>	LC	Increasing	WM
	Common Greenshank <i>Tringa nebularia</i>	LC	Stable	WM
	Common Sandpiper <i>Actitis hypoleucos</i>	LC	Decreasing	WM
	Common Snipe <i>Gallinago gallinago</i>	LC	Decreasing	WM
	Great Sand Plover <i>Charadrius leschenaultii</i>	LC	Decreasing	WM
	Northern Lapwing <i>Vanellus vanellus</i>	NT	Decreasing	WM
	Grey Plover <i>Pluvialis squatarola</i>	LC	Decreasing	WM
	Little Ringed Plover <i>Charadrius dubius</i>	LC	Stable	WM
	Sociable Lapwing <i>Vanellus gregarius</i>	CR	Decreasing	WM
	White-tailed Lapwing <i>Vanellus leucurus</i>	LC	Unknown	WM
	Red-wattled Lapwing <i>Vanellus indicus</i>	LC	Stable	YRR
	Kentish Plover <i>Charadrius alexandrinus</i>	LC	Decreasing	WM
Family: Glareolidae	Cream-colored Courser <i>Cursorius cursor</i>	NT	Unknown	WM
	Indian Courser <i>Cursorius coromandelicus</i>	LC	Stable	WM
	Small Pratincole <i>Glareola lactea</i>	LC	Unknown	SB
	Oriental Pratincole <i>Glareola maldivarum</i>	LC	Decreasing	V
Family: Burhinidae	Eurasian Thick-knee <i>Burhinus oedicephalus</i>	LC	Decreasing	YRR
	Great Thick-knee <i>Esacus recurvirostris</i>	NT	Decreasing	YRR
Family: Recurvirostridae	Pied Avocet <i>Recurvirostra avosetta</i>	LC	Unknown	WM
	Black-winged Stilt <i>Himantopus himantopus</i>	LC	Increasing	YRR
	Greater Painted Snipe <i>Rostratula benghalensis</i>	LC	Decreasing	WM
Family: Jacanidae	Pheasant-tailed Jacana <i>Hydrophasianus chirurgus</i>	LC	Decreasing	YRR

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Order/Family	Species	IUCN status*	Trend	Occurrence**
Order: Accipitriformes				
Family: Accipitridae	Black Kite <i>Milvus migrans</i>	LC	Unknown	YRR
	Greater Spotted Eagle <i>Aquila clanga</i>	VU	Decreasing	WM
	Shikra <i>Accipiter badius</i>	LC	Stable	YRR
	Black-shouldered Kite <i>Elanus caeruleus</i>	LC	Stable	YRR
	Brahminy Kite <i>Haliastur indus</i>	LC	Decreasing	YRR
	Pallas's Fish Eagle <i>Haliaeetus leucoryphus</i>	EN	Decreasing	YRR
	Pallid Harrier <i>Circus macrourus</i>	NT	Decreasing	WM
	Steppe Eagle <i>Aquila nipalensis</i>	EN	Decreasing	WM
	Montagu's Harrier <i>Circus pygargus</i>	LC	Decreasing	WM
	Eurasian Marsh Harrier <i>Circus aeruginosus</i>	LC	Increasing	WM
	Eurasian Sparrowhawk <i>Accipiter nisus</i>	LC	Stable	WM
	Eurasian Griffon <i>Gyps fulvus</i>	LC	Increasing	WM
	Osprey <i>Pandion haliaetus</i>	LC	Increasing	WM
Order: Gruiformes				
Family: Rallidae	Common Coot <i>Fulica atra</i>	LC	Increasing	WM
	Baillon's Crake <i>Porzana pusilla</i>	LC	Unknown	WM
	Ruddy-breasted Crake <i>Porzana fusca</i>	LC	Decreasing	WM
	White-breasted Waterhen <i>Amaurornis phoenicurus</i>	LC	Unknown	YRR
	Little Crake <i>Porzana parva</i>	LC	Stable	WM
	Spotted Crake <i>Porzana porzana</i>	LC	Stable	WM
	Purple Swampphen <i>Porphyrio porphyrio</i>	LC	Unknown	YRR
	Water Rail <i>Rallus aquaticus</i>	LC	Decreasing	WM
	Brown Crake <i>Amaurornis akool</i>	LC	Unknown	YRR
	Watercock <i>Gallicrex cinerea</i>	LC	Decreasing	SB
	Common Moorhen <i>Gallinula chloropus</i>	LC	Stable	YRR
	Common Crane <i>Grus grus</i>	LC	Increasing	PM
Family: Gruidae	Demoiselle Crane <i>Grus virgo</i>	LC	Increasing	PM
Order: Pelecaniformes				
Family: Ardeidae	Black Bittern <i>Dupetor flavicollis</i>	LC	Decreasing	YRR
	Cattle Egret <i>Bubulcus ibis</i>	LC	Increasing	YRR
	Western Reef Egret <i>Egretta gularis</i>	LC	Stable	YRR
	Yellow Bittern <i>Ixobrychus sinensis</i>	LC	Unknown	YRR
	Little Heron <i>Butorides striatus</i>	LC	Decreasing	YRR
	Purple Heron <i>Ardea purpurea</i>	LC	Decreasing	YRR
	Cinamon Bittern <i>Ixobrychus cinnamomeus</i>	LC	Stable	YRR
	Black-crowned Night Heron <i>Nycticorax nycticorax</i>	LC	Decreasing	YRR
	Great Egret <i>Casmerodius albus</i>	LC	Unknown	YRR
	Little Bittern <i>Ixobrychus minutus</i>	LC	Decreasing	YRR
	Little Egret <i>Egretta garzetta</i>	LC	Increasing	YRR
	Grey Heron <i>Ardea cinerea</i>	LC	Unknown	YRR

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Order/Family	Species	IUCN status*	Trend	Occurrence**
Family: Pelecanidae	Indian Pond Heron <i>Ardeola grayii</i>	LC	Unknown	YRR
	Great Bittern <i>Botaurus stellaris</i>	LC	Decreasing	WM
	Dalmatian Pelican <i>Pelecanus crispus</i>	NT	Decreasing	YRR
	Great White Pelican <i>Pelecanus onocrotalus</i>	LC	Unknown	YRR
Family: Threskiornithidae	Glossy Ibis <i>Plegadis falcinellus</i>	LC	Decreasing	PM
	Eurasian Spoonbill <i>Platalea leucorodia</i>	LC	Unknown	WM
Order: Ciconiiformes				
Family: Ciconiidae	White Stork <i>Ciconia ciconia</i>	LC	Increasing	PM
	Woolly-necked Stork <i>Ciconia episcopus</i>	VU	Decreasing	V
	Black Stork <i>Ciconia nigra</i>	LC	Unknown	PM
	Painted Stork <i>Mycteria leucocephala</i>	NT	Decreasing	YRR
	Black-necked Stork <i>Ephippiorhynchus asiaticus</i>	NT	Decreasing	PM
Order: Coraciiformes				
Family: Alcedinidae	Black-capped Kingfisher <i>Halcyon pileata</i>	LC	Decreasing	V
	Common Kingfisher <i>Alcedo atthis</i>	LC	Unknown	YRR
	White-throated Kingfisher <i>Halcyon smyrnensis</i>	LC	Increasing	YRR
	Crested Kingfisher <i>Megaceryle lugubris</i>	LC	Decreasing	YRR
	Pied Kingfisher <i>Ceryle rudis</i>	LC	Unknown	YRR
Order: Falconiformes				
Family: Falconidae	Eurasian Hobby <i>Falco subbuteo</i>	LC	Decreasing	WM
	Peregrine Falcon <i>Falco peregrinus</i>	LC	Stable	WM
	Red-necked Falcon <i>Falco chicquera</i>	NT	Decreasing	YRR
	Common Kestrel <i>Falco tinnunculus</i>	LC	Decreasing	WM
Order: Suliformes				
Family: Phalacrocoracidae	Great Cormorant <i>Phalacrocorax carbo</i>	LC	Increasing	YRR
Family: Anhingidae	Oriental Darter <i>Anhinga melanogaster</i>	NT	Decreasing	YRR
Family: Phalacrocoracidae	Little Cormorant <i>Phalacrocorax niger</i>	LC	Unknown	WM
	Indian Cormorant <i>Phalacrocorax fuscicollis</i>	LC	Unknown	YRR
Order: Podicipediformes				
Family: Podicipedidae	Red-necked Grebe <i>Podiceps grisegena</i>	LC	Decreasing	V
	Little Grebe <i>Tachybaptus ruficollis</i>	LC	Decreasing	YRR
	Great Crested Grebe <i>Podiceps cristatus</i>	LC	Unknown	WM
	Black-necked Grebe <i>Podiceps nigricollis</i>	LC	Unknown	WM
Order: Phoenicopteriformes				
Family: Phoenicopteridae	Greater Flamingo <i>Phoenicopeterus ruber</i>	LC	Increasing	PM
	Lesser Flamingo <i>Phoenicopeterus minor</i>	NT	Decreasing	PM
Order: Bucerotiformes				
Family: Bucerotidae	Fulvous Whistling-duck <i>Dendrocygna bicolor</i>	LC	Decreasing	V

*IUCN, International Union for Conservation of Nature; LC, Least Concern; NT, Near Threatened; VU, Vulnerable; EN, Endangered; CR, Critically Endangered. **YRR, Year-Round Resident; WM, Winter Migrant; SB, Summer Breeder; V, Vagrant; PM, Passage Migrant.

Supplementary Table SII. Species diversity at thirty wetlands.

Sr. No.	Species	Chashma	Jahlar	Khabakki	Taunsa	Uchalli	Bajwat	Baeri wali lake	Dhok Kutab Din dam	Dhok Talian dam	Dhurabi dam	Ghamaghar lake	Head Islam	Indus game reserve	Jar Wali lake	Kalar Kahar lake	Kharral lake	Khokhar Zair dam	Kot Raja dam	Kutty Wali lake	Lal Suhanra lake	Marala headworks	Nammal lake	Qadirabad barrage	Qadirabad link canal	Rangla lake	Rasul barrage	Rawal lake	Shahpur dam	Simli dam	Soan river
1	Ashy Prinia <i>Prinia socialis</i>	59	9	3	5	3	23	13	3	8	18	9	3	30	8	48	5	21	8	3	11	113	61	35	24	25	35	36	19	19	23
2	Bailon's Crake <i>Porzana pusilla</i>				5		9					3	1	12		8					7	3		5	3			3		3	
3	Bank Myna <i>Acridotheres tristis</i>	68	9	6	174	31	444	19	7	23	32	19	29	292	21	441	21	305	353	31	33	752	539	389	735	203	503	569	166	293	276
4	Bar-headed Goose <i>Anser indicus</i>	110			19		786							351								1148		187	5			42	15	19	19
5	Bam Swallow <i>Hirundo rustica</i>	103	9	16	10	23	109	18	21	11	20	8	7	92	7	217	3	218	19	23	25	353	171	294	73	23	35	39	43	25	34
6	Bay-backed Shrike <i>Lanius vittatus</i>		9	4	3	7	30	9		2	7	3	25	7	6	5	4	5	5	3	3	19	26	20	9	3	5	5		5	15
7	Black Bittern <i>Dupetor flavicollis</i>				5		22					3	1	8		11					3	13		9	9		2	2		5	
8	Black Drongo <i>Dicrurus macrocerus</i>	68	8	9	12	7	115	11	5	9	1	3	3	37	20	25	7	27	19	8	7	31	198	35	35	9	15	21	9	22	34
9	Black Kite <i>Milvus ml-grans</i>	167	19	17	60	32	129	29	2	18	28	39	28	425	32	336	18	291	291	45	131	693	843	157	535	170	318	218	285	330	184
10	Black Stork <i>Ciconia nigra</i>				9		7							7			1	1	5	3							2	7		3	3
11	Black-bellied Tern <i>Sterna acuticauda</i>	13			9	5	19	9		2	5	3	1	17	8	19	3		3		5	5		5	5	5	5	3	7	7	9
12	Black-capped Kingfisher <i>Halecyon pileata</i>					2		1					1	5												6		2			

Table continued on next page.....

Sr. No.	Species	Chashma	Jahlar	Khabakki	Taunsa	Uchalli	Bajwat	Baeri wali lake	Dhok Kutab Din dam	Dhok Talian dam	Dhurabi dam	Ghamaghar lake	Head Islam	Indus game reserve	Jar Wali lake	Kalar Kahar lake	Kharral lake	Khokhar Zair dam	Kot Raja dam	Kutty Wali lake	Lal Suhanra lake	Marala headworks	Nammal lake	Qadirabad barrage	Qadirabad link canal	Rangla lake	Rasul barrage	Rawal lake	Shahpur dam	Simli dam	Soan river
13	Black-crowned Night Heron <i>Nycticorax nycticorax</i>	167	10	27	25	8	29	9	3	7	21	7	3	61	13	41	3	55	27	19	7	153	145	253	204	42	195	162	159	147	264
14	Black-headed Gull <i>Larus ridibundus</i>	130		25	78	6	18			9	5	7	1	15	5	13	3		3			12	9	11	21	3	3	7	10	9	5
15	Black-necked Grebe <i>Podiceps nigricollis</i>	4		1	3		3			2			1	7	5						5	7	3	1			3			2	
16	Black-necked Stork <i>Ephippiorhynchus asiaticus</i>				10		11							5		9	1							7		7		2			5
17	Black-shouldered Kite <i>Elanus caeruleus</i>	19	7	3	7	5	20	2	2	3	2	3	3	22	4	5	5	5	5	3	3	8	9	5	3	3	4	3	3	4	3
18	Black-tailed Godwit <i>Limosa limosa</i>	6	4	9	5	6	88	3	4	2	9	3	1	9	11	13	1	19	10	9	5	32	20	24	25	21	18	28	39	29	20
19	Black-winged Stilt <i>Himantopus himantopus</i>	263	67	43	432	324	115	31	19	18	17	29	21	381	43	217	5	193	260	37	23	202	164	265	346	203	294	219	297	193	195
20	Blue Throat <i>Luscinia svecica</i>	19	6		29	2	19	3		2		7	1	23	7	8	3	8	8	3	7	18	36	24	21	8		9		10	
21	Brahminy Kite <i>Haliaeetus indus</i>				3		2					2	1	15																3	
22	Brown Crake <i>Amaurornis akool</i>						18					2	3	13	5	5				3	9		5	9		2	2		2	3	2
23	Brown-headed Gull <i>Larus brunicephalus</i>	37	3	37	5	10				7		2	1	7							291	8	10	5		3	8		8		8

Table continued on next page.....

Table continued on next page.....

Sr. No.	Species	Chashma	Jahlar	Khabakki	Taunsa	Uchalli	Bajwat	Baeri wali lake	Dhok Kutab Din dam	Dhok Talian dam	Dhurabi dam	Ghamaghar lake	Head Islam	Indus game reserve	Jar Wali lake	Kalar Kahar lake	Kharral lake	Khokhar Zair dam	Kot Raja dam	Kutty Wali lake	Lal Suhanra lake	Marala headworks	Nammal lake	Qadirabad barrage	Qadirabad link canal	Rangla lake	Rasul barrage	Rawal lake	Shahpur dam	Simli dam	Soan river
24	Caspian Gull <i>Larus cachinnans</i>	5	3	3	13	9	20	15		2	3	5	1	5	5	13	1	9	8	8	3	5	9	8	3	5	3	5	9	9	9
25	Cattle Egret <i>Bubulcus ibis</i>	265	9	21	74	65	191	23	14	13	11	18	17	169	53	205	5	22	147	19	31	931	252	354	210	203	252	152	43	162	295
26	Cinnamon Bittern <i>Ixobrychus cinnamomeus</i>						20					4	5	21		11					3	19		9	5		5	3		5	
27	Citrine Wagtail <i>Motacilla citreola</i>	134	19	37	5	109	133	22	19	29	23	28	17	191	17	2	3	195	212	18	3	831	195	286	185	213	195	195	186	184	167
28	Clamorous Reed Warbler <i>Acrocephalus scintereus</i>	9			37		2					3		9	7		3					9		9	5					5	
29	Comb Duck <i>Sarkidiornis melanotos</i>	11	2		37		3							3							3	2						2	3		
30	Common Bab-bler <i>Turdoides caudatus</i>	29	7		27	19	34	12	3	20	4	5	7	65	25	31	3	19	29	8	9	101	71	64	56	21	26	34	22	39	39
31	Common Chiffchaff <i>Phylloscopus collybita</i>	23			5		194				4			49		23					27		168	59	21					34	
32	Common Coot <i>Fulica atra</i>	11837	334	1301	78	10467	3913	26	288	49	224	69	251	2713	135	2105	2	289	273	107	31	7239	6137	5891	730	1550	3265	3698	3645	2935	2589
33	Common Crane <i>Grus grus</i>	19	5	5	12	11		1		1			3	5	5	13	1	8	7	6		5	9	2	3	5	2	3	3	7	2
34	Common Goldeneye <i>Bucephala clangula</i>	136	32		10		192			34	5	5	5	5	9	13	1	7		28	5	5	7	5	2	2	1	3	1	1	1
35	Common Greenshank <i>Tringa nebularia</i>	337	25	9	29	210	205	9		3	3	3	7	35	9	27	1	35	23	3	7	315	29	38	48	30	45	29	31	63	29

Table continued on next page.....

Sr. No.	Species	Chashma	Jahlar	Khabakki	Taunsa	Uchalli	Bajwat	Baeri wali lake	Dhok Kutab Din dam	Dhok Talian dam	Dhurabi dam	Ghamaghar lake	Head Islam	Indus game reserve	Jar Wali lake	Kalar Kahar lake	Kharral lake	Khokhar Zair dam	Kot Raja dam	Kutty Wali lake	Lal Suhanra lake	Marala headworks	Nammal lake	Qadirabad barrage	Qadirabad link canal	Rangla lake	Rasul barrage	Rawal lake	Shahpur dam	Simli dam	Soan river
36	Common Kestrel <i>Falco tinnunculus</i>	19	2	3	5	3	3		2	2	2		1	3	3	5	1	3	5	2	13	30				2	2	2	3	2	3
37	Common Kingfisher <i>Alcedo atthis</i>	61	3	7	8	5	12	2	1	3	3	2	1	19	8	9	3	3	8	3	3	9	8	5	5	10	3	3	5	3	4
38	Common Merganser <i>Mergus merganser</i>	272			3	3	3					1		1								3		3	1		3			2	
39	Common Moorhen <i>Gallinula chloropus</i>	93		9	13	12	54	2	2	8	5	9	7	220	8	7	4	29	209	7	18	269	130	356	202	203	134	165	185	95	80
40	Common Myna <i>Acridotheres tristis</i>	202	9	19	28	9	115	22	11	21	25	18	18	629	31	252	5	178	320	15	19	152	612	370	307	203	514	514	72	148	180
41	Common Pochard <i>Aythya ferina</i>	1257	454	230	1098	2130	159	13	30	17	220	12	175	932	16	915	3	12	20	5	1	1429	123	513	15	130	783	235	10	13	21
42	Common Red-shank <i>Tringa totanus</i>	193	59	9	78	90	135	8	3	4	3	3	1	151	8	27	1	18	7	9	5	93	43	44	39	21	13	19	94	64	40
43	Common Sandpiper <i>Actitis hypoleucos</i>	423	19	19	13	93	81	16	18	3	9	18	3	49	12	43	3	29	9	18	13	108	78	53	46	39	69	45	31	39	46
44	Common Shelduck <i>Tadorna tadorna</i>	142	7	3	10	180	92	7	1	2	3	2	3	110	9	19	1	29	17	5	5	5	79	23	20	45	20	14	18	2	8
45	Common Snipe <i>Gallinago gallinago</i>	116	3		29	58	55	9	1			2	3	9	7	8	3	5	10	7	7	231	45	52	43	31	39	32	29	37	39
46	Common Teal <i>Anas crecca</i>	574	268	31	5	459	235	7	14	11	28	29	5	252	15	244	3	8	159	17	23	450	381	345	9	393	340	192	952	285	298
47	Common Tern <i>Sterna hirundo</i>	49	9	3	13	4	8	1	2		1		1	18	9	21					20		7	5	3		5	5	5		
48	Common Stonechat <i>Saxicola torquatus</i>	1																													

Table continued on next page.....

Sr. No.	Species	Chashma	Jahlar	Khabakki	Taunsa	Uchalli	Bajwat	Baeri wali lake	Dhok Kutab Din dam	Dhok Talian dam	Dhurabi dam	Ghamaghar lake	Head Islam	Indus game reserve	Jar Wali lake	Kalar Kahar lake	Kharral lake	Khokhar Zair dam	Kot Raja dam	Kutty Wali lake	Lal Suhanra lake	Marala headworks	Nammal lake	Qadirabad barrage	Qadirabad link canal	Rangla lake	Rasul barrage	Rawal lake	Shahpur dam	Simli dam	Soan river
49	Cotton Pygmy- Goose <i>Netapus coro-mandelianus</i>	6			19		8															11								3	
50	Cream-colored Courser <i>Cur-sorius cursor</i>				19									7	3							19				5				9	
51	Crested Kingfisher <i>Megaceryle lugubris</i>																										6	3	3	3	
52	Crested Lark <i>Galerida cristata</i>		12	9	5	8	10	1	1	3	7	28	20	28	3	9	19	3	5	27	28	5	5	9	6	11	5	6	9		
53	Curlew Sand-piper <i>Calidris ferruginea</i>	67	9	5	11	9	11	2	5	2	3	3	3	13	1	13	3	4		7	3	3	3	9	5	7	7	8	5		
54	Dalmatian Pel- ican <i>Pelecanus crispus</i>	9			4								9								9								5		
55	Demoiselle Crane <i>Gras virgo</i>	85	25	19	46	32	31	6	3	18	1	30	7				13	2	15	21	9	8	10	13	8	7					
56	Dunlin <i>Calid- ris alpina</i>	11	4	2	19	9	3	1	1	1	1	1	9	3	5	1	3	9	1	6	5	3	3	3	2	2	2	2	3	2	
57	Eurasian Cur-lew <i>Numenius arquata</i>	19	9	9	78	19	19	1	20	1	2	1	7	7	13	1	5	5	3	4	83	9	7	3	5	8	8	7	9	5	
58	Eurasian Hobby <i>Falco subbuteo</i>	3			17	2	1	1			1	3	5		5				3	8		3	2	2	3	3			4		
59	Eurasian Griffon <i>Gyps fulvus</i>	2	2		2		2		1	1	1	1	5		5					8	3		2	2	3	2			2		
60	Eurasian Marsh Harrier <i>Circus aerugi-nosus</i>	17	1		13		5	3	1		3	2	2	5	3	5	2		1	3	12	8	3	3	2	2	2	3	3	3	
61	Eurasian Spoonbill <i>Platalea leucorodia</i>	73		21	10	61	25		3	9	5	3	23	12	13	1	9		4	6	245	29	21	31	11	18	18	9	18	21	

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Sr. No.	Species	Chashma	Jahlar	Khabakki	Taunsa	Uchalli	Bajwat	Baeri wali lake	Dhok Kutab Din dam	Dhok Talian dam	Dhurabi dam	Ghamaghar lake	Head Islam	Indus game reserve	Jar Wali lake	Kalar Kahar lake	Kharral lake	Khokhar Zair dam	Kot Raja dam	Kutty Wali lake	Lal Suhanra lake	Marala headworks	Nammal lake	Qadirabad barrage	Qadirabad link canal	Rangla lake	Rasul barrage	Rawal lake	Shahpur dam	Simli dam	Soan river
62	Eurasian Sparrowhawk <i>Accipiter nisus</i>				3		2					2		5							1			9	5			3			
63	Eurasian Thick-knee <i>Burhinus oedienemus</i>				19		35						3	9							5			5	7		7			6	
64	Eurasian Wigeon <i>Anas penelope</i>	721	38	96	29	964	598	25	19	23	8	7	472	15	319	1	259	353	9	20	250	238	674	293	174	210	198	216	189	248	
65	Falcated Duck <i>Anas falcata</i>	3			3		1						7							3	3	6		1		2					
66	Fulvous Whis-ting-duck <i>Dendrocygna bicolor</i>	9			9		3						5		1					1			3	2		2					
67	Gadwall <i>Anas strepera</i>	46	29	81	5	3041	913	9	17	7	48	18	21	1931	17	317	3	147	137	15	25	1307	391	660	90	93	512	169	165	285	185
68	Garganey <i>Anas querquedula</i>	194	49	91	13	198	331	21	9	20	21	21	9	345	15	307	1	229	309	15	18	291	270	267	173	93	259	105	194	134	285
69	Glossy Ibis <i>Plegadis falcinellus</i>	19		37	13	31	30							55							31		5	5		13		10	8		
70	Graceful Prinia <i>Prinia gracilis</i>	13		3	9	5	26					3	3	15	5	22	3	8	5	5	5	5	67	8	9	3	5	5	5	7	13
71	Great Bittern <i>Botaurus stellaris</i>						7					5	1	10		5	1	3			13		5	5		3	3		3	4	
72	Great Cormorant <i>Phalacrocorax carbo</i>	685		33	85		913	2				27	5	8	201	209		555	9		181	347	505	185	203	195	558	215	192	298	
73	Great Crested Grebe <i>Podiceps cristatus</i>	24		11		41	9			2	3	2	1	9		13					79								8		
74	Great Egret <i>Casmerodius albus</i>	80	5	30	84	149	295	7				18	12	7	244	7	206	1	92	8	260	374	404	258	284	160	349	257	248	84	
75	Great Sand Plover <i>Charadrius leschenaultii</i>	7	2	6	5	2	5	3	2				5	9							43		25	18	18	9			5		

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Sr. No.	Species	Chashma	Jahlar	Khabakki	Taunsa	Uchalli	Bajwat	Baeri wali lake	Dhok Kutab Din dam	Dhok Talian dam	Dhurabi dam	Ghamaghar lake	Head Islam	Indus game reserve	Jar Wali lake	Kalar Kahar lake	Kharral lake	Khokhar Zair dam	Kot Raja dam	Kutty Wali lake	Lal Suhanra lake	Marala headworks	Nammal lake	Qadirabad barrage	Qadirabad link canal	Rangla lake	Rasul barrage	Rawal lake	Shahpur dam	Simli dam	Soan river	
76	Great Thick-knee <i>Esacus recurvirostris</i>				4		9							11							9			3	9				8			
77	Great White Pelican <i>Pelecanus onocrotalus</i>	11			5									5							9							4				
78	Greater Flamingo <i>Phoenicopterus ruber</i>	91	38	72	265	6				25				181						8	23	10						6				
79	Greater Painted Snipe <i>Rostratula benghalensis</i>	85			10	9	9	2		1	1	2	19	7	19	3				9	55	28	7	33	31	36	9	7	9			
80	Greater Spotted Eagle <i>Aquila clanga</i>	4			19		4							5							9		2	3				2				
81	Greater White-fronted Goose <i>Anser albifrons</i>	3			18		9														15							1				
82	Green Sand-piper <i>Tringa ochropus</i>	145	5	5	5	7	33	9	7	2	1	1	5	21	9	53	3	45	23	7	9	195	45	45	63	29	34	32	36	29	31	
83	Grey Heron <i>Ardea cinerea</i>	186		40	58	155	185	3			26	6	7	128		106	3		48		270	300	204	117	261	114	389	135	260	53		
84	Grey Plover <i>Pluvialis squatarola</i>	91	3	9	29	15	41	7	1	3	1	1	3	52	5	7	3	37	3	3	5	9	79	9	45	5	10	4	4	3	5	
85	Greylag Goose <i>Anser anser</i>	44			78		213							112							545		191	3		19		19				
86	Gull-billed Tern <i>Gelochelidon nilotica</i>	23	5	7	5	9	20	7		2	3	3	3	19	7	9	3	5	5	3		5	8	7	9		5	5	9	5		
87	House Crow <i>Corvus splendens</i>	758	29	131	393	365	541	30	37	81	22	25	22	741	61	958	15	371	3	25	130	963	979	456	657	315	586	675	540	595	601	

Table continued on next page.....

Sr. No.	Species	Chashma	Jahlar	Khabakki	Taunsa	Uchalli	Bajwat	Baeri wali lake	Dhok Kutab Din dam	Dhok Talian dam	Dhurabi dam	Ghamaghar lake	Head Islam	Indus game reserve	Jar Wali lake	Kalar Kahar lake	Kharral lake	Khokhar Zair dam	Kot Raja dam	Kutty Wali lake	Lal Suhanra lake	Marala headworks	Nammal lake	Qadirabad barrage	Qadirabad link canal	Rangla lake	Rasul barrage	Rawal lake	Shahpur dam	Simli dam	Soan river	
88	House Sparrow <i>Passer domesticus</i>	245	35	132	79	68	199	24	21	15	17	19	21	141	52	313	7	185	19	21	39	203	412	165	130	95	190	205	372	295	188	
89	Indian Cormorant <i>Phalacrocorax fasciollis</i>	182	45	151	461		245				29	35	322			17				33	20	353	296	250	173	127	387			183	67	
90	Indian Courser <i>Cursorius coromandelicus</i>				37								3	9	3							80		3		5				4		
91	Indian Pond Heron <i>Ardeola grayii</i>	156	9	19	65	96	245	11	3	18	18	19	23	151	41	213	5	94	8	19	11	155	235	201	183	167	189	387	162	392	174	
92	Indian Skimmer <i>Rynchops albigollis</i>				10		3				1	7	1								6			2					3			
93	Indian Robin <i>Copsychus fulicans</i>	1	2	2	1		6	2	3	3	1	2	3	9	3	9	3	4	4	3	2	9	9	9	3	3	3	3	4	2	4	3
94	Jack Snipe <i>Limnocyptes minimus</i>				13	5	7	3			4	1	5	3	9		8	8	3	8	9	13	3	2	5	32	7	4	8	3		
94	Kentish Plover <i>Charadrius alexandrinus</i>	19		7	10	13	10	3	2	1	5	2	3	3	5	9	1	9	9	3	6	171	9	7	5	2	7	3	5	3	19	
95	Lesser Flamingo <i>Phoenicopterus minor</i>	3			1		1	1		1				1								1	3							1		
96	Lesser Whistling Duck <i>Dendrocygna javanica</i>	267				5	63				7	9				1						617		490	163		40			28		
97	Lesser White-fronted Goose <i>Anser erythropus</i>						1														5				1							
98	Little Heron <i>Butorides striatus</i>	5					3				2	3																	3			

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Sr. No.	Species	Chashma	Jahlar	Khabakki	Taunsa	Uchalli	Bajwat	Baeri wali lake	Dhok Kutab Din dam	Dhok Talian dam	Dhurabi dam	Ghamaghar lake	Head Islam	Indus game reserve	Jar Wali lake	Kalar Kahar lake	Kharral lake	Khokhar Zair dam	Kot Raja dam	Kutty Wali lake	Lal Suhanra lake	Marala headworks	Nammal lake	Qadirabad barrage	Qadirabad link canal	Rangla lake	Rasul barrage	Rawal lake	Shahpur dam	Simli dam	Soan river
99	Little Bitem <i>Isobrychus minutus</i>				13		21						5	3	9		13	5	9	4	3	9	9	9	6	5	3	5	5	4	
100	Little Commo-rant <i>Phalacrocorax niger</i>	1434	86	5	29		1934	21	19	23	50	25	1	741	192	524	1	603	321	19	44	1630	911	1860	821	334	1953	1542	1860	1893	1953
101	Little Crake <i>Porzana parva</i>				5		1			1	3	2	7	5	9	1					15		5	2		5	3	4	3	3	
102	Little Egret <i>Egretta garzetta</i>	101	9	40	138	43	290	19	4	7	19	19	7	137	31	327	3	213	5	10	23	227	345	256	217	95	217	193	95	194	167
103	Little Grebe <i>Tachybaptus ruficollis</i>	405	167	61	150	450	319	24	21	19	44	62	23	305	47	568	3	335	353	28	25	334	1357	469	192	258	158	495	965	758	487
104	Little Ringed Plover <i>Charadrius dubius</i>	364	18	9	5	19	9	3	3	2	1	4	1	22	9	9	2	29	27	8	10	230	279	73	23	30	35	45	39	38	48
105	Little Stint <i>Calidris minuta</i>	148	9	25	19	8	32	2	2	2	2	1	3	9	7	8	1	37	9	7	3	408	45	23	18	31	41	40	37	38	25
106	Little Tern <i>Sterna albi-frons</i>	205	3	17	29	29	19	8	9	3	19	3	5	30	3	23		9	5	6		193	5	15	5		3	3	5	7	4
107	Mallard Anas <i>platyrhynchos</i>	722	193	302	78	404	189	19	21	31	40	2	11	215	21	205	1	395	175	28	36	1236	781	876	384	503	657	698	893	753	942
108	Marbled Duck <i>Marmaronetta angustirostris</i>	2			37		9						21	21						7					218				1	3	
109	Marsh Sand-piper <i>Tringa stagnatilis</i>	95	4	5	10	37	48	9	10	2	8	8	9	39	25	37	1		18	5	11	353	101	55	40	47	29	35	29	39	34
110	Montagu's Harrier <i>Circus pygargus</i>	1			13		2						1	3	5				1		5	1		3	2					2	
111	Northern Lap-wing <i>Laniellus vanelus</i>	3			29	23	9	3	17			25	9	9	8	37			165	5	27		11	7	5	3			6	5	
112	Northern Pintail <i>Anas acuta</i>	172	52	235	5	344	193	21	16	40	23	20	3	397	13	313	3	195	135	7	18	335	245	317	209	190	215	298	167	298	273

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Sr. No.	Species	Chashma	Jahlar	Khabakki	Taunsa	Uchalli	Bajwat	Baeri wali lake	Dhok Kutab Din dam	Dhok Talian dam	Dhurabi dam	Ghamaghar lake	Head Islam	Indus game reserve	Jar Wali lake	Kalar Kahar lake	Kharral lake	Khokhar Zair dam	Kot Raja dam	Kutty Wali lake	Lal Suhanra lake	Marala headworks	Nammal lake	Qadirabad barrage	Qadirabad link canal	Rangla lake	Rasul barrage	Rawal lake	Shahpur dam	Simli dam	Soan river
113	Northern Shoveler <i>Anas clypeata</i>	349	159	297	5	298	213	23	19	44	2	27	11	167	21	129	3	253	197	9	23	308	55	126	93	103	129	138	294	395	392
114	Oriental Darter <i>Anhinga melanogaster</i>				5								3	8																1	
115	Oriental Pratincole <i>Gareola maldivarum</i>				15		38					3	1	13	11				3		7			19	31	2					
116	Osprey <i>Pandion haliaetus</i>	3			19		2					3	1	3							9			3	3		3			3	
117	Painted Stork <i>Mycteria leucocephala</i>				29		8	3					1	16							15	7	7	12	5				7		
118	Pallas's Fish Eagle <i>Haliaeetus leucorhynchus</i>				19								3	2	2														2		
119	Pallas's Gull <i>Larus ichthyophaga</i>	19	5		13	9	11	8			2	5	2	5	2	9			9	2	29	7	5	7	3	3	25	8		11	4
120	Pallid Harrier <i>Circus macrourus</i>	1			10		1						1	5	3						5	3	1	2	3	5	2		3	3	
121	Peregrine Falcon <i>Falco peregrinus</i>	4			37		3					1	1	3							5	3	2	1			3		2		
122	Pheasant-tailed Jacana <i>Hypophasianus chirurgus</i>				29		8						2	7							19		7	5					5		
123	Pied Avocet <i>Recurvirostra amouensis</i>	21	9	9	78	12	9					1	3	25		7			7	7	45	3	8	7			8			5	
124	Pied Bushchat <i>Saxicola caprata</i>	13	9	9	5	5	25	9	3	8	6	5	3	39	9	19	4	9	7	5	9	19	42	23	21	21	21	18	19	20	23
125	Pied Kingfisher <i>Ceryle rudis</i>	65	4	3	37	7	20	3	2	3	3	3	2	35	12	18	2	9	8	5	7	11	9	5	5	3	5	3	5	4	4

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Sr. No.	Species	Chashma	Jahlar	Khabakki	Taunsa	Uchalli	Bajwat	Baeri wali lake	Dhok Kutab Din dam	Dhok Talian dam	Dhurabi dam	Ghamaghar lake	Head Islam	Indus game reserve	Jar Wali lake	Kalar Kahar lake	Kharral lake	Khokhar Zair dam	Kot Raja dam	Kutty Wali lake	Lal Suhanra lake	Marala headworks	Nammal lake	Qadirabad barrage	Qadirabad link canal	Rangla lake	Rasul barrage	Rawal lake	Shahpur dam	Simli dam	Soan river
126	Plain Prinia <i>Prinia inornata</i>	71	9	7	13	5	24	3	3	7	1	3	3	21	11	29	3	33	9	8	4	23	23	21	25	19	19	32	19	9	10
127	Purple Heron <i>Ardea purpurea</i>	54		15	78	41	73			9	5	3	3	75	7	151		54	28	7		120	190	45	82	203	207	157	84	105	79
128	Purple Swamphen <i>Porphyrio porphyrio</i>	45		10			325			5	3	147	55	3	173						191		38	235	58		179			172	
129	Red-crested Pochard <i>Nettion rufina</i>	672	650	49	5	359	32	11	17	20	7	8	319		319				171		5	930	289	294	209	95	409	298		296	
130	Red-necked Falcon <i>Falco chiqueura</i>	5			5		2					1	3								5			3			2		2		2
131	Red-necked Grebe <i>Podiceps grisegena</i>	7	3	5	7	3	1			5	5	11						3			3			1	1		3		2		1
132	Red-necked Phalarope <i>Phalaropus lobatus</i>	5	9	5	5	4						2	5		5						9	7							5		
133	Red-vented Bulbul <i>Pycnonotus cafer</i>	97	19	3	78	8	19	9	9	15	8	8	9	28	17	19	7	21	33	7	19	11	98	37	31	23	19	19	31	22	23
135	Red-wattled Lapwing <i>Vanellus indicus</i>	5	167	3			8					1	5	5	3				1	5	9	9	3	9	3		3	2		1	
136	River Tern <i>Sterna aurantia</i>	237	31	32	13	43	278	9	19	20	23	5	10	282	29	193	7	285	150	33	21	272	310	285	213	215	203	193	194	173	294
137	Ruddy Shelduck <i>Tadorna ferruginea</i>	45		21	19	17	102	9	8	11	19	19	8	19	25	39	3	18	13	10	5	353	45	19	21	21	26	19	18	19	17
138	Ruddy Turnstone <i>Actinoternis interpres</i>	187		1	19	289	213	5		1		1	41	9	33						381	53	233	209	25	45	262	26	29	42	

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Sr. No.	Species	Chashma	Jahlar	Khabakki	Taunsa	Uchalli	Bajwat	Baeri wali lake	Dhok Kutab Din dam	Dhok Talian dam	Dhurabi dam	Ghamaghar lake	Head Islam	Indus game reserve	Jar Wali lake	Kalar Kahar lake	Kharral lake	Khokhar Zair dam	Kot Raja dam	Kutty Wali lake	Lal Suhanra lake	Marala headworks	Nammal lake	Qadirabad barrage	Qadirabad link canal	Rangla lake	Rasul barrage	Rawal lake	Shahpur dam	Simli dam	Soan river
139	Ruddy-breasted Crane <i>Porzana fusca</i>	3	2	3	78	5							3	5		9														3	
140	Rufi <i>Philomachus pugnax</i>						9	1	2					3		7					8		5	3						3	
141	Rufous-fronted <i>Prinia Prinia buchanani</i>	87	5	13	7	72	49	5		2	9	5	3	11	7	19	1	5	9	5	2	318	52	18	28	21	7	20	31	25	21
142	Rufous-vented <i>Prinia Prinia burnesii</i>	7			5		7					3	3	21	3	8	5				3	291	9	9	5	5		26	9	5	9
143	Rufous-tailed Shrike <i>Lanius isabellinus</i>													3							5										
144	Shikra <i>Accipiter badius</i>				2		1							1							3								1		1
145	Small Pratincole <i>Glareola lactea</i>				2	2	1							2							1									1	1
146	Sociable Lap-wing <i>Vanellus gregarius</i>	1			5		1						3	2	7					3	3		3	3	9	5	7		7	8	8
147	Spot-billed Duck <i>Anas poecilorhynchos</i>												3		3						9		5	6				9		5	5
148	Spotted Crane <i>Porzana porzana</i>	373					346						7	245							1390		946	81			170			13	13
149	Spotted Red-shank <i>Tringa erythropus</i>						7						1	3		7					8		5	3		3			2	2	2
150	Steppe Eagle <i>Aquila nipalensis</i>	148	3	5	13	7	49	3	2	2	3	1	1	42	3	13	1	19	5	3	45	37	26	3	33	3	19	37	5	38	38
151	Streaked-throated Swallow <i>Hirundo fluviicola</i>	19	5	6	37	6	3		7		9	7	1	11	5	5		3	5	5	11	9	5	3	5	5	4	5	4	4	4

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152	Striated Prinia <i>Prinia crinitigera</i>	445			5		320	9				21	7	83	26		3			3	19	159		53	207						53
153	Temminck's Stint <i>Calidris temminckii</i>	43			29		12					8	2	23	7	8	2		5	8	3	13	19	9	10	3	3	9	9	9	9
154	Tufted Duck <i>Aythya fuligula</i>	49	3	7	10	9	892	3	1	2	1	3	3	9	6	22	3	8	3	3	4	189	13	35	31	7	22	31	39	36	3
155	Water Pipit <i>Anthus spinoletta</i>	197		21	29	394	57						7	5					3		23	3	5	3			2	3	2	2	1
156	Water Rail <i>Rallus aquatilis</i>	9	2	4	5	11	13	2		2	3	3	1	5	5	8	3	9	5	2	5	21	10	16	5	9	5	3	7	5	21
157	Watercock <i>Gallinix cinerea</i>				5		20			1			1	5	7	9		5			3	79	9	5	3	5	3	3	3	3	3
158	Western Reef Egret <i>Egretta gularis</i>	3			19		9					1	1	5	3		2				4	7		5	5		4		1	3	
159	Whiskered Tern <i>Chlidonias hybridus</i>				37								1	5							5								1		
160	White Stork <i>Ciconia ciconia</i>	16		10	9	9	2			3	5	1	3	3		8		5			3	5	10	3	5	8	5	6	8	9	
161	White Wagtail <i>Motacilla alba</i>	9			4		1					1		5							3	5	8	7	2			3	3		
162	White-breasted Waterhen <i>Amaurornis phoenicurus</i>	312	45	18	78	298	320	20	21	23	23	19	7	341	31	333	5	172	91	18	30	261	187	274	282	192	210	158	183	174	167
163	White-browed Wagtail <i>Motacilla maderaspatensis</i>	145	6	9	5	17	198	9	3	2	21	7	3	150	31	235	3	193	5	5	10	353	198	3	180	89	138	293	137	92	72
164	White-eared Bulbul <i>Pycnonotus leucotis</i>	304	19	35	19		177	36	19	20	25	19	21	329	71	263	8	193	5	29	19	191	318	138	296	128	210	103	182	195	165

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165	White-headed Duck <i>Oxyura leucocephala</i>	83	9	5	78	9			3	2	8	8	3	19	5	8	3	19	5		3	15	21				7		9	9	9
166	White-throated Kingfisher <i>Halcyon smymerensis</i>	3		2		3																		2	2					1	
167	White-winged Tern <i>Chlidonias leucopernus</i>	85	5	9	13	9	19	4	3	20	4	2	3	18	11	19	3	5	5	3	3	23	9	9	7	5	5	5	3	4	3
168	White-tailed Lapwing <i>Panellus leucurus</i>	13			10		10					5	3	33	7	8	1			3	5	5		19	11	6	5	5	8	7	7
169	Wire-tailed Swallow <i>Hirundo smithii</i>	9	3	9	3	3	3	2	3		5	5	7	10			5	3	3		3	7		3	5		2	6	3	1	2
170	Wood Sand-piper <i>Tringa glareola</i>	103	9	19	78	114	43	23	15	21	25	22	19	140	32	59	1	103	5	17	32	283	215	219	52	53	5	22	54	66	19
171	Woolly-necked Stork <i>Ciconia episcopus</i>	87	4	15	19	21	94	6	9	8	9	7	6	50	7	52	3	21	3	5	7	382	40	36	45	47	32	34	35	32	32
172	Yellow Bittern <i>Ixobrychus sinensis</i>				5		1			2				5		5						7		5	7			3			
173	Yellow Wag-tail <i>Motacilla flava</i>						29					3	1	23	9	17	1				3	11		9	10		3	3	9	4	8
174	Yellow-bellied Plover <i>Pluvialis flaviventris</i>	197	19	29	19	115	60	19	20	29	19	18	19	340	19	139	1	145	353	23	21	605	219	213	161	95	210	194	183	150	192
175	Zitting Cisticola <i>Cisticola juncidis</i>	11		29			11					19	2	23	7	13	3				3	15		6	20	5	6	7	9	3	7