

# Diversity of Wetland Avifauna from Sangli District, Maharashtra

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## Abstract

Sangli is one of the southernmost districts of Maharashtra having different geographical status. Bird occurs throughout the world their presence indicates the health of the ecosystem. They serve as a route to connect aquatic ecosystems with terrestrial ecosystems by nutrient cycling and maintaining them stable. They also provide direct and indirect benefits to humans. The present study attempted to record the diversity and status of wetland avifauna from the Sangli district of Maharashtra State from 2021 to 2024 in which 122 species of wetland birds were recorded of 19 orders and 49 families during the period of study. Among the recorded species 14 were migratory, 24 were residential migratory and 84 were residential species.

**Key words:** Wetland, Sangli district, Birds, Avifaunal diversity

Aquatic ecosystems serve as vital habitats for water-dependent species, including birds, animals, plants, and microbes, while also offering livelihood opportunities for nearby human populations, particularly around wetlands. Man-made water bodies such as reservoirs and lakes, often constructed for irrigation, also contribute to this ecological network. Birds, in particular, act as biological indicators of aquatic ecosystem health. They provide valuable information on the quality and integrity of these environments [1-2]. Many bird species are highly sensitive to changes in environmental conditions and habitat structures, making them early responders to shifts in ecosystem dynamics. Changes in bird populations or behaviors often signal underlying issues such as pollution, habitat degradation, or climate change, offering a way to monitor and assess the overall health of aquatic ecosystems [3].

Aquatic birds are the most important components of the wetland ecosystem as they occupy several tropical levels in the food web of the wetland nutrient cycle [4]. Birds play various important roles as pollinators and predators of insect pests [5].

Wetlands are indeed one of the most productive ecosystems on Earth, providing critical services such as water purification, flood control, carbon storage, and biodiversity support. Their ecological sensitivity is tied to their adaptive responses to both natural and human-induced changes, making them vulnerable to degradation. The diversity within wetlands stems from variations in factors such as geographical location, water conditions, soil types, and species compositions. This diversity contributes to their resilience and the broad range of ecosystem services they offer, but it also means that they can be highly sensitive to disturbances [6-7].

Wetland avifauna refers to the variety of bird species that inhabit wetlands, including marshes, swamps, bogs, rivers, lakes, and coastal areas. Wetlands are vital ecosystems that support a rich diversity of birdlife, offering essential resources like food, nesting sites, and protection from predators. The

diversity of wetland birds varies greatly depending on the region, habitat type, and water availability, which influences the presence of different species. Monitoring wetland birds provides important information about the health and well-being of wetlands. This study aims to examine the diversity, status and abundance of wetland birds from Sangli district.

## MATERIALS AND METHODS

### a) *The study area*

Sangli district is a part of Deccan plateau lies between latitude 16° 52' and 16° 87' N and longitude 74° 34' and 74° 56' E. Total geographical area of Sangli district is 8572 square feet. It consists 10 tehsils, Walwa, Shirala, Atpadi, Khanapur / Vita, Tasgaon, Miraj, Jath, Kavathe-Mahankal, Kadegaon and Palus. 10 wetlands from 7 tehsil were selected to record diversity of wetland birds.

*Walwa (Rethare dharan Pazar talav):* It is a natural waterbody in village walwa islampur situated near highway of walwa-shirala (Lat 17° 00'57" N Lon 74° 11'01" E). The lake is surrounded by agricultural field from two sides, another side constructed wall continued with woodland habitat that provides shelter and abundant food to arial forager. But the wetland is highly affected by influence of human activity and disturbance of traffic noise due to highway.

*Shirala (Takave lake and Mankarwadi dam):* Takave and Mankarwadi are small villages from shirala tehsil. Takave lake named on the village name. A lake spread over large area. Low activity of human into lake region.

Mankarwadi dam is man-made wetland (Lat 17° 2'30" N Lon 74° 4'28" E) used for irrigation, drinking, cloth washing purpose. It has heavily influenced with human activity due to farming and other activities (washing and drinking buffalo's,

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cows, sheep, and goat in lake). The lake provides potable water to 5 villages.

*Vita (Vita Lake)*: It is artificial lake (Lat 17°16'00" N Lon 74° 31'05" E). It situated near small village Suryanagar away from the vita city. The lake having large shallow water zone, dense shrubs and nearby cultivated land of different crops providing habitat, food and shelter for wetland birds as well as an aerial forager. It has low influence by human activity and enhances the high diversity of birds.

*Kadegaon (Bombalewadi lake and Kadegaon reservoir)*: Bombalewadi lake is an artificial lake situated at the boundary of village bombalewadi (Lat 17° 23'39" N Lon 74° 16'45" E). Large lakes with high influence of human activity, and surrounding agricultural areas provide protective shelter to wetland birds for breeding and nesting purposes. It shows abundant avifauna. Kadegaon reservoir is also an artificial situated lake away from the city (Lat 17°17'24" N Lon 74°19'06" E). They are influenced by human activity. Migratory and threatened birds visit this site.

*Tasgaon (Tasgaon lake and Kavathe Ekand lake)*: Tasgaon lake is situated in the city area (Lat 17° 01'54" N Lon 74° 37'49" E) near the school. The lake is surrounded by lush greenery having a disturbance of humans.

Kavathe Ekand lake is situated away from the village (Lat 17° 00'02" N Lon 74° 37'58" E) surrounded by agricultural fields providing a good habitat for wetland birds. It has low disturbance.

*Palus (Sandgewadi lake)*: Sandgewadi lake is in the village of Sandgewadi in Palus tehsil situated away from the town (Lat 17° 06'05" N Lon 74° 28'05" E). It has dense shrub and cultivated land which provides shelter and nesting habitat for some birds. The wetland is disturbed by road noise which is passing through nearby waterbody.

*Jath (Birnall lake)*

Birnall is a small village in Jath tehsil famous for Birnall lake (Lat 17° 3'53" N Lon 75° 10'24" E). The area of a lake surrounded by agricultural fields and dense shrubs provides protective shelter for several birds.



Kadegaon reservoir



Birnall Lake Jath



Sandgewadi Lake Palus



Mankarwadi Dam Shirala



Vita Lake



Rethare Dharan Walwa

## b) Methodology

The present study was carried out from September 2021 to January 2024 by using a field binocular (8×42x magnification) and a 65x optical zoom camera with 20.3 megapixels lens for photography. The survey was undertaken from 6 am to 9 am and from 4 pm to 6 pm. Sometimes afternoon visits were also done to check the activities of birds. The book of Birds of the Indian Subcontinent by Grimmett *et al.* [8] and the book of common birds of the Indian subcontinent by Banerjee [9] were used as field guides. For identification, several characteristics were taken into consideration. Size, colours and other physical features such as bill, legs and feet are the best indicators of the identity of a species at a close range or through binoculars. Calls also served as an important clue in identifying and locating birds in their habitat.

## RESULTS AND DISCUSSION

A total of 122 species of birds belonging to 49 families of 1 order were recorded from 10 wetlands of the Sangli district during the study period. Out of which 14 were migratory, 24 were residential migratory and 84 were residential species identified [9-13]. Among the recorded species of birds 47 species from order Passeriformes, 15 species from Charadriiformes, 12 species from Pelecaniformes, 8 species from Anseriformes, 5 species from Coraciiformes and Columbiformes, 4 species from Accipitriformes, 3 species from Suliformes, Gruiformes, Galliformes, Cuculiformes, Camprimulgiformes and Ciconiiformes, 2 species from Psittaciformes and Bucerotiformes, 1 species from Podicipediformes, Petrochelidoniformes, Strigiformes, and

Piciformes [14-16]. In total recorded species we observed 2 species are near threatened (Black-headed ibis and Woolly-necked stork) and 2 vulnerable (Common pochard and River tern) as per Clements, version 2023. Seasonal variation in the occurrence of birds is also seen [17-20]. In summer generally summer migratory species (Garganey, Common rose finch), have been sighted from some sites, in winter almost all species shown in the table were sighted from all wetlands especially migratory species of Waterfowl and ducks (Northern shoveler, Northern pintail, Ruddy shelduck, Common pochard, Common teal), large waders (Intermediate egret) and small waders (Wagtails, Black-winged stilt, Common ringed plovers, Wood sandpiper, Little stint) were sighted from all wetlands [21-23]. In monsoons generally, the number of species and individuals are less sighted [24-26]. During summer wetlands become shrinks and the number of birds is less than in the winter season [26]. The number of wetland birds started to increase from the post-monsoon [27]. More species of birds were recorded in the winter season [28].

A total of 122 bird species from 49 families across 18 orders were recorded, indicating a rich avian diversity in the wetlands of Sangli. The birds are classified based on their migratory behavior:

*14 migratory species:* These birds visit the region seasonally, often during winter.

*24 residential migratory species:* Birds that reside in the region but also migrate short distances.

*84 residential species:* Permanent residents that inhabit the wetlands year-round.

The study highlights the presence of two near-threatened species—the Black-headed ibis and Woolly-necked stork—as well as two vulnerable species—the Common pochard and River tern. These findings suggest that the wetlands are critical habitats for species of global conservation concern, underscoring the importance of wetland conservation efforts in the region. The study also points out that during summer, wetlands shrink, reducing available habitat and resulting in lower bird counts. However, as water levels replenish after the monsoon, bird populations begin to rise again, peaking in winter. The wetlands of Sangli play a critical role in supporting diverse bird populations, especially migratory species during winter. The fluctuating seasonal conditions create varied habitats that attract different bird species throughout the year. This study emphasizes the need for wetland conservation, particularly to protect vulnerable and near-threatened species.

Table 1 Checklist of Wetland Avifauna from Sangli District, Maharashtra, India.

S. No.	Order	Family	Common name	Scientific name	Status	IUCN status		
1	Anseriformes	Anatidae	Northern Shoveler	<i>Anas clyeata</i>	M	LC		
2			Northern Pintail	<i>Anas acuta</i>	M	LC		
3			Ruddy shelduck	<i>Tadorna ferruginea</i>	M	LC		
4			Common pochard	<i>Aythya ferina</i>	M	VU		
5			Lesser whistling duck	<i>Dendrocygna javanica</i>	R	LC		
6			Garganey	<i>Spatula querquedula</i>	M	LC		
7			Common teal	<i>Anas crecca</i>	M	LC		
8			Spot -billed duck	<i>Anas poecilorhyncha</i>	R	LC		
9			Charadriiformes	Recurvirostridae	Black winged stilt	<i>Himantopus himantopus</i>	M	LC
10	Charadriidae	Little ringed plover			<i>Charadrius dabius</i>	RM	LC	
11		Red wattled lapwing			<i>Vanellus indicus</i>	R	LC	
12		Yellow wattled lapwing			<i>Vanellus malabaricus</i>	RM	LC	
13		Common ringed plover			<i>Charadrius hiaticula</i>	M	LC	
14		Scolopacidae			Common sandpiper	<i>Tringa hypoleucos</i>	RM	LC
15	Green sandpiper				<i>Tringa ochropus</i>	RM	LC	
16	Wood sandpiper				<i>Tringa glareola</i>	M	LC	
17	Marsh sandpiper				<i>Tringa stagnatilis</i>	RM	LC	
18	Common greenshank				<i>Tringa nebularia</i>	RM	LC	
19	Little stint				<i>Calidris minuta</i>	M	LC	
20	Common snipe				<i>Gallinago gallinago</i>	RM	LC	
21	Glareolidae				Little pranticole	<i>Glareola lactea</i>	R	LC
22		Jacanidae			Pheasant tailed jacana	<i>Hydrophasianus chirurgus</i>	R	LC
23	Pelecaniformes	Ardeidae			River tern	<i>Sterna aurantia</i>	R	VU
24					Great egret	<i>Ardea alba</i>	RM	LC
25					Intermediate egret	<i>Mesophoyx intermedia</i>	M	LC
26					Little egret	<i>Egretta garzetta</i>	R	LC
27					Cattle egret	<i>Bubulcus ibis</i>	R	LC
28					Indian pond heron	<i>Ardeola grayii</i>	R	LC
29					Purple heron	<i>Ardea purpuria</i>	R	LC
30					Black crowned night heron	<i>Nycticorax nycticorax</i>	R	LC
31			Grey heron	<i>Ardea cinerea</i>	R	LC		

32		Threskiornithidae	Glossy ibis	<i>Plegadis falcinellus</i>	RM	LC
33			Black headed ibis	<i>Threskiornis melanocephalus</i>	RM	NT
34			Red naped ibis	<i>Pseudibis papillosa</i>	R	LC
35			Eurasian spoonbill	<i>Anastomus oscitans</i>	RM	LC
36	Podicipediformes	Podicipedidae	Little Grebe	<i>Tachybaptus</i>	R	LC
37	Galliformes	Phasianidae	Painted francolin	<i>Francolinus pictus</i>	R	LC
38			Gray francolin	<i>Ortygornis pondicerianus</i>	R	LC
39			Indian peafowl	<i>Pavo cristatus</i>	R	LC
40	Suliformes	Phalacrocoracidae	Little cormorant	<i>Phalacrocorax niger</i>	R	LC
41			Great cormorant	<i>Phalacrocorax carbo</i>	RM	LC
42			Indian cormorant	<i>Phalacrocorax fuscicollis</i>	R	LC
43	Accipitriformes	Accipitridae	Black kite	<i>Milvus migrans</i>	R	LC
44			Black shouldered kite	<i>Elanus caeruleus</i>	R	LC
45			Brahminy kite	<i>Haliastur indus</i>	R	LC
46			Shikra	<i>Accipiter badius</i>	R	LC
47	Gruiformes	Rallidae	White breasted waterhen	<i>Amaurornis phoenicurus</i>	R	LC
48			Comon coot	<i>Fulica atra</i>	R	LC
49			Purple swamphen	<i>Porphyrio porphyrio</i>	R	LC
50	Columbiformes	Columbidae	Rock pigeon/ dove	<i>Columba livia</i>	R	LC
51			Yellow footed green pigeon	<i>Treron phoenicopterus</i>	R	LC
52			Spotted dove	<i>Streptopelia chinensis</i>	R	LC
53			Laughing dove	<i>Streptopelia senegalensis</i>	R	LC
54			Eurasian collared dove	<i>Streptopelia decaocto</i>	RM	LC
55	Cuculiformes	Cuculidae	Western/Asian koel	<i>Eudynamis scolopacea</i>	R	LC
56			Jacobin cuckoo	<i>Clamator jacobinus</i>	R	LC
57			Southern coucal	<i>Centropus sinensis</i>	R	LC
58	Coraciiformes	Alcedinidae	White Throated Kingfisher	<i>Halcyon smyrensis</i>	R	LC
59			Pied kingfisher	<i>Ceryl rudis</i>	R	LC
60			Common kingfisher	<i>Alcedo atthis</i>	R	LC
61		Meropidae	Green beeeater	<i>Merops orientalis</i>	RM	LC
62		Coraciidae	Indian roller	<i>Coracias benghalensis</i>	R	LC
63	Bucerotiformes	Upupidae	Common hoopoe	<i>Upupa epops</i>	RM	LC
64		Bucerotidae	Indian grey hornbill	<i>Ocyrceros birostris</i>	R	LC
65	Psittaciformes	Psttiaculidae	Plum headed parakeet	<i>Psittacula cyanocephala</i>	R	LC
66			Rose ringed parakeet	<i>Psittacula krameri</i>	R	LC
67	Passeriformes	Laniidae	Long tailed shrike	<i>Lanius schach</i>	R	LC
68			Brown shrike	<i>Lanius cristatus</i>	RM	LC
69		Dicruridae	Ashy drongo	<i>Dicrurus leucophaeus</i>	RM	LC
70			Black drongo	<i>Dicrurus adsimilis</i>	RM	LC
71		Corvidae	House crow	<i>Corvus spendense</i>	R	LC
72			Jungle crow	<i>Corvus macrorhynchus</i>	R	LC
73		Alaudidae	Rufous tailed lark	<i>Ammomanes phoenicura</i>	R	LC
74			Ashy crowned sparrow lark	<i>Eremopterix grisea</i>	R	LC
75			Creasted lark	<i>Galerida cristata</i>	R	LC
76		Hirundinidae	Barn swallow	<i>Hirundo rustica</i>	R	LC
77			Red rumped swallow	<i>Cecropis daurica</i>	R	LC
78			Wire tailed swallow	<i>Hirundo smithii</i>	R	LC
79			Dusky crag martin	<i>Ptyonoprogne concolor</i>	R	LC
80		Pycnonotidae	Red-vented bulbul	<i>Pycnonotus cafer</i>	R	LC
81		Leiotherichidae	Yellow eyed babbler	<i>Chrysomma</i>	R	LC

82		Jungle babbler	<i>Argya striata</i>	R	LC	
83		Large grey babbler	<i>Argya malcolmi</i>	R	LC	
84	Cisticolidae	Ashy prinia	<i>Prinia socialis</i>	R	LC	
85		Plain prinia	<i>Prinia inornata</i>	R	LC	
86	Muscicapidae	Indian robin	<i>Copsychus fulicatus</i>	R	LC	
87		Oriental magpie robin	<i>Copsychus saularis</i>	R	LC	
88		Pied bush chat	<i>Saxicola caprata</i>	R	LC	
89		Common stonechat	<i>Saxicola torquatus</i>	RM	LC	
90		Blue rock thrush	<i>Monticola solitarius</i>	RM	LC	
91	Sturnidae	Brahminy starling	<i>Sturnus pagodarum</i>	R	LC	
92		Chestnut tailed starling	<i>Sturnus malabarica</i>	R	LC	
93		Common myna	<i>Acridotheris tristis</i>	R	LC	
94	Nectariniidae	Purple rumped sunbird	<i>Nectarinia zeylonica</i>	R	LC	
95		Purple sunbird	<i>Nectarinia asiatica</i>	R	LC	
96	Motacillidae	Yellow wagtail	<i>Motacilla flava</i>	M	LC	
97		White wagtail	<i>Motacilla alba</i>	M	LC	
98		Grey wagtail	<i>Motacilla cinerea</i>	M	LC	
99		White browed wagtail	<i>Motacilla maderaspatensis</i>	R	LC	
100		Tree pipit	<i>Anthus trivialis</i>	R	LC	
101		Paddyfield pipit	<i>Anthus rufulus</i>	R	LC	
102	Acrocephalidae	Paddyfield warbler	<i>Acrocephalus agricola</i>	RM	LC	
103	Passeridae	House sparrow	<i>Passer domesticus</i>	R	LC	
104	Ploceidae	Baya weaver	<i>Ploceus philippinus</i>	R	LC	
105	Estrildidae	Indian silverbill	<i>Lonchura malabarica</i>	R	LC	
106		Scaly breasted munia	<i>Lonchura punctualata</i>	R	LC	
107		Red avadavat/munia	<i>Esterilda amandava</i>	RM	LC	
108		Black headed munia	<i>Lonchura malacca</i>	R	LC	
109	Rhipiduridae	White browed fantail	<i>Rhipidura aureola</i>	R	LC	
110	Aegithinidae	Common iora	<i>Aegithina tiphia</i>	R	LC	
111	Zosteropidae	Indian white eye	<i>Zosterops palpebrosus</i>	R	LC	
112	Fringillidae	Common rosefinch	<i>Carpodacus erythrinus</i>	RM	LC	
113	Paridae	Great tit	<i>Parus major</i>	R	LC	
114	Ciconiiformes	Ciconiidae	Asian openbill stork	<i>Anastomus oscitans</i>	R	LC
115		Painted stork	<i>Mycteria leucocephala</i>	R	LC	
116	Caprimulgiformes	Caprimulgidae	Woolly necked stork	<i>Ciconia episcopus</i>	RM	NT
117		Indian nightjar	<i>Caprimulgus asiaticus</i>	R	LC	
118		Asian palm swift	<i>Cypsiurus balasiensis</i>	R	LC	
119		Little swift	<i>Apus affinis</i>	R	LC	
120	Petrocloformes	Pteroclididae	Chestnut bellied sandgrouse	<i>Pterocles senegallus</i>	R	LC
121	Strigiformes	Strigidae	Spotted owl	<i>Athene brama</i>	R	LC
122	Piciformes	Megalaimidae	Coppersmith barbet	<i>Psilopogon haemacephalus</i>	R	LC

LC- Least Concern, NT- Near Threatened, VU- Vulnerable, R- Resident, RM- Resident as well as migrant, M- Migrant

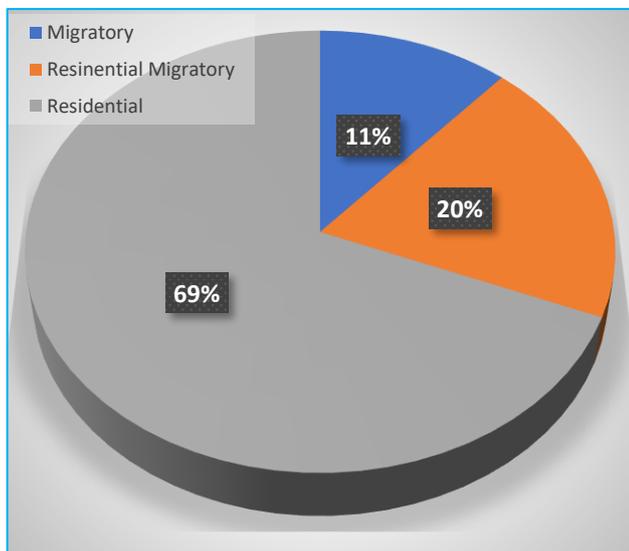


Fig 1 Status % of wetland avifauna from Sangli district

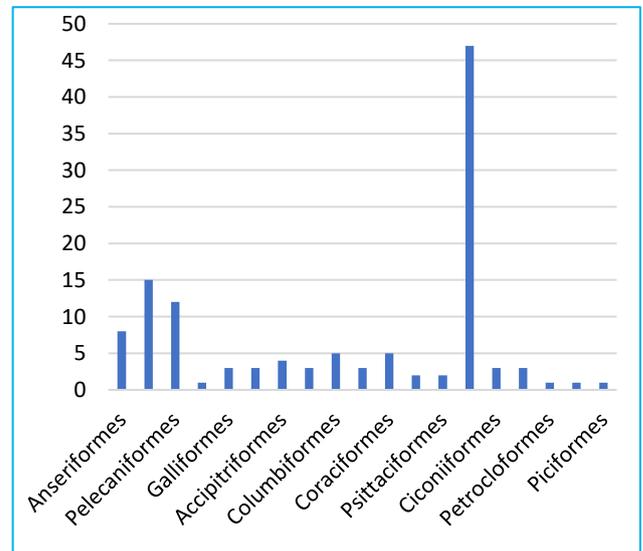


Fig 2 Number of birds recorded by order



Fig 3 Black winged stilt



Fig 4 Little egret



Fig 5 Little cormorant



Fig 6 Woolly-necked stork



Fig 7 Asian open-billed stork



Fig 8 Brahminy starling



Fig 9 Green bee-eater



Fig 10 Red-wattled lapwing



Fig 11 White-throated kingfisher



Fig 12 Red-naped ibis



Fig 13 Common sandpiper

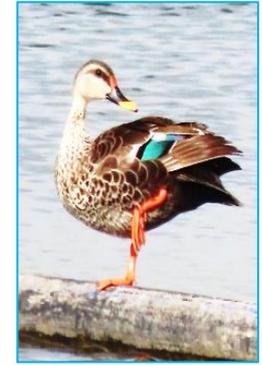


Fig 14 Spot-billed duck

## CONCLUSION

The study recorded a total of 122 bird species from 49 families and 18 orders across 10 wetlands in the Sangli district. Among these, 84 species were residential, 24 were residential migratory, and 14 were migratory. The order Passeriformes had the highest representation with 47 species, followed by Charadriiformes (15 species) and Pelecaniformes (12 species). The seasonal variation in bird occurrences was notable, with higher species diversity and abundance during the winter, especially among migratory waterfowl and waders. Summer saw fewer species due to the shrinking wetlands, while post-monsoon periods marked the beginning of an increase in bird numbers. Of the recorded species, two were near-threatened

(Black-headed ibis, Woolly-necked stork), and two were vulnerable (Common pochard, River tern) according to the 2023 Clements checklist. This highlights the ecological significance of these wetlands as vital habitats for both resident and migratory birds, emphasizing the need for ongoing conservation efforts.

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