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***Research Article** (Open Access)*

AVIAN COMMUNITY IN AND AROUND THE SELECTED WETLAND HABITAT OF SOUTHERN ARAVALLI REGION, RAJASTHAN

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ABSTRACT
During study, we studied a total of five wetland habitats, namely: Mangalwad Pond (Chittorgarh), Rundera Pond (Udaipur), Sarjana Dam (Udaipur), Sei Dam (Udaipur) and West Banas Dam (Sirohi), located in southern-Aravalli regions, with the objective of evaluating avian diversity and abundance. We documented a total of 194 avian species across 67 families in these selected wetland habitats. Anatidae family has the highest number of species, a total of 16, followed by the Accipitridae with 10 species. Both the Motacillidae and Muscicapidae families comprise nine species each. According to IUCN Red List, the majority of bird species were classified as least concern category (LC = 179) followed by near threatened (NT = 11), vulnerable (VU = 3) and endangered for single-species Egyptian vultures. The categorization of species according to seasonal occurrence indicates that the predominant group was the resident category, comprising 129 species (R = 129) followed by the winter migratory category, which includes 63 species (WM = 63). One species was classified under the monsoon migratory category, while another species was classified under the summer migratory category. Sarjana Dam had the highest species count (n = 169) among the five chosen wetland habitats followed by Mangalwad Pond (n = 167), Rundera Pond (n = 166), West Banas Dam (n = 163), and Sei Dam (n = 162). Wetland habitat of the southern Aravalli regions attracts numerous migratory bird species, particularly during winter, owing to the abundant water resources and food availability following the rainy seasons. Wetlands' environment additionally sustains terrestrial and other aquatic-dependent avian species because of its variety of surrounding microhabitat habitats, including agricultural land and uncultivated areas.

Keywords: *Wetland habitat, Aravalli, Avian Diversity, Seasons, Migratory, Microhabitat*

INTRODUCTION
Avian diversity and richness serve as indicators of the health of a particular area and ecosystem. Birds play an essential role in ecosystems by providing responsibilities such as predator-prey interactions, pollen and seed dispersal. They are crucial for maintaining the equilibrium of natural ecosystems (Raman, 2001). The importance of species-habitat relationships for the structure of local vegetation and landscape appearance demonstrates how processes simultaneously influence the bird community and its natural composition at various levels. Bird groups are fundamentally dependent on their habitat for refuge, sustenance, reproduction and other vital functions; thus, even slight alterations in vegetation and its structure will affect their survival (MacArthur *et al.,* 1962; Collins *et al.,* 1982). Environmental Impact Assessments (E.I.A.) currently monitors by birds due to their greater susceptibility to environmental changes. People assert that some avian species serve as markers of both season and time, with certain birds capable of predicting the hour of day and night; for instance, the crowing of a rooster at dawn (Joshi and Shrivastava, 2012). Birds are a crucial element in ecological studies due to their capacity to evade

adverse conditions through flight. Consequently, they are considered significant health markers of an ecosystem's ecological status and productivity (Li and Mundkur, 2007). Earth's diverse habitats vary in temperature, humidity, light and numerous additional variables. A wide range of animals and plants have persisted in each of these environments due to diverse adaptations. A species' habitat comprises a distinct range of physical environmental variables essential for its survival and reproduction (Block and Brennan, 1993). A specific area's resources and conditions enable the occupancy, survival and reproduction of a specific organism (Hall *et al.,* 1997; Choudhary and Chishty, 2024). The primary factors of the avian study include species richness, diversity and abundance (Nilsson and Nilsson, 1978), food availability (Krebs, 1974), wetland size (Paracuellos, 2006) and abiotic alterations in wetlands, all of which influence bird assemblages (Lagos *et al.,* 2008). The examination of avian habitat selection and patterns has had a long tradition (Block and Brennan, 1993) and offers essential insights for formulating a species conservation management approaches and strategies (Caughley, 1994; Onorato *et al.,* 2010). Numerous studies have examined the diversity and abundance of birds in specific areas in the southern Aravalli regions (Chhangani, 2002; Bhatnagar *et al.,* 2011; Chishty and Choudhary, 2020 a&b; Choudhary and Chishty, 2020a, b&c; Choudhary and Chishty, 2022, 2023; Choudhary, 2024), but no studies have examined the selected wetland habitats of southern Aravalli. We conducted a long-term study to analyze the avian community in and around various wetland habitats (Mangalwad Pond, Rundera Pond, Sarjana Dam, Sei Dam and West Banas Dam) in the Southern Aravalli ranges of Rajasthan.

MATERIALS AND METHODS

Present study was conducted in various wetland habitats across three districts of southern Rajasthan: Chittorgarh, Udaipur and Sirohi. Throughout study period, a total of five wetland habitats were examined: Mangalwad Pond (Chittorgarh), Rundera Pond (Udaipur), Sarjana Dam (Udaipur), Sei Dam (Udaipur) and West Banas Dam (Sirohi District). Study was carried out from July 2018 to June 2024, excluding the COVID-19 pandemic lockdown period. Data collection and field surveys were conducted in the early morning and late evening time. Data collection and field surveys were operated in and around wetland habitats. We conducted a visual examination using a Nikon P1000 camera at a safe distance without disturbing the birds or their habitat. Identification and field diagnosis of birds were conducted using standard field guides, including Birds of the Indian Subcontinent (Grimmett *et al.,* 2011), Birds of Rajasthan (Vyas, 2013) and Birds of India (Majumder *et al.,* 2022). Birdlife International (2024) and the IUCN Red List (2024) confirmed the nomenclature, including the common names, scientific names and families of birds. We categorized the identified bird species according to IUCN threat levels: least concern (LC), near-threatened (NT), vulnerable (VU), endangered (EN) and critically endangered (CE) (Birdlife International, 2024; IUCN, 2024). Presence of species for specific durations, such as resident species (seen throughout the year), winter migratory (only seen in winter months), summer migratory (only seen in summer months) and monsoon migratory (only seen in monsoon months), determines the residential status of birds (Choudhary and Chishty, 2023; Choudhary, 2024). We regularly visited each season of the year to evaluate the relative diversity and abundance of each chosen site. We visited each site three–four days per season, ensuring that we visited each site at least 9–12 times a year. We categorized the abundance of birds into four groups based on the frequency of sightings: very common (VC), common (C), uncommon (UC) and rarely sighted (RS). Frequency of bird sightings during specific seasons or throughout the study period determines the relative abundance of birds (MacKinnon and Phillipps, 1993). Bird species sighted more than ten times were referred to as a very common species (VC); species sighted seven to nine times were referred to as a common species (C); species sighted between three to six times were referred to as uncommon species (UC) and species sighted only one or two times throughout the entire period of study were referred to as a rarely sighted species (RS). The relative diversity (RDi) of families was calculated using the following formula (Torre-Cuadros *et al.,* 2007):

$$\mathbf{RDi} = \frac{\mathbf{Number\ of\ Avian\ species\ in\ family}}{\mathbf{Total\ number\ of\ species}}\mathbf{X100}$$

RESULTS AND DISCUSSION

During the entire period of study, July 2018 to June 2024 (excluding COVID-19 periods), we examined a total of five wetland habitats, namely: Mangalwad Pond (Chittorgarh), Rundera Pond (Udaipur), Sarjana Dam (Udaipur), Sei Dam (Udaipur) and West Banas Dam (Sirohi District), for assessing avian diversity and abundance. During study, we observed a total of 194 bird species from 67 families in selected wetland habitats in the southern Aravalli region (Table 1). The highest number of species belongs to Anatidae family (16) followed by Accipitridae (10), Motacillidae and Muscicapidae, which consisted of nine species each. Ardeidae family consisted of eight species, while Columbidae family had seven. Scolopacidae and Cisticolidae consisted of six species each. Four families such as Ciconiidae, Strigidae, Picidae and Sturnidae consisted of five species. Five families, such as Threskiornithidae, Rallidae, Cuculidae, Laniidae and Estrildidae consisted of four species each. Nine families such as Phalacrocoracidae, Charadriidae, Psittacidae, Alcedinidae, Hirundinidae, Leiothrichidae, Paridae, Emberizidae and Corvidae consisted of three species each. Remaining 15 families each consisted of two species, while 26 families each represented a single species. Anatidae family had the highest relative diversity value (5.24) followed by Accipitridae (5.15). Tables 2 represent the relative diversity of the remaining families.

IUCN Status of Birds: During study, we observed a total of 194 bird species belonging to 67 families. As per IUCN red list category, most bird species belong to the least concern category (LC = 179) followed by near threatened (NT = 11), vulnerable (VU = 3) and single-species Egyptian vultures belong to the endangered category (Table 1).

Bird migration status: Based on seasonal occurrence, the majority of species fall into the resident category (R = 129) followed by winter migratory category (WM = 63). One species, the Pied-crested Cuckoo or Jacobin Cuckoo, belongs to the monsoon migratory category and one species, the Indian Pita, belongs to the summer migratory category (Table 1).

Site-wise species richness: Of these five selected wetland habitats, Sarjana Dam had the highest number of species (n = 169) followed by Mangalwad Pond (n = 167), Rundera Pond (n = 166), West Banas Dam (n = 163) and Sei Dam (n = 162) (Table 1).

Site-wise relative abundance: We classified birds into four categories based on the frequency of sightings: very common (VC), common (C), uncommon (UC) and rarely sighted (RS) species.

1. Maglwad Pond: We observed a total of 167 bird species in the Manglwad Pond areas. Of these, the most of species belongs to very common category (VC= 106) followed by common species (C=32), uncommon species (UC=22) and rare-sighted species (RS= 7) account for the least number of species (Table 1).

2. Rundera Pond: We observed 166 bird species in the Rundera pond areas, with the highest number belonging to the very common category (VC= 107) followed by the common category (C=34), uncommon category (UC= 21) and lowest number belonging to the rarely sighted category (RS= 4)(Table 1).

3. Sarjana Dam: We observed a total of 169 bird species in the Sarjana pond areas, with the highest count being very common category (VC=106) followed by common (C= 32), uncommon (UC=26) and the lowest count being rare-sighted (RS= 5)(Table 1).

4. Sei Dam: We observed a total of 162 bird species from the Sei dam areas; the most of species belongs to very common category (VC= 100 species) followed by the common category with 31, the uncommon category with 28 and the least number of species belongs to rarely sighted category (RS=4) (Table 1).

5. West-Banas Dam: We observed a total of 163 bird species in the West-Banas Dam areas. Of these, the most of species belongs to very common category (VC=100) followed by uncommon (UC= 30), common (C= 29) and the least number of species belongs to rarely sighted category (RS= 5) (Table 1).

Wetlands are one of the planet's most productive ecosystems. They are essential for controlling soil erosion, managing floods, recharging water reservoirs and absorbing nutrients (Kumar *et al.*, 2011). They establish optimal conditions and environments for diverse flora and fauna including birds. Numerous aquatic avian species consume the abundant invertebrates present in the sediment, including mollusks and annelids. According to Thapa and Saund (2012), wetlands are defined as natural or artificial regions, such as swamps, marshes, riverine floodplains, lakes and water retention areas, which contain water from subterranean aquifers or atmospheric precipitation. These regions may be permanent or ephemeral, static or dynamic and contain either freshwater or saline water. During study, we observed a total of 194 bird species in these selected wetlands habitats. Out of these, most species were resident followed by winter migratory birds. During the study, we found that the wetland habitat of the southern Aravalli regions has attracted numerous migratory avian species, especially in winter seasons, due to the plentiful availability of water resources and food materials after the rainy seasons. Out of five wetland habitats, Sarjana Dam had the highest number of species observed (n = 169) followed by Mangalwad Pond (n = 167), Rundera Pond (n = 166), West Banas Dam (n = 163) and Sei Dam (n = 162) (Table 1).

We found that, among these 67 families, the Anatidae family exhibited the highest diversity in terms of species richness, boasting 16 bird species. Similarly, Choudhary and Chishty (2023) and Choudhary (2024) also observed 201 bird species belonging to 63 families from Mount Abu Wildlife Sanctuary; out of these families, they found that the Anatidae was more diverse in terms of species richness, with 15 species. Present study indicates that the wetland habitats of southern Aravalli regions are home of several aquatic species including Anatidae. During study, following Anatidae species: Cotton pygmy-goose, Knob-billed Duck, Indian Spot-billed Duck, Northern Pintail, Northern Shoveler, Gadwall, Mallard, Eurasian Wigeon, Common Teal, Ruddy Shelduck, Red-Crested Pochard, Tufted Duck, Ferruginous Duck, Lesser-Whistling Duck, Greylag Goose and Bar-headed Goose were observed. Wetlands attract several migratory and resident bird species due to their substantial nutritional value and productivity (Paracuellos, 2006). Alterations in the primary physical and chemical properties of the waters at the watershed scale influence wetlands, which are cohesive systems. These factors influence wetland-dependent communities and ecosystem characteristics such as species richness, distribution and density (Burkert *et al.*, 2005). The wetlands' habitat also supports terrestrial and other water-dependent bird species due to the presence of a variety of habitats surrounding them. In these selected wetland habitat, numerous other microhabitats such as agricultural, uncultivated lands and terrestrial habitats are also present due to the numerous terrestrial bird species also sighted here. Waterfowl select wetlands based on various criteria, including water chemistry, aquatic vegetation, invertebrate fauna and physical characteristics (Patra *et al.*, 2010). The physical and chemical properties of water bodies regulate the species composition, abundance, productivity and physiological conditions of aquatic organisms (Bhat *et al.*, 2009).

Table 1: A list of bird species recorded from selected wetland habitats in the southern-Aravalli region. *(LC- Least concern, NT-Near threatened, VU- Vulnerable, EN- Endangered; R-Resident, WM-Winter migratory, SM- Summer migratory, MM- Monsoon Migratory; VC- Very common, C- Common, UC- Uncommon, R-rare sighted, 0- Represent species absent in entire habitat; MP- Mangalwad pond, RP- Rundera pond, SRD- Sarjana Dam, SID- Sei Dam, WBD- West-Banas Dam)*

S.no.	Name	Zoological name	IUCN Conservation status	Migration status	Selected wetland habitat				
					MP	RP	SRD	SID	WBD
Family: Podicipedidae									
1	Little Grebe	*Tachybaptus ruficollis*	LC	R	VC	VC	VC	VC	VC

Family: Pelecanidae									
2	Great White Pelican	*Pelecanus onocrotalus*	LC	WM	0	UC	RS	0	VC
3	Dalmatian Pelican	*Pelecanus crispus*	NT	WM	0	R	RS	0	UC
Family: Phalacrocoracidae									
4	Little cormorant	*Microcarbo niger*	LC	R	VC	VC	VC	VC	VC
5	Greater Cormorant	*Phalacrocorax carbo*	LC	R	VC	VC	VC	C	UC
6	Indian Cormorant	*Phalacrocorax fuscicollis*	LC	R	VC	VC	VC	VC	VC
Family: Anhingidae									
7	Oriental Darter	*Anhinga melanogaster*	NT	R	VC	VC	VC	UC	UC
Family: Ardeidae									
8	Little Egret	*Egretta garzetta*	LC	R	VC	VC	VC	VC	VC
9	Intermediate egret	*Ardea intermedia*	LC	R	VC	VC	VC	VC	VC
10	Black-crowned Night heron	*Nycticorax nycticorax*	LC	R	0	0	UC	RS	0
11	Purple heron	*Ardea purpurea*	LC	R	C	C	C	UC	UC
12	Cattle- Egret	*Bubulcus ibis*	LC	R	VC	VC	VC	VC	VC
13	Great White Egret	*Ardea alba*	LC	R	VC	VC	VC	VC	UC
14	Indian Pond Heron	*Ardeola grayii*	LC	R	VC	VC	VC	VC	VC
15	Grey Heron	*Ardea cinerea*	LC	R	VC	VC	VC	VC	VC
Family: Ciconiidae									
16	Black stork	*Ciconia nigra*	LC	WM	0	0	0	0	RS
17	Black-necked stork	*Ephippiorhynchus asiaticus*	NT	WM	RS	RS	UC	0	0
18	Painted Stork	*Mycteria leucocephala*	NT	R	VC	VC	VC	UC	UC
19	Asian Openbill	*Anastomus oscitans*	LC	R	VC	VC	VC	UC	UC
20	Asian woolly necked Stork	*Ciconia episcopus*	NT	R	C	C	C	C	C
Family: Threskiornithidae									
21	Glossy Ibis	*Plegadis falcinellus*	LC	R	VC	VC	C	UC	UC
22	Eurasian Spoonbill	*Platalea leucorodia*	LC	WM	VC	VC	VC	VC	VC
23	Red naped Ibis	*Pseudibis papillosa*	LC	R	VC	VC	VC	VC	VC
24	Black-headed Ibis	*Threskiornis melanocephalus*	NT	R	VC	VC	VC	VC	UC

Family: Phoenicopteridae									
25	Greater flamingo	*Phoenicopterus roseus Pallas, 1811*	LC	WM	0	C	0	0	VC
Family: Anatidae									
26	Cotton pygmy-goose	*Nettapus coromandelianus*	LC	R	UC	0	UC	0	0
27	Knob-billed Duck	*Sarkidiornis melanotos*	LC	R	VC	VC	VC	0	0
28	Indian Spot-billed Duck	*Anas poecilorhyncha*	LC	R	VC	VC	VC	VC	VC
29	Northern Pintail	*Anas acuta*	LC	WM	VC	VC	VC	VC	VC
30	Northern Shoveler	*Spatula clypeata*	LC	WM	VC	VC	VC	VC	VC
31	Red-Crested Pochard	*Netta rufina*	LC	WM	RS	RS	0	0	0
32	Tufted Duck	*Aythya fuligula*	LC	WM	C	C	C	0	0
33	Ferruginous Duck	*Aythya nyroca*	NT	WM	C	C	C	C	0
34	Lesser-Whistling Duck	*Dendrocygna javanica*	LC	R	C	C	C	C	C
35	Gadwall	*Mareca strepera*	LC	WM	VC	VC	VC	VC	VC
36	Mallard	*Anas platyrhynchos*	LC	WM	VC	VC	VC	VC	VC
37	Eurasian Wigeon	*Mareca penelope*	LC	WM	VC	VC	VC	VC	VC
38	Common Teal	*Anas crecca*	LC	WM	VC	VC	VC	VC	VC
39	Ruddy Shelduck	*Tadorna ferruginea*	LC	WM	VC	VC	VC	VC	VC
40	Greylag Goose	*Anser anser*	LC	WM	VC	VC	VC	VC	VC
41	Bar-headed Goose	*Anser indicus*	LC	WM	VC	VC	VC	VC	VC
Family: Accipitridae									
42	Shikra	*Accipiter badius*	LC	R	VC	VC	VC	VC	VC
43	White eyed buzzard	*Butastur teesa*	LC	R	0	0	0	C	C
44	Black-shouldered Kite	*Elanus caeruleus*	LC	R	VC	VC	VC	VC	VC
45	Black kite	*Milvus migrans*	LC	R	UC	UC	UC	UC	RS
46	Egyptian vulture	*Neophron percnopterus*	EN	R	UC	UC	0	0	UC
47	Short-toed Snake-eagle	*Circaetus gallicus*	LC	R	UC	UC	UC	C	C
48	Crested serpent-Eagle	*Spilornis cheela*	LC	R	RS	RS	0	0	VC
49	Western Marsh-Harrier	*Circus aeruginosus*	LC	WM	UC	UC	UC	UC	UC
50	Bonelli's eagle	*Aquila fasciata*	LC	R	0	0	0	UC	0

51	Changeable hawk-eagle	*Nisaetus cirrhatus*	LC	R	0	0	0	C	UC
Family: Pandionidae									
52	Osprey	*Pandion haliaetus*	LC	WM	UC	UC	UC	UC	UC
Family: Falconidae									
53	Common Kestrel	*Falco tinnunculus*	LC	WM	C	C	C	C	C
Family: Phasianidae									
54	Grey Francolin	*Francolinus pondicerianus*	LC	R	VC	VC	VC	VC	VC
55	Indian Peafowl	*Pavo cristatus*	LC	R	VC	VC	VC	VC	VC
Family: Gruidae									
56	Sarus crane	*Grus antigone*	VU	R	C	C	C	0	RS
57	Common crane	*Grus grus*	LC	WM	VC	VC	VC	0	0
Family: Rallidae									
58	Common Moorhen	*Gallinula chloropus*	LC	R	C	C	C	UC	UC
59	Common Coot	*Fulica atra*	LC	R	VC	VC	VC	VC	VC
60	White-breasted water hen	*Amaurornis phoenicurus*	LC	R	VC	VC	VC	VC	VC
61	Purple Swamp hen	*Porphyrio porphyrio*	LC	R	C	C	C	UC	RS
Family: Jacanidae									
62	Bronze-winged Jacana	*Metopidius indicus*	LC	R	UC	UC	0	0	0
63	Pheasant tailed-Jacana	*Hydrophasianus chirurgus*	LC	R	0	0	UC	0	0
Family: Rostratulidae									
64	Greater Painted-Snipe	*Rostratula benghalensis*	LC	R	C	C	C	C	C
Family: Charadriidae									
65	Yellow-wattled lapwing	*Vanellus malabaricus*	LC	R	C	C	UC	UC	UC
66	Little Ringed Plover	*Charadrius dubius*	LC	R	VC	VC	C	C	C
67	Red- wattled Lapwing	*Vanellus indicus*	LC	R	VC	VC	VC	VC	VC
Family: Scolopacidae									
68	Ruff	*Calidris pugnax*	LC	WM	C	C	C	C	C
69	Common Snipe	*Gallinago gallinago*	LC	WM	VC	VC	VC	C	C
70	Black-tailed Godwit	*Limosa limosa*	NT	WM	C	C	C	C	C
71	Common Red shank	*Tringa totanus*	LC	WM	C	C	C	0	UC

72	Green Sandpiper	*Tringa ochropus*	LC	WM	C	C	C	UC	UC
73	Common sandpiper	*Actitis hypoleucos*	LC	WM	C	C	C	C	C
Family: Recurvirostridae									
74	Pied Avocet	*Recurvirostra avosetta*	LC	WM	0	0	0	0	UC
75	Black-winged Stilt	*Himantopus himantopus*	LC	R	VC	VC	VC	VC	VC
Family: Burhinidae									
76	Indian Thick-knee	*Burhinus indicus*	LC	R	UC	UC	UC	UC	UC
77	Great Thick-knee	*Esacus recurvirostris*	NT	R	UC	UC	UC	0	0
Family: Glareolidae									
78	Small Pratincole	*Glareola lactea*	LC	WM	UC	UC	UC	0	0
Family: Laridae									
79	River Tern	*Sterna aurantia*	VU	R	VC	VC	VC	VC	VC
Family: Columbidae									
80	Eurasian Collered Dove	*Streptopelia decaocto*	LC	R	VC	VC	VC	VC	VC
81	Red turtle Dove	*Streptopelia tranquebarica*	LC	R	VC	VC	VC	VC	VC
82	Oriental Turtle Dove	*Streptopelia orientalis*	LC	WM	0	0	0	R	UC
83	Rock Pigeon	*Columba livia*	LC	R	VC	VC	VC	VC	VC
84	Yellow footed green Pigeon	*Treron phoenicopterus*	LC	R	VC	VC	VC	VC	VC
85	Laughing Dove	*Streptopelia senegalensis*	LC	R	VC	VC	VC	VC	VC
86	Spotted Dove	*Streptopelia chinensis*	LC	R	VC	VC	VC	VC	VC
Family: Psittacidae									
87	Alexandrine Parakeet	*Psittacula eupatria*	NT	R	RS	RS	UC	0	0
88	Plum headed Parakeet	*Psittacula cyanocephala*	LC	R	VC	VC	VC	VC	VC
89	Rose-ringed Parakeet	*Psittacula krameri*	LC	R	VC	VC	VC	VC	VC
Family: Cuculidae									
90	Asian Koel	*Eudynamys scolopaceus*	LC	R	VC	VC	VC	VC	VC
91	Greater Coucal	*Centropus sinensis*	LC	R	VC	VC	VC	VC	VC
92	Pied crested Cuckoo	*Clamator jacobinus*	LC	MM	UC	UC	UC	0	0

93	Indian Cuckoo	*Cuculus micropterus*	LC	WM	C	C	C	C	C
Family: Tytonidae									
94	Common Barn-owl	*Tyto alba*	LC	R	RS	0	RS	UC	0
Family: Strigidae									
95	Indian Eagle-Owl	*Bubo bengalensis*	LC	R	RS	0	0	RS	0
96	Indian Scopus owl	*Otus bakkamoena*	LC	R	UC	0	0	UC	0
97	Jungle Owlet	*Glaucidium radiatum*	LC	R	0	0	UC	UC	0
98	Mottled Wood-owl	*Strix ocellata*	LC	R	0	0	UC	R	0
99	Spotted Owlet	*Athene brama*	LC	R	VC	VC	VC	VC	VC
Family: Caprimulgidae									
100	Indian Jungle Nightjar	*Caprimulgus indicus*	LC	R	C	C	C	0	0
Family: Alcedinidae									
101	Common Kingfisher	*Alcedo atthis*	LC	R	VC	VC	VC	VC	VC
102	White-breasted Kingfisher	*Halcyon smyrnensis*	LC	R	VC	VC	VC	VC	VC
103	Pied Kingfisher	*Ceryle rudis*	LC	R	VC	VC	VC	VC	VC
Family: Meropidae									
104	Blue-tailed Bee-eater	*Merops philippinus*	LC	R	UC	UC	UC	0	0
105	Asian Green bee-eater	*Merops orientalis*	LC	R	VC	VC	VC	VC	VC
Family: Coraciidae									
106	European Roller	*Coracias garrulus*	NT	WM	UC	UC	UC	UC	UC
107	Indian Roller	*Coracias benghalensis*	LC	R	C	C	C	C	C
Family: Upupidae									
108	Common Hoopoe	*Upupa epops*	LC	R	C	C	C	C	C
Family: Bucerotidae									
109	Indian Grey Hornbill	*Ocyceros birostris*	LC	R	VC	VC	VC	VC	VC
Family: Megalaimidae									
110	Brown-headed Barbet	*Psilopogon zeylanicus*	LC	R	0	0	0	VC	VC
111	Copper Smith Barbet	*Psilopogon haemacephalus*	LC	R	VC	VC	VC	VC	VC

Family: Picidae									
112	Yellow crowned Woodpecker	*Leiopicus mahrattensis*	LC	R	VC	VC	VC	VC	VC
113	White napped woodpecker	*Chrysocolaptes festivus*	LC	R	VC	VC	VC	VC	VC
114	Eurasian Wryneck	*Jynx torquilla*	LC	WM	UC	UC	UC	0	UC
115	Indian Pygmy Woodpecker	*Picoides nanus*	LC	R	VC	VC	VC	VC	VC
116	Black-rumped Flame back Woodpecker	*Dinopium benghalense*	LC	R	VC	VC	VC	VC	VC
Family: Pittidae									
117	Indian Pitta	*Pitta brachyura*	LC	SM	RS	0	RS	0	0
Family: Alaudidae									
118	Ashy-crowned Sparrow-lark	*Eremopterix griseus*	LC	R	C	C	C	VC	VC
Family: Hirundinidae									
119	Wire-tailed Swallow	*Hirundo smithii*	LC	R	VC	VC	VC	VC	VC
120	Dusky Crag Martin	*Ptyonoprogne concolor*	LC	R	C	C	C	C	C
121	Barn Swallow	*Hirundo rustica*	LC	WM	VC	VC	UC	UC	UC
Family: Motacillidae									
122	Large Pied Wagtail	*Motacilla maderaspatensis*	LC	R	VC	VC	VC	VC	VC
123	White Wagtail	*Motacilla alba*	LC	WM	VC	VC	VC	VC	VC
124	Olive-backed pipit	*Anthus hodgsoni*	LC	WM	C	C	0	0	C
125	Paddy field pipit	*Anthus rufulus*	LC	WM	0	0	0	C	C
126	Citrine Wagtail	*Motacilla citreola*	LC	WM	C	VC	VC	VC	C
127	Yellow wagtail	*Motacilla flava*	LC	WM	VC	VC	VC	VC	VC
128	Grey Wagtail	*Motacilla cinerea*	LC	WM	VC	VC	VC	VC	C
129	Blyth's Pipit	*Anthus godlewskii*	LC	WM	0	0	0	C	UC
130	Tree Pipit	*Anthus trivialis*	LC	WM	0	0	0	C	C
Family: Vangidae									
131	Common Wood shrike	*Tephrodornis pondicerianus*	LC	R	UC	UC	UC	C	C
Family: Campephagidae									
132	Small Minivet	*Pericrocotus cinnamomeus*	LC	R	C	C	C	C	C
Family: Pycnonotidae									
133	White-eared	*Pycnonotus*	LC	R	0	0	0	0	VC

	Bulbul	*leucotis*							
134	Red-vented Bulbul	*Pycnonotus cafer*	LC	R	VC	VC	VC	VC	VC
Family: Aegithinidae									
135	Common iora	*Aegithina tiphia*	LC	R	VC	VC	VC	VC	VC
Family: Laniidae									
136	Isabelline Shrike	*Lanius isabellinus*	LC	WM	0	0	UC	UC	RS
137	Great Grey Shrike	*Lanius excubitor*	LC	R	0	0	0	UC	C
138	Bay-backed Shrike	*Lanius vittatus*	LC	R	VC	VC	VC	VC	VC
139	Long-tailed shrike	*Lanius schach*	LC	R	C	C	C	VC	VC
Family: Muscicapidae									
140	Indian Robin	*Saxicoloides fulicatus*	LC	R	VC	VC	VC	VC	VC
141	Black Redstrat	*Phoenicurus ochruros*	LC	WM	VC	VC	VC	VC	VC
142	Siberian Stone chat	*Saxicola maurus*	LC	WM	VC	VC	VC	VC	VC
143	Blue-rockThrush	*Monticola solitarius*	LC	WM	UC	UC	0	0	0
144	Bluethroat	*Luscinia svecica*	LC	WM	C	C	C	C	C
145	Oriental Megpie Robin	*Copsychus saularis*	LC	R	VC	VC	VC	VC	VC
146	Pied Bush Chat	*Saxicola caprata*	LC	WM	0	0	0	C	UC
147	Brown Rock Chat	*Oenanthe fusca*	LC	R	VC	VC	VC	VC	VC
148	Desert Wheatear	*Oenanthe deserti*	LC	WM	0	0	0	RS	UC
Family: Leiothrichidae									
149	Common Babbler	*Argya caudata*	LC	R	VC	VC	VC	VC	VC
150	Large Grey Babbler	*Argya malcolmi*	LC	R	VC	VC	VC	VC	VC
151	Jungle Babbler	*Turdoides striata*	LC	R	VC	VC	VC	VC	VC
Family: Paradoxornithidae									
152	Yellow-eyed Babbler	*Chrysomma sinense*	LC	R	C	C	C	UC	UC
Family: Cisticolidae									
153	Jungle Prinia	*Prinia sylvatica*	LC	R	VC	VC	VC	VC	VC
154	Grey breasted Prinia	*Prinia hodgsonii*	LC	R	UC	UC	0	UC	UC
155	Common Tailor Birds	*Orthotomus sutorius*	LC	R	VC	VC	VC	VC	VC

156	Zitting Cisticola	*Cisticola juncidis*	LC	WM	0	0	RS	UC	UC
157	Plain Prinia	*Prinia inornata*	LC	R	VC	VC	VC	VC	VC
158	Ashy Prinia	*Prinia socialis*	LC	R	VC	VC	VC	VC	VC
Family: Phylloscopidae									
159	Sulphur-bellied warbler	*Phylloscopus griseolus Blyth, 1847*	LC	WM	VC	VC	VC	VC	VC
160	Siberian Chiffchaff	*Phylloscopus collybita (Vieillot, 1817)*	LC	WM	VC	VC	VC	VC	VC
Family: Acrocephalidae									
161	Booted Warbler	*Iduna caligata*	LC	WM	UC	UC	VC	VC	VC
Family: Sylviidae									
162	Lesser White throat	*Sylvia curruca*	LC	WM	VC	VC	VC	VC	VC
Family: Muscicapidae									
163	Tickell's Blue Flycatcher	*Cyornis tickelliae*	LC	R	UC	UC	UC	UC	0
164	Red-breasted flycatcher	*Ficedula parva*	LC	WM	VC	VC	VC	VC	VC
Family: Stenostiridae									
165	Grey-headed Canary Flycatcher	*Culicicapa ceylonensis*	LC	WM	VC	VC	VC	0	0
Family: Monarchidae									
166	Indian Paradise-flycatcher	*Terpsiphone paradisi*	LC	R	UC	UC	UC	0	0
Family: Rhipiduridae									
167	White-throated Fantail	*Rhipidura albicollis*	LC	R	C	C	C	C	C
168	White-browned Fantail	*Rhipidura aureola*	LC	R	C	C	C	C	C
Family: Paridae									
169	Black lored Tit	*Machlolophus xanthogenys*	LC	R	VC	VC	VC	VC	VC
170	Great Tit	*Parus major*	LC	R	VC	VC	VC	VC	VC
171	White-napped Tit	*Machlolophus nuchalis*	VU	R	0	0	UC	UC	0
Family: Nectariniidae									
172	Purple Sunbird	*Cinnyris asiaticus*	LC	R	VC	VC	VC	VC	VC
Family: Zosteropidae									
173	Oriental white eye	*Zosterops palpebrosus*	LC	R	VC	VC	VC	VC	VC

Family: Emberizidae									
174	White-capped Bunting	*Emberiza stewarti*	LC	WM	0	0	0	UC	C
175	Crested Bunting	*Emberiza lathami*	LC	R	C	C	C	UC	UC
176	Grey-necked Bunting	*Emberiza buchanani*	LC	WM	0	0	UC	C	C
Family: Fringillidae									
177	Common Rose finch	*Carpodacus erythrinus*	LC	WM	C	C	C	C	C
Family: Estrildidae									
178	Scaly-breasted Munia	*Lonchura punctulata*	LC	R	VC	VC	VC	VC	VC
179	Tricoloured Munia	*Lonchura malacca*	LC	WM	UC	UC	C	0	0
180	Red Avadavat	*Amandava amandava*	LC	WM	0	C	VC	0	0
181	Indian Silverbill	*Euodice malabarica*	LC	R	VC	VC	VC	VC	VC
Family: Passeridae									
182	Yellow-throated sparrow	*Gymnoris xanthocollis*	LC	R	VC	VC	VC	VC	VC
183	House Sparrow	*Passer domesticus*	LC	R	VC	VC	VC	VC	VC
Family: Ploceidae									
184	Baya Weaver	*Ploceus philippinus*	LC	R	VC	VC	VC	VC	VC
Family: Sturnidae									
185	Asian Pied Starling	*Gracupica contra*	LC	R	VC	VC	VC	VC	VC
186	Common Myna	*Acridotheres tristis*	LC	R	VC	VC	VC	VC	VC
187	Rosy Starling	*Pastor roseus*	LC	WM	VC	VC	VC	VC	VC
188	Brahminy Starling	*Sturnia pagodarum*	LC	R	VC	VC	VC	VC	VC
189	Bank Myna	*Acridotheres ginginianus*	LC	R	VC	VC	VC	VC	VC
Family: Dicruridae									
190	White-bellied Drongo	*Dicrurus caerulescens*	LC	R	VC	VC	VC	VC	VC
191	Black Drongo	*Dicrurus macrocercus*	LC	R	VC	VC	VC	VC	VC
Family: Corvidae									
192	Large-billed crow	*Corvus macrorhynchos*	LC	R	VC	VC	VC	VC	VC
193	Rufous Treepie	*Dendrocitta vagabunda*	LC	R	VC	VC	VC	VC	VC
194	House crow	*Corvus splendens*	LC	R	VC	VC	VC	VC	VC

Table 2: Bird families, along with the number of species and their relative diversity, observed in the wetland habitats of the Southern Aravalli regions.

Bird families	Number of species per family	Relative diversity (RDi)
Anatidae	16	8.24
Accipitridae	10	5.15
Motacillidae, Muscicapidae	9	4.63
Ardeidae	8	4.12
Columbidae	7	3.60
Scolopacidae, Cisticolidae	6	3.09
Ciconiidae, Strigidae, Picidae, Sturnidae	5	2.57
Threskiornithidae, Rallidae, Cuculidae, Laniidae, Estrildidae	4	2.06
Phalacrocoracidae, Charadriidae, Psittacidae, Alcedinidae, Hirundinidae, Leiothrichidae, Paridae, Emberizidae, Corvidae	3	1.54
Pelecanidae, Phasianidae, Gruidae, Jacanidae, Recurvirostridae, Burhinidae, Meropidae, Coraciidae, Megalaimidae, Pycnonotidae, Phylloscopidae, Muscicapidae, Rhipiduridae, Passeridae, Dicruridae	2	1.03
Podicipedidae, Anhingidae, Phoenicopteridae, Pandionidae , Falconidae, Rostratulidae, Glareolidae, Laridae, Tytonidae, Caprimulgidae, Upupidae, Bucerotidae, Pittidae, Alaudidae, Vangidae, Campephagidae, Aegithinidae, Paradoxornithidae, Acrocephalidae, Sylviidae, Stenostiridae, Monarchidae, Nectariniidae, Zosteropidae, Fringillidae, Ploceidae	1	0.51

Figure 1: Painted Stork

Figure 2: Purple Swamphen

Figure 3: Great thick-knee

Figure 4: Sarus crane

Figure 5: Lesser whistling duck

Figure 6: Black-necked stork

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