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# Avifaunal diversity of Jodhpur Jhal Wetland Mathura (Uttar Pradesh) India: A preliminary survey

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## ABSTRACT

The present study is the first preliminary checklist of Birds from Jodhpur Jhal Wetland, Mathura (Uttar Pradesh), India. The area is located in Farah Block of District Mathura's Koah village Panchayat close to NH-2 (Agra-Mathura National Highway) Uttar Pradesh, India. The survey was carried out between 2019 to 2021. A total number of 181 bird species were observed and most of them were photographed as well. The identification was done using field guides, relevant literature, expert suggestions and online bird data depositories. The observed 181 species belong to 57 orders of the class Aves and the highest number of birds were observed belong to the order Passeriformes. Out of the 181 species recorded from the observation period, 169 species in Endangered (EN) category and 8 species in Nearly Threatened (NT) category. Among the total observed species, the highest number of the species observed were Residents (136), followed by Migratory species (33) and Residents Migrants (12) respectively. The present study is the first documentation of the avifauna from the region and the study was aimed for support in the conservation of the endangered and threatened bird species and for safeguarding the habitat of the resident as well as for the migratory bird species of the area.

Key words: Avifauna, Biodiversity, first checklist, Jodpur Jhal Wetland, Mathura, India.

# **INTRODUCTION**

Birds are the one form of organisms that nearly everyone encounters every day like most insects. However, we sometimes take them for granted, but these creatures have been constant throughout human history (DeGraaf 1978). Humans have a fascination with birds that goes back thousands of years across nearly every culture earth has ever witnessed. One of the fascinating things about the birds is their migration. The movement of birds from one place to another is an incredible migratory behavioural cycle driven by evolutionary trends among different species of birds and makes them one of the unique and fascinating creatures of this natural world (Lincoln & Peterson 1979). Birds are one the best indicators of our environmental health since we can predict the health of any ecosystem by monitoring birds that are residing in a particular place. Many trophic levels from mid-level consumers to top predators are occupied by the birds. Besides other organisms living in a particular environment, birds help in maintaining sustainable population levels of their prey and predator species (Levey & Stiles 1994). Many species of birds play an important role in plant reproduction through their services as pollinators and many acts as keystone species in an ecosystem (Anderson et al. 2016; Plunkett 1979).

There are around 10787 extant species of birds recorded across the globe, which on the contrary makes (40 Orders, 252 Families, 2359 Genera) within the class Aves. In India, more than 1335 species of birds have been recorded across [26 orders, 113 families and 485 genera] (Patel et al. 2021; Praveen et al., 2020). The Indian bird fauna is very unique and important for the ecosystems of the vast country. Besides helping ecosystems in many sustainable ways, migratory birds connect not only the ecosystem but also people and the nations. The sustainable use of natural resources will create favourable conditions for the conservation of these migratory birds. However, one of the major challenges that birds are facing particularly migratory species is habitat loss and increasing pollution. Since quite a large number of birds and many species are particularly dependent on the wetlands which are being polluted at a very large scale. The breeding and feeding grounds of birds need to be well preserved and well maintained (Weller 1999). The awareness campaigns should be initiated among the local people for the conservation of both bird species as well their habitats. Citizen science is a very fast-growing platform that aims at providing help to scientists and researchers in observing and monitoring the animals from different taxa (Riyaz et al. 2021). With the help of citizen science projects; scientists, researchers, birders along with the general public aim at collecting birding data about observations of birds across the globe which will provide the database of bird species and aids in the conservation of these organisms and their habitat as well.

A number of studies on biodiversity, taxonomy and documentation of the avifauna have been reported from many parts of the Uttar Pradesh state by a number of authors; Gopi and Kittur, 2011; Yadav et al. 2020; Jha, 2013; Chaube et al. 2018; Mishra, 2020; Bhargava et al. 2016; Kumar et al. 2018; Mazumder and Khan, 2020; Verma, 2020; Kumari et al. 2020; Singh et al. 2018; Prakash & Verma 2016; Kanaujia et al. 2015; Tomar and Chouksey, 2018; Kumar et al. 2015; Mishra et al. 2016; Dwevedi et al. 2014; Kushwaha et al. 2019. The present study is the first documentation and checklist of the avifauna from Jodpur Jhal Wetland Bird Sanctuary, Mathura Uttar Pradesh part of India.

#### MATERIALS AND METHODS

#### **Study Area**

Jodpur village comes under the jurisdiction of Farah Block of District Mathura's Koah village Panchayat which is close to NH-2 (Agra-Mathura National Highway) Uttar Pradesh. Jodpur Jhal Sanctuary is located between 27°14`35``N and 77°46`25``E (Fig. 1) and nearly 8 kilometres from Soor Sarovar Bird Sanctuary and 35 kilometres from Keoladeo National Park Bharatpur. Jodhpur Jhal wetland falls between the two canals named Sikendra Rajvah and Terminal Rajvah. The area is a terminal on Agra Canal where the water is flown to Soor Sarovar Bird Sanctuary Agra through Keetham canal. The managing authority of Jodhpur Jhal Wetland and control of lower Khand Agra canal, Agra, U.P is the Department of Irrigation. The Gata number (Field/Revenue plot number) of this wetland is 85 to 105 and the area is 55.381 hectares. Jodhpur Jhal wetland is a low depth water body, marshes and grassland (Fig. 2). About 25% area of this wetland is saline soil type. Average temperature ranges from 3 °C in winters and up to 40 °C during the peak summer season. The dominant flora in this wetland including Typha domingensis, Typha latifolia, Saccharum bengalense, Saccharum munja, Saccharum spontaneum, Phoenix dactylifera, Abrus precatorius and aquatic floral species are Ceratophyllum submersum, Nymphaea alba, Eichhornia crassipes and Lemna minor.



Fig. 1. Map of the study area



Fig. 2. Jodpur Jhal Wetland Bird Sanctaury

S.	Family	Common Name	Scientific Name	Resident	IUCN
No.	·			Status	Status
01.	Accipitridae	Black kite	Milvus migrans	R	LC
02.	Accipitridae	Black wing kite	Elanus caeruleus	R	LC
03.	Accipitridae	Changeable hawk-eagle or	Nisaetus cirrhatus	D	LC
		crested hawk- eagle		N	
04.	Accipitridae	Egyptian vulture	Neophron percnopterus	R	EN
05.	Accipitridae	Indian spotted eagle	Clanga hastata	R	VU
06.	Accipitridae	Long legged Buzzard	Buteo rufinus	R	LC
07.	Accipitridae	Marsh harrier	Circus aeruginosus	R	LC
08.	Accipitridae	Shikra	Accipiter badius	R	LC
09.	Acrocephalidae	Blyth's reed warbler	Acrocephalus dumetorum	M	LC
10.	Acrocephalidae	Booted warbler	Iduna caligata	M	LC
11.	Acrocephalidae	Clamorous reed warbler	Acrocephalus stentoreus	R	LC
12.	Acrocephalidae	Sykes's warbler	Iduna rama	R	LC
13.	Alaudidae	Ashy crown sparrow lark	Eremopterix griseus	R	LC
14.	Alaudidae	Bush Lark	Mirafra assamica	R	LC
15.	Alaudidae	Crested lark	Galerida cristata	R	LC
16.	Alaudidae	Eurasian skylark	Alauda arvensis	R	LC
17.	Alcedinidae	Common kingfisher	Alcedo atthis	R	LC
18.	Alcedinidae	Pied Kingfisher	Ceryle rudis	R	
19.	Alcedinidae	White throated Kingfisher	Halcyon smyrnensis	ĸ	
20.	Anatidae	Bar headed Goose	Anser indicus	M	
21.	Anatidae	Cotton pygmy goose	Nettapus coromandelianus	K	
22.	Anatidae	Eurasian teal	Anas crecca	M	
23. 24	Anatidae	Gadwall	Mareca strepera	NI M	
24. 25	Anatidae	Garganey Gravlag googo	Spatula querqueaula	M	
25. 26	Anatidae	Knob billed duck	Anser unser Sarkidiornis malanotos	NI D	
20. 27	Anatidae	Lesser whistling duck	Dendrocyana jayanica	K D	
27. 28	Anatidae	Mallard	Anas platyrhynchos	M	
20. 20	Anatidae	Northern pintail	Anas acuta	M	
29. 30	Anatidae	Northern shoveler	Spatula chineata	M	
30.	Anatidae	Red-crested pochard	Netta rufina	M	
32	Anatidae	Ruddy shelduck	Tadorna ferrusinea	R	
33.	Anatidae	Spot billed Duck	Anas poecilorhyncha	R	
34.	Anatidae	Tuffed duck	Avthva fuligula	M	LC
35.	Anhingidae	Oriental darter	Anhinga melanogaster	R	NT
36.	Apodidae	Little swift	Apus affinis	R	LC
37.	Ardeidae	Black bittern	Ixobrychus flavicollis	R	LC
38.	Ardeidae	Cattle Egret	Bubulcus ibis	R	LC
39.	Ardeidae	Great egret	Ardea alba	R	LC
40.	Ardeidae	Grey Heron	Ardea cinerea	R	LC
41.	Ardeidae	Indian pond heron	Ardeola grayii	R	LC
42.	Ardeidae	Intermediate Egret	Ardea intermedia	R	LC
43.	Ardeidae	Night heron	Nycticorax nycticorax	R	LC
44.	Ardeidae	Purple heron	Ardea purpurea	R	LC
45.	Ardeidae	Yellow bittern	Ixobrychus sinensis	R	LC
46.	Ardeidae	Little egret	Egretta garzetta	R	LC
47.	Bucerotidae	Indian grey hornbill	Ocyceros birostris	R	LC
48.	Charadriidae	Kentish plover	Charadrius alexandrinus	R	LC
49.	Charadriidae	Little ring plover	Charadrius dubius	R	LC
50.	Charadriidae	Red-wattled lapwing	Vanellus indicus	R	LC
51.	Charadriidae	River lapwing	Vanellus duvaucelii	R	NT
52.	Charadriidae	White-tailed lapwing	Vanellus leucurus	R	LC
53.	Ciconiidae	Black-necked stork	Ephippiorhynchus	R	NT
			asiaticus	_	_
54.	Ciconiidae	Open bill stork	Anastomus oscitans	R	LC

55.	Ciconiidae	Painted stork	Mvcteria leucocephala	R	NT
56.	Ciconiidae	Woolly-necked stork	Ciconia episcopus	R	NT
57.	Cisticolidae	Ashy prinia	Prinia socialis	R	LC
58.	Cisticolidae	Plain Prinia	Prinia inornata	R	LC
59.	Cisticolidae	Rufous-fronted prinia	Prinia buchanani	R	LC
60.	Cisticolidae	Tailorbird	Orthotomus sutorius	R	LC
61.	Cisticolidae	Yellow-bellied prinia	Prinia flaviventris	R	LC
62.	Cisticolidae	Zitting cisticola / streaked	Cisticola juncidis	_	LC
0_1		fantail warbler		R	
63.	Columbidae	Eurasian collared dove	Streptopelia decaocto	R	LC
64.	Columbidae	Laughing Dove	Spilopelia senegalensis	R	LC
65.	Columbidae	Red collared dove	Streptopelia tranquebarica	R	LC
66.	Columbidae	Rock dove, rock pigeon /	Columba livia	_	LC
		common pigeon		R	
67.	Columbidae	The vellow-footed green	Treron phoenicoptera	_	LC
0.11		pigeon		R	
68.	Coraciidae	Indian roller	Coracias benghalensis	R	LC
69.	Corvidae	house crow	Corvus splendens	R	LC
70.	Corvidae	Indian jungle crow	Corvus culminatus	R	LC
71.	Corvidae	Rufous treepie	Dendrocitta vagabunda	R	LC
72.	Cuculidae	Asian koel	Eudvnamvs scolopaceus	R	LC
73.	Cuculidae	Greater coccul	Centropus Sinensis	R	LC
74.	Cuculidae	Jacobin cuckoo	Clamator jacobinus	M	LC
75.	Dicruridae	Black drongo	Dicrurus macrocercus	R	LC
76.	Emberizidae	Red-headed bunting	Emberiza brunicens	R	LC
77.	Estrildidae	Chestnut munia	Lonchura atricapilla	R	LC
78.	Estrildidae	Indian silverbill	Euodice malabarica	R	LC
79.	Estrildidae	Red Avadavat	Amandava amandava	R	LC
80.	Estrildidae	Scaly-breasted munia	Lonchura punctulate	R	LC
81.	Estrildidae	Tricolored munia	Lonchura malacca	R	LC
82.	Falconidae	Common kestrel	Falco tinnunculus	R	LC
83.	Fringillidae	Common rosefinch /	Carpodacus erythrinus		LC
	11	scarlet rosefinch		R	20
84.	Gruidae	Sarus crane	Grus antigone	R	VU
85.	Hirundinidae	Barn swallow	Hirundo rustica	R	LC
86.	Hirundinidae	Grey-throated martin or	Riparia chinensis		LC
		Asian plain martin	I man in the second sec	R	
87.	Hirundinidae	Pale martin or pale sand	Riparia diluta	-	LC
		martin	1	R	
88.	Hirundinidae	Wire Tailed Swallow	Hirundo smithii	R	LC
89.	Jacanidae	Bronze-winged jacana	Metopidius indicus	R	LC
90.	Jacanidae	Pheasant-tailed jacana	Hydrophasianus chirurgus	R	LC
91.	Laniidae	Bay-backed shrike	Lanius vittatus	R	LC
92.	Laniidae	Great grey shrike	Lanius excubitor	R	LC
93.	Laniidae	Long-tailed shrike	Lanius schach	R	LC
94.	Laridae	River tern	Sterna aurantia	R	VU
95.	Leiothrichidae	Common babbler	Argya caudata	R	LC
96.	Leiothrichidae	Jungle babbler	Argya striata	R	LC
97.	Leiothrichidae	Large grey babbler	Turdoides malcolmi	R	LC
98.	Leiothrichidae	Striated babbler	Argya earlei	R	LC
99.	Megalaimidae	Brown-headed barbet	Psilopogon zeylanicus	R	LC
100.	Megalaimidae	Coppersmith barbet	Psilopogon haemacephalus	R	LC
101.	Meropidae	Blue-tailed bee-eater	Merops philippinus	RM	LC
102.	Meropidae	Blue-cheeked bee-eater	Merops persicus	RM	LC
103.	Monarchidae	Indian paradise flycatcher	Terpsiphone paradisi	R	LC
104.	Motacillidae	Citrine Wagtail	Motacilla citreola	Μ	LC
105.	Motacillidae	Eastern yellow wagtail	Motacilla tschutschensis	Μ	LC
106.	Motacillidae	Long-billed pipit	Anthus similis	R	LC
107.	Motacillidae	Paddy Field Pipit	Anthus rufulus	R	LC
108.	Motacillidae	Richard's pipit	Anthus richardi	R	LC

109.	Motacillidae	Tawny pipit	Anthus campestris	М	LC
110.	Motacillidae	Tree pipit	Anthus trivialis	R	LC
111.	Motacillidae	Western yellow wagtail	Motacilla flava	Μ	LC
112.	Motacillidae	White wagtail	Motacilla alba	RM	LC
113.	Motacillidae	White-browed wagtail or	Motacilla maderaspatensis	рм	LC
		large pied wagtail		<b>K</b> IVI	
114.	Muscicapidae	Bluethroat	Luscinia svecica	Μ	LC
115.	Muscicapidae	Brown rock chat	Oenanthe fusca	R	LC
116.	Muscicapidae	European Stonechat	Saxicola rubicola	R	LC
117.	Muscicapidae	Indian robin	Copsychus fulicatus	R	LC
118.	Muscicapidae	Oriental magpie-robin	Copsychus saularis	R	LC
119.	Muscicapidae	Red-breasted flycatcher	Ficedula parva	Μ	LC
120.	Muscicapidae	Siberian stonechat	Saxicola maurus	RM	LC
121.	Nectariniidae	Purple sunbird	Cinnyris asiaticus	R	LC
122.	Oriolidae	Indian golden oriole	Oriolus kundoo	R	LC
123.	Passeridae	Yellow-throated sparrow /	Gymnoris xanthocollis		LC
		chestnut- shouldered		R	
		petronia			
124.	Pelecanidae	Dalmatian Pelican	Pelecanus crispus	Μ	NT
125.	Pelecanidae	Great white pelican	Pelecanus onocrotalus	$\mathbf{M}$	LC
126.	Phalacrocoracidae	Great cormorant	Phalacrocorax carbo	$\mathbf{M}$	LC
127.	Phalacrocoracidae	Indian Cormorant	Phalacrocorax fuscicollis	R	LC
128.	Phalacrocoracidae	Little cormorant	Microcarbo niger	R	LC
129.	Phasianidae	Black francolin	Francolinus francolinus	R	LC
130.	Phasianidae	Grey francolin	Francolinus pondicerianus	R	LC
131.	Phasianidae	Indian peafowl	Pavo cristatus	R	LC
132.	Phasianidae	Rain quail / Black-breasted	Coturnix coromandelica	R	LC
		quail			
133.	Phoenicopteridae	Greater Flamingos	Phoenicopterus roseus	Μ	LC
134.	Picidae	Black-rumped flameback	Dinopium benghalense	R	LC
135.	Picidae	Eurasian wryneck or northern wryneck	Jynx torquilla	Μ	LC
136.	Picidae	Yellow-crowned	Leiopicus mahrattensis	_	LC
2000		woodpecker	<sub>F</sub>	R	
137.	Pittidae	Indian pitta	Pitta brachvura	R	LC
138.	Ploceidae	Baya weaver	Ploceus philippinus	R	LC
139.	Ploceidae	Black Breasted Weaver	Ploceus benghalensis	R	LC
140.	Ploceidae	Streaked weaver	Ploceus manyar	R	LC
141.	Podicipedidae	Little grebe	Tachybaptus ruficollis	R	LC
142.	Psittaculidae	Plum-headed parakeet	Psittacula cyanocephala	R	LC
143.	Psittaculidae	Rose-ringed parakeet	Psittacula krameri	R	LC
144.	Pycnonotidae	Red-vented bulbul	Pycnonotus cafer	R	LC
145.	Pycnonotidae	Red-whiskered bulbul	Pycnonotus jocosus	R	LC
146.	Rallidae	Common coot	Fulica atra	Μ	LC
147.	Rallidae	Common moorhen	Gallinula chloropus	R	LC
148.	Rallidae	Grey-headed swamphen /	Porphyrio poliocephalus	р	LC
		Purple swamphen		ĸ	
149.	Rallidae	Watercock	Gallicrex cinerea	RM	LC
150.	Rallidae	White-breasted waterhen	Amaurornis phoenicurus	R	LC
151.	Recurvirostridae	Black-winged stilt	Himantopus himantopus	RM	LC
152.	Recurvirostridae	Pied avocet	Recurvirostra avosetta	Μ	LC
153.	Recurvirostridae	Pied Bushchat	Saxicola caprata	R	LC
154.	Recurvirostridae	Pied myna	Gracupica contra	R	LC
155.	Rostratulidae	Painted-snipes	Rostratula benghalensis	R	LC
156.	Scolopacidae	Black-tailed godwit	Limosa limosa	Μ	NT
157.	Scolopacidae	Common greenshank	Tringa nebularia	RM	LC
158.	Scolopacidae	Common redshank	Tringa totanus	RM	LC
159.	Scolopacidae	Ruff	Calidris pugnax	Μ	LC
160.	Scolopacidae	Temminck's stint	Calidris temminckii	RM	LC
161.	Scolopacidae	Wood sandpiper	Tringa glareola	Μ	LC

162.	Scolopacidae	Marsh sandpiper	Tringa stagnatilis	М	LC
163.	Scolopacidae	Green sandpiper	Tringa ochropus	Μ	LC
164.	Scolopacidae	Common sandpiper	Actitis hypoleucos	RM	LC
165.	Sittidae	Indian nuthatch	Sitta castanea	R	LC
166.	Strigidae	Indian scops owl	Otus bakkamoena	R	LC
167.	Strigidae	Short-eared owl	Asio flammeus	R	LC
168.	Strigidae	Spotted owl	Strix occidentalis	R	NT
169.	Strigidae	Spotted owlet	Athene brama	R	LC
170.	Sturnidae	Bank myna	Acridotheres ginginianus	R	LC
171.	Sturnidae	Brahminy starling	Sturnia pagodarum	R	LC
172.	Sturnidae	Common myna	Acridotheres tristis	R	LC
173.	Sturnidae	Rosy starling	Pastor roseus	Μ	LC
174.	Sylviidae	Lesser whitethroat	Curruca curruca	Μ	LC
175.	Threskiornithidae	European Spoonbill	Platalea ajaja	RM	LC
176.	Threskiornithidae	Glossy ibis	Plegadis falcinellus	R	LC
177.	Threskiornithidae	Red naped Ibis / Black Ibis	Pseudibis papillosa	R	LC
178.	Threskiornithidae	White Ibis / Black headed	Threskiornis	р	NT
		ibis	melanocephalus	ĸ	
179.	Tytonidae	Barn Owl	Tyto alba	R	LC
180.	Upupidae	Common Hoopoe	Upupa epops	R	LC
181.	Zosteropidae	Indian white-eye	Zosterops palpebrosus	R	LC

#### **Observation and Identification protocols**

During the study observation period, the birds were observed by Loop 25-75x70 Waterproof Spotting Scope and Nikon ACULON A211 (10x50) Binoculars and were later photographed using Nikon 7000D and 5500 D and Canon 200D with Tamron 150-600 lens. Most of the observation was carried out in the morning and evening hours followed by the whole day observation during the migration period of some bird species. The study observation was carried during the time period from 2019-2021. The identification of the observed and photographed bird species was done using morphological characters with the help field guides and reference books. Further identification was done by experts on online data depositories and identification web-portals such as eBird India (https://ebird.org/india/home), Bird Count of India (https://birdcount.in/ebird-india-portal-launched/),

Birds of India (https://www.birdsofindia.org/), India Biodiversity Portal (https://indiabiodiversity.org/) and Indian Bird Watching (https://www.indiabirdwatching.com/birding-field-

guide-for-india/). The species-level identification of the observed bird species was done using the available literature (Grimmett and Inskipp, 2010; Grewal et al. 2011; Grewal, 2000; Ali and Ripley, 1983; Inskipp et al., 1996; Manakadan, 1998).

#### RESULTS

During this study, a total number of 181 species of birds were observed during the study period. These 181 species are spread across 57 families (Table 1) and some important species have been photographed as well (Fig. 3). The highest number of species were observed from the order Passeriformes (70 species) which are spread across the families viz. Acrocephalidae (4), Alaudidae (4), Cisticolidae (6), Corvidae (3), Dicruvidae (1), Emberizidae (1), Estrildidae (5), Fringillidae (1), Hirundinidae (4), Laniidae (3), Leiothrichidae (4), Monarchidae (1), Motacillidae (10), Muscicapidae (7), Nectariniidae (1), Oriolidae (1), Passeridae (1), Pittidae (1), Ploceidae (3), Pycnonotidae (2), Sittidae (1), Sturnidae (4), Sylviidae (1), Zosteropidae (1) (Fig. 4).

The rest of the 111 species recorded for the observation period are spread across the families viz. Accipitridae (8), Alcedinidae (13), Anatidae (15), Anhingidae (1), Apodidae (1), Ardeidae (10), Bucerotidae (1), Charadriidae (5), Ciconiidae (4), Columbidae (5), Coraciidae (1), Cuculidae (3), Falconidae (1), Gruidae (1), Jacanidae (2), Laridae (1), Megalaimidae (2), Meropidae (2), Pelecanidae (2), Phalacrocoracidae (3),Phasianidae (4).Phoenicopteridae (1), Picidae (3), Podicipedidae (1), Psittaculidae (2), Rallidae (5), Recurvirostridae (4), Rostratulidae (1), Scolopacidae (9), Strigidae (4), Threskiornithidae (4), Tytonidae (1), Upupidae (1) (Fig. 5).

The conservation status for the species were obtained from the official website of the IUCN Red List of Threatened Species (https://www.iucnredlist.org). Out of the 181 species recorded from the observation period, 169 species recorded were among Least Concern (LC) category followed by 3 species in Vulnerable (VU) category, 1 species in Endangered (EN) category and 8 species in Nearly Threatened (NT) category (Fig. 6).

The resident status of the recorded bird species was classified into Resident (R), Migrants (M) and Resident Migrants. Among the 181 species, the highest number of the species observed were Residents (136), followed by Migratory species (33) and Residents Migrants (12) respectively (Fig. 7).

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**Fig. 3,** Photographs of some birds captured in Jodhpur Jhal Wetland. (1) Red-naped ibis; (2) Paddyfield pipit; (3) Black-rumped flameback; (4) White wagtail; (5) White-browed wagtail; (6) Large grey babbler; (7) Greater spotted eagle; (8) Western yellow wagtail; (9) White-breasted waterhen; (10) Oriental darter; (11) Grey heron; (12) Indian grey Hornbill; (13) Purple heron; (14) Plain prinia; (15) Oriental magpie-robin; (16) Ashy-crowned sparrow-lark; (17) Black drongo; (18) Wire-tailed swallow; (19) Streaked weaver; (20) Pied kingfisher.



**Fig. 3**, Photographs of some birds captured in Jodhpur Jhal Wetland. (21) Pale sand martin; (22) Plumheaded parakeet; (23) Indian roller; (24) Siberian stonechat; (25) ; (26) (27) Short-eared owl; (28) Mallard; (29) Baya weaver; (30) Tricolored munia; (31) Great grey shrike; (32) Bar-headed goose; (33) Little and Intermediate egret; (34) Rufous-fronted Prinia; (35) India nuthatch; (36) Rufous treepie; (37) Eurasian wryneck; (38) Eurasian spoonbill; (39) Red munia; (40) Asian koel.



**Fig. 3,** Photographs of some birds captured in Jodhpur Jhal Wetland. (41) Black-necked stork; (42) Brown rock chat; (43) Red-headed bunting; (44) Wooly-necked stork (45) Pied bush chat; (46) Yellow-footed green pigeon; (47) Pied avocet; (48) Pied bush chat; (49) Indian silverbill; (50) Northern shoveler; (51) Greater coucal; (52) Blue-tailed bee-eater; (53) Northern pintail; (54) Sky lark; (55) Common snipe; (56) Oriental white-eye; (57) Indian paradise-flycatcher; (58) Shikra; (59) Black-shouldered kite; (60) Ashy prinia.



**Fig. 3**, Photographs of some birds captured in Jodhpur Jhal Wetland. (61) Tailor bird; (63) Grey-headed swamphen; (64) Bronze-winged jacana; (65) Ruddy shelduck; (66) Crested lark; (67) Watercock; (68) Scaly-breasted munia; (69) Knob-billed duck; (70) Bluethroat; (71) Common rose finch; (72) Zitting cisticola; (73) Tree pipit; (74) Tawny pipit; (75) Blyth's reed warbler; (76) Common greenshank; (77) Long-tailed shrike; (78) Common redshank; (79) Egyptian vulture; (80) Sarus crane.



**Fig. 3**, Photographs of some birds captured in Jodhpur Jhal Wetland. (81) Greater flamingo; (82) Asian openbill; (83) Brahminy starling; (84) Asian green bee-eater; (85) Pheasant-tailed jacana; (86) Indian peafowl (87) Common coot; (88) Black-headed ibis; (89) Cotton pygmy goose; (90) Bar-headed goose; (91) Lesser-whistling duck; (92) Black-tailed godwit; (93) Black-breasted weaver; (94) Great egret and intermediate egret; (95) Graceful prinia; (96) Chestnut-shouldered petronia.



Fig. 4. Species distribution from the order Passeriformes







Fig. 6. Percentage of birds as per the IUCN Red List category.



Fig. 7. Percentage habitat status of the birds

#### CONCLUSION

The present study was aimed to assess the bird fauna of the area. A total number of 181 bird species were observed and most of them were photographed. The rising population, industrialization and large-scale utilization of pesticides have created havoc among the bird communities and habitats in which they are residing. The breeding and feeding grounds of these bird species are turning into garbage yards which have resulted in the excessive loss of the bird species and their habitats. The loss of these bird species has negative implications for both humankind and natural ecosystems since these animal species are an important part of our ecosystems. The present millennium is experiencing a high and fast rate of endangerment and extinction of both plant and animal species and the introduction of species is also contributing a major threat to biodiversity. Conservation steps should be put forward and management strategies should be executed to save the wetland ecosystems which are both breeding and feeding grounds of hundreds of bird species.

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