



RESEARCH ARTICLE

Avian diversity in and around Bassein Fort and Creek, Dist. Thane, Maharashtra

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Abstract

The Avian diversity in and around Bassein (Vasai) Fort, Dist. Thane, Maharashtra was carried out during February 2004 to March 2012. In the study area various habitats such as marshes, mangroves, tidal flood plains, rocky fort and surrounding forest patches allure rich biodiversity. The present study was aimed to document Avian diversity of Bassein fort and creek. A total of 143 Aves species belonging to 45 families (resident and migratory) were recorded during 9 years of study. Altogether 193 visits were made with two visits per month such as first visit in the first week of the month and second visit in the mid week of the month with alternation of Day (06.00hr-10.00hr) and Night (17.00hr-23.00hr and sometimes 21.00hrs-03.00hr). Red whiskered Bulbul (*Pycnonotus jocosus*), White Breasted Kingfisher (*Halcyon smyrensis*), Blue tailed Bee Eater (*Merops philippinus*), Black kite (*Milvus migrans migrans*), Cattle egret (*Bubulcus ibis*), Common Myna (*Acridotheres tristis*) as diurnal and Barn owl (*Tyto alba*) as nocturnal species were most commonly spotted in the study area. A large number of migratory birds were seen to be visiting the study area in winter season between December to February.

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Introduction

Mumbai (lat 18° 54' to 19° 09' N long 72° 47' to 72° 56' E) one of the major metropolis in India is surrounded with various water bodies such as Thane creek and Mumbai harbor in the south east, Ulhas Estuary and Bassein Creek in the north. Walmiki et al. (2012). The Bassein Fort is situated in Mumbai suburb located on west coast of India. Fort lies on the belt of Thane Creek towards offshore side. Structurally and geographically surrounded by varied habitats the fort is home to wetland birds, urban birds as well as forest dwelling birds. The overall biodiversity value around the Bassein Fort and Creek is so rich that the, Herpetofunal diversity in and around Bassein fort was studied in depth by Walmiki

et al. (2013). The present studies aim to document Avian diversity in and around Bassein Fort. The Fort is a historical monument with rocky structure ideal for predatory birds and most of the reptilian species. It is located (19°19'49"N 72°48'54"E) near to Vasai jetty, spanning in an area of 35 Sq. miles. Surrounding area sustains rich diversity of mangroves. The most dominant species were *Avicennia marina*, some other common species were also noted from this area. Mangrove diversity attracts many water birds in this area the most commonly observed birds were Brown headed gull, Gull billed tern and Cormorants. The fort also shows a characteristic vegetation of trees, climbers, herbs and shrubs viz. Baobab

(*Adansonia digitata*), Acacia coral (*Adenanthera pavonina*), Banyan tree (*Ficus benghalensis*), Pipal tree (*Ficus religiosa*), Rock papal (*Ficus arnottiana*), Mahogany (*Swietenia mahogani*), Indian wild date (*Phoenix sylvestris*), African fan palm (*Borassus flabellifer*), Indian jalap (*Operculina turpethum*), Banana (*Musa paradisiaca*), Nirgundi (*Vitex negundo*), Peanut butter shrub (*Clerodendrum trichotomum*), Bilimbi (*Averrhoa bilimbi*), Rui (*Calotropis gigantea*) and Jamun (*Syzygium cumini*). The near shore fort with adjacent wetland has a good biodiversity. The wetland provides great biodiversity value to such type of habitats. After the introduction of Ramsar conservation Act in 1975, the biodiversity study in the wetland was boosted up.

In 1984 Hussain et.al studied the biodiversity of Chilka Lake at Orissa. Deiva Oswin S. in 1999 studied the Avifaunal diversity of Muthupet mangrove forest. In 2002 Verma et. al reported Preliminary Biodiversity report on Mahul Creek, Mumbai. Nitsure, S.R (2002), studied avifauna of Thane Creek, Quadros, G (2001) reported 55 species of birds in Thane Creek, Berde et al.(2005) have reported 32 species of wetland birds at Bhatye Estuary at Ratnagiri. In 2006 Natarajan Ezhilarasi and Lalitha Vijayan reported the birds of Chidiyatapu biological park, South Andaman. Kosambe and Wadatkar in 2007 studied the biodiversity of birds at Pohara-Malkhed reserve forest, Amravati, Maharashtra. In 2008 Bhat et. al has reported Avifaunal diversity on Anekere wetland, Karkara, Karnataka.

Table. 1 Diversity, status and habitat preference of Avifauna in and around Bassein fort

No.	Common Name	Family	Scientific Name	Status	Category	IUCN Status	Habitat
1	Osprey	Pandionidae	<i>Pandion haliaetus</i>	UN	WM	Least Concern	Pl, Fw
2	Black kite	Accipitridae	<i>Milvus migrans migrans</i>	C	R	Least Concern	Hh,Mc
3	Oriental honey buzzard	Accipitridae	<i>Pernis ptilorhyncus</i>	UN	PM	Least Concern	Sd,Gr
4	Brahminy Kite	Accipitridae	<i>Haliaastur indus</i>	C	LM	Least Concern	Hh,Mc
5	Eurasian Marsh Harrier	Accipitridae	<i>Circus aeruginosus</i>	C	WM	Least Concern	Mg,Sw,Fw
6	White Bellied Sea Eagle	Accipitridae	<i>Haliaeetus leucogaster</i>	S	LM	Least Concern	Pl
7	Greater spotted Eagle	Accipitridae	<i>Aquila clanga</i>	S	WM	Vulnerable C2a(ii)	Ag,Te
8	Shikra	Accipitridae	<i>Accipiter badius</i>	UN	LM	Least Concern	Ag,Mg
9	Steppe Eagle	Accipitridae	<i>Aquila nipalensis</i>	S	WM	Least Concern	Tc,Sd
10	Booted Eagle	Accipitridae	<i>Hieraaetus pennatus</i>	S	WM	Least Concern	Se,Sd
11	White-rumped Vulture	Accipitridae	<i>Gyps bengalensis</i>	S	R	Critically Endangered A2bce+4bce	Se, Sd
12	Peregrine Falcon	Falconidae	<i>Falco peregrines</i>	UN	WM	Least Concern	Ag,Sd
13	Cattle Egret	Ardeidae	<i>Bubulcus ibis</i>	C	R	Least Concern	Fw,Ag
14	Greater Egret	Ardeidae	<i>Cosmerodius albus</i>	C	R	Least Concern	Fw,Mg
15	Little Egret	Ardeidae	<i>Egretta garzetta</i>	C	R	Least Concern	Mg,Fw
16	Western Reef Egret	Ardeidae	<i>Egretta gularis</i>	C	R	Least Concern	Pl,Mg
17	Intermediate Egret	Ardeidae	<i>Mesophoyx intermedia</i>	C	R	Least Concern	Mg,Fw
18	Grey Heron	Ardeidae	<i>Ardea cinerea</i>	UN	LM	Least Concern	Mg,Fw
19	Purple Heron	Ardeidae	<i>Ardea purpurea</i>	S	LM	Least Concern	Mg,Fw
20	Indian Pond Heron	Ardeidae	<i>Ardeola grayii</i>	C	R	Least Concern	Fw
21	Little Heron	Ardeidae	<i>Butorides striata</i>	UN	LM	Least Concern	Pl,Mg

22	Cinnamon Bittern	Ardeidae	<i>Ixobrychus cinnamomeus</i>	S	R	Least Concern	Sw,Mg
23	Black Crowned Night Heron	Ardeidae	<i>Nycticorax nycticorax</i>	UN	R	Least Concern	Fw
24	Greater Flamingo	Phoenicopteridae	<i>Phoenicopterus ruber</i>	C	WM	Least Concern	Sw,Mg
25	Lesser Flamingo	Phoenicopteridae	<i>Phoeniconaias minor</i>	C	WM	Near Threatened	Sw,Mg
26	Little Cormorant	Phalacrocoracidae	<i>Phalacrocorax niger</i>	C	R	Least Concern	Fw
27	Indian Cormorant	Phalacrocoracidae	<i>Phalacrocorax fuscicollis</i>	UN	R	Least Concern	Pl,Fw
28	Glossy Ibis	Threskiornithidae	<i>Plegadis falcinellus</i>	S	LM	Least Concern	Sw,Ag
29	Oriental White Ibis	Threskiornithidae	<i>Threskiornis melanocephalus</i>	C	LM	Near Threatened	Sw,Ag
30	Eurasian Spoonbill	Threskiornithidae	<i>Platalea leucorodia</i>	UN	LM	Least Concern	Sw,Fw
31	Painted Stork	Ciconiidae	<i>Mycteria leucocephala</i>	UN	LM	Near Threatened	Sw,Fw
32	Asian Openbill Stork	Ciconiidae	<i>Anastomus oscitans</i>	UN	LM	Least Concern	Sw,Md
33	Woly Neck Stork	Ciconiidae	<i>Ciconia episcopus</i>	UN	LM	Least Concern	Sw,Fw
34	Rosy Starling	Sturnidae	<i>Sturnus roseus</i>	UN	WM	Least Concern	Tc,Ag
35	Asian Pied starling	Sturnidae	<i>Sturnus contra</i>	UN	LM	Least Concern	Sw,Ag
36	Common Myna	Sturnidae	<i>Acridotheres tristis</i>	C	R	Least Concern	Gr,Hh
37	Brahminy Starling	Sturnidae	<i>Sturnus pagodarum</i>	C	LM	Least Concern	Ag,Hh
38	Dusky Martine	Hirundinidae	<i>Hirundo concolor</i>	C	LM	Least Concern	Mc,Hh
39	Barn Swallow	Hirundinidae	<i>Hirundo rustica</i>	C	WM	Least Concern	Sw,Ag
40	Wire Tailed Swallow	Hirundinidae	<i>Hirundo smithii</i>	UN	LM	Least Concern	Md,Fw
41	Red Rumped swallow	Hirundinidae	<i>Hirundo daurica</i>	C	LM	Least Concern	Md,Tc
42	Red Whiskered Bulbul	Pycnonotidae	<i>Pycnonotus jocosus</i>	C	R	Least Concern	Sd,Ag
43	Red Vented Bulbul	Pycnonotidae	<i>Pycnonotus cafer</i>	C	R	Least Concern	Gr,Hh
44	White Eared Bulbul	Pycnonotidae	<i>Pycnonotus leucotis</i>	UN	R	Least Concern	Mg,Ag
45	Gray Wagtail	Motacillidae	<i>Motacilla cinerea</i>	UN	LM	Least Concern	Fw,Sw
46	Citrine Wagtail	Motacillidae	<i>Motacilla citreola</i>	UN	WM	Least Concern	Md,Sw
47	Yellow Wagtail	Motacillidae	<i>Motacilla flava</i>	UN	WM	Least Concern	Md,Sw
48	Paddyfield Pipit	Motacillidae	<i>Anthus rufulus</i>	C	WM	Least Concern	Ag,Gr
49	Baya Weaver	Ploceidae	<i>Ploceus philippinus</i>	UN	R	Least Concern	Ag,Tc
50	House Sparrow	Passeridae	<i>Passer domesticus</i>	C	R	Least Concern	Hh,Ag
51	Scaly Breasted Munia	Estrildinae	<i>Lonchura punctulata</i>	UN	R	Least Concern	Tg,Ag
52	Black headed Munia	Estrildinae	<i>Lonchura malacca</i>	UN	WM	Least Concern	

53	Red Avadavat	Estrildinae	<i>Amandava amandava</i>	S	R	Least Concern	Mg,Sw
54	Zitting Cisticola	Cisticolidae	<i>Cisticola juncidis</i>	UN	R	Least Concern	Mg,Ag
55	Ashy Prinia	Cisticolidae	<i>Prinia socialis</i>	C	R	Least Concern	Tc,Hh
56	Plain Prinia	Cisticolidae	<i>Prinia inornata</i>	UN	R	Least Concern	Tc,Hh
57	Blyth's Reed Warbler	Sylviidae	<i>Acrocephalus dumetorum</i>	C	WM	Least Concern	Ag,Sd
58	Clamorous Reed Warbler	Sylviidae	<i>Acrocephalus stentoreus</i>	UN	WM	Least Concern	Ag,Gr
59	Common Tailor Bird	Sylviidae	<i>Orthotomus sutorius</i>	C	R	Least Concern	Ag,Hh
60	Common Chiffchaff	Sylviidae	<i>Phylloscopus collybita</i>	S	WM	Least Concern	Ag,Se
61	Pale-billed Flower Picker	Dicaeidae	<i>Dicaeum erythrorhynchos</i>	C	R	Least Concern	Sd,Ag
62	Crimson-backed Sunbird	Nectariniidae	<i>Leptocoma minima</i>	S	R	Least Concern	Ag, Sd
63	Purple Rumped Sunbird	Nectariniidae	<i>Nectarinia zeylonica</i>	C	R	Least Concern	Ag,Gr
64	Purple Sunbird	Nectariniidae	<i>Nectarinia asiatica</i>	UN	R	Least Concern	Se,Sd
65	Common Rose Finch	Fringillidae	<i>Carpodacus erythrinus</i>	S	WM	Least Concern	Ag,Gl
66	Lesser Whistling Duck	Anatidae	<i>Dendrocygna javanica</i>	UN	LM	Least Concern	Mg,Fw
67	Garganey	Anatidae	<i>Anas querquedula</i>	S	WM	Least Concern	Mg,Fw
68	Copper Smith Barbet	Ramphastidae	<i>Megalaima haemacephala</i>	C	R	Least Concern	Sd,Se
69	Brown-headed Barbet	Ramphastidae	<i>Megalaima zeylanica</i>	UN	R	Least Concern	
70	Common Hoopoe	Upupidae	<i>Upupa epops</i>	UN	LM	Least Concern	Se,Sd
71	Indian Roller	Caraciidae	<i>Coracias benghalensis</i>	S	PM	Least Concern	Ag,Sd
72	Lesser Pied Kingfisher	Alcedinidae	<i>Ceryle rudis</i>	S	LM	Least Concern	Fw,Md
73	Common Kingfisher	Alcedinidae	<i>Alcedo atthis</i>	UN	LM	Least Concern	Mg,Fw
74	White Breasted Kingfisher	Alcedinidae	<i>Halcyon smyrnensis</i>	C	R	Least Concern	Ag,Fw
75	Black Caped Kingfisher	Alcedinidae	<i>Halcyon pileata</i>	S	WM	Least Concern	Mg
76	Green Bea Eater	Meropidae	<i>Merops orientalis</i>	C	LM	Least Concern	Se,Tc
77	Blue Tailed Bee Eater	Meropidae	<i>Merops philippinus</i>	UN	LM	Least Concern	Sd,Se
78	Common Hawk Cuckoo	Cuculidae	<i>Clamator jacobinus</i>	S	LM	Least Concern	Gr,Se
79	Asian Koel	Cuculidae	<i>Eudynamis scolopaceus</i>	C	R	Least Concern	Gr,Th
80	Greater Coucal	Cuculidae	<i>Centropus sinensis</i>	C	R	Least Concern	Tc,Se
81	Alexandrine Parakeet	Psittacidae	<i>Psittacula eupatria</i>	C	R	Least Concern	Gr,Se
82	Rose Ringed Parakeet	Psittacidae	<i>Psittacula krameri</i>	C	R	Least Concern	Gr,Se

83	Rock Pigeon	Columbidae	<i>Columba livia</i>	C	R	Least Concern	Mc,Th
84	Laughing Dove	Columbidae	<i>Stigmatopelia senegalensis</i>	S	R	Least Concern	Ag,Th
85	Spotted Dove	Columbidae	<i>Stigmatopelia chinensis</i>	UN	LM	Least Concern	Ag,Gr
86	White Breasted Water Hen	Family – Rallidae	<i>Amaurornis phoenicurus</i>	UN	R	Least Concern	Mg,Sw
87	Ruddy Breasted Crane	Rallidae	<i>Porzana fusca</i>	S	LM	Least Concern	Mg,Sw
88	Common Snipe	Scolopacidae	<i>Gallinago gallinago</i>	S	MM	Least Concern	Mg,Sw
89	Bar-tailed Godwit	Scolopacidae	<i>Limosa lapponica</i>	S	WM	Least Concern	Mg,Fw
90	Black tailed Godwit	Scolopacidae	<i>Limosa limosa</i>	C	WM	Near Threatened	Mg,Fw
91	Whimbrel	Scolopacidae	<i>Numenius phaeopus</i>	UN	WM	Least Concern	Sw,Pl
92	Eurasian Curlew	Scolopacidae	<i>Numenius arquata</i>	C	WM	Near Threatened	Mg,Pl
93	Common Red Shank	Scolopacidae	<i>Tringa tetanus</i>	C	WM	Least Concern	Mg,Sw
94	Spotted red Shank	Scolopacidae	<i>Tringa erythropus</i>	UN	WM	Least Concern	Mg,Sw
95	Green Sand Piper	Scolopacidae	<i>Tringa ochropus</i>	UN	WM	Least Concern	SW,Mg
96	Common Sand Piper	Scolopacidae	<i>Actitis hypoleucos</i>	C	WM	Least Concern	Fw,Mg
97	Wood Sandpiper	Scolopacidae	<i>Tringa glareola</i>	UN	WM	Least Concern	Sw,Mg
98	Terek Sandpiper	Scolopacidae	<i>Xenus cinereus</i>	S	WM	Least Concern	Sw,Mg
99	Broad billed Sandpiper	Scolopacidae	<i>Limicola falcinellus</i>	UN	WM	Least Concern	Sw,Mg
100	Curlew sandpiper	Scolopacidae	<i>Calidris ferruginea</i>	C	WM	Least Concern	Sw,Mg
101	Little Stint	Scolopacidae	<i>Calidris minuta</i>	C	WM	Least Concern	Sw,Mg
102	Temminthes Stint	Scolopacidae	<i>Calidris temminckii</i>	C	WM	Least Concern	Sw,Mg
103	Dunlin	Scolopacidae	<i>Calidris alpine</i>	S	WM	Least Concern	Sw,Mg
104	Ruff	Scolopacidae	<i>Philomachus pugnax</i>	UN	WM	Least Concern	Sw,Mg
105	Black Winged Stilt	Rescurvirostridae	<i>Himantopus himantopus</i>	C	WM	Least Concern	Sw,Mg
106	Pied Avocet	Rescurvirostridae	<i>Recurvirostra avosetta</i>	S	WM	Least Concern	Sw,Mg
107	Pacific Golden Plover	Charadriidae	<i>Pluvialis fulva</i>	S	WM	Least Concern	Sw,Mg
108	Grey Plover	Charadriidae	<i>Pluvialis squatarola</i>	UN	WM	Least Concern	Sw,Mg
109	Little Ringed Plover	Charadriidae	<i>Charadrius dubius</i>	C	WM	Least Concern	Mg,Sw
110	Crab Plover	Dromadidae	<i>Dromas ardeola</i>	S	WM	Least Concern	Mg,Sw
111	Greater Sand Plover	Charadriidae	<i>Charadrius leschenaultia</i>	C	WM	Least Concern	Mg,Sw
112	Kentich Plover	Charadriidae	<i>Charadrius alexandrines</i>	S	WM	Least Concern	Mg,Sw
113	Lesser Sand Plover	Charadriidae	<i>Charadrius mongolus</i>	C	WM	Least Concern	Mg,Sw
114	Red Wattled	Charadriidae	<i>Vanellus indicus</i>	C	R	Least Concern	Ag,Sw

	lapwing						
115	Yellow Legged Gull	Laridae	<i>Larus cachinnans</i>	C	WM	Least Concern	Sw,Pl
116	Pallas's Gull	Laridae	<i>Larus ichthyaetus</i>	S	WM	Least Concern	Pl,Sw
117	Brown Headed Gull	Laridae	<i>Larus brunnicephalus</i>	C	WM	Least Concern	Pl,Sw
118	Black Headed Gull	Laridae	<i>Larus ridibundus</i>	C	WM	Least Concern	Pl,Sw
119	Heuglin's Gull	Laridae	<i>Larus heuglini</i>	C	WM	Least concern	Sw,Pl
120	Slender Billed Gull	Laridae	<i>Larus genei</i>	C	WM	Least Concern	Pl,Sw
121	Long Tailed shrike	Laniidae	<i>Lanius schach</i>	UN	WM	Least Concern	Ag,Tc
122	House Crow	Corvidae	<i>Corvus splendens</i>	C	R	Least Concern	Gr,Th
123	Large billed Crow	Corvidae	<i>Corvus macrorhynchos</i>	C	R	Least Concern	Gr,Th
124	Eurasian golden Oriole	Oriolidae	<i>Oriolus oriolus</i>	UN	WM	Least Concern	Gr,Se
125	Black Hooded Oriole	Oriolidae	<i>Oriolus xanthornus</i>	S	WM	Least concern	Gr,Se
126	White throated fantail	Rhipiduriade	<i>Rhipidura albicollis</i>	UN	R	Least Concern	Gr,Se
127	Black Drongo	Dicruridae	<i>Dicrurus macrocercus</i>	UN	LM	Least Concern	Gr,Th
128	White Bellied Drongo	Dicruridae	<i>Dicrurus caerulescens</i>	S	LM	Least Concern	Se,Sd
129	Asian Paradise Flycatcher	Monarchidae	<i>Terpsiphone paradise</i>	S	WM	Least Concern	Gr,Sd
130	Black Naped Monarch FlyCatcher	Monarchidae	<i>Hypothymis azurea</i>	S	LM	Least Concern	Gr,Sd
131	Oriental Magpie Robin	Muscicapidae	<i>Copsychus saularis</i>	C	R	Least Concern	Gr,Ag
132	Indian Robin	Muscicapidae	<i>Saxicoloides fulicatus</i>	UN	LM	Least Concern	Ag,Sd
133	Gull Billed Tern	Sternidae	<i>Gelochelidon nilotica</i>	C	WM	Least Concern	Pl,Fw
134	Common Tern	Laridae	<i>Sterna hirundo</i>	S	WM	Least Concern	Pl,Sw
135	Caspian Tern	Laridae	<i>Sterna caspia</i>	UN	WM	Least Concern	Pl,Sw
136	Lesser Crested Tern	Laridae	<i>Sterna bengalensis</i>	S	WM	Least Concern	Pl,Sw
137	Whiskered Tern	Laridae	<i>Chlidonias hybrid</i>	C	WM	Least Concern	Pl,Sw
138	Lesser Frigate Bird	Fregatidae	<i>Fregata ariel</i>	S	MM	Least Concern	Pl
139	House Swift	Apodidae	<i>Apus affinis</i>	C	R	Least Concern	Mc,Hh
140	Barn Owl	Tytonidae	<i>Tyto alba</i>	C	R	Least Concern	Mc,Hh
141	Brown Fish Owl	Strigidae	<i>Ketupa zeylonensis</i>	S	R	Least Concern	Mg,Fw
142	Indian Rock Owl	Strigidae	<i>Bubo bubo bengalensis</i>	S	R	Least Concern	Mc,Sd
143	Oriental Scops Owl	Strigidae	<i>Otus scops</i>	UN	R	Least Concern	Ag,Hh

Common(C), Uncommon (UN) and Scarce (S)

Habitat: Pelagic- Pl, Mudflat- Md, Swamps- Sw, Freshwater bodies- Fw, Mangroves-Mg, Semievergreen Forest- Sd, Mountains- Mc, Grooves- Gr, Savannah- Sv, Agricultural- Ag, Human habitation- Hh, Thorny country- Tc, Grassland- Gl

Materials and Methods:

The Avian diversity was studied in and around Bassein fort, in different months for the period of 9 years with 193 visits i.e 2 visits per month such as first visit in the first week of the month and second visit in the mid week of the month with alternation of Day (06.00hr-10.00hr) and Night (17.00hr-23.00hr and sometimes 21.00hrs-03.00hr). The Avifauna was observed using binoculars (8x40) and a spotting scope (100x30-90), by direct spotting and counting method. The various habitats were studied for different types of birds. The observed birds were identified by using Pocket Guide to Birds of the Indian Subcontinent (Richard Grimmett, 2006), the book of Indian Birds (Dr. Salim Ali, 2002), Birds of Western ghats, konkan and Malabar (Satish Pande, 2003) and the methodology used from Counting birds in India: Methodologies and trends (A.J.Urfi et.al., Current science, 2005) The status of the birds as Common (C), Uncommon (UN), and Scarce (S) is based on the frequency of spotting.

The status of the birds was classified as,
R – Resident: The species found throughout the year.

M – Migrants or Migratory species, which is again subcategorized as follows

Winter migratory - (WM), Monsoon migratory - (MM), Local migratory - (LM) and Passage migratory - (PM).

Fig 1. Map locating the Bassein (Vasai) Fort and adjacent Bassein (Vasai) Creek.

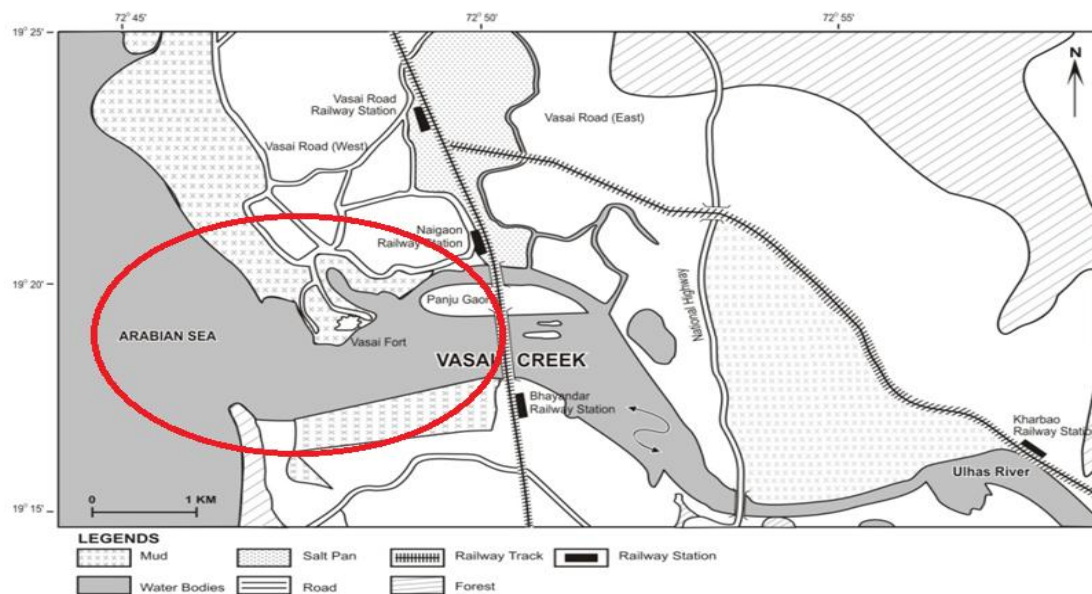


Fig 2. Bassein Fort and mouth of Vasai Creek.

Observations:

The continuous study and observation led to record 143 birds belonging to 44 families as check listed in Table 1.

The most commonly sighted bird during night time in the fort area was the Barn Owl, the appropriate climatic and habitat conditions in the fort was very much suitable for Owl species. Some other species of owls were also spotted in the area whereas, Oriental scop owl was observed occasionally. Brown fish owl and Eagle owl which were rarely spotted, since 2007 they had never been observed again. 11 species of raptors (Accipiteridae) were observed in and around Bassein fort of which *Gyps bengalensis* was the rarest of rare bird spotted only once on 2nd March 2005 at 13hrs. Also in March 2005 few tourists had also spotted *Gyps bengalensis* since then it has never been observed again in studied area.

Red whiskered bulbul was the most commonly spotted bird. Some other species of bulbul viz. red Vented bulbul and White eared bulbul were also spotted. Large number of migratory birds visits the creek area in different seasons. The most common amongst them were brown headed gull they migrate to this area for feeding purpose. Yellow headed gull, Pallas gull and Black headed gull were also spotted. A large number of raptors were also recorded. Brahminy kite, Black kite and Eurasian marsh harrier were common. Some rare species in this area viz. Oriental honey buzzard, White bellied sea eagle and Steppe eagle. Western reef egret, Cattle egret, Little egret, Indian pond heron, Little cormorant are easily spotted in study area. Some rare species like Grey heron, Purple heron, Cinnamon bittern were also spotted in the study area.

Availability of food and climatic conditions being similar to Sewri Creek Flamingoes also migrate to the study area during December to March (WM). Common kingfisher, White breasted kingfisher were spotted in all seasons in the study area, Black caped kingfisher was only spotted in the month of February. Asian pied starling, Common myna, Red vented bulbul, Citrine wagtail, Ashy prinia, House crow, Crow pheasant, Coppersmith barbet, Purple rumped sunbird, Common sandpiper and House swift were commonly spotted in the study area. Nesting of Baya weaver was also seen in fort area. Some uncommon and winter migratory birds were also spotted in the study area viz. Rosy starling, Wire tail swallow, Yellow wagtail, Scaly breasted munia, Paddy field pipit, Plain prinia, Blue tailed bee eater, Whimbrel, Black winged stilt, Indian Roller and Ashy billed drongo. Rare birds like Glossy ibis, Eurasian spoonbill, Red avadavat, Common chiffchaff, Common rose finch, Common hawk cuckoo, Laughing Dove, Pied avocet, Common Snipe, Asian paradise flycatcher and Common tern were also spotted in this area in different seasons.

A total of 143 bird species was recorded in the study area, of which 66% were migratory (22% LM, 41% WM, 1% PM and 2% MM) and 34% were residing species (Figure 2). The Richest family observed with maximum number of species was Scolopacidae with 17 species (12%), Ardeidae with 11 species (8%), Accipitridae with 10 species (7%) and 25 other families representing least number of species with 1%.

Table 2. Species distribution in their respective families

Sr.No	Family	Total Nos of Species	Percentage
1	Scolopacidae	17	12%
2	Ardeidae	11	8%
3	Accipitridae	10	7%
4	Charadriidae	9	6%
5	Laridae	6	4%
6	Passeridae	6	4%
7	Sternini	5	3%
8	Hirundinidae	4	3%
9	Nectariniidae	4	3%
10	Sturnidae	4	3%
11	Sylviidae	4	3%
12	Tytoninae	4	3%
13	Ciconiidae	3	2%
14	Cisticolidae	3	2%
15	Columbidae	3	2%
16	Decurinae	3	2%
17	Estrildinae	3	2%
18	Pycnonotidae	3	2%
19	Threskiornithidae	3	2%
20	Alcedinidae	2	1%
21	Corvidae	2	1%
22	Cuculidae	2	1%
23	Halcyonidae	2	1%
24	Megalaimidae	2	1%
25	Meropidae	2	1%
26	Monarchini	2	1%
27	Muscicapidae	2	1%
28	Oriolini	2	1%
29	Phalacrocoracidae	2	1%
30	Phoenicopteridae	2	1%
31	Psittacidae	2	1%
32	Rallidae	2	1%
33	Anatidae	1	1%
34	Apodidae	1	1%
35	Caraciidae	1	1%
36	Centropodidae	1	1%
37	Dendrocygndiae	1	1%
38	Falconidae	1	1%
39	Fregatidae	1	1%

40	Fringillidae	1	1%
41	Laniidae	1	1%
42	Pandionidae	1	1%
43	Rescurvirostridae	1	1%
44	Upupidae	1	1%

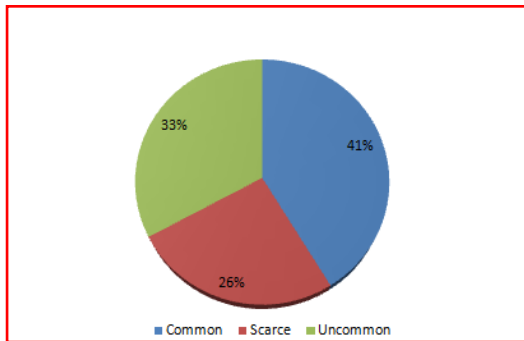


Fig 3. Pie- diagram representing status of Avian diversity in and around Bassien fort viz Common(C), Uncommon (UN) and Scarce(S)

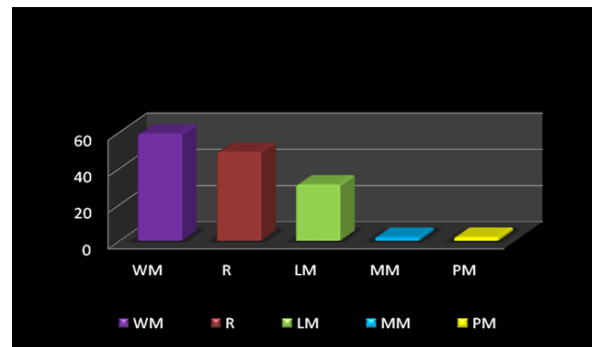


Fig 4. Migratory and Residential Status of Avian diversity in the study area. WM- Winter Migratory, R- Residential, LM- Local Migratory, MM- Monsoon Migratory, PM- Passage Migratory.



Fig 5. Brown-headed Gull



Fig 6. Crab Plover



Fig 7. Wood Sandpiper



Fig 8. Lesser Flamingo feeding at Bassien Creek



Fig 9: Western Reef Egret



Fig 10. Black capped Kingfisher



Fig 11. Coppersmith Barbet



Fig 12. Great Thick-knee



Fig 13. Ruddy turnstone



Fig 14. Tailor bird



Fig 15. Pied Avocet



Fig 16. Grey Heron



Fig 17. Yellow-legged Gull

Conclusion and Suggestion:

The total number of birds (143 species) suggests a good healthy condition in the study area. The fort and the surrounding area support rich avian diversity 3% of Near threatened (n=5), 1% of Critical endangered species (n=1), 1% of Vulnerable (n=1) and 95% of Least concern species (n=136). The diversity in this area is not very much influenced by anthropogenic activities in the surrounding area but the increasing anthropogenic are of great concern considering the future existence of these species.

Large number of migratory and residing birds recorded, are indicative of good breeding and feeding conditions in Bassien fort with creek. A large number of winter and local migratory birds also visit this area during winter season (December to February).

By considering these facts, the birds are the bio-monitors of healthy and diversified condition of the area there is a need for awareness in coastal community towards conservation of such diverse avifauna and its importance with respect to coastal

ecosystem and this area should be declared as Ramsar site.

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