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Review **Open Access**

Distribution of avian species in the vicinity of Ramsar Sites of Pakistan

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SUMMARY

Wetland in Pakistan describe 0.78 million hectare area 9.7% total area of the country. Most importantly, the freshwater lakes occupy 73.9% of this area while the coastal wetlands occupy 26.1%. This review aims to document avian diversity in Ramsar sites across Pakistan, highlights the challenges faced by bird populations, including habitat loss, pollution, and climate change, while assessing the effectiveness of current conservation efforts. Data were studied from various sources including articles, feild guides, books, reports, and websites. Pakistan has 19 Ramsar Sites. During the documentation noted that 540 species are documented by the ornithologist in the Ramsar sites of the Pakistan. These avian species belong to 91 families, and 25 orders. During the documentation noted that the highest avian species are observed in Thanedar Wala (number of species i.e. 402), while 377 species are documented from Uchhali Complex, 367 species are noted from Chashma Barrage, 360 species are documented from Indus Delta, 354 species are documented Tanda Dam, While less than 350 species are documented from the following Ramsar sites Haleji Lake, Kinjhar Lake, Taunsa Barrage Astola Island, Indus Dolphin Reserve, Jiwani Coastal, Jubho lagoon, Miani Hor, Nurri Lagoon, Ormara Turtle Beach and Rann of Kutch. During the analysis noted that 88% species are Least Concern, 5% species are Near Threatened, 4% avian species are Vulnerable, less than 2% species are Endangered (EN), and also less than 2% species Critically Endangered.

Keywords: Ramsar Sites, Wetalnds, Pakistan, Birds, Data analysis, Threats, Conservation

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INTRODUCTION

SIGNIFICANCE OF RAMSAR SITES

Wetlands have been described as areas that interface between land and water, where the water table is often at or near the surface and the land is often flooded by shallow water. Inland and marine wetlands cover over 12.1 million km² globally where 54% consists of permanent water and 46% consist of seasonal water. Taken together, they make up 6 percent of the global land surface. The concept for the coming of a convention on wetlands began back in 1962 and was spearheaded by IUCN in concert with the International Waterfowl and Wetland Research Bureau, the International Council for Bird Preservation, and BirdLife International. The first meeting of

Ramsar was held in Ramsar, Iran in 1971. Pakistan became the member of the Ramsar list in 1976. Today there are 1,701 Global Ramsar sites that countries covering 150 million hectares of land and water while Pakistan has 19 Ramsar sites that covering 1.3 million hectare of land and water. Wetland in Pakistan describe 0.78 million hectare area 9.7% total area of the country. Most importantly, the freshwater lakes occupy 73.9% of this area while the coastal wetlands occupy 26.1% (Frazier, 1999; Tiéga 1, 2011; Altaf et al., 2014a; Mauerhofer et al., 2015).

Wetlands are among the most productive ecosystems, fulfilling many human needs (Mitsch et al., 2009). These areas, characterized by the presence of permanent streams and watercourses, exhibit high productivity and species density. The core services provided by wetlands include water supply, while additional services encompass groundwater augmentation, climate change mitigation through carbon storage, and water regime regulation, which helps prevent waterlogging and flooding. Wetlands support a diverse array of flora and fauna, creating meaningful environments that significantly enhance the living standards of local and indigenous communities (Junk et al., 2006; Alikhani et al., 2021). Preserving these vital components of the biosphere holds socio-religious, economic, ecological, and aesthetic value for humanity and other species within the ecosystem (Sharma and Singh, 2021). However, wetlands continue to suffer from various anthropogenic disturbances.

IMPORTANCE OF AVIAN SPECIES

Wetlands, being a significantly distinct sort of surroundings, offer sustenance and habitat for flora and fauna populations, along with several ecological advantages such as flood reduction, enhancement of water quality, and natural resources for people (Elliott et al., 2020). Additionally, they facilitate environmental processes comparable to those found in different freshwater systems, ranging from local to global scales. Wetlands play an important role in safeguarding habitats and retaining biodiversity, specifically for avian species. The variety of birds is a key aspect of biodiversity, fulfilling numerous roles within ecosystems. The principal idea of biodiversity-ecosystem function principle is that a greater variety of species can enhance ecosystem performance, prompting habitat restoration professionals to include a much broader variety of habitats and species into their recovery techniques. The variety of environments and resources in wetlands impacts bird diversity, and this will affect ecosystem functioning, including material cycles and energy flow in wetlands, along with disturbance dynamics and management of insect pests (Sharma and Singh, 2021).

The avian community effectively inhabits restored wetland areas, contributing to increased species diversification and richness. Wetlands are among the most valuable ecosystems, and their conservation and restoration are essential for improving overall environmental conditions. Many managers believe that a bottom-up approach will automatically enhance species diversity, using metrics like species abundance and biomass to gauge restoration success. Generally, increased avian richness is observed when wetland restoration addresses ecological degradation and its impacts. However, key questions remain regarding how much benefit birds can derive from restored marsh habitats. Currently, there are no clear patterns to illustrate

the changes in bird composition resulting from wetland restoration, making it difficult to provide numerical recommendations that are crucial for evaluating various conservation goals for future wetland restoration efforts (Weller, 1999; Altaf et al., 2015; Altaf, 2016; Ali et al., 2020; Rahman et al., 2021; Rahman et al., 2023).

OBJECTIVES OF THE REVIEW

This review aims to document avian diversity in Ramsar sites across Pakistan, focusing on the ecological roles that these birds play in wetland ecosystems. It highlights the challenges faced by bird populations, including habitat loss, pollution, and climate change, while assessing the effectiveness of current conservation efforts and management practices.

METHODOLOGY

This paper is completely based on the desk review and analysis. The data was collected through review of secondary sources as considerable published material is available on the subject issue. Data were collected from field guides, books (Roberts, 1991, 1992; Mirza and Wasiq, 2007; Grimmett et al., 2008; Mirza, 2012; Altaf et al., 2014b; Grimmett et al., 2016), reports, articles (Ali and Akhtar, 2005; Ali et al., 2011; Afsar et al., 2013; Bibi and Ali, 2013; Ghalib et al., 2013; Zehra et al., 2014; Begum et al., 2016; Dauda et al., 2016; Dauda et al., 2017; Ghalib et al., 2017; Umar et al., 2018; Ashraf et al., 2019; Haider et al., 2022a, b; Rasool et al., 2023; Kazam et al., 2024), websites i.e. GBIF (https://www.gbif.org/) and IUCN (https://www.iucnredlist.org/), as well as through search engine i.e. Google Scholar (https://scholar.google.com/). The study was descriptive and exploratory in order to establish understanding of avian diversity associated with Ramsar Sites of Pakistan.

RAMSAR SITES OF PAKISTAN

Ramsar Convention came into force 1976 in Pakistan, Ramsar area and numbers were designed by Council for the Conservation of Wildlife (NCCW) and Ministry of Environment in Pakistan. List of Internationally Important Wetlands (Ramsar sites) in Pakistan are the following; Uchhali Complex in Punjab (1,243 ha), Thanedar Wala in NWFP (4,047 ha), Taunsa Barrage in Punjab (6,576 ha), Tanda Dam in NWFP (405 ha), Runn of Kutch in Sindh (566,375 ha), Ormara Turtle Beaches in Balochistan (2,400 ha), Nurri Lagoon in Sindh (2,540ha), Miani Hor in Balochistan (55,000 ha), Kinjhar (Kalri) Lake in Sindh (13,468 ha), Jubho Lagoon in Sindh (706 ha), Jiwani Coastal Wetland in Balochistan (4,600 ha), Indus Dolphin Reserve in Sindh (125,000 ha), Indus Delta in Sindh (472,800 ha), Hub (Hab) Dam in Balochistan (27,000 ha), Haleji Lake in Sindh (1,704 ha), Drigh Lake in Sindh (164 ha), Deh Akro-II Desert Wetland Complex in Sindh (20,500 ha), Chashma Barrage in Punjab (area, 34,099 ha), Astola (Haft Talar) Island in Balochistan (5,000 ha) (Figure 1).

BIRD DIVERSITY IN RAMSAR SITES OF PAKISTAN

During the documentation noted that 540 species (Table 1) are documented by the ornithologist in the Ramsar sites of the Pakistan. These avian species belong to 91 families (i.e. Muscicapidae, Anatidae, Accipitridae, Scolopacidae, Laridae, Motacillidae, Corvidae, Alaudidae, Ardeidae, Phylloscopidae, Fringillidae,

Charadriidae, Phasianidae, Strigidae, Columbidae, Falconidae, Rallidae, Cisticolidae, Emberizidae, Laniidae, Picidae, Hirundinidae, Passeridae, Ciconiidae, Cuculidae, Pteroclidae, Acrocephalidae, Leiothrichidae, Podicipedidae, Sturnidae, Sylviidae, Caprimulgidae, Glareolidae, Otididae, Turdidae, Prunellidae, Alcedinidae, Apodidae, Gruidae, Meropidae, Pycnonotidae, Paridae, Ploceidae, Sittidae, Megalaimidae, Phalacrocoracidae, Psittaculidae, Stenostiridae, Threskiornithidae, Turnicidae, Aegithalidae, Cettiidae, Cinclidae, Dicruridae, Estrildidae, Paradoxornithidae, Burhinidae, Campephagidae, Coraciidae, Jacanidae, Panuridae, Pelecanidae, Recurvirostridae, Locustellidae, Monarchidae, Nectariniidae, Oceanitidae, Passerida, Pellorneidae, Procellariidae, Remizidae, Anhingidae, Bombycillidae, Cathartidae, Certhiidae, Dromadidae, Gaviidae, Haematopodidae, Hypocoliidae, Oriolidae, Zosteropidae, Pandionidae, Phoenicopteridae, Rhipiduridae, Rostratulidae, Sulidae, Tichodromidae, Troglodytidae, Upupidae, Vangidae and Zosteropidae) (Figure 2), and 25 orders i.e. Bucerotiformes, Gaviiformes, Phoenicopteriformes, Procellariiformes, Psittaciformes, Apodiformes, Caprimulgiformes, Otidiformes, Suliformes, Podicipediformes, Ciconiiformes, Cuculiformes, Pterocliformes, Coraciiformes, Columbiformes, Falconiformes, Galliformes, Piciformes, Strigiformes, Gruiformes, Pelecaniformes, Accipitriformes, Anseriformes, Charadriiformes and Passeriformes (Figure 3).

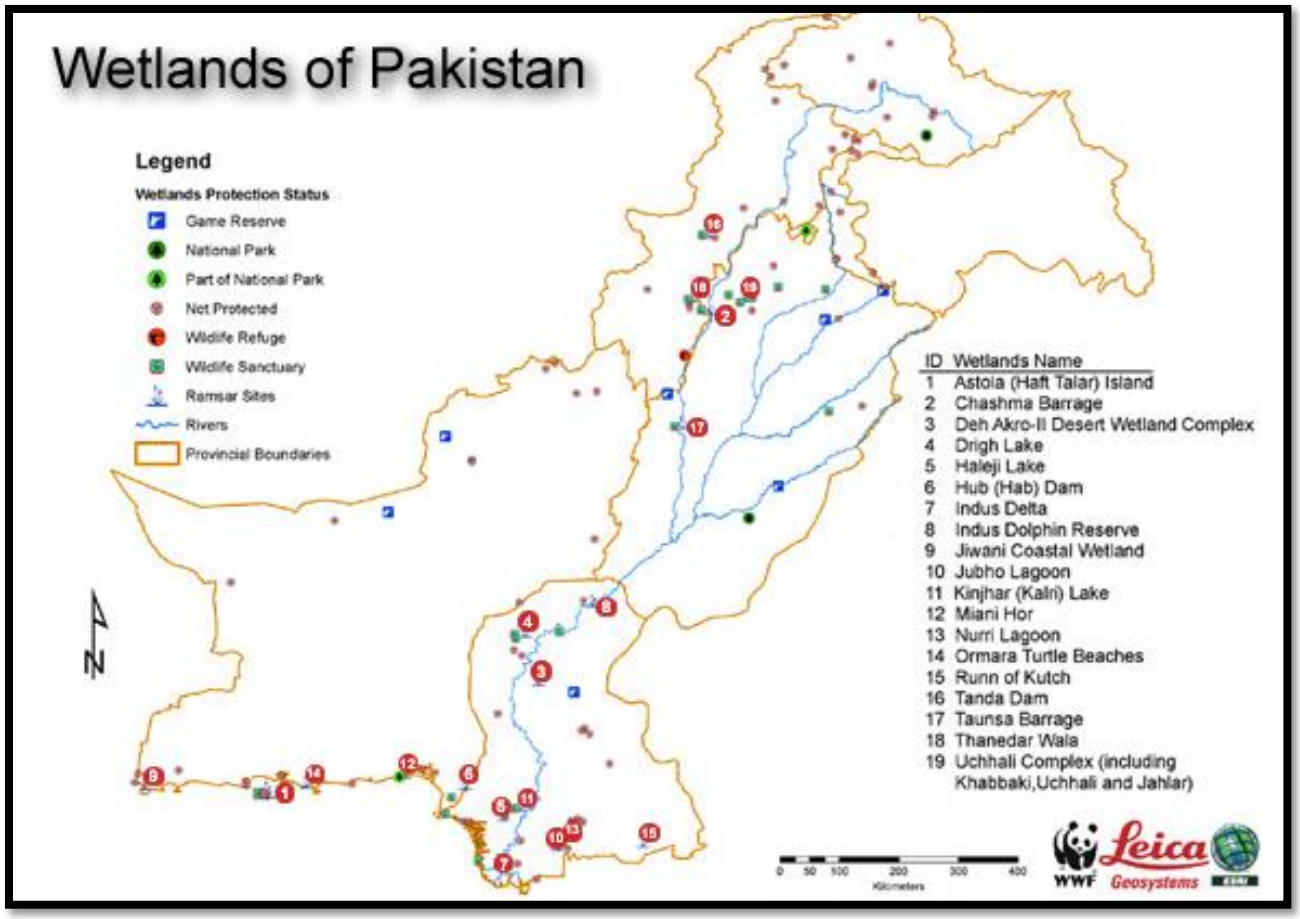

Figure 1: Ramsar sites of Pakistan (WWF, 2024).

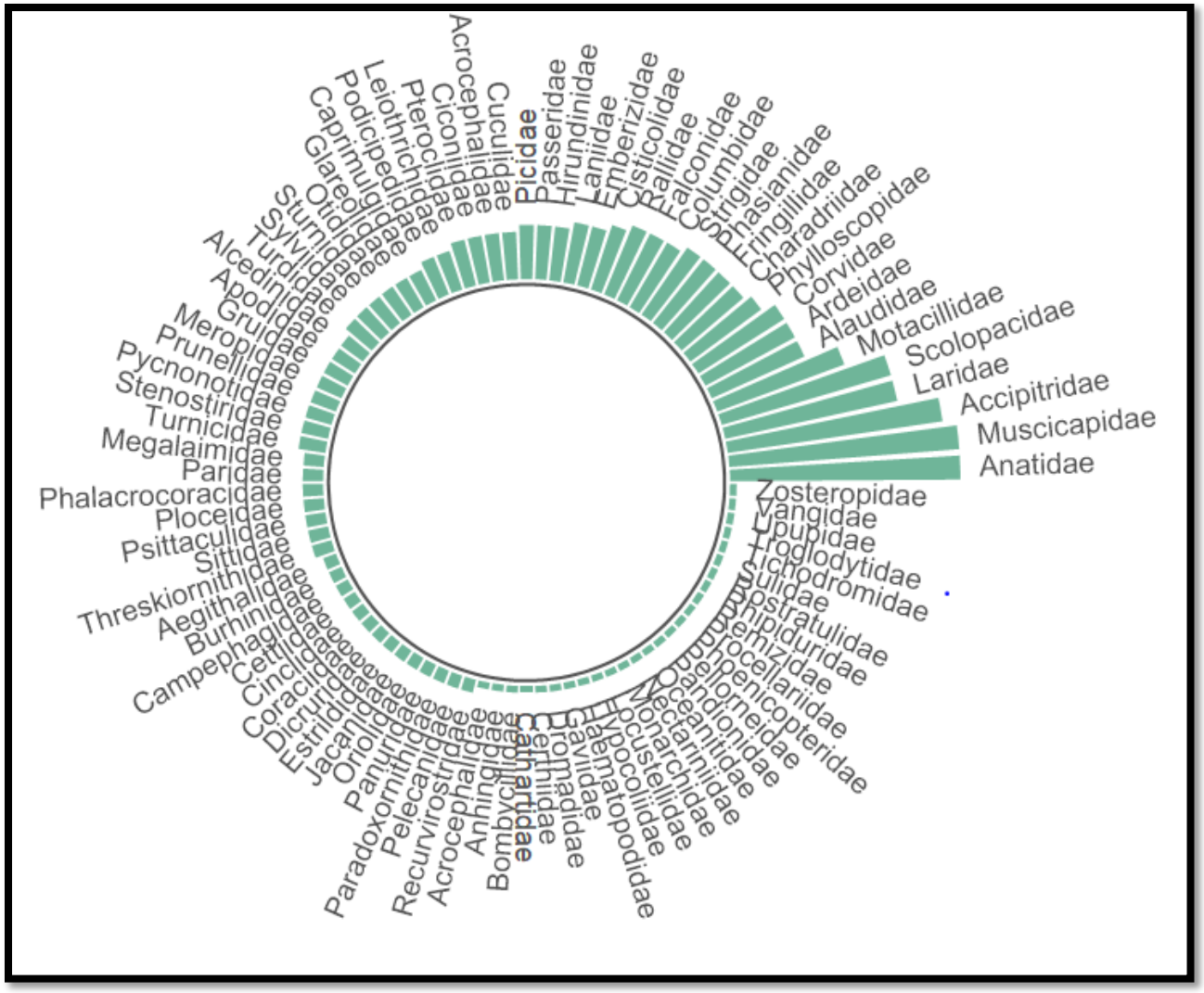

Figure 2: Following families of avian species are documented from the Ramsar sites of Pakistan.

During the documentation noted that the highest avian species are observed in Thanedar Wala (number of species i.e. 402), while 377 species are documented from Uchhali Complex, 367 species are noted from Chashma Barrage, 360 species are documented from Indus Delta, 354 species are documented Tanda Dam, While less than 350 species are documented from the following Ramsar sites Haleji Lake, Kinjhar Lake, Taunsa Barrage Astola Island, Indus Dolphin Reserve, Jiwani Coastal, Jubho lagoon, Miani Hor, Nurri Lagoon, Ormara Turtle Beach and Rann of Kutch (Figure 4).

During the analysis noted that 477 (88%) species are Least Concern (LC), 27 (5%) species are Near Threatened (NT), 21 (4%) avian species are Vulnerable (VU), 8 (less than 2%) species are Endangered (EN), while 7 (more than 1%) species are Critically Endangered (CR) as shown in Figure 5.

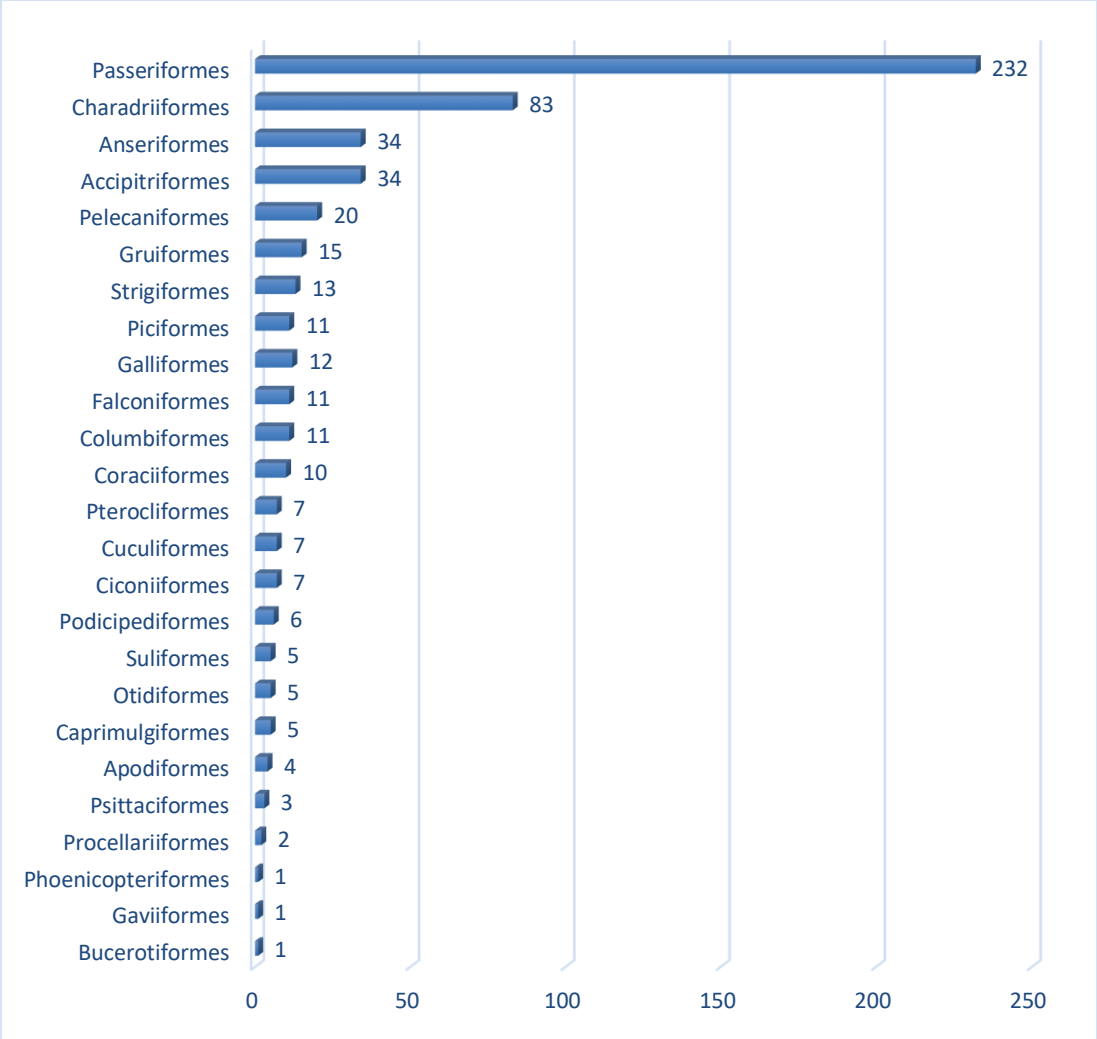

Figure 3: Following orders of avian species are documented from the Ramsar sites of Pakistan.

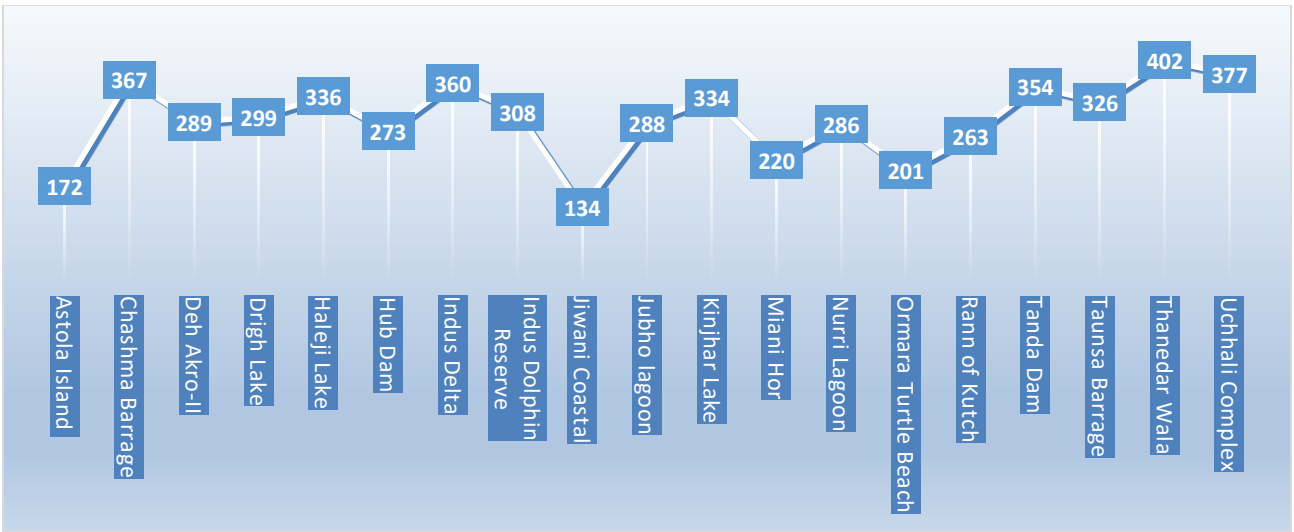

Figure 4: Avian species distribution in Ramsar sites of Pakistan.

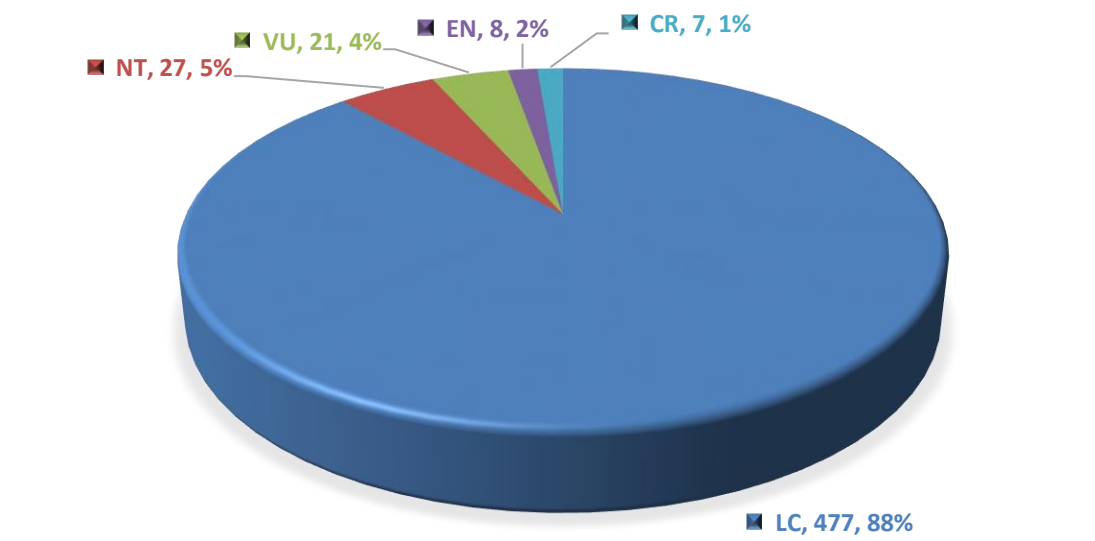

Figure 5: Status of avian species in Ramsar sites of Pakistan.

ECOLOGICAL ROLES OF BIRDS IN WETLANDS

Birds are exceptionally important in ecosystems. Birds deliver all four types of ecological services: four conceptual areas of the role that the library plays, including; providing, regulating, cultural, and supporting. Hoece regards ecosystem services as the ways people benefit from ecosystem resources and processes. Birds can be directly beneficial to human welfare in several ways they can act as bio-indicators, pollinators, seed dispersers, predators, scavengers, or ecosystem engineers. They include one of the most important classes of animals, which inhabits various regions and environment types worldwide and is involved significantly in the food chain. Birds serve Critical ecosystem services such as their involvement in the food chain and nourishment recycling apart from representing as culture, social and scientific values for individuals. It is well understood that the birds are the most important and significant groups of species which imperative for the save of biological diversity. Such rodents help in keeping the area clean as they feed on dead animals; also defend the plant cover from pests and other animals; assist in plant pollination; increase plant reproduction through seed distribution; and in giving nutrients to the ecosystem. The analysis of bird assemblages has gathered significant value as a tool for promoting and suggesting conservation measures to maintain species distribution and richness in areas that have relatively high human and animal exploitative pressures, particularly those that relate to water resources. Birds can be termed as the bio – indicators of the environment (Green and Elmberg, 2014; Mariyappan et al., 2023).

THREATS TO BIRD POPULATIONS

Birds are recognized as biological indicators for assessing the status and value of wetlands, as they inhabit these environments. Currently, just over a quarter of bird species worldwide are threatened with extinction, primarily due to habitat destruction, noise pollution, hunting, competition from invasive species, and various natural processes influenced by climate change. The alarming decline in bird diversity has led to increased global attention on bird conservation. Consequently, bird conservation faces challenges from multiple angles. For example, large-scale and

intensive exploitation of wetland resources has resulted in significant habitat loss and degradation. Many studies have examined global bird population threats. For instance, several studies indicate that the loss of wetlands along coast poses the greatest threat to migrating shorebirds, leading to significant population declines (Wang et al., 2018; Li et al., 2021).

Currently, there is a lack of comprehensive data on bird fauna. However, awareness of the need for bird protection has increased in recent years, coinciding with the emphasis from national and local governments on conserving bird and wetland habitats. This presents opportunities to enhance bird conservation efforts. Additionally, understanding bird population dynamics in China is crucial for developing effective national and regional avian conservation strategies (O'Connell, 2000; Butt et al., 2021).

THREATS TO WETLANDS

Freshwater wetland habitats are among the most utilized and manipulated ecosystems for promoting environmental sustainability and human well-being. However, the heavy reliance on freshwater and other natural resources in these areas has placed significant pressure on global ecology, directly impacting species diversity and abundance. Consequently, many species dependent on wetland ecosystems, have either gone extinct or are facing global threats. Reducing wetland acreage has a detrimental effect on the essential services that wetlands provide. Factors such as urbanization, changes in land use, conversion to agricultural land, infrastructure development, pollution from industrial waste and agricultural runoff, and the unpredictability of climate change have all significantly contributed to the global loss of wetlands (Xu et al., 2019).

Urbanization impacts on wetlands

In few decades, the number of urban areas in Pakistan doubled, and the urban population surged eightfold. This rapid growth placed immense pressure on marshes and floodplains to provide sufficient food and water for the expanding populace. Many of Pakistan's major river basins are undergoing changes in size to accommodate both agricultural and non-agricultural demands, leading to the conversion of floodplains, primary forests, grasslands, and associated freshwater habitats to support the needs of the burgeoning population (Azous and Horner, 2001; Khan, 2019).

The irrigation and water supply systems in the country have been improved, resulting in changes to the intake points and distribution areas of various water bodies. While significant reservoir projects provide numerous benefits for water supply, flood management, irrigation, and hydroelectric power generation, they have also caused the loss and fragmentation of freshwater habitats due to economic planning. Furthermore, the reduction in water flow has led to decreased ecological flow rates. Additionally, socio-economic growth, including urbanization, affects wetland characteristics by altering hydrological and sedimentation properties, as well as introducing nutrient and chemical pollutants. Unutilized water resources, inadequate conservation measures, pollution, and the rapidly increasing local demand for water are also pushing these essential ecosystems toward extinction.

Agricultural intensification impacts on wetlands

Most rivers, lakes, streams, and wetlands in Asia have significantly deteriorated, primarily due to runoff from agricultural pesticides and fertilizers, as well as discharges from industrial and urban waste water. These factors contribute to widespread eutrophication. The treatment of sewage is further hindered by deficiencies in the sewage collection system and malfunctioning treatment units. As a result, there is a substantial gap between wastewater production and processing in urban areas of Pakistan, where most sewage is released untreated into natural water bodies like rivers and streams (Bartzen et al., 2010; Bassi et al., 2014).

Climate change impacts

Global climate change is anticipated to significantly impact the loss and transformation of wetland ecosystems. This is particularly important for the subcontinent, where average atmospheric temperatures and heavy rainfall occurrences have risen, while the number of rainy days and total annual precipitation have declined due to increasing greenhouse gas levels in the atmosphere (Junk et al., 2013). A study on the impacts of climate change on wetlands in Pakistan indicates that both high-altitude and coastal wetlands are particularly vulnerable. For instance, climate change has resulted in rising water levels in glacial-fed high-altitude lakes, which have submerged crucial breeding islands for endangered migratory species. Additionally, increasing sea surface temperatures and rising sea levels due to thermal expansion may disrupt fish distribution and threaten the survival of significant parts of the mangrove ecosystem in coastal wetlands (Chaudhry, 2010; Khan and Arshad, 2014; Salimi et al., 2021; Ali et al., 2022).

CONSERVATION EFFORTS FOR WETLAND AND BIRD

Wetlands are vital ecosystems that offer food, shelter, and nesting sites for numerous bird species. They function as natural sponges, absorbing water during heavy rains and releasing it gradually, which helps control flooding. However, these essential habitats face threats from human activities, including agricultural runoff, pollution, and urban development. To safeguard these ecosystems, governments and organizations are actively working to restore damaged wetlands, reduce pollution, and promote sustainable land management practices. Additionally, raising awareness among local communities about the importance of wetlands is crucial for their preservation. Wetlands are essential for the survival of migratory birds. Conservation efforts include creating protected areas, such as national parks and wildlife reserves, where birds can safely nest and feed. Researchers and volunteers monitor bird populations to detect changes and address emerging issues. Additional strategies involve introducing native plants and managing non-native species.

CONCLUSION

The authors of the study propose that Pakistan is home to various types of wetlands and boasts a rich diversity of bird species. However, these valuable resources face temporary threats from multiple factors, making their conservation essential. Furthermore, it has been noted that these critical resources are in significant danger

due to several influences. This chapter illustrates that while the composition of wetlands is predominantly physical, it is the hydrological and hydrodynamic processes that drive their functionality. Consequently, when these processes are altered by human activities, the essential functions and services provided by wetlands are severely affected. Despite their importance, wetlands across the nation are deteriorating, and bird populations are declining primarily due to the impact of human activities as the main stressor. Thus, preserving wetlands and bird species in Pakistan is crucial.

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Table 1: The avian diversity of Ramsar sites of Pakistan.

Sr.	***Scientific Name***	**Family**	**Order**	**Status**
1.	*Accipiter badius*		Accipitriformes	LC
2.	*Accipiter Gentilis*			LC
3.	*Accipiter nisus*			LC
4.	*Aegypius monachus*			NT
5.	*Aquila chrysaetos*			LC
6.	*Aquila clanga*			VU
7.	*Aquila fasciata*			LC
8.	*Aquila hastate*			VU
9.	*Aquila heliacal*			VU
10.	*Aquila nipalensis*			EN
11.	*Aquila rapax*			VU
12.	*Butastur teesa*			LC
13.	*Buteo rufinus*			LC
14.	*Circaetus gallicus*			LC
15.	*Circus aeruginosus*			LC
16.	*Circus cyaneus*			LC
17.	*Circus Macrourus*			NT
18.	*Circus melanoleucos*			LC
19.	*Circus pygargus*			LC
20.	*Elanus caeruleus*			LC
21.	*Gypaetus barbatus*			NT
22.	*Gyps bengalensis*			CR
23.	*Gyps fulvus*			LC
24.	*Gyps himalayensis*			NT
25.	*Haliaeetus albicilla*			LC
26.	*Haliastur indus*			LC
27.	*Hieraaetus Pennatus*	Accipitridae		LC

28.	*Milvus migrans*			LC
29.	*Neophron percnopterus*			EN
30.	*Nisaetus nipalensis*			NT
31.	*Pandion haliaetus*	Pandionidae		LC
32.	*Pernis ptilorhynchus*	Accipitridae		LC
33.	*Sarcogyps calvus*	Cathartidae		CR
34.	*Spilornis cheela*	Accipitridae		LC
35.	*Anas acuta*		Anseriformes	LC
36.	*Anas clypeata*			LC
37.	*Anas crecca*			LC
38.	*Anas platyrhynchos*			LC
39.	*Anas poecilorhyncha*			LC
40.	*Anser albifrons*			LC
41.	*Anser anser*			LC
42.	*Anser erythropus*			VU
43.	*Anser indicus*			LC
44.	*Aythya baeri*			CR
45.	*Aythya ferina*			VU
46.	*Aythya fuligula*			LC
47.	*Aythya marila*			LC
48.	*Aythya nyroca*			NT
49.	*Bucephala clangula*			LC
50.	*Cygnus Cygnus*			LC
51.	*Dendrocygna bicolor*			LC
52.	*Dendrocygna javanica*			LC
53.	*Mareca falcate*			NT
54.	*Mareca penelope*			LC
55.	*Mareca strepera*			LC
56.	*Marmaronetta angustirostris*			NT
57.	*Mergellus albellus*			LC
58.	*Mergus merganser*			LC
59.	*Mergus serrator*			LC
60.	*Netta rufina*			LC
61.	*Nettapus coromandelianus*			LC
62.	*Oxyura leucocephala*			EN
63.	*Sarkidiornis melanotos*			LC
64.	*Sibirionetta Formosa*			LC
65.	*Spatula clypeata*			LC
66.	*Spatula querquedula*			LC
67.	*Tadorna ferruginea*			LC
68.	*Tadorna tadorna*	Anatidae		LC
69.	*Apus affinis*		Apodiformes	LC
70.	*Apus apus*	Apodidae		LC

71.	*Apus pallidus*			LC
72.	*Tachymarptis melba*			LC
73.	*Upupa epops*	Upupidae	Bucerotiformes	LC
74.	*Caprimulgus aegyptius*		Caprimulgiformes	LC
75.	*Caprimulgus affinis*			LC
76.	*Caprimulgus asiaticus*			LC
77.	*Caprimulgus europaeus*			LC
78.	*Caprimulgus mahrattensis*	Caprimulgidae		LC
79.	*Anous stolidus*	Laridae	Charadriiformes	LC
80.	*Arenaria interpres*	Scolopacidae		LC
81.	*Burhinus oedicnemus*	Burhinidae		LC
82.	*Calidris alba*			LC
83.	*Calidris alpine*			LC
84.	*Calidris canutus*			NT
85.	*Calidris ferruginea*			NT
86.	*Calidris minuta*			LC
87.	*Calidris pugnax*			LC
88.	*Calidris temminckii*			LC
89.	*Calidris tenuirostris*	Scolopacidae		EN
90.	*Charadrius alexandrinus*			LC
91.	*Charadrius dubius*			LC
92.	*Charadrius hiaticula*			LC
93.	*Charadrius leschenaultii*			LC
94.	*Charadrius mongolus*			LC
95.	*Chettusia gregaria*	Charadriidae		CR
96.	*Childonias hybrida*			LC
97.	*Childonias leucopterus*			LC
98.	*Chroicocephalus brunnicephalus*			LC
99.	*Chroicocephalus genei*	Laridae		LC
100.	*Cursorius coromandelicus*	Glareolidae		LC
101.	*Cursorius cursor*			NT
102.	*Dromas ardeola*	Dromadidae		LC
103.	*Esacus recurvirostris*	Burhinidae		NT
104.	*Gallinago Gallinago*	Scolopacidae		LC
105.	*Gallinago stenura*			LC
106.	*Geliochelidon nilotica*	Laridae		LC
107.	*Glareola lacteal*			LC
108.	*Glareola maldivarum*	Glareolidae		LC
109.	*Glareola pratincola*			LC
110.	*Haematopus ostralegus*	Haematopodidae		NR
111.	*Himantopus himantopus*	Recurvirostridae		LC
112.	*Hydrophasianus chirurgus*	Jacanidae		LC
113.	*Hydroprogne caspia*	Laridae		LC

114.	*Larus argentatus*			LC
115.	*Larus barabensis*			LC
116.	*Larus cachinnans*			VU
117.	*Larus fuscus*			LC
118.	*Larus hemprichii*			LC
119.	*Larus heuglini*			LC
120.	*Larus marinus*			LC
121.	*Larus ridibundus*			LC
122.	*Limicola falcinellus*			VU
123.	*Limosa lapponica*			NT
124.	*Limosa limosa*			NT
125.	*Lymnocryptes minimus*	Scolopacidae		LC
126.	*Metopidius indicus*	Jacanidae		LC
127.	*Numenius arquata*	Scolopacidae		NT
128.	*Numenius phaeopus*			LC
129.	*Onychoprion anaethetus*	Laridae		LC
130.	*Phalaropus lobatus*	Scolopacidae		LC
131.	*Pluvialis fulva*	Charadriidae		LC
132.	*Pluvialis squatarola*			LC
133.	*Recurvirostra avosetta*	Recurvirostridae		LC
134.	*Rostratula benghalensis*	Rostratulidae		LC
135.	*Rynchops albicollis*	Laridae		EN
136.	*Scolopax rusticola*	Scolopacidae		LC
137.	*Stercorarius parasiticus*			LC
138.	*Stercorarius pomarinus*			LC
139.	*Sterna acuticauda*			EN
140.	*Sterna aurantia*			VU
141.	*Sterna hirundo*			LC
142.	*Sterna repressa*			LC
143.	*Sternula albifrons*			LC
144.	*Sternula saundersi*			LC
145.	*Thalasseus bengalensis*			LC
146.	*Thalasseus bergii*			LC
147.	*Thalasseus sandvicensis*	Laridae		LC
148.	*Tringa erythropus*			LC
149.	*Tringa glareola*			LC
150.	*Tringa nebularia*			LC
151.	*Tringa ochropus*			LC
152.	*Tringa stagnatilis*			LC
153.	*Tringa tetanus*	Scolopacidae		LC
154.	*Turnix sylvatica*			LC
155.	*Turnix sylvaticus*	Turnicidae		LC
156.	*Turnix tanki*			LC

157.	*Vanellus indicus*	Charadriidae		LC
158.	*Vanellus leucurus*			LC
159.	*Vanellus malabaricus*			LC
160.	*Vanellus Vanellus*			NT
161.	*Xenus cinereus*	Scolopacidae		LC
162.	*Anastomus oscitans*	Ciconiidae	Ciconiiformes	LC
163.	*Ciconia ciconia*			LC
164.	*Ciconia episcopus*			NT
165.	*Ciconia nigra*			LC
166.	*Ephippiorhynchus asiaticus*			NT
167.	*Leptoptilos dubius*			EN
168.	*Mycteria leucocephala*			NT
169.	*Columba eversmanni*	Columbidae	Columbiformes	VU
170.	*Columba Livia*			LC
171.	*Columba palumbus*			LC
172.	*Spilopelia senegalensis*			LC
173.	*Streptopelia chinensis*			LC
174.	*Streptopelia decaocto*			LC
175.	*Streptopelia Orientalis*			LC
176.	*Streptopelia tranquebarica*			LC
177.	*Streptopelia turtur*			VU
178.	*Treron bicinctus*			LC
179.	*Treron phoenicopterus*			LC
180.	*Alcedo atthis*	Alcedinidae	Coraciiformes	LC
181.	*Ceryle rudis*			LC
182.	*Coracias benghalensis*	Coraciidae		LC
183.	*Coracias garrulus*			LC
184.	*Halcyon pileata*	Alcedinidae		VU
185.	*Halcyon smyrnensis*			LC
186.	*Merops apiaster*	Meropidae		LC
187.	*Merops orientalis*			LC
188.	*Merops persicus*			LC
189.	*Merops philippinus*			LC
190.	*Cacomantis passerinus*	Cuculidae	Cuculiformes	LC
191.	*Centropus sinensis*			LC
192.	*Clamator jacobinus*			LC
193.	*Cuculus canorus*			LC
194.	*Eudynamys scolopaceus*			LC
195.	*Hierococcyx varius*			LC
196.	*Taccocua leschenaultii*			LC
197.	*Falco cherrug*	Falconidae	Falconiformes	EN
198.	*Falco chicquera*			NT
199.	*Falco columbarius*			LC

200.	*Falco concolor*			VU
201.	*Falco Jugger*			NT
202.	*Falco naumanni*			LC
203.	*Falco peregrinus*			LC
204.	*Falco peregrinus babylonicus*			NT
205.	*Falco peregrinus pelegrinoides*			LC
206.	*Falco subbuteo*			LC
207.	*Falco tinnunculus*			LC
208.	*Alectoris chukar*		Galliformes	LC
209.	*Ammoperdix Griseogularis*			LC
210.	*Coturnix Coromandelica*			LC
211.	*Coturnix Coturnix*			LC
212.	*Francolinus Francolinus*			LC
213.	*Francolinus Pondicerianus*			LC
214.	*Lerwa lerwa*			LC
215.	*Lophophorus impejanus*			LC/ MD
216.	*Pavo cristatus*			LC
217.	*Pucrasia macrolopha*			LC
218.	*Tetraogallus himalayensis*			LC
219.	*Tragopan melanocephalus*	Phasianidae		VU
220.	*Gavia stellate*	Gaviidae	Gaviiformes	LC
221.	*Amaurornis akool*		Gruiformes	LC
222.	*Amaurornis phoenicurus*	Rallidae		LC
223.	*Anthropoides virgo*	Gruidae		LC
224.	*Fulica atra*			LC
225.	*Gallicrex cinerea*			LC
226.	*Gallinula Chloropus*	Rallidae		LC
227.	*Grus Antigone*			VU
228.	*Grus grus*			LC
229.	*Leucogeranus leucogeranus*	Gruidae		CR
230.	*Porphyrio porphyrio*			LC
231.	*Porzana Fusca*			LC
232.	*Porzana parva*			LC
233.	*Porzana porzana*			LC
234.	*Porzana pusilla*			LC
235.	*Rallus aquaticus*	Rallidae		VU
236.	*Ardeotis nigriceps*		Otidiformes	CR
237.	*Chlamydotis macqueenii*			VU
238.	*Chlamydotis undulata*			VU
239.	*Sypheotides indica*			CR
240.	*Tetrax tetrax*	Otididae		NT
241.	*Aaemon alaudipes*	Alaudidae	Passeriformes	LC
242.	*Acridotheres ginginianus*			LC

243.	*Acridotheres tristis*	Sturnidae		LC
244.	*Acrocephalus dumetorum*	Acrocephalidae		LC
245.	*Acrocephalus agricola*			LC
246.	*Acrocephalus arundinaceus*			LC
247.	*Acrocephalus melanopogon*			LC
248.	*Acrocephalus stentoreus*			LC
249.	*Aegithalos leucogenys*	Aegithalidae		LC
250.	*Aegithalos niveogularis*			LC
251.	*Alauda arvensis*	Alaudidae		LC
252.	*Alauda gulgula*			LC
253.	*Amandava amandava*	Estrildidae		LC
254.	*Ammomanes cinctura*	Alaudidae		LC
255.	*Ammomanes deserti*			LC
256.	*Ammomanes phoenicura*			LC
257.	*Anthus cervinus*	Motacillidae		LC
258.	*Anthus compestris*			LC
259.	*Anthus petrosus*			LC
260.	*Anthus richardi*			LC
261.	*Anthus roseatus*			LC
262.	*Anthus spinoletta*			LC
263.	*Anthus sylvanus*			LC
264.	*Anthus trivialis*			LC
265.	*Bombycilla garrulus*	Bombycillidae		LC
266.	*Bucanetes githagineus*	Fringillidae		LC
267.	*Calandrella acutirostris*	Alaudidae		LC
268.	*Calandrella brachydactyla*			LC
269.	*Calandrella raytal*			LC
270.	*Carduelis cannabina*	Fringillidae		LC
271.	*Carduelis carduelis*			LC
272.	*Carpodacus erythrinus*			LC
273.	*Carpodacus rhodochlamys*			LC
274.	*Cecropis daurica*	Hirundinidae		LC
275.	*Cercotrichas galactotes*	Muscicapidae		LC
276.	*Certhia himalayana*	Certhiidae		LC
277.	*Cettia cetti*	Cettiidae		LC
278.	*Cettia fortipes*			LC
279.	*Chaimarrornis leucocephalus*	Muscicapidae		LC
280.	*Chelidorhynx hypoxanthus*	Stenostiridae		LC
281.	*Chrysomma altirostre*	Paradoxornithidae		VU
282.	*Chrysomma sinense*			LC
283.	*Cinclus cinclus*	Cinclidae		LC
284.	*Cinclus pallasii*			LC
285.	*Cinnyris asiaticus*	Nectariniidae		LC

286.	*Cisticola juncidis*	Cisticolidae		LC
287.	*Coccothraustes coccothraustes*	Fringillidae		LC
288.	*Corvus corax*	Corvidae		LC
289.	*Corvus cornix*			LC
290.	*Corvus corone*			LC
291.	*Corvus frugilegus*			LC
292.	*Corvus macrorhynchos*			LC
293.	*Corvus monedula*			LC
294.	*Corvus splendens*			LC
295.	*Corvus subcorax*			LC
296.	*Culicicapa ceylonensis*	Stenostiridae		LC
297.	*Curruca althaea*	Sylviidae		LC
298.	*Curruca curruca*			LC
299.	*Delichon dasypus*	Hirundinidae		LC
300.	*Dendrocitta vagabunda*	Corvidae		LC
301.	*Dicrurus leucophaeus*	Dicruridae		LC
302.	*Dicrurus macrocercus*	Dicruridae		LC
303.	*Emberiza bruniceps*	Emberizidae		LC
304.	*Emberiza buchanani*			LC
305.	*Emberiza cia*			LC
306.	*Emberiza leucocephalos*			LC
307.	*Emberiza melanocephala*			LC
308.	*Emberiza sahari*			LC
309.	*Emberiza schoeniclus*			LC
310.	*Emberiza stewarti*			LC
311.	*Emberiza stiolata*			LC
312.	*Eremopterix griseus*	Alaudidae		LC
313.	*Eremopterix nigriceps*			LC
314.	*Euodice malabarica*	Estrildidae		LC
315.	*Ficedula parva*	Muscicapidae		LC
316.	*Ficedula tricolor*			LC
317.	*Fringilla coelebs*	Fringillidae		LC
318.	*Fringilla montifringilla*			LC
319.	*Galerida cristata*	Alaudidae		LC
320.	*Garrulus lanceolatus*	Corvidae		LC
321.	*Gracupica contra*	Sturnidae		LC
322.	*Gymnoris xanthocolis*	Passeridae		LC
323.	*Hirundo rustica*	Hirundinidae		LC
324.	*Hirundo smithii*			LC
325.	*Hypocolius ampelinus*	Hypocoliidae		LC
326.	*Hypsipetes leucocephalus*	Pycnonotidae		LC
327.	*Iduna caligata*	Acrocephalidae		LC
328.	*Iduna rama*			LC

329.	*Lanius collurio*			LC
330.	*Lanius excubitor*			LC
331.	*Lanius isabellinus*			LC
332.	*Lanius meridionalis*			LC
333.	*Lanius minor*			LC
334.	*Lanius pallidirostris*			LC
335.	*Lanius Phoenicuroides*			LC
336.	*Lanius schach*			LC
337.	*Lanius vittatus*	Laniidae		LC
338.	*Laticilla burnesii*	Pellorneidae		NT
339.	*Locustella naevia*	Locustellidae		LC
340.	*Luscinia brunnea*			LC
341.	*Luscinia svecica*	Muscicapidae		LC
342.	*Melanocorypha bimaculata*			LC
343.	*Mirafra cantillans*			LC
344.	*Mirafra erythroptera*	Alaudidae		LC
345.	*Monticola cinclorhynchus*			LC
346.	*Monticola saxatilis*			LC
347.	*Monticola solitaries*	Muscicapidae		LC
348.	*Motacilla citreola calcarata*			LC
349.	*Motacilla alba alboides*			LC
350.	*Motacilla alba dukhunensis*			LC
351.	*Motacilla alba personata*			LC
352.	*Motacilla cinerea*			LC
353.	*Motacilla citreola*			LC
354.	*Motacilla citreola werae*			LC
355.	*Motacilla flava bema*			LC
356.	*Motacilla flava leucocephala*			LC
357.	*Motacilla flava melanogrisea*			LC
358.	*Motacilla flava thunbergi*			LC
359.	*Motacilla maderaspatensis*	Motacillidae		LC
360.	*Muscicapa dauurica*			LC
361.	*Muscicapa latirostris*			LC
362.	*Muscicapa ruficauda*			LC
363.	*Muscicapa sibirica*			LC
364.	*Muscicapa striata*	Muscicapidae		LC
365.	*Mycerobas carnipes*	Fringillidae		LC
366.	*Myophoneus caeruleus*	Muscicapidae		LC
367.	*Nucifraga caryocatactes*	Corvidae		LC
368.	*Nucifraga multipunctata*			LC
369.	*Oenanthe albonigra*			LC
370.	*Oenanthe chrysopygia*			LC
371.	*Oenanthe deserti*	Muscicapidae		LC

372.	*Oenanthe finschii*			LC
373.	*Oenanthe isabellina*			LC
374.	*Oenanthe monacha*			LC
375.	*Oenanthe picata*			LC
376.	*Oenanthe pleschanka*			LC
377.	*Oriolus kundoo*			LC
378.	*Oriolus oriolus*	Oriolidae		LC
379.	*Orthotomus sutorius*	Cisticolidae		LC
380.	*Panurus biarmicus*	Panuridae		LC
381.	*Parus major*	Paridae		LC
382.	*Passer cinnamomeus*			LC
383.	*Passer domesticus*			LC
384.	*Passer domesticus bactrianus*			LC
385.	*Passer hispaniolensis*			LC
386.	*Passer montanus*			LC
387.	*Passer pyrrhonotus*	Passeridae		LC
388.	*Pericrocotus cinnamomeus*			LC
389.	*Pericrocotus ethologus*	Campephagidae		LC
390.	*Periparus ater*			LC
391.	*Periparus ater melanolophus*	Paridae		LC
392.	*Petrochelidon fluvicola*	Hirundinidae		LC
393.	*Petronia petronia*	Passeridae		LC
394.	*Phoenicurus phoenicurus*			LC
395.	*Phoenicurus caeruleocephalus*			LC
396.	*Phoenicurus erythronotus*			LC
397.	*Phoenicurus fuliginosus*			LC
398.	*Phoenicurus ochruros*	Muscicapidae		LC
399.	*Phylloscopus griseolus*			LC
400.	*Phylloscopus humei*			LC
401.	*Phylloscopus inornatus*			LC
402.	*Phylloscopus magnirostris*			LC
403.	*Phylloscopus neglectus*			LC
404.	*Phylloscopus nitidus*			LC
405.	*Phylloscopus occipitalis*	Phylloscopidae		LC
406.	*Phylloscopus proregulus*	Parulidae		LC
407.	*Phylloscopus sindianus*			LC
408.	*Phylloscopus subviridis*			LC
409.	*Phylloscopus trochiloides*			LC
410.	*Phylloscopus tytleri*	Phylloscopidae		LC
411.	*Pica pica*	Corvidae		LC
412.	*Ploceus benghalensis*			LC
413.	*Ploceus manyar*			LC
414.	*Ploceus philippinus*	Ploceidae		LC

415.	*Prinia gracillis*	Cisticolidae		LC
416.	*Prinia buchanani*			LC
417.	*Prinia crinigera*			LC
418.	*Prinia flaviventris*			LC
419.	*Prinia hodgsonii*			LC
420.	*Prinia inornata*			LC
421.	*Prinia socialis*			LC
422.	*Prunella atrogularis*	Prunellidae		LC
423.	*Prunella collaris*			LC
424.	*Prunella himalayana*			LC
425.	*Prunella strophiata*			LC
426.	*Ptyonoprogne rupestris*	Hirundinidae		LC
427.	*Pycnonotus leucogenys*	Pycnonotidae		LC
428.	*Pycnonotus leucotis*			LC
429.	*Pycnonotus cafer*			LC
430.	*Pyrrhocorax graculus*	Corvidae		LC
431.	*Pyrrhocorax pyrrhocorax*			LC
432.	*Pyrrhula aurantiaca*	Fringillidae		LC
433.	*Remiz coronatus*	Remizidae		LC
434.	*Remiz pendulinus*	Passerida		LC
435.	*Rhipidura aureola*	Rhipiduridae		LC
436.	*Rhodospiza obsoleta*	Fringillidae		LC
437.	*Riparia diluta*	Hirundinidae		LC
438.	*Riparia paludicola*			LC
439.	*Saxicola caprata*	Muscicapidae		LC
440.	*Saxicola macrorhynchus*	Muscicapidae		VU
441.	*Saxicola torquata*			LC
442.	*Saxicoloides fulicatus*			LC
443.	*Scotocerca inquieta*	Cisticolidae		LC
444.	*Seicercus xanthoschistos*	Phylloscopidae		LC
445.	*Serinus pusillus*	Fringillidae		LC
446.	*Sitta cashmirensis*	Sittidae		LC
447.	*Sitta cinnamoventris*			LC
448.	*Sitta tephronota*			LC
449.	*Sturnia pagodarum*	Sturnidae		LC
450.	*Sturnus vulgaris*			LC
451.	*Sylvia communis*	Phylloscopidae		LC
452.	*Sylvia hortensis*	Sylviidae		LC
453.	*Sylvia minula*			LC
454.	*Sylvia nana*			LC
455.	*Tarsiger cyanurus*	Muscicapidae		LC
456.	*Tarsiger rufilatus*			LC
457.	*Tephrodornis pondicerianus*	Vangidae		LC

458.	*Terpsiphone paradise*	Monarchidae		LC
459.	*Tichodroma muraria*	Tichodromidae		LC
460.	*Trochalopteron lineatum*			LC
461.	*Trochalopteron variegatum*	Leiothrichidae		LC
462.	*Troglodytes troglodytes*	Troglodytidae		LC
463.	*Turdoides caudate*			LC
464.	*Turdoides earlei*			LC
465.	*Turdoides malcolmi*			LC
466.	*Turdoides striata*	Leiothrichidae		LC
467.	*Turdus atrogularis*			LC
468.	*Turdus boulboul*			LC
469.	*Turdus rubrocanus*			LC
470.	*Turdus unicolor*			LC
471.	*Turdus viscivorus*	Turdidae		LC
472.	*Zosterops palpebrosus*	Zosteropidae		LC
473.	*Ardea intermedia*		Pelecaniformes	LC
474.	*Ardea alba*			LC
475.	*Ardea cinerea*			LC
476.	*Ardea purpurea*			LC
477.	*Ardeola grayii*			LC
478.	*Botaurus stellaris*			LC
479.	*Bubulcus ibis*			LC
480.	*Butorides striata*			LC
481.	*Egretta alba*			LC
482.	*Egretta garzetta*			LC
483.	*Ixobrychus minutus*			LC
484.	*Ixobrychus sinensis*			LC
485.	*Ixobrychus cinnamomeus*			LC
486.	*Ixobrychus flavicollis*			LC
487.	*Nycticorax nycticorax*	Ardeidae		LC
488.	*Pelecanus crispus*			NT
489.	*Pelecanus onocrotalus*	Pelecanidae		LC
490.	*Platalea leucorodia*			LC
491.	*Plegadis falcinellus*			LC
492.	*Pseudibis papillosa*	Threskiornithidae		LC
493.	*Phoenicopterus roseus*	Phoenicopteridae	Phoenicopteriformes	LC
494.	*Dendrocopos assimilis*		Piciformes	LC
495.	*Dendrocopos himalayensis*			LC
496.	*Dendrocoptes auriceps*			LC
497.	*Dinopium benghalense*			LC
498.	*Jynx torquilla*			LC
499.	*Leiopicus mahrattensis*	Picidae		LC
500.	*Megalaima haemacephala*	Megalaimidae		LC

501.	*Picus canus*	Picidae		LC
502.	*Picus squamatus*			LC
503.	*Psilopogon asiaticus*	Megalaimidae		LC
504.	*Psilopogon haemacephalus*			LC
505.	*Podiceps auritus*	Podicipedidae	Podicipediformes	VU
506.	*Podiceps cristatus*			LC
507.	*Podiceps cristatus*			LC
508.	*Podiceps grisegena*			LC
509.	*Podiceps nigricollis*			LC
510.	*Tachybaptus ruficollis*			LC
511.	*Oceanites oceanicus*	Oceanitidae	Procellariiformes	LC
512.	*Puffinus persicus*	Procellariidae		LC
513.	*Psittacula eupatria*	Psittaculidae	Psittaciformes	NT
514.	*Psittacula himalayana*			LC
515.	*Psittacula krameri*			LC
516.	*Pterocles alchata*	Pteroclidae		LC
517.	*Pterocles coronatus*			LC
518.	*Pterocles exustus*			LC
519.	*Pterocles indicus*			LC
520.	*Pterocles lichtensteinii*			LC
521.	*Pterocles orientalis*			LC
522.	*Pterocles senegallus*			LC
523.	*Asio flammeus*	Strigidae	Strigiformes	LC
524.	*Asio otus*			LC
525.	*Athene brama*			LC
526.	*Athene noctua*			LC
527.	*Bubo bubo*			LC
528.	*Bubo coromandus*			LC
529.	*Glaucidium brodiei*			LC
530.	*Ketupa zeylonensis*			LC
531.	*Otus bakkamoena*			LC
532.	*Otus brucei*			LC
533.	*Otus scops*			LC
534.	*Strix aluco*			LC
535.	*Tyto alba*	Tytonidae		LC
536.	*Anhinga melanogaster*	Anhingidae	Suliformes	LC
537.	*phalacrocorax carbo*	Phalacrocoracidae		LC
538.	*Phalacrocorax fuscicollis*			LC
539.	*phalacrocorax niger*			LC
540.	*Sula dactylatra*	Sulidae		LC