

Research Article

Avian Community Composition in and around Mandothi Wetlands, Haryana, India

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Abstract

Comprising an area of approximately 1000 acres, Mandothi wetlands are located in Bahadurgarh tehsil of Jhajjar district of Haryana, India and provide an important wintering ground for migratory birds. From December 2021 to June 2022, fortnightly surveys were made to document the avian community composition of the study area in Mandothi wetlands using point-count and line-transect methods. A total of 124 species belonging to 90 genera, 38 families, and 15 orders were recorded. Passeriformes was the most represented avian order, with 38 species and 15 families. Feeding guild analysis revealed that carnivore was the most dominant feeding guild in the study area. Of the recorded 124 avian species, 73 species were residents, 44 species were winter migrants and 7 species were summer migrants. As per the IUCN Red List 8 species were classified as Near Threatened (Ferruginous Duck *Aythya nyroca*, Black-tailed Godwit *Limosa limosa*, Eurasian Curlew *Numenius arquata*, Painted Stork *Mycteria leucocephala*, Woolly-necked Stork *Ciconia episcopus*, Black-necked Stork *Ephippiorhynchus asiaticus*, Black-headed Ibis *Threskiornis melanocephalus*, Darter *Anhinga melanogaster*) and 2 species were classified as Vulnerable (Sarus Crane *Antigone antigone* and River Tern *Sterna aurantia*). In addition to the present survey, 17 species were also reported from secondary sources, resulting in a checklist of 141 bird species. The occurrence of migratory and species of global conservation priority documents the importance of this wetland as a potential habitat for avifauna in Haryana.

Keywords: Mandothi, Near Threatened, Passeriformes, Vulnerable, Waterbird assemblages

INTRODUCTION

Wetlands play a significant role in maintaining bird diversity by providing food and habitat to a great number of bird species as well as to many mammals, invertebrates, and to plants. Aquatic and terrestrial habitats connect through wetlands, which are intricate ecosystems (Torell *et al.*, 2001; Zedler and Kercher, 2005; Kumar *et al.*, 2006). According to Ramsar Convention, "wetlands are defined as an area of fen, marsh, peat land, or water, either natural or artificial, temporary or permanent, static or flowing fresh, marine, brackish, or saltwater along with a depth of six meters at low tide" (Ramsar Convention Secretariat, 2013). Recently, the Ministry of Environment, Forest and Climate Change added 21 more wetlands sites to the list of Ramsar sites, creating the total number of Ramsar sites in India to 75 with a total surface area of 13,26,677 ha.

The importance of birds in wetland habitats cannot be overstated (Sharma and Saini, 2014; Kumar *et al.*, 2016). An estimated 13% of the world's bird species can be found on the Indian Subcontinent (Grimmett *et al.*, 2011). Birdlife International (2022) presented 1210 bird species in India, consisting of 93 species globally threatened and 76 species endemic to the country. Natural and artificial wetlands in India have been shown to harbour diverse avifauna (Rai *et al.*, 2017a; Kumar and Sharma, 2018; Ahmed *et al.*, 2019; Rai *et al.*, 2019; Rai and Vanita, 2021, 2022). In addition to serving as a biodiversity catalog for species presence, distribution, ecological condition, conservation status, and adaptations to climate change, ornithological surveys are widely used as archives of fundamental data (Gardner *et al.*, 2011; Rai and Vanita, 2022). An assessment of species occurrence was done to evaluate the diversity and status of the avifauna in the current

study in Mandothi wetlands, district Jhajjar, Haryana.

MATERIALS AND METHODS

Study area

The current study was conducted in the Mandothi wetlands of District Jhajjar, Haryana, India, located between the latitudes of 28°22'49" North and the longitudes of 76°18'59" East (Fig.1). The district acts as a portion of Indo-Gangetic Plain. Village Mandothi is located on the NH-9 in the Bahadurgarh assembly and Rohtak parliamentary constituencies with its geographical coordinates 28°70'585"N and 76°81'225"E. Rainwater has accumulated over roughly 1,000 acres of private farmland, drawing a large number of birds (Ipsita Pati, 2020). The average annual rainfall in this district is 444

mm, while the average minimum and maximum temperatures are 7° C (in January) and 40.5° C (in May and June), respectively (Kumar and Dhankar, 2015). Numerous bird species may be found throughout the wetland due to the interconnected network of scrubland, fallow land, reeds, flooded zones, and different trees like *Acacia*, *Typha*, Phragmites, and water hyacinth reed beds are also plentiful in this marsh (Ipsita Pati, 2020).

Data collection

From December 2021 to June 2022, fortnightly bird surveys were made in the study area in the morning phase using point-count and line-transect methods (Gaston, 1975; Sutherland *et al.*, 2005). Birds were recorded directly using field binoculars (Nikon 10x50).

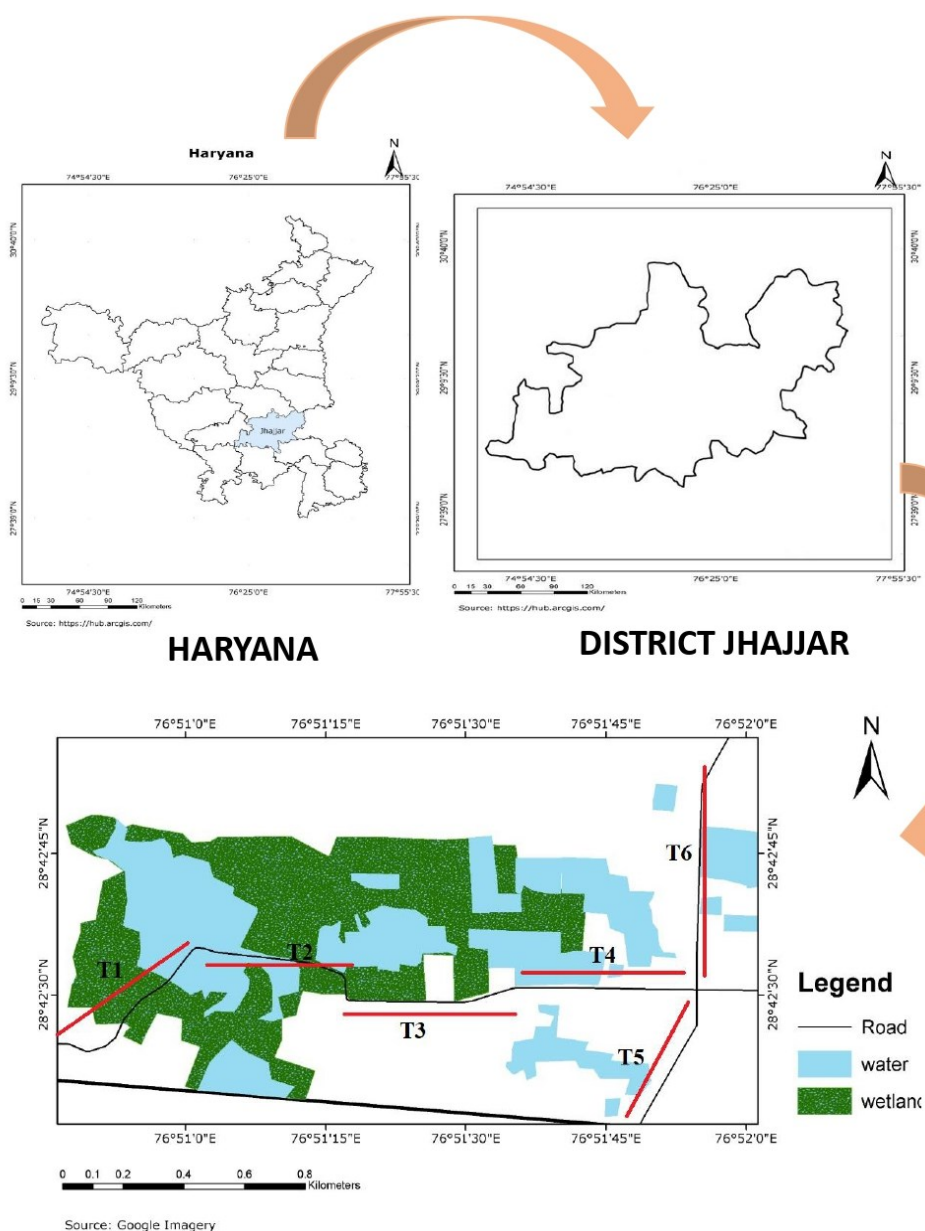


Fig. 1. Location and area of Mandothi wetlands, Village Mandothi, District Jhajjar, Haryana

Nikon P1000 digital camera was used to observe the birds in the study area. In addition, opportunistic observations of birds were also made at other times of the day by scanning the periphery or banks of the selected wetlands to document a comprehensive checklist. Birds were identified using the Merlin bird ID application and field guides (Grimmett *et al.*, 2015; Arlott, 2015; Grimmett and Inskipp, 2019; and Kalsi *et al.*, 2019). Following Praveen and Jayapal (2022), and IUCN (2022), a checklist of reported bird species with the common name, scientific name, alternative name, order, family, and genus was prepared. The conservation status of the recorded species was assessed using the IWPA (1972) and CITES (2012). The Red List of IUCN (2022) was followed to compile the conservation status and the global population trend population trends (increasing↑, decreasing↓, stable→, and unknown?) of the observed species. Based on the direct field observations and available literature (Ali and Ripley, 1987; Grimmett *et al.*, 1999; Singh *et al.*, 2020), recorded bird species were categorized into seven major feeding guilds (carnivores, insectivores, omnivores, herbivores, frugivores, granivores, and piscivores).

RESULTS AND DISCUSSION

A total of 124 species of birds belonging to 90 genera, 38 families, and 15 orders were recorded from the selected study area during the entire study period (Table

1). Order Passeriformes dominated the avifauna with 38 species and 15 families followed by Charadriiformes (21 species and 6 families) and the rest orders (Fig.2). Similar results from other ornithological surveys indicated that Order Passeriformes is the most dominant avian taxa in India (Chopra *et al.*, 2012; Rai *et al.*, 2017a,b,c; Desta *et al.*, 2020; Ullah *et al.*, 2021; Rai and Vanita, 2021, 2022). Passerines are highly diverse birds in the area because they can live in various environments and eat various foods (Beresford *et al.*, 2005; Rai and Vanita, 2021 and 2022). During this survey, it was observed that carnivores were the dominant feeding guild with 40 species. These results are in confirmation with observations made by Mishra *et al.*, 2016 and Rai and Vanita, 2021. Insectivores were the second dominant guild with 35 species, followed by omnivores with 30 species; herbivores with 9 species; granivores with 6 species; frugivores with 2 species; piscivores and nectarivores with one species each (Table 1). The highest richness of carnivorous bird species indicates that the wetland offers abundant food sources for birds in the form of vertebrates and non-vertebrates, including amphibians, crabs, fish, and reptiles (Kumar and Gupta, 2013; Jamwal *et al.*, 2017; Kumar and Sharma, 2018; Sohil and Sharma, 2020; Rai and Vanita, 2021).

Among recorded 124 bird species, 8 species were classified as Near Threatened (Ferruginous Duck *Aythya nyroca*, Black-tailed Godwit *Limosa limosa*, Eura-

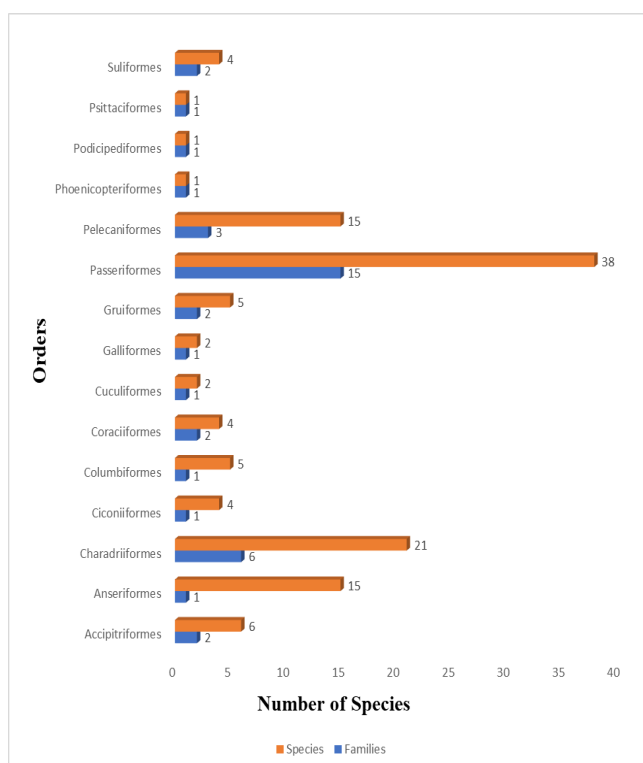


Fig. 2. Number of families and avian species per order recorded from Mandothi wetlands of district Jhajjar, Haryana

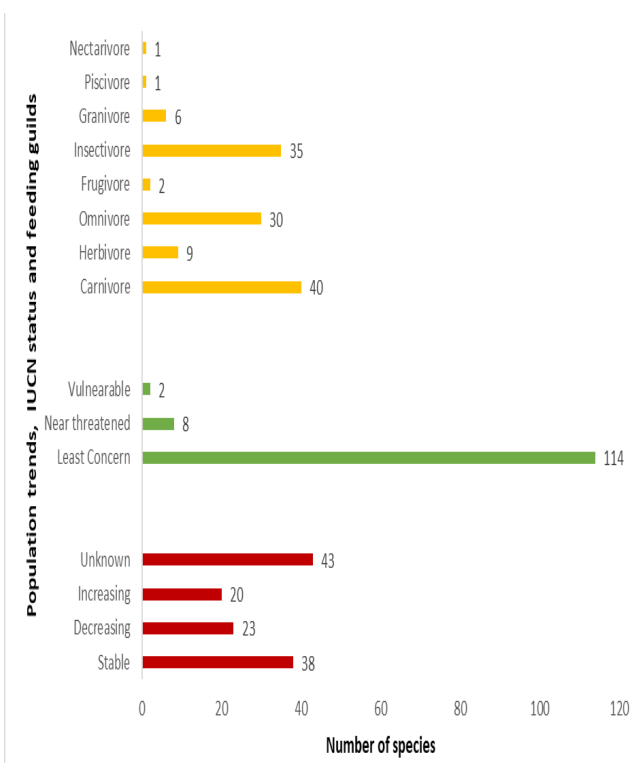


Fig. 3. Population trend, IUCN conservation status and Feeding Guilds of recorded species from Mandothi wetlands of district Jhajjar, Haryana

Table 1. Checklist of Avifaunal species with their record in Mandothi wetlands, Jhajjar, Haryana

Sr. No.	Order/Family/Common name/ Scientific name	Feed- ing guild	Global popula- tion trends	Conservation status			Alternative names
				IUCN (2022)	CITES (2012)	IWPA (1972)	
1.	PASSERIFORMES (Species =38 and Families=15)						
1.1.	Alaudidae (2)						
1.	Crested Lark <i>Galerida cristata</i> (Linnaeus, 1758)	O	↓	LC	-	IV	-
2.	Sand Lark <i>Alaudala raytal</i> (Blyth, 1845)	O	→	LC	-	IV	Indian Short-toed Lark
1.2.	Cisticolidae (3)						
3.	Plain Prinia <i>Prinia inornata</i> Sykes, 1832	In	→	LC	-	IV	Plain Wren Warbler
4.	Ashy Prinia <i>Prinia socialis</i> Sykes, 1832	In	→	LC	-	IV	Ashy Wren Warbler
5.	Graceful Prinia <i>Prinia gracilis</i> (M.H.C. Lichtenstein, 1823)	In	→	LC	-	IV	Streaked Wren Warbler
1.3.	Corvidae (2)						
6.	House Crow <i>Corvus splendens</i> Vieillot, 1817	O	→	LC	-	V	-
7.	Large-billed Crow <i>Corvus macrorhynchos</i> Wagler, 1827	O	→	LC	-	IV	Jungle Crow, Indian Jungle Crow, Eastern Jungle Crow
1.4.	Dicruridae (1)						
8.	Black Drongo <i>Dicrurus macrocercus</i> Vieillot, 1817	In	?	LC	-	IV	-
1.5.	Hirundinidae (4)						
9.	Wire-tailed Swallow <i>Hirundo smithii</i> Leach, 1818	In	↑	LC	-	IV	-
10.	Barn Swallow <i>Hirundo rustica</i> Linnaeus, 1758	In	↓	LC	-	IV	Common Swallow
11.	Streak-throated Swallow <i>Petrochelidon fluvicola</i> (Blyth, 1855)	In	→	LC	-	IV	Indian Cliff Swallow
12.	Grey-throated Martin <i>Riparia chinensis</i> (J.E. Gray, 1830)	In	↓	LC	-	IV	Grey-throated Sand Martin, Asian Plain Martin
1.6.	Laniidae (1)						
13.	Isabelline Shrike <i>Lanius isabellinus</i> Hemprich & Ehrenberg, 1833	In	→	LC	-	IV	Pale Brown Shrike, Rufous-tailed Shrike
1.7.	Leiothrichidae (2)						
14.	Striated Babbler <i>Argya earlei</i> (Blyth, 1844)	O	↓	LC	-	IV	-
15.	Jungle Babbler <i>Turdoides striata</i> (Dumont, 1823)	O	→	LC	-	IV	-
1.8.	Passeridae (2)						
16.	House Sparrow <i>Passer domesticus</i> (Linnaeus, 1758)	O	↓	LC	-	IV	-
17.	Sind Sparrow <i>Passer pyrrhonotus</i> Blyth, 1845	O	→	LC	-	IV	Sind Jungle Sparrow
1.9.	Pycnonotidae (1)						
18.	Red-vented Bulbul <i>Pycnonotus cafer</i> (Linnaeus, 1766)	O	↑	LC	-	IV	-

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Table 1. Contd....

1.10. Motacillidae (8)							
19.	Tree Pipit <i>Anthus trivialis</i> (Linnaeus, 1758)	In	↓	LC	-	IV	Eurasian Tree Pipit
20.	Tawny Pipit <i>Anthus campestris</i> (Linnaeus, 1758)	In	→	LC	-		-
21.	Paddyfield Pipit <i>Anthus rufulus</i> Vieillot, 1818	In	→	LC	-	IV	-
22.	Western Yellow Wagtail <i>Motacilla flava</i> Linnaeus, 1758	In	↓	LC	-	IV	-
23.	Grey Wagtail <i>Motacilla cinerea</i> Tunstall, 1771	In	→	LC	-	IV	-
24.	White Wagtail <i>Motacilla alba</i> Linnaeus, 1758	In	→	LC	-	IV	Pied Wagtail
25.	Citrine Wagtail <i>Motacilla citreola</i> Pallas, 1776	In	↑	LC	-	IV	Yellow-headed Wagtail
26.	White-browed Wagtail <i>Motacilla maderaspatensis</i> J.F. Gmelin, 1789	In	→	LC	-	IV	Large Pied Wagtail
1.11. Muscicapidae (5)							
27.	Indian Robin <i>Saxicoloides fulicatus</i> (Linnaeus, 1766)	In	→	LC	-	IV	Indian Black Robin
28.	Oriental Magpie Robin <i>Copsychus saularis</i> (Linnaeus, 1758)	In	→	LC	-	IV	-
29.	Pied Bushchat <i>Saxicola caprata</i> (Linnaeus, 1766)	In	→	LC	-	IV	-
30.	Siberian Stonechat <i>Saxicola maurus</i> (Pallas, 1773)	In	→	LC	-	IV	Collared Bushchat, Eastern Stonechat, Common Stonechat
31.	Bluethroat <i>Cyaneculla svecica</i> (Linnaeus, 1758)	In	→	LC	-	IV	-
1.12. Nectariniidae (1)							
32.	Purple Sunbird <i>Cinnyris asiaticus</i> (Latham, 1790)	N	→	LC	-	IV	-
1.13. Sturnidae (4)							
33.	Common Myna <i>Acridotheres tristis</i> (Linnaeus, 1766)	O	↑	LC	-	IV	-
34.	Bank Myna <i>Acridotheres ginginianus</i> (Latham, 1790)	In	↑	LC	-	IV	-
35.	Asian Pied Starling <i>Gracupica contra</i> (Linnaeus, 1758)	O	↑	LC	-	IV	Pied Myna
36.	Common Starling <i>Sturnus vulgaris</i> Linnaeus, 1758	O	↓	LC	-	IV	European Starling
1.14. Ploceidae (1)							
37.	Baya Weaver <i>Ploceus philippinus</i> (Linnaeus, 1766)	G	→	LC	-	IV	Indian Baya
1.15. Estrildidae (1)							
38.	Indian Silverbill <i>Euodice malabarica</i> (Linnaeus, 1758)	G	→	LC	-	IV	White-throated Munia

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Table 1. Contd....

2. CHARADRIIFORMES (Species =21 and Families =6)							
2.1 Recurvirostridae (2)							
39.	Black-winged Stilt <i>Himantopus himantopus</i> (Linnaeus, 1758)	C	↑	LC	-	IV	-
40.	Pied Avocet <i>Recurvirostra avosetta</i> Linnaeus, 1758	C	?	LC	-	IV	Avocet
2.2 Charadriidae (2)							
41.	Red-wattled Lapwing <i>Vanellus indicus</i> (Boddaert, 1783)	C	?	LC	-	IV	-
42.	White-tailed Lapwing <i>Vanellus leucurus</i> (M.H.C. Lich- tenstein, 1823)	C	?	LC	-	IV	-
2.3 Scolopacidae (11)							
43.	Ruff <i>Calidris pugnax</i> (Linnaeus, 1758)	In	↓	LC	-	IV	-
44.	Common Sandpiper <i>Actitis hypoleucos</i> (Linnaeus, 1758)	In	↓	LC	-	IV	-
45.	Green Sandpiper <i>Tringa ochropus</i> Linnaeus, 1758	In	↑	LC	-	IV	-
46.	Spotted Redshank <i>Tringa erythropus</i> (Pallas, 1764)	In	→	LC	-	IV	-
47.	Common Redshank <i>Tringa totanus</i> (Linnaeus, 1758)	In	?	LC	-	IV	-
48.	Wood Sandpiper <i>Tringa glareola</i> Linnaeus, 1758	In	→	LC	-	IV	Spotted Sandpiper
49.	Marsh Sandpiper <i>Tringa stagnatilis</i> (Bechstein, 1803)	In	↓	LC	-	IV	-
50.	Black-tailed Godwit <i>Limosa limosa</i> (Linnaeus, 1758)	In	↓	NT	-	IV	-
51.	Eurasian Curlew <i>Numenius arquata</i> (Linnaeus, 1758)	C	↓	NT	-	IV	-
52.	Temminck's stint <i>Calidris temminckii</i> (Leisler, 1812)	In	?	LC	-	IV	-
53.	Little Stint <i>Calidris minuta</i> (Leisler, 1812)	In	↑	LC	-	IV	-
2.4 Laridae (4)							
54.	River Tern <i>Sterna aurantia</i> J.E. Gray, 1831	C	↓	VU	-	IV	-
55.	Brown-headed Gull <i>Chroicocephalus brunnicephalus</i> (Jerdon, 1840)	O	→	LC	-	IV	-
56.	Black-headed Gull <i>Chroicocephalus ridibundus</i> (Linnaeus, 1766)	O	?	LC	-	IV	-
57.	Whiskered Tern <i>Chlidonias hybrida</i> (Pallas, 1811)	C	→	LC	-	IV	-

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Table 1. Contd....

2.5	Jacaniidae (1)							
58.	Pheasant-tailed Jacana <i>Hydrophasianus chirurgus</i> (Scopoli, 1786)	O	↓	LC	-	IV	-	
2.6	Rostratulidae (1)							
59.	Greater Painted-Snipe <i>Rostratula benghalensis</i> (Linnaeus, 1758)	O	↓	LC	-	IV	-	
3.	ANSERIFORMES (Species= 15 and Family=1)							
3.1.	Anatidae (15)							
60.	Bar-headed Goose <i>Anser indicus</i> (Latham, 1790)	H	↓	LC	-	IV	-	
61.	Greylag Goose <i>Anser anser</i> (Linnaeus, 1758)	H	↑	LC	-	IV	-	
62.	Ruddy Shelduck <i>Tadorna ferruginea</i> (Pallas, 1764)	O	?	LC	-	IV	Brahminy Duck	
63.	Garganey <i>Spatula querquedula</i> (Linnaeus, 1758)	H	↓	LC	-	IV	-	
64.	Northern Shoveler <i>Spatula clypeata</i> C.L. Brehm, 1831	O	↓	LC	-	IV	-	
65.	Northern Pintail <i>Anas acuta</i> Linnaeus, 1758	C	↓	LC	-	IV	-	
66.	Common Teal <i>Anas crecca</i> Linnaeus, 1758	O	?	LC	-	IV	Green-winged Teal, Eurasian Teal	
67.	Comb Duck <i>Sarkidiornis melanotos</i> (Pennant, 1769)	O	↓	LC	-	IV	Knob-billed Duck, African Comb Duck	
68.	Eurasian Wigeon <i>Mareca penelope</i> (Linnaeus, 1758)	H	↓	LC	-	IV	-	
69.	Indian Spot-billed Duck <i>Anas poecilorhyncha</i> J.R. Forster, 1781	H	↓	LC	-	IV	Spotbill Duck	
70.	Gadwall <i>Mareca strepera</i> (Linnaeus, 1758)	H	↑	LC	-	IV	-	
71.	Red-crested Pochard <i>Netta rufina</i> (Pallas, 1773)	H	?	LC	-	IV	-	
72.	Tufted Duck <i>Aythya fuligula</i> (Linnaeus, 1758)	H	?	LC	-	IV	Tufted Pochard	
73.	Cotton Teal <i>Nettapus coromandelianus</i> (J.F. Gmelin, 1789)	O	?	LC	-	IV	Cotton Pygmy Goose	
74.	Ferruginous Duck <i>Aythya nyroca</i> (Güldenstädt, 1770)	O	↓	NT	-	IV	White-eyed Pochard	
4.	PELECANIFORMES (Species = 15 and Families=3)							
4.1.	Ardeidae (10)							
75.	Black-crowned Night Heron <i>Nycticorax nycticorax</i> (Linnaeus, 1758)	C	↓	LC	-	IV	-	
76.	Indian Pond Heron <i>Ardeola grayii</i> (Sykes, 1832)	C	→	LC	-	IV	Paddybird	
77.	Cattle Egret <i>Bubulcus ibis</i> (Linnaeus, 1758)	C	↑	LC	-	IV	Eastern Cattle Egret	
78.	Grey Heron <i>Ardea cinerea</i> Linnaeus, 1758	C	→	LC	-	IV	-	
79.	Purple Heron <i>Ardea purpurea</i> Linnaeus, 1766	C	↓	LC	-	IV	-	
80.	Great Egret <i>Ardea alba</i> Linnaeus, 1758	C	?	LC	-	IV	Large Egret	

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Table 1. Contd....

81.	Intermediate Egret <i>Ardea intermedia</i> Wagler, 1829	C	↓	LC	-	IV	Median Egret, Smaller Egret
82.	Little Egret <i>Egretta garzetta</i> (Linnaeus, 1766)	C	↑	LC	-	IV	
83.	Western Reef Egret <i>Egretta gularis</i> (Bosc, 1792)	C	→	LC	-	IV	Western Reef Heron, Indian Reef Heron
84.	Cinnamon Bittern <i>Ixobrychus cinnamomeus</i> (J.F. Gmelin, 1789)	C	→	LC	-	IV	Chestnut Bittern
4.2. Pelecanidae (1)							
85.	Great White Pelican <i>Pelecanus onocrotalus</i> Linnaeus, 1758	C	?	LC	-	IV	Rosy Pelican
4.3. Threskiornithidae (4)							
86.	Black-headed Ibis <i>Threskiornis melanocephalus</i> (Latham, 1790)	C	↓	NT	-	IV	White Ibis, Orien- tal White Ibis
87.	Indian Black Ibis <i>Pseudibis papillosa</i> (Temminck, 1824)	C	↓	LC	-	IV	Red-naped Ibis
88.	Glossy Ibis <i>Plegadis falcinellus</i> (Linnaeus, 1766)	C	↓	LC	-	IV	-
89.	Eurasian Spoonbill <i>Platalea leucorodia</i> Linnaeus, 1758	C	→	LC	-	I	-
5. ACCIPITRIFORMES (Species= 6 and Families= 2)							
5.1. Accipitridae (5)							
90.	Black-winged Kite <i>Elanus caeruleus</i> (Desfontaines, 1789)	C	→	LC	II	I	Black-shouldered Kite
91.	Black Kite <i>Milvus migrans</i> (Boddaert, 1783)	C	→	LC	II	I	Pariah kite
92.	Greater Spotted Eagle <i>Clanga clanga</i> (Pallas, 1811)	C	↓	VC	II	I	-
93.	Shikra <i>Accipiter badius</i> (J.F. Gmelin, 1788)	C	→	LC	II	I	-
94.	Western Marsh Harrier <i>Circus aeruginosus</i> (Linnaeus, 1758)	C	→	LC	II	I	Eurasian Marsh Harrier
5.2. Pandionidae (1)							
95.	Osprey <i>Pandion haliaetus</i> (Linnaeus, 1758)	C	↑	LC	II	I	Western Osprey
6. COLUMBIFORMES (Species= 5 and Family=1)							
6.1. Columbidae (5)							
96.	Rock Dove <i>Columba livia</i> J.F. Gmelin, 1789	G	↓	LC	-	IV	Blue Rock Pigeon, Rock Pigeon
97.	Eurasian Collared Dove <i>Streptopelia decaocto</i> (Frisvaldszky, 1838)	G	↑	LC	-	IV	Indian Ring Dove
98.	Spotted Dove <i>Streptopelia chinensis</i> (Scopoli, 1786)	G	↑	LC	-	IV	Western Spotted Dove, Eastern Spotted Dove
99.	Laughing Dove <i>Streptopelia senegalensis</i> (Linnaeus, 1766)	G	→	LC	-	IV	Little Brown Dove, Senegal Dove
100.	Yellow-legged Green Pigeon <i>Treron phoenicopterus</i> (Latham, 1790)	F	↑	LC	-	IV	Yellow-footed Green Pigeon

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7.	GRUIFORMES (Species = 5 and Families=2)						
7.1.	Gruidae (1)						
	Sarus Crane						
101.	<i>Antigone antigone</i> (Linnaeus, 1758)	O	↓	VU	II	IV	-
7.2.	Rallidae (4)						
	Purple Swamphen						
102.	<i>Porphyrio porphyrio</i> (Linnaeus, 1758)	O	?	LC	-	IV	Purple Moorhen, Grey-headed Swamphen
	Common Moorhen						
103.	<i>Gallinula chloropus</i> (Linnaeus, 1758)	O	→	LC	-	IV	Eurasian Moorhen, Indian Moorhen
	Common Coot						
104.	<i>Fulica atra</i> Linnaeus, 1758	H	↑	LC	-	IV	Eurasian Coot
	White-breasted Waterhen						
105.	<i>Amaurornis phoenicurus</i> (Pennant, 1769)	O	?	LC	-	IV	-
8.	CICONIIFORMES (Species=4 and Family=1)						
8.1	Ciconiidae (4)						
	Painted Stork						
106.	<i>Mycteria leucocephala</i> (Pennant, 1769)	C	↓	NT	I	IV	-
	Asian Openbill						
107.	<i>Anastomus oscitans</i> (Boddaert, 1783)	C	?	LC	-	IV	Openbill Stork, Open-billed Stork
	Woolly-necked Stork						
108.	<i>Ciconia episcopus</i> (Boddaert, 1783)	C	↓	NT	-	IV	Asian Woollyneck, White-necked Stork
	Black-necked Stork						
109.	<i>Ephippiorhynchus asiaticus</i> (Latham, 1790)	C	↓	NT	-	IV	-
9.	CORACIIFORMES (Species = 4 and Family =2)						
9.1.	Meropidae (1)						
	Green Bee-eater						
110.	<i>Merops orientalis</i> Latham, 1801	In	↑	LC	-	IV	Small Green Bee-eater
	Blue-cheeked Bee-eater						
111.	<i>Merops persicus</i> Pallas, 1773	In	→	LC	-	IV	-
9.2.	Alcedinidae (2)						
	Pied Kingfisher						
112.	<i>Ceryle rudis</i> (Linnaeus, 1758)	P	?	LC	-	IV	Lesser Pied Kingfisher
	White-throated Kingfisher						
113.	<i>Halcyon smyrnensis</i> (Linnaeus, 1758)	C	↑	LC	-	IV	White-breasted Kingfisher
10.	SULIFORMES (Species = 4 and Family=2)						
10.1	Anhingidae (1)						
	Darter						
114.	<i>Anhinga melanogaster</i> Pennant, 1769	C	↓	NT	-	IV	Snake-bird
10.2.	Phalacrocoracidae (3)						
	Little Cormorant						
115.	<i>Microcarbo niger</i> (Vieillot, 1817)	C	?	LC	-	IV	-
	Great Cormorant						
116.	<i>Phalacrocorax carbo</i> (Linnaeus, 1758)	C	↑	LC	-	IV	Large Cormorant
	Indian Cormorant						
117.	<i>Phalacrocorax fuscicollis</i> Stephens, 1826	C	?	LC	-	IV	Indian Shag
11.	CUCULIFORMES (Species = 2 and Family = 1)						
11.1.	Cuculidae (2)						
	Greater Coucal						
118.	<i>Centropus sinensis</i> (Stephens, 1815)	C	→	LC	-	IV	Crow-pheasant

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Table 1. Contd....

119.	Asian Koel <i>Eudynamis scolopaceus</i> (Linnaeus, 1758)	O	→	LC	-	IV	Common Koel
12.	GALLIFORMES (Species =2 and Family =1)						
12.1.	Phasianidae (2)						
120.	Indian Peafowl <i>Pavo cristatus</i> Linnaeus, 1758	O	→	LC	-	I	Blue Peafowl, Common Peafowl
121.	Grey Francolin <i>Francolinus pondicerianus</i> (J.F. Gmelin, 1789)	O	→	LC	-	IV	Grey Partridge
13.	PHOENICOPTERIFORMES (Species = 1and Family=1)						
13.1.	Phoenicopteridae (1)						
122.	Greater Flamingo <i>Phoenicopus roseus</i> Pallas, 1811	O	↑	LC	-	IV	-
14.	PODICIPEDIFORMES (Species = 1and Family=1)						
14.1.	Podicipedidae (1)						
123.	Little Grebe <i>Tachybaptus ruficollis</i> (Pallas, 1764)	C	↓	LC	-	IV	Dabchick
15.	PSITTACIFORMES (No. of Species = 1and No. of Family=1)						
15.1.	Psittaculidae (1)						
124.	Rose-ringed Parakeet <i>Psittacula krameri</i> (Scopoli, 1769)	F	↑	LC	-	IV	-

"Feeding guild: In-Insectivore, O-Omnivore, C-Carnivore, H-Herbivore, P-Piscivore, G-Granivore, N-Nectarivore, F-Frugivore; Conservation Status: IUCN- International Union for Conservation of Nature and Natural Resources, CITES- Convention on International Trade in Endangered Species of Wild Fauna and Flora, WPA- Wildlife Protection Act; NT-Near- threatened, LC-Least Concern, VU-Vulnerable, I- Schedule I of IWPA (highly preferred species), IV- Schedule IV of IWPA (moderately preferred species); Population trends: ↑- Increasing, ↓- Decreasing, →- Stable, ?- Unknown."

sian Curlew *Numenius arquata*, Painted Stork *Mycteria leucocephala*, Woolly-necked Stork *Ciconia episcopus*, Black-necked Stork *Ephippiorhynchus asiaticus*, Black-headed Ibis *Threskiornis melanocephalus*, Darter *Anhinga melanogaster*, 2 species were classified as Vulnerable (Sarus Crane *Antigone antigone* and River Tern *Sterna aurantia*) and the remaining 114 species as Least Concern as per the Red List of IUCN (2022). According to the IWPA(1972) 6 species of Order Accipitriformes (Black-winged Kite *Elanus caeruleus*, Black Kite *Milvus migrans*, Greater Spotted Eagle *Clanga clanga*, Shikra *Accipiter badius*, Western Marsh Harrier *Circus aeruginosus*, Osprey *Pandion haliaetus*) one species each of Galliformes (Indian Peafowl *Pavo cristatus*) and Pelecaniformes (Eurasian Spoonbill *Platalea leucorodia*) were included in Schedule-I, House Crow *Corvus splendens* of Order Passeriformes is documented under Schedule V, and the rest of the 115 species fall under Schedule IV. In addition to this, seven bird species are listed in Appendix-II and one species in Appendix-I of CITES (2012). With regard to global population trend, the study area supported 20 bird species with an increasing population trend globally, 23 species with decreasing trend, 38 species with a stable population trend, and 48 species has an unknown trend globally (Fig. 3).

Assessment of the residential status of recorded 124

avian species revealed that 73 species were residents, 44 species were winter migrants and 7 species were summer migrants in the study area. Among 73 resident species, 67 were Least Concern, one was Vulnerable and 5 were Near Threatened. Whereas among winter migrants out of 44 species, 40 were Least Concern, one species was Vulnerable and 3 were Near Threatened, and among 7 summer migrants species, all were least concerned (Fig.4). In addition to the present survey, 17 species were reported from secondary sources (Table 2), thereby making a checklist of 141 bird species of the studied wetland. The occurrence of bird spe-

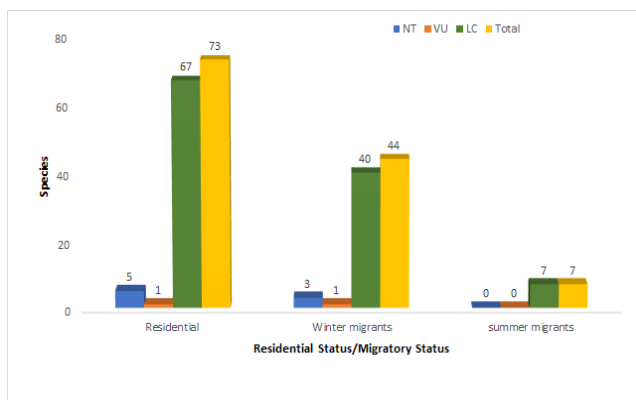


Fig. 4. Relationship between population trends and residential status of species recorded from Mandothi wetlands of district Jhajjar, Haryana

Table 2. Avian species recorded by secondary sources at Mandothi wetland, Haryana

Sr. No.	Order/Family/Common name / Scientific name/Source	Feeding guild	Global population trends	Conservation status			Alternative names
				IUCN (2022)	CITES (2012)	IWPA (1972)	
1. PASSERIFORMES (Species= 7and Families= 5)							
1.1. Ploceidae (1)							
1.	Black-breasted Weaver <i>Ploceus benghalensis</i> (Linnaeus, 1758) https://www.facebook.com/groups/278563458885940/permalink/4962672423808330/?sfnsn=wiwspwa&ref=share	O	→	LC	-	IV	Bengal Weaver, Black-throated Weaver
1.2. Leiothrichidae (1)							
2.	Common Babbler <i>Argya caudata</i> (Dumont, 1823) https://www.facebook.com/groups/278563458885940/permalink/5011732165569022/?sfnsn=wiwspwa&ref=share	O	→	LC	-	IV	Scrub Babbler
1.3. Alaudidae (3)							
3.	Ashy-crowned Sparrow Lark <i>Eremopterix griseus</i> (Scopoli, 1786) https://m.facebook.com/groups/278563458885940/permalink/3847525338656383/?sfnsn=wiwspwa&extid=a&ref=share&mibextid=zXt0fq	O	→	LC	-	IV	Ashy-crowned Finch Lark
4.	Bengal Bushlark <i>Mirafra assamica</i> Horsfield, 1840 https://www.facebook.com/groups/278563458885940/permalink/5299402633468639/?sfnsn=wiwspwa&ref=share	O	→	LC	-	IV	Rufous-winged Bushlark
5.	Oriental Skylark <i>Alauda gulgula</i> Franklin, 1831 https://www.facebook.com/groups/278563458885940/permalink/5189669884441915/	O	↓	LC	-	IV	Small Skylark
1.4. Motacillidae (1)							
6.	Rosy Pipit <i>Anthus roseatus</i> Blyth, 1847 https://www.facebook.com/groups/278563458885940/permalink/5139709472771290/	In	→	LC	-	IV	Vina-ceous-breasted Pipit
1.5. Emberizidae (1)							
7.	Red-headed Bunting <i>Emberiza bruniceps</i> von Brandt, 1841 https://www.facebook.com/groups/278563458885940/permalink/5159435870798650/?sfnsn=wiwspwa&ref=share	In	→	LC	-	IV	-
2. CHARADRIIFORMES (No. of Species= 2and No. of Families= 2)							
2.1. Scolopacidae (1)							
8.	Common Greenshank <i>Tringa nebularia</i> (Gunnerus, 1767) https://www.facebook.com/groups/278563458885940/permalink/5091314520944119/	In	→	LC	-	IV	Green-shank

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Table 2. Contd....

2.2. Glareolidae (1)							
9.	Oriental Pratincole <i>Glareola maldivarum</i> J.R. Forster, 1795 https://www.facebook.com/groups/278563458885940/permalink/5297240127018223/?sfnsn=wiwspwa&ref=share	In	↓	LC	-	IV	Large Indian Swallow-plover, Large Indian Pratincole
3. PELECANIFORMES (Species= 2 and Family= 1)							
3.1. Ardeidae (2)							
10.	Yellow Bittern <i>Ixobrychus sinensis</i> (J.F. Gmelin, 1789) https://www.facebook.com/groups/278563458885940/permalink/5179415805467323/	O	?	LC	-	IV	-
11.	Black Bittern <i>Ixobrychus flavicollis</i> (Latham, 1790) https://www.facebook.com/groups/278563458885940/permalink/5190825697659667/	C	↓	LC	-	IV	-
4. ACCIPITRIFORMES (Species= 1and Family= 1)							
4.1. Accipitridae (1)							
12.	Grey-headed Fish Eagle <i>Icthyophaga ichthyaetus</i> (Horsfield, 1821) https://m.facebook.com/groups/278563458885940/permalink/4980466358695603/?sfnsn=wiwspwa&extid=a&ref=share&mibextid=zXt0fq	C	↓	NT	II	I	Grey-headed Fishing Eagle
5. ANSERIFORMES (Species= 1 and Family= 1)							
5.1. Anatidae (1)							
13.	Marbled Teal <i>Marmaronetta angustirostris</i> (Ménétriés, 1832) https://m.facebook.com/groups/278563458885940/permalink/4945960172146222/?sfnsn=wiwspwa&extid=a&ref=share&mibextid=zXt0fq	O	↓	Vu	-	IV	Marbled Duck
6. FALCONIFORMES (Species= 1and Family= 1)							
6.1. Falconidae (1)							
14.	Peregrine Falcon <i>Falco peregrinus</i> Tunstall, 1771 https://www.facebook.com/groups/278563458885940/permalink/5067393516669553/?sfnsn=wiwspwa&ref=share	C	↑	LC	I	I	
7. GRUIFORMES (Species= 1and Family= 1)							
7.1. Rallidae							
15.	Ruddy-breasted Crake <i>Zapornia fusca</i> (Linnaeus, 1766) https://www.facebook.com/groups/278563458885940/permalink/5192959924112911/	O	↓	LC	-	IV	Ruddy Crake

Contd.....

Table 2. Contd....

8. PODICIPEDIFORMES (Species= 1and Family= 1)							
8.1. Podicipedidae (1)							
Great crested Grebe							
<i>Podiceps cristatus</i> (Linnaeus, 1758)							
https://m.facebook.com/groups/278563458885940/permalink/4967992036609702/?sfnsn=wiwspwa&extid=a&ref=share&mibextid=zXt0fq							
16.		O	?	LC	-	IV	-
9. STRIGIFORMES (Species= 1and Family= 1)							
9.1. Strigidae (1)							
Spotted Owlet							
<i>Athene brama</i> (Temminck, 1821)							
https://www.facebook.com/groups/278563458885940/permalink/4975646685844237/?sfnsn=wiwspwa&ref=share							
17.		C	→	LC	II	IV	-

cies of global conservation priority and a significant number of migratory species reflected that the studied wetland is a potential bird habitat in Haryana.

Recent rapid population growth, development initiatives, changes in land cover, hypertrophication, alien species incursion, industrial effluents, household sewage, and fertilizer runoff, interactions between humans and wetlands have become increasingly complex (Chopra *et al.*, 2017; Rai *et al.*, 2017b,c; Rai *et al.*, 2019). Consequently, the habitat for different bird species has deteriorated, thereby influencing the structural composition, diversity, abundance, and species richness of the avian community. The present study will provide the baseline for further research on long-term population monitoring of the existing avifauna and proper management of their habitat.

Conclusion

The present study has shown that the Mandothi wetlands, Jhajjar, Haryana has the potential of around 141 species (17 orders, 44 families), where 8 species belong to Near Threatened and 2 species covered under Vulnerable category by IUCN. Along with this, rare sighting of Little Bittern *Ixobrychus minutus* was recorded after four decades in the years 2021 and 2022 in the study area. Six of the reported bird species are also included in schedule-I of the Indian Wildlife Protection Act, 1972. This information can be used to evaluate future views and suitable management strategies for preserving wetlands and their sustainable use. Long-term monitoring is essential to assess the consequences of anthropogenic pressures and execute conservation plans for the area's avifaunal diversity.

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Conflict of interest

The authors declare that they have no conflict of interest.

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