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Avifaunal diversity in and around the Wetland of Kasheli Village, Ratnagiri district, Maharashtra

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Abstract
Birds are the most amazing and unique creatures of the nature. They are found all over the world. They play a critical role in reducing and maintaining populations of insects in natural systems. Birds are the vital component of an ecosystem. They are adapted to all types of habitats and are found in all types of ecosystems including wetlands. The wetlands are complex communities of living organisms which assimilate them with their physical environment and have been productive in nature. These are also considered the most biologically diverse of all ecosystems, serving as home to a wide range of plant and animal life. Wetlands are occupied by many birds as they get food, water and shelter from the wetlands. In the Konkan region, many unexplored wetlands can be seen. The present study was undertaken to record the avifauna in and around a wetland site of Kasheli village, Ratnagiri district. The visual encounter survey method was used to observe the birds. The total of 85 species of the birds, belonging to 43 different families was found during the survey. Some visitor/ migrant species of birds including some 'Nearly threatened', 'Vulnerable' species were also found to inhabit the study site. The present study indicates that this Wetland site is free from anthropogenic activities and therefore, it is blessed with rich avifaunal diversity.

Keywords: Wetland, avifauna, conservation, Ratnagiri, Kasheli

Introduction

Birds are vertebrate animals adapted to flight. They are spectacular creation of nature and their presence has always been pleasant to the human eyes. In India, 1301 species of birds are found, Ali and Ripley (1986) [2]. Birds are a vital component of an ecosystem. They have a crucial position in the food chain, some birds are also considered as keystone species and they are important pollinating agents too. Birds are found all over the world. They are adapted to all types of habitats and are found in all types of ecosystems including wetlands.

According to Jamwal *et al.,* (2017) [9], almost 25% of the bird species found (1224 species belonging to 78 families and 17 orders) in India and are dependent on wetlands. The wetlands are complex communities of living organisms that integrate them with their physical environment and have been productive in nature, Dar *et al*., (2017) [6]. Ponds, lakes, swamps, marshy lands including mangrove ecosystem, shallow rivers, etc. are included in wetlands.

Wetland is an ecosystem that is helpful to maintain biodiversity. Wetlands are inhabited by many birds as their natural habitat for various reasons. Birds get food, water, shelter from the wetlands. Some birds also use wetlands for breeding, for rearing the young ones and even for social interactions. Therefore, wetlands are important to keep the avian diversity maintained. In the Konkan region, many unexplored wetlands can be seen. These wetlands have a major contribution in maintaining the diversity of birds across Konkan region. The present study was undertaken to record the avifauna of the Kasheli wetland site. Till now, no anthropogenic activities are taking place in this region and therefore, the selected site is undisturbed and in its natural condition. Occasional fishing is only done by some natives for livelihood. Therefore, any sign of environmental deterioration has not been observed at this wetland site till now but localites should have awareness about this fact, so that, the same natural conditions will be maintained in the future. Therefore, the present study will contribute to the same thing and it will eventually be helpful to conserve wetlands in general and avian diversity in particular.

Study area

'Kasheli' is a small village in Rajapur Tehsil. It is situated in the coastal area of Ratnagiri district of Maharashtra state at 16.73^0 N, 73.31^0 E coordinates. Hilly landscapes are found throughout the village. Being in the coastal region, the large estuary comes into the village from the Arabian Sea. Predominant vegetation of this area includes farms of *Areca catechu*, *Mangifera indica*, *Cocos nucifera*, *Artocarpus heterophyllus*, etc. and some natural forest area. Open grasslands and paddy fields (rice) occupy the banks of the estuary, which during monsoon (from June to September) and periodic high tides gets submerged in the brackish water and during the low tides as well as in summer, gets exposed. Therefore, a marshy area has been created. Many invertebrates are seen at this marshy region during the low tides which becomes a feast for the birds. Patches of mangrove forests are found sporadically in the estuary. Heavy rainfall occurs during the monsoon season in this area. The climate is of hot and humid type. Average temperature ranges between 20^0C- 30^0C throughout the year. Due to all these circumstances, this wetland site is accompanied with sufficient food sources, shelter and favourable climatic conditions which are necessary for the avian community. Therefore, this particular wetland site was selected to monitor avian diversity.

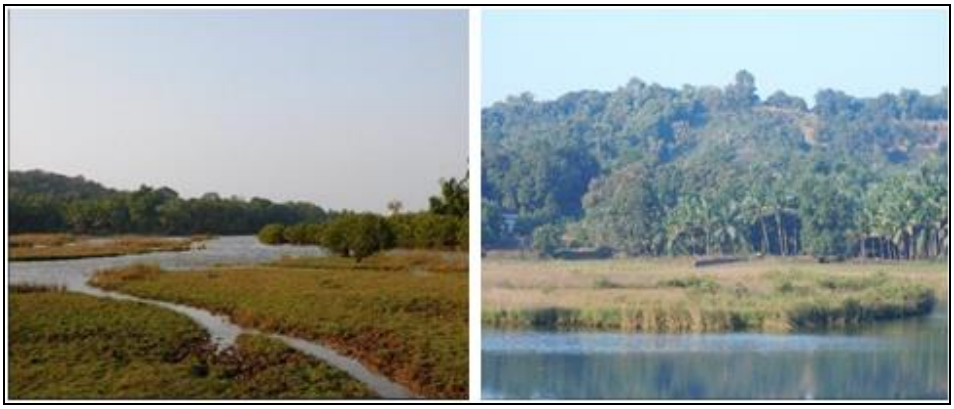

Fig 1&2: Pictures of wetland site at Kasheli.

Materials and Methods

The study was conducted for the period of one year from March 2020 to February 2021, at the selected wetland site. For the observations, 4 different sites were fixed on the periphery of the wetland covering an area of approximately 1 km^2. The visual encounter survey method was used to study the avian biodiversity in this area. Regular observations were made, at the fixed timings, early in the morning from 6.00 AM to 10.00 AM and in the evening from 4.00 PM until the Sunset, twice a month. Observations were also made on other days and timings also, in addition to the fixed timings. Occasional boating is also practised across the mangrove ecosystem to sight the avifauna. Birds were sighted and photographs were taken, wherever possible. Nikon Coolpix B600 digital camera with 60X wide optical zoom lens was used to capture the pictures. For identification of sighted birds some books like Grimmett *et al.*, (2014) [8], Kasambe (2016) [10], Kasambe (2020) [11] were referred and pocket guide [1] as well as Pakshimitra's website (2019) [22] were used. Calls from the birds were also recorded and used for the identification of the birds. No bird sample was collected for any reason.

Table 1: List of the birds according to the abundance of the families, found at Kasheli.

Sr. No.	Common Name	Scientific Name	Family	IUCN status
1	Great Egret	*Ardea alba*	Ardeidae	LC
2	Cattle Egret	*Bubulcus coromandus*	Ardeidae	LC
3	Little Egret	*Egretta garzetta*	Ardeidae	LC
4	Purple Heron	*Ardea purpurea*	Ardeidae	LC
5	White breasted Waterhen	*Amourornis phoenicurus*	Ardeidae	LC
6	Striated Heron	*Butorides striata*	Ardeidae	LC
7	Indian Pond Heron	*Ardeola grayii*	Ardeidae	LC
8	Grey Heron	*Ardea cinerea*	Ardeidae	LC
9	Common Kingfisher	*Alcedo atthis*	Alcedinidae	LC
10	Pied Kingfisher	*Ceryle rudis*	Alcedinidae	LC
11	Stork billed Kingfisher	*Pelargopsis capensis*	Alcedinidae	LC
12	Oriental dwarf Kingfisher	*Ceyx eritheca*	Alcedinidae	LC
13	White throat Kingfisher	*Halcyon smyrnensis*	Alcedinidae	LC
14	Brahminy Kite	*Haliastur indus*	Accipitridae	LC
15	Black Kite	*Milvus migrans*	Accipitridae	LC
16	Indian spotted Eagle	*Clanga hastata*	Accipitridae	VU
17	White bellied Sea Eagle	*Haliaeetus leucogaster*	Accipitridae	LC
18	Marsh Harrier	*Circus aeruginosus*	Accipitridae	LC
19	Indian Black Robin	*Saxicoloides fulicotus*	Turdinae	LC
20	Oriental Magpie Robin	*Copsychus saularis*	Turdinae	LC
21	Orange headed Thrush	*Geokichla citrina*	Turdinae	LC
22	White rumped Shama	*Copsychus malabaricus*	Turdinae	LC
23	Blue faced Malkoha	*Phaenicophaeus viridirostris*	Cuculidae	LC
24	Commom Cuckoo	*Cuculus canorus*	Cuculidae	LC
25	Asian Coel	*Eudynamys scolopaceus*	Cuculidae	LC
26	Jacobin Cuckoo	*Clamator jacobinus*	Cuculidae	LC
27	Red rumped Swallow	*Cecropis daurica*	Hirundinidae	LC
28	White rumped Swallow	*Tachycineta leucorrhoa*	Hirundinidae	LC
29	Wire tailed Swallow	*Hirundo smitthii*	Hirundinidae	LC
30	Crimson Sunbird	*Aethopyga siparaja*	Nectariniidae	LC
31	Purple rumped Sunbird	*Leptocoma zeylonica*	Nectariniidae	LC
32	Vigors's Sunbird	*Aethopyga vigorsii*	Nectariniidae	LC
33	Asian Paradise Flycatcher	*Terpsiphone paradise*	Monarchidae	LC
34	Black naped- Blue Flycatcher	*Hypothemis azurea*	Monarchidae	LC
35	Tickel's Blue Flycatcher	*Cyornis tickelliae*	Muscicapidae	LC
36	Siberian Stonechat	*Saxicola maurus*	Muscicapidae	LC

37	Crow Phaesant	*Centropus sinensis*	Phasianidae	LC
38	Peacock	*Povo cristatus*	Phasianidae	LC
39	Emerald Dove	*Chalcophaps indica*	Columbidae	LC
40	Spotted Dove	*Streptopelia chinensis*	Columbidae	LC
41	Black Drongo	*Edolius macrocercus*	Dicruridae	LC
42	Fork tailed Drongo	*Dicrurus adsimilis*	Dicruridae	LC
43	Red whiskers Bulbul	*Pycnonotus jacosus*	Pycnonotidae	LC
44	Red vented Bulbul	*Pycnonotus cafer*	Pycnonotidae	LC
45	Cormorant	*Phalacrocorax fuscicollis*	Phalacrocoracidae	LC
46	Little Cormorant	*Microcarbo niger*	Phalacrocoracidae	LC
47	Grey Wagtail	*Motacilla cinerea*	Motacillidae	LC
48	Paddyfield Pipit	*Anthus rufulus*	Motacillidae	LC
49	Common Myna	*Cridotheres tristis*	Sturnidae	LC
50	Jungle Myna	*Cridotheres fuscus*	Sturnidae	LC
51	Black hooded Oriole	*Oriolus xanthornus*	Oriolidae	LC
52	Golden Oriole	*Oriolus kundoo*	Oriolidae	LC
53	Common Crow	*Corvus brachyrhynchos*	Corvidae	LC
54	RufousTreepie	*Dendrocitta vagabunda*	Corvidae	LC
55	Red wattled Lapwing	*Vanellus indicus*	Charadriidae	LC
56	Yellow wattled Lapwing	*Vanellus malabaricus*	Charadriidae	LC
57	Coppersmith Barbet	*Megalaima haemacephala*	Capitonidae	LC
58	Brown headed Barbet	*Megalaima zeylanica*	Capitonidae	LC
59	Malabar pied Hornbill	*Anthracoceros coronatus*	Bucerotidae	NT
60	Indian Grey Hornbill	*Ocyceros birostris*	Bucerotidae	LC
61	Black rumped flame back Woodpecker	*Dinopium benghalense*	Picidae	LC
62	White naped flame back Woodpecker	*Crysocolaptes festivus*	Picidae	LC
63	Common Tailorbird	*Orthotomus sutorius*	Sylviinae	LC
64	Plain Prinia	*Prinia innomata*	Sylviinae	LC
65	Rose ringed Parakeet	*Psittacula krameri*	Psittacidae	LC
66	Vernal hanging Parrot	*Loriculus vernalis*	Psittacidae	LC
67	Sandpiper	*Actitis hypoleucos*	Scolopacidae	LC
68	Black headed Ibis	*Threskiornis melanocephalus*	Threskiornithidae	NT
69	Jungle Babbler	*Turdoides striata*	Timaliinae	LC
70	Little Green Bee-eater	*Meropes orientalis*	Meropidae	LC
71	Common Iora	*Aegithina tiphia*	Irenidae	LC
72	Indian Pitta	*Pitta brachyura*	Pittidae	LC
73	Small Minivet	*Pericrocotus cinamomeus*	Campephagidae	LC
74	Indian Yellow Tit	*Parus aplonotus*	Paridae	LC
75	Grey headed Swamphen	*Porphyrio poliocephalus*	Rallidae	LC
76	Painted Stork	*Mycteria leucocephala*	Ciconiidae	NT
77	Yellow throat Sparrow	*Gymnoris xanthocollis*	Passerinae	LC
78	Malabar crested Lark	*Galerida malabarica*	Alaudidae	LC
79	Baya Weaver	*Ploceus philippinus*	Ploceinae	LC
80	Lesser whistling Duck	*Dendrocygna javanica*	Anatidae	LC
81	Common Tern	*Sterna hirundo*	Laridae	LC
82	Indian Roller	*Coracias benghalensis*	Coraciidae	LC
83	Crested Tree Swift	*Hemiporcne coronata*	Hemiprocnidae	LC
84	Common Swift	*Apus apus*	Apodidae	LC
85	Bronze-winged Jacana	*Metopidius indicus*	Jacanidae	LC

LC= Least Concern, VU= Vulnerable, NT= Nearly Threatened

Results

A total of 85 species of the birds were found during the survey in an entire year, belonging to
43 different bird families. Family Ardeidae was found to be dominant (8 species). Afterwards, this order of dominance with respect to the number of the bird species was found to be like - Alcedinidae and Accipitridae (5 species in each), turdinae and Cuculidae (4 species in each), Hirundinidae, Nectarinidae (3 species in each). The remaining families were found to contain 1 – 2 species of birds. Birds like Great egret, Little egret, Cattle egret, Little cormorant, Pond heron, Red wattle lapwing, White-throated kingfisher, Pied kingfisher, Green bee-eater, Spotted dove, Jungle myna, kites, wire taled swallow were found to be abundant. On the contrary Purple heron, Grey heron, Marsh harrier, White-bellied sea eagle, Stork-billed kingfisher, Rock pigeon and yellow wattled lapwing were less abundant. Some seasonal visitors/ migratory birds were also observed at the study site. The birds of different eating habits *i.e.* frugivores, granivores, nectarivores, insectivores, omnivores were found in this wetland as the area around the wetland contains sufficient food sources required for the birds.

Discussion

Wetlands become the suitable feeding and breeding grounds for various bird species and therefore, the bird population seems to be more in and around the wetlands. Bird watching has always given immense pleasure to the human eyes. Perhaps, this fact has urged many researchers to conduct bird surveys across various places. Narayanan *et al*., (2011) [15] recorded the avifauna of Kuttanad, the southern portion of the Vembanad-Kole Ramsar site in the state of Kerala. Besides, the avifauna of various sites in Kerala has been

explored by many other researchers like Chullakkattil and Seedikkoya (2017) [5] at Kottuli wetland,
Kuruvilla (2016) [13] at Kole wetlands, Vincy *et al*., (2015) [21] at Meenachil river wetland, *etc*. in the recent years. The 53 species of birds spread over 31 families and 15 orders at the three different lakes in Dharwad of Karnataka state were documented by Nadaf and Ganesh (2016) [14].
In the state of Maharashtra, a checklist of birds, found along the banks of the Godavari River and its tributaries was prepared by Chavan *et al*., (2015) [4]. Kumbar and Ghadage (2012) [12] at Krishna river basin, in Sangli district, explored the presence of a total of 126 bird species. Various other terrains of Maharashtra state have also been explored to study wetland avifauna by researchers including Bavaskar *et al*., (2016) [3] along with Deshmukh and Rudey (2019) [7] in Chandrapur district, Puri and Virani (2016) [19] in Gondia district, Pawar and Wanjari (2015) [18] in Yavatmal district, Patil *et al*., (2015) [16] in Sindhudurg district, Pawar *et al.*, (2011) [17] in Raigad district and Taware *et al.*, (2012) [20] in the district of Ratnagiri. The present work would be one of the pioneering works, as this particular wetland has still been unexplored by contemporary researchers. In this study, 85 species of birds were found to inhabit the study site. Some 'Nearly Threatened' (IUCN) species had marked their presence during the study period which includes- Painted Stork, Malabar Pied Hornbill and Black- headed Ibis. Malabar Pied Hornbill had been found to be a resident bird at this particular site. Bronze Winged Jacana, River Turn, Indian Roller, and Lesser whistling Duck were the visitors to this place. The monsoon visitor Indian Pitta was also sighted throughout the monsoon. Indian Spotted Eagle which is a 'Vulnerable' (IUCN) bird species was seen during the survey. Remaining all the bird species found were resident species and are considered as species of 'Least Concern', according to IUCN. These findings show that the wetlands are the ultimate ecosystems for the birds and the subjected wetland site is one such unique site that has been inhabited by many birds.

Conclusion

In conclusion, it's veracious to say that wetlands are just like the strong pillars which support and conserve biodiversity which includes many avian species. On the other hand, the presence of a large number of birds adds more aesthetic sense to the wetland site. The wetland site considered in the present study is also an example of such a wetland site. It is free from anthropogenic activities including the expansion of settlements, agriculture and livestock grazing which may prove to be the major threats to maintain biodiversity and for the survival of the birds. Therefore, the study site is providing a suitable microenvironment, cushioning to the avian community and thus, it is blessed with rich avifaunal diversity.

Fig 3: Some representative photographs of the birds captured during the survey.

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