



## WETLAND BIRD DIVERSITY OF PANDAV TALAV, NAGBHID (MAHARASHTRA), INDIA

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Communicated : 12.01.2023

Revision : 16.02.2023 & 23.02.2023

Published : 30.05.2023

Accepted : 22.03.2023

### ABSTRACT:

The present study was undertaken to explore species avifaunal diversity, and their residential status in and around the study area. The study area, Pandav Talav (Pond) near Nagbhid (20°34'52.32"N and longitude 79 °39'02.27"E) is a water reservoir, located within newly approved Ghodazari Sanctuary by Government of Maharashtra. It presents unique geographical site having mountaneous dry deciduous tropical forest, on its north-western side, paddy fields on eastern side and towards south-eastern side is now being encroached by local community for residential purpose. The moist deciduous tropical forest is dominated by teak *Tectona grandis* and bamboo *Dendrocalamus strictus*, interspersed with meadows and paddy cultivations. It presents unique geographical site having mountaneous tropical forest range bounding Ghodazari Lake from three sides and Paddy fields on another side. A total of around 54 species belonging to 24 families 10 orders were recorded during Jan, 2016 to Dec. 2018. The species recorded included 13 Migrant (M), 22 Passage Migrant (LM) and 40 Residents (R). Among these Orders, Charadriiformes is richest orders in terms of avian species diversity, represented by 11 species while families Ardeidae, and Anatidae are found predominant. *Ardea grayii*, *Phalacrocorax niger*, *Charadrius dubios* are most abundant species while *Phalacrocorax corbo*, *Anhinga melanogaster*, *Vanellus malabaricus* and *Circus aeruginosus* are few rare birds sighted here. Present study will help in designing conservation strategy as this agro-forest ecosystem posing threat by grazing, forest fires during summer, poaching of birds and man-animal conflict and hence require immediate attention.

**Keywords :-** Avifauna, Ghodazari, Ardeidae, Phalacrocorax, Charadriiformes.

### INTRODUCTION :

The variety of avian species in ecosystems reflects the well being of its habitat. Wetland birds are an important component of wetland ecosystem, as they form vital links in the food webs. According to the International Wetlands Convention, the wetland is a place where water is the main factor in its plant and animal environment; hence, wetlands refer to all river, lake, coastal, forest and pond areas as well as fish farms, canals and the like with a maximum depth of 6 m during the tide (Ramsar Bureau Convention, 2000). Birds are likely to work better as biodiversity indicator taxa in terrestrial habitats than in either freshwater or marine habitats. As the birds are the indicators of environment hence used for conservation and environmental impact assessment (Gregory, *et al.*, 2003). The India checklist acknowledges a

total of 1263 species of birds for India, constituting about 12% of the world avifauna (Pravin *et al.*, 2016) while Bird life International projected 1212 species of avifauna, out of which 995 are landbirds. (BirdLife, 2018) Bird communities have been studied fairly well both in temperate and tropical forests (Abdulali, 1981; Islam & Rahmani, 2004; Acharya, *et al.*, 2010; Kasambe *et al.*, 2016; Pravin, *et al.*, 2016). India checklist reported 310 wetland birds, out of which 243 are waterbirds and 67 are wetland associated birds. (Arunkumar, *et al.*, 2005) Day by day, human impacts on wetlands is on rise. It results in heavy degradation of wetlands and loss of wader and wetland dependant birds habitat. Wetlands are very critical to biodiversity as they are home to 1,00,000 species of fresh water flora and fauna. 64% of world's wetlands are degraded since 1990's.

Hence, presence investigation was undertaken to explore the diversity of waterbirds and wetland dependent birds as they are key component of wetland ecosystem, as envisioned in the Wetland conservation strategic plan, 2016-2024.

#### **MATERIAL AND METHOD:**

The study area, Pandav Talav (Pond) near Nagbhid (20°34'52.32"N and longitude 79°39'02.27"E) is a water reservoir, located within newly approved Ghodazari Sanctuary by Government of Maharashtra. Preliminary bird survey of bird community was carried out during Jan, 2016 to Dec. 2018. The avian survey was conducted in 1sq. km perimeter by monthly visit to the study area. Eight sampling sites with radius of 500m had been randomly selected in the study area. (Fig.1) According to point transect method for sampling of birds. (Bibby *et al.* 2000) Birds recorded from eight point transects, observed by Olympus 118760 10x50 DPSI Wide-Angle Binocular and wherever possible photographed by digital camera Canon EOS 200D. The identification of birds was done as per the photographic guides to the birds of India (Ali and Ripley, 2001; Grimmett *et al.*, 2011). Qualitative data on threats to vegetation and birds were also gathered throughout the study period.

The bird list (Appendix Tables 1 & 2) was compiled based on present observations as well as check list of birds, (Kumar, *et al.*, 2005, Praveen *et al.*, 2016). Abundance percentile of species density calculated.

#### **RESULT :**

In the present survey, 2587 birds were recorded which belongs to 54 species, 24 families and 10 orders during Jan, 2016 to Dec. 2018. The species recorded included 13 Migrant (M), 22 Passage Migrant (LM) and 40 Residents (R). Maximum abundance recorded from Fam - Ardeidae with 16 % of total waders represented by 08 species followed by Fam-Anatidae represented by 7 species. Conservation status of

bird community of study area indicates that only two birds, Black Headed Ibis (*Threskiornis melanocephalus*) and Darter (*Anhinga melanogaster*) threatened species category, while all other wader birds are identified as Least Concern (LC) category as per IUCN list. Checklist of bird community in the study area is prepared on the basis bird field guides of Ali & Ripley, 2001; Grewal, *et al.*, (2002); Arunkumar, *et al.*, 2005; Grimmett, *et al.*, (2011) and India check list by Pravin, *et al.*, (2016), eBird (2017) and Bird Life International (2018). (Appendix Table.1, 2, and 3)

#### **DISCUSSION :**

Waders diversity of Pandav Talav (Pond), situated within the newly approved Ghodazari Wildlife Sanctuary in Bramhapuri Forest Division of Maharashtra, remained unexplored till date. During present survey of study site, total 54 species belonging to 24 families 10 orders were recorded. Bayani and Dandekar (2017) recorded 255 species of avifauna from Tadoba-Andhari Tiger Reserve (TATR) forest in Maharashtra, which is located in the vicinity of study area.

Ecosystem of local area impacted composition of bird community and their foraging guild (Gregory, *et al.*, 2003; Bhagvat, *et al.*, 2008; Beaudrot, *et al.*, 2016; Karanth, *et al.*, 2016). Insects plays important role as a consumer of organic waste and serve as a food for fishes (Tak, *et al.*, 2003) The dominance of insectivorous birds (36%) in the present investigation of foraging guild of waterbirds authenticate the same. Substantial number of rare bird species like Spotted redshank, Pied Kingfisher, Bronze Winged Jacana, Darter, Bluethroat, Temmink's Stint, and Gadwall, adds to the rich diversity waders in this habitat. Results during the present investigation indicates rich diversity and abundance of water birds from site 1 and 2 as compared to others sites as these sites have

access to forest of Ghodazari Sanctuary and comparative less anthropogenic impact.

Open Bill Stork and Black Necked Ibis are monsoon breeding migrants recorded newly in study area. They arrive from their faraway nesting places in North-East India, Burma and Bangladesh to breeding places in the month of June-July and departs from breeding place in the month of December. (Wells et al., 1999; Ali and Ripley, 2001; Das, et al., 2014; Pramanik, et al., 2016). Large flock of Gadwall (*Mareca strepera*) seen are in the pond. Earlier these migratory birds were reported by Bayani and Dandekar (2017) in Tadoba The rich diversity of waders attributed to the plenty of food availability in marshy wetland and cosy remote habitat of study site, indicates that Panda talav is a healthy habitat for wader birds, hence needed to be conserved.

#### CONCLUSION :

Darter and Black Necked Ibis are regarded as threatened species by IUCN Red Data List. Anthropogenic activities like livestock grazing, fishing, uses of pesticides in agriculture and deforestation are posing threat to the bird diversity in the study area hence need conservation measures. In view of our rich diversity of waders in Pandav Talav (Pond), Government of Maharashtra decision to approve new Ghadazari Sanctuary would be seen as right step for conservation of this valuable habitat.

#### ACKNOWLEDGEMENTS :

I acknowledge the help and expertise provided by our friends, Mr. Narendra Lohbare and Mr. Satish Charthal. Without their assistance this work would not have been possible.

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**Table 1. Wader bird species recorded in and around PandavTalav (Pond), Maharashtra, India Jan, 2016 to Dec. 2018. LM=Local Migrant, M= Migrant, and R=Resident.**

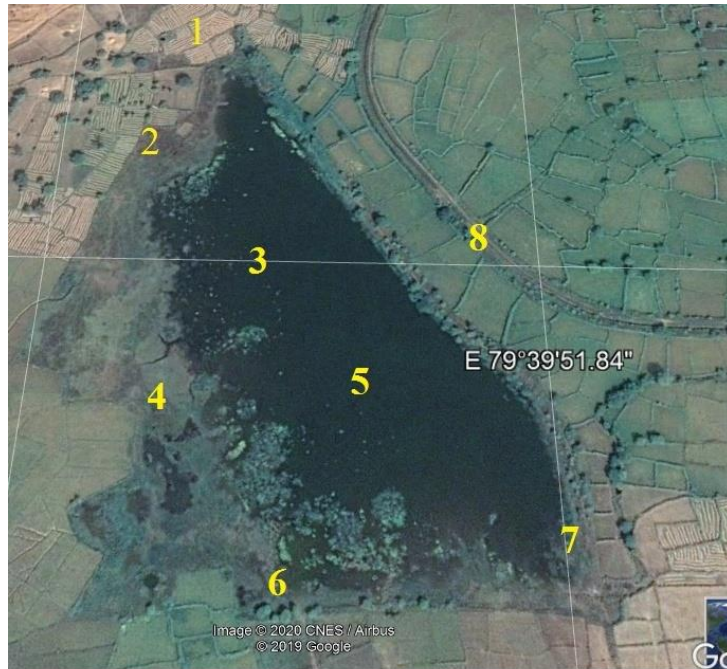
Sr. No.	Common Name	Zoological Name	Individuals	Density (%)	Residential Status
<b>Order – Ciconiformes, Family - Ciconidae</b>					
1	Asian Openbill Stork	<i>Anastomus oscitans</i> (Boddaert, 1783)	49	1.89	R/LM
<b>Order – Peliconiformes, Family - Ardeidae</b>					
2	Purple Heron	<i>Ardea pupurea</i> (Linnaeus, 1766)	20	0.77	R/LM
3	Indian Pond Heron	<i>Ardea grayii</i> (Sykes, 1832)	140	5.41	R
4	Grey Heron	<i>Ardea cinerea</i> (Linnaeus, 1758)	14	0.54	R/LM
5	Little Green Heron	<i>Butorides striatus</i> (Linnaeus, 1758)	24	0.92	R
6	Catle Egret	<i>Bubulcus ibis</i> (Linnaeus, 1758)	94	3.63	R
7	Little Egret	<i>Egretta garxetta</i> (Linnaeus, 1766)	47	1.81	R/LM
8	Large Egret	<i>Casmerodius albus</i> (Linnaeus, 1758)	33	1.27	R/LM
9	Intermediate Egret	<i>Ardea intermedia</i> (Wagler, 1829)	49	1.89	R/LM
<b>Family - Threskiorniodae</b>					
10	Black Headed Ibis	<i>Threskiornis melanocephalus</i> (Latham, 1790)	22	0.85	R/LM
11	Red Naped Ibis	<i>Pseudibis papilosa</i> (Temrninck. 1824)	105	4.05	R/LM
<b>Order – Suliformes, Family - Phalacrocoracidae</b>					
12	Little Cormorant	<i>Phalacrocorax niger</i> (Viellot, 1817)	126	4.87	R/LM
13	Great Cormorant	<i>Phalacrocorax corbo</i> (Linnaeus, 1758)	11	0.42	WM
<b>Family - Anhingidae</b>					
14	Darter	<i>Anhinga melanogaster</i> (Pennant, 1769)	12	0.46	WM
<b>Order – Gruiformes, Family - Raliidae</b>					
15	White breasted Waterhen	<i>Amaurornis phoenicurus</i> (Pennant,1769)	55	2.12	R
16	Eurasian Coot	<i>Fulica atra</i> (Linnaeus. 1758)	28	1.08	WM
17	Common Moorhen	<i>Gallinula chloropus</i> (Linnaeus, 1758)	39	1.50	R
18	Grey Headed Swamphen	<i>Porphyrio poliocephalus</i> (Linnaeus, 1758)	75	2.89	R/LM
<b>Order – Charadiiformes, Family - Charadriidae</b>					
19	Little Ringed Plover	<i>Charadrius dubios</i> (Scopoli, 1786)	145	5.60	R
20	Red Wattled Lapwing	<i>Vanellius indicus</i> (Boddaert, 1783)	118	4.56	R
21	Yellow Wattled Lapwing	<i>Vanellius malabaricus</i> (Boddaert, 1783)	13	0.50	R/LM
<b>Family - Scolopacidae</b>					
22	Temminck's Stint	<i>Calidris temminckii</i> (Leister, 1812)	37	1.43	WM
23	Pin Tailed Snipe	<i>Gallinago stenura</i> (Bonaparte, 1830)	19	0.73	R/LM
24	Spotted Redshank	<i>Tringa erythropus</i> (Pallas, 1764)	13	0.50	WM
25	Wood Sandpiper	<i>Tringa glareola</i> (Linnaeus, 1758)	26	1.00	R/LM
<b>Family - Jacanidae</b>					
26	Bronze Winged Jacana	<i>Metopodius indicus</i> (Latham, 1790)	16	0.61	R/LM
<b>Family - Rostratulidae</b>					
27	Greater Painted Snipe	<i>Rostratula benghalensis</i> (Ridgway, 1919)	10	0.38	WM
<b>Family - Laridae</b>					
28	River Tern	<i>Sterna aurantia</i> (J.E.Grey,1831)	42	1.62	R/LM

<b>Family - Recurvirostridae</b>					
29	Black Winged Stilt	<i>Himantopus himantopus</i> (Linnaeus, 1758)	48	1.85	WM
<b>Order – Anseriformes, Family - Anatidae</b>					
30	Lesser Whistling duck	<i>Dedrocygna javanica</i> (Horsfield, 1821)	56	2.16	R
31	Indian spot billed duck	<i>Anas poecilorhyncha</i> (J.R. Forester. 1781)	92	3.55	R/LM
32	Gadwall	<i>Mareca strepera</i> (Linnaeus. 1758)	56	2.16	WM
33	Northern pintail	<i>Anas acuta</i> (Linnaeus. 1758)	75	2.89	WM
34	Common Teal	<i>Anas crecca</i> (Linnaeus. 1758)	14	0.54	WM
35	Mallard	<i>Anas platyrhynchos</i> (Linnaeus. 1758)	26	1.00	WM
36	Cotton Pygmy Goose	<i>Nettapus coromandianus</i> (Gmelin, 1789)	46	1.77	R/LM
<b>Order – Coraciiformes , Family - Coraciidae</b>					
37	Indian Roller	<i>Coracias bengalensis</i> (Linnaeus, 1758)	67	2.58	R
<b>Family - Meropidae</b>					
38	Green bee-eater	<i>Merops orientalis</i> (Latham, 1801)	88	3.40	R
<b>Family - Alcedinidae</b>					
39	White Throated Kingfisher	<i>Halcyon smyrnensis</i> (Linnaeus. 1758)	31	1.198	R
40	Common Kingfisher	<i>Alcedo atthis</i> (Linnaeus. 1758)	46	1.77	R
41	Pied Kingfisher	<i>Cerule rudis</i> (Linnaeus. 1758)	34	1.31	R/LM
<b>Order – Podicepediformes , Family - Podicepedidae</b>					
42	Little Grebe	<i>Tachybaptus ruficolis</i> (Pallas, 1764)	15	0.57	R/LM
<b>Order – Accipitriformes, Family - Accipitridae</b>					
43	Western Marsh Harrier	<i>Circus aeruginosus</i> (Linnaeus, 1758)	8	0.30	WM
44	Crested Serpent Eagle	<i>Spilornis cheela</i> (Latham, 1790)	5	0.19	WM
<b>Order – Passeriiformes, Family - Muscicapidae</b>					
45	Bluethroat	<i>Luscinia svecica</i> (Linnaeus, 1758)	16	0.61	WM
<b>Family - Dicruridae</b>					
46	Black Drongo	<i>Dicrurus macroceres</i> (Vieillot, 1817)	70	2.70	R
<b>Family - Hirudinidae</b>					
47	Barn Swallow	<i>Hirundo rustica</i> (Linnaeus, 1758)	58	2.24	R/LM
<b>Family - Alaudidae</b>					
48	Indian Bush Lark	<i>Mirafr erythroptera</i> (Blyth, 1845)	50	1.93	R
49	Ashy Crowned Sparrow Lark	<i>Erimopteryx griseus</i> (Scopoli, 1786)	92	3.55	R
50	Rufous Tailed Lark	<i>Ammomanes phoenicura</i> (Franklin, 1831)	53	2.05	R
<b>Family - Cisticolidae</b>					
51	Plain Prinia	<i>Prinia inornata</i> (Sykes, 1832)	53	2.05	R
52	Ashy Prinia	<i>Prinia socialis</i> (Sykes, 1832)	41	1.58	R/LM
<b>Family - Motaciliidae</b>					
53	Citrine Wagtail	<i>Motacila citreola</i> (Pallas, 1776)	39	1.51	R/LM
54	White browed Wagtail	<i>Motacila maderaspatensis</i> (Gmelin, 1789)	26	1.05	R/LM
<b>Total</b>			2587		

**Table 2. Abundance of Families recorded in the study area.**

Sr.No.	Families	No. of Species	% of Species	No. of Individual	% of Individuals
1	Ciconidae	1	1.85185185	49	1.894085814
2	Ardeidae	8	14.8148148	421	16.27367607
3	Threkiornidae	2	3.7037037	127	4.909161191
4	Phalacocoreidae	2	3.7037037	137	5.295709316
5	Anhingidae	1	1.85185185	12	0.46385775
6	Raliidae	4	7.40740741	197	7.614998067
7	Charadriidae	3	5.55555556	276	10.66872826
8	Scolopacedae	4	7.40740741	95	3.67220719
9	Jacanidae	1	1.85185185	16	0.618477
10	Rostratulidae	1	1.85185185	10	0.386548125
11	Laridae	1	1.85185185	42	1.623502126
12	Recurvirostridae	1	1.85185185	48	1.855431001
13	Anatidae	7	12.962963	365	14.10900657
14	Coraciidae	1	1.85185185	67	2.589872439
15	Meropidae	1	1.85185185	88	3.401623502
16	Alcedonidae	3	5.55555556	111	4.29068419
17	Podicepedidae	1	1.85185185	15	0.579822188
18	Accipitridae	2	3.7037037	13	0.502512563
19	Muscicapidae	1	1.85185185	16	0.618477
20	Dicruridae	1	1.85185185	70	2.705836877
21	Hirudinidae	1	1.85185185	58	2.241979126
22	Alaudidae	3	5.55555556	195	7.537688442
23	cisticolidae	2	3.7037037	94	3.633552377
24	Motaciliidae	2	3.7037037	65	2.512562814
<b>Total</b>		54		2587	

Sample	Mean Individuals	Variance	Standard Deviation	Standard Error	Total Individuals	Total Species	Minimum	Maximum
Site1	10.52	89.122	9.44	1.285	568	47	0	35
Site2	10.5	76.104	8.724	1.187	567	47	0	35
Site 3	4.11	58.101	7.622	1.037	222	19	0	34
Site 4	7.3	71.76	8.471	1.153	394	34	0	35
Site 5	2.82	48.833	6.988	0.951	152	14	0	35
Site 6	4.37	29.86	5.464	0.744	236	29	0	23
Site 7	3.57	27.193	5.215	0.71	193	26	0	24
Site 8	4.72	49.035	7.002	0.953	255	26	0	26



**Fig. 1.** Google map of study area showing point transects from 1 to 8