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Avifaunal Diversity of the wetlands of Vasai-Virar Konkan area, Maharashtra, India

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ABSTRACT

Topographic and climatic heterogeneity makes India a bio diversely rich country. India is habitat to around 13% species of birds documented worldwide. Avifauna plays an important role in the food chain and are considered as biological indicators of ecosystem. Birds are scavengers, pollinating agents, seed dispersers and pest controllers. The avifaunal documentation of study area, Gogte saltpan (19°23'42" N, 72°48'38" E) and Viva wetland (19°27'35" N, 72°47'41" E) which are located in the northern part of Mumbai in Palghar district was done during the months of November 2021 and January 2022 by line transact and point count method. Overall, 84 species of birds including 15 orders and 36 families were recorded from both the study areas. Order Passeriformes (32%) was dominant followed by Charadriiformes (17%) and Pelecaniformes (12%), while family Scolopacidae (10%) was dominant followed by Ardeidae (10%), Anatidae (6%) and Accipitridae (6%). Both the study areas were dominated by order Passeriformes and family Ardeidae. Viva wetland recorded large number of avian diversities with count of 65 species, while 45 species were recorded in Gogte saltpan. IUCN Redlist species such as Black-tailed Godwit (NT), Lesser Flamingo (NT), Painted Stork (NT) and Greater Spotted Eagle (VU) were also observed during the study period. Both the study areas show similar habitat namely marshy wetland and grassland. Rapid urbanization as well as other anthropogenic activities are degrading and destroying the terrestrial as well as wetland habitats and are the major threats to birds. Proper monitoring of the same is required for sustainable development. The study highlights on the anthropogenic activities which are destroying these ecosystems and stresses on the need of sustainable utilization of these ecosystems to conserve biodiversity.

Key words: Gogte Saltpan, Viva wetland, Avifauna, Wetland

Introduction

Birds are one of the essential elements of the biodiversity of the planet earth (Kiros *et al.*, 2018). Topographic and climatic heterogeneity makes India a bio-diversely rich country. Avifauna plays an important role in ecosystems (Kushwaha and Kulkarni, 2013; Abie *et al.*, 2019; Vala *et al.*, 2020; Dendup *et al.*, 2021). Urbanization leads to land cover changes, habitat destruction and fragmentation which are one of the major problems for declin-

ing population of birds (Singh *et al.*, 2018; Chen *et al.*, 2021; Lee *et al.*, 2022). According to estimates, the majority of people on earth will reside in urban areas by the year 2050 which raised concern over the future of already reduced diversity (Gatesire *et al.*, 2014).

Wetlands have water table near the surface of the land or are covered by shallow water and hence act as transitional land between aquatic and terrestrial ecosystem. Wetlands are considered to be one of the most productive ecosystems of the world and play S170

various roles such as aquifer recharge, flood control, nutrient absorption and erosion control (Kumar and Gupta, 2009; Luo *et al.*, 2019; Siva and Neelanarayanan, 2021). Present study focuses on the present diversity of birds in the study areas and importance of wetland ecosystems to birds for foraging food, roosting and nesting. Due to anthropogenic activities, these wetlands are declining at a very fast pace. Hence, there is an urgent requirement for sustainable use of these ecosystem resources to conserve the precious habitats for the benefit of mankind and other living species on the earth.

Materials and Methods

The study area Gogte saltpan (19°23'42" N, 72°48'38" E) and Viva wetland (19°27'35" N, 72°47'41" E) are located near Vasai Road and Virar railway station respectively, in the northern part of Mumbai in Palghar district. These are the temporary wetlands and consist of varied habitats in various season which attract resident as well as migratory birds. Both the habitats comprises of shrubland, grassland and small waterbodies which serve as a roosting, feeding and breeding sites for many species of birds. In Gogte, apart from saltpan, there are two water bodies namely Chulne lake and Gass lake. In Viva, local villagers use considerable and surrounding the wetland for cultivation of rice (Khan *et al.*, 2016) while majority of land in Gogte is used as saltpans.

The study was carried out in the month of November 2021 and January 2022 between 7:00 am to 2:00 pm. During the study period three visits were made to both the sites. Line transect and point count



Fig. 1. Study area of Gogte Saltpan (https://ebird.org)

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Fig. 2. Study area of Viva Wetland (https://ebird.org)

methods were employed for documenting bird diversity. Birds were observed and photographed with the help of Nikon action Ex 7x35 binocular and Nikon B600 camera. Field guide Grimmett *et al.* (2016) was used to identify the birds and were further classified into Resident, Resident Migrant and Migrant category using IUCN Red List database and ebird web portal.

Results and Discussion

Observation



Fig. 3. Order wise representation of avifauna of Viva wetland

Discussion

84 species of birds were observed during the survey

Black Kite Re Miltus nigrans Accipitriformes Accipitrifores Accifitriformes <	Sr. No.	Common M Name	igratory/ Non-	Scientific Name	Order	Family	IUCN Status	Viva Wet- land	Gogte Saltpan
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3 burasian Marsh-Harner M. Circle ariginous Accipitridores Accipitr	2	Booted Eagle	M	Hieraaetus pennatus	Accipitriformes	Accipitridae	LC	×	N
4 Creater Spotted Lagle M Clanga Canga Accipitriones Accipitridae IC × v 6 Oriental Honey-buzzard Re Pernis pitlorhynchus Anscriformes Anatidae IC × × 6 Cotton Pygmy-Goose Re Nettapis coronandelianis Anscriformes Anatidae IC × × 7 Indian Spot-billed Duck M Sarkifornis melanotos Anscriformes Anatidae IC × × 8 Knob-billed Duck RM Dendrograps paramica Anscriformes Anatidae IC × × 10 Northern Shoveler M Spatula Cyperta Anscriformes Inandiale IC × × 11 Eurasian Hoopoe RM Lipupa epys Buccrotiformes Jacanidae IC × × 11 Bronze-winged Jacana Re Vanelluis indicus Charadriiformes Jacanidae IC × × 12 Little Ringed Plover RM Chiradrinis indicus Charadriiformes Scolpacidae IC × × 13 Red-wattled Jacana Re Vanelluis indicus Charadriiformes Scolpacidae IC × × 14 Bronze-winged Jacana Re Chilopiduis lubrida Charadriiformes Scolpacidae IC × × 15 Pheasant-tailed Goowit	3	Eurasian Marsh-Harrier	M	Circus aeruginosus	Accipitriformes	Accipitridae	LC	N	N
5 Oriental Honey-buzzard Ke Perms pittorhynchus Accipitritornes Accipitritornes Accipitritornes Anaidae LC v 7 Indian Spot-Billed Duck M Anas poccilorhyncha Anseriformes Anatidae LC v x 8 Knob-Dilled Duck M Brakilonisi melanolos Anseriformes Anatidae LC v x 9 Lesser Whistling-Duck RM Dendrocygna javanica Anseriformes Anatidae LC v x 10 Northern Shoveler M Dendrocygna javanica Anseriformes Anatidae LC v x 12 Little Ringed Plover RM Charadriis dubus Charadriiformes jacanidae LC v x 13 Red-wattled Lapwing Re Matopialius indicus Charadriiformes Jacanidae LC v x 14 Bronze-winged Jacana RM Hydrophasinus Charadriiformes Scolopacidae LC x x 15 Pheasant-tailed Godwit M Linosa linnosa Charadriiformes Scolopacidae LC x x <td>4</td> <td>Greater Spotted Eagle</td> <td>M</td> <td>Clanga clanga</td> <td>Accipitriformes</td> <td>Accipitridae</td> <td>VU</td> <td>N</td> <td>N</td>	4	Greater Spotted Eagle	M	Clanga clanga	Accipitriformes	Accipitridae	VU	N	N
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Table 1. Continued ...

Sr No.	Common I Name	Migratory/ Non- migratory	Scientific Name	Order	Family	IUCN Status land	Viva Wet-	Gogte Saltpan
53	Red-rumped Swallow	RM	Cecropis daurica	Passeriformes	Hirundinidae	LC		×
54	Long-tailed Shrike	Μ	Lanius schach	Passeriformes	Laniidae	LC		×
55	Gray Wagtail	Μ	Motacilla cinerea	Passeriformes	Motacillidae	LC	×	
56	Bluethroat	М	Luscinia svecica	Passeriformes	Muscicapidae	LC		×
57	Oriental Magpie-Robin	n Re	Copsychus saularis	Passeriformes	Muscicapidae	LC		×
58	Siberian Stonechat	М	Saxicola maurus	Passeriformes	Muscicapidae	-		
59	Purple-rumped Sunbin	rd Re	Leptocoma zeylonica	Passeriformes	Nectariniidae	LC		×
60	Indian Golden Oriole	RM	Oriolus kundoo	Passeriformes	Oriolidae	LC	×	
61	House Sparrow	Re	Passer domesticus	Passeriformes	Passeridae	LC		
62	Common Chiffchaff	М	Phylloscopus collybita	Passeriformes	Phylloscopida	e -	×	
63	Red-vented Bulbul	Re	Pycnonotus cafer	Passeriformes	Pycnonotidae	LC		
64	Common Myna	Re	Acridotheres tristis	Passeriformes	Sturnidae	LC		×
65	Indian Pied Starling	Re	Gracupica contra	Passeriformes	Sturnidae	-		
66	Rosy Starling	М	Pastor roseus	Passeriformes	Sturnidae	LC		×
67	Gray Heron	RM	Ardea cinerea	Pelecaniformes	Ardeidae	LC		
68	Great Egret	Re	Ardea alba	Pelecaniformes	Ardeidae	LC		
69	Indian Pond-Heron	Re	Ardeola grayii	Pelecaniformes	Ardeidae	LC		
70	Intermediate Egret	Re	Ardea intermedia	Pelecaniformes	Ardeidae	-		
71	Little Egret	Re	Egretta garzetta	Pelecaniformes	Ardeidae	-		
72	Purple Heron	Re	Ardea purpurea	Pelecaniformes	Ardeidae	LC		
73	Western Reef-Heron	Re	Egretta gularis	Pelecaniformes	Ardeidae	-		
74	Cattle Egret	RM	Bubulcus ibis	Pelecaniformes	Ardeidae	LC		
75	Eurasian Spoonbill	RM	Platalea leucorodia	Pelecaniformes	Threskiorni- thidae	LC	×	\checkmark
76	Glossy Ibis	М	Plegadis falcinellus	Pelecaniformes	Threskiorni- thidae	LC	×	\checkmark
77	Lesser Flamingo	RM	Phoeniconaias minor	Phoenicopteri- formes	Phoenicopte- ridae	NT	×	\checkmark
78	Coppersmith Barbet	Re	Psilopogon haemacephalus	Piciformes	Megalaimidae	LC	×	
79	Eurasian Wryneck	Μ	Jynx torquilla	Piciformes	Picidae	LC		×
80	Indian Cormorant	Re	Phalacrocorax fuscicollis	Suliformes	Phalacrocor- acidae	LC	\checkmark	\checkmark
81	Little cormorant	RM	Microcarbo niger	Suliformes	Phalacrocor- acidae	LC	\checkmark	\checkmark
82	Diurnal raptor sp.	-	Unknown	Unknown	Unknown	-	\checkmark	×
83	Pipit sp.	-	Unknown	Unknown	Unknown	-	×	
84	Swallow sp.	-	Unknown	Unknown	Unknown	-	\checkmark	×

Re- Resident; RM- Resident Migratory; M- Migratory; LC- Least Concern; NT- Near Threatened; VU- Vulnerable; √ - Present; ×- Absent.



Fig. 4. Family wise representation of Avifauna of Viva wetland



Fig. 5. Order wise representation of Avifauna of Gogte saltpan



Fig. 6. Family wise representation of Avifauna of Gogte saltpan

in both the places comprising of 15 orders and 36 families. Order Passeriformes (32%) was dominant followed by Charadriiformes (17%) and Pelecaniformes (12%) while family Scolopacidae (10%) was dominant followed by Ardeidae (10%), Anatidae (6%) and Accipitridae (6%). Both the study areas were dominated by order Passeriformes and family Ardeidae. Viva wetland was recorded with a large number of avian diversities with a count of 65 species while Gogte saltpan had a count of 45 species. Overall, 26 species were found to be migratory bird species, 42 species were resident and 13 species were resident-migratory. IUCN Red List species such as Black-tailed Godwit (NT), Lesser Flamingo (NT), Painted Stork (NT) and Greater Spotted Eagle (Vulnerable) were also observed during the study period.

For functioning of the ecosystem and assessing the biodiversity, habitat quality is of prime importance. Habitat conservation has become an urgent issue due to rapid urbanization (Liu, 2022). Temporal changes, availability of food and roosting sites in both the habitats attract various birds, including migrants. Numerous factors, such as habitat loss, habitat destruction by pollutants and intense anthropogenic pressures reduce quality of terrestrial ecosystem which ultimately affects bird population. During the course of present study, pollutants in the form of sewage discharge and disposal of garbage were recorded. Previous studies by Verkey et al. (2015) and Khan et al. (2016) show high avifaunal diversity in the study area, which has reduced in the present study. This is a clear indication that anthropogenic activities have reduced the breeding, roosting and nesting sites of birds. Identifying and monitoring such biodiverse terrestrial habitat is the need of the hour. Effective laws should also be enforced by concerned authorities to conserve these precious terrestrial habitats.

Wetlands are part of terrestrial ecosystem and are

one of the most productive lands in the world which nurture biodiversity and also have high potential in providing livelihood to human. There is need of preservation and conservation of habitat and birds respectively from various anthropogenic activities such as habitat destruction, poisoning, bird traps etc. There is need for sustainable utilization of these ecosystems to conserve biodiversity and long-term use of produce.

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