

A PRELIMINARY REPORT ON THE BIODIVERSITY OF MAHUL CREEK, MUMBAI, INDIA WITH SPECIAL REFERENCE TO AVIFAUNA

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ABSTRACT

A preliminary faunal survey, with emphasis on avifauna, was carried out during July 2001-December 2002 in the Mahul Creek and its environs along the Arabian Sea coast. Various habitat types such as tidal flood plains, mangroves, marshes, saltpans, crop fields and plantations attract rich biodiversity. A total of 149 species of birds, seven mammals, 10 reptiles, 10 fish, 28 butterflies, five crabs, 15 molluscs and two species of polychaetes were identified. The tidal flood plains all along the creek attract more than 20,000 waterbirds every year making the area more appropriate to be declared a Ramsar site. The area, being prohibited for public, is free from human disturbance to a large extent and therefore forms a large roosting site for flamingos, gulls and other small waders. However, the factors influencing the survival of fauna and flora in this creek include chemical pollution and oil spillage.

KEYWORDS

Faunal diversity, Mahul Creek, preliminary survey, waterbirds

Thane and Mahul creeks are the two major creeks on the east coast of Mumbai. The former, stretching about 26km from Trombay, extends till Thane and the latter, about 10km, extends upto Sewri. All along the creeks are mudflats and mangrove forests. Biodiversity and physiochemistry of Thane Creek has been studied in depth (Patil *et al.*, 2002; Quadros & Athalye 2002; Borkar *et al.*, 2002), while negligible work has been carried out on the Mahul Creek ecosystem (Samant, 2002; Verma *et al.*, 2002). The present study aims to document biodiversity of Mahul Creek and to focus light on myriad of bird species and large congregation of migratory and resident water birds which use the area both as a stopover and as a wintering ground.

STUDY AREA

Mahul Creek (19°01'N & 72°53'E) lying on the east coast of Mumbai along the Arabian sea, is situated in Chembur suburb in the northeastern corner of Mumbai about 15km from Victoria Terminus (Fig. 1). The temperature of the area ranges between 13°C and 39°C. The southwest monsoon (June to mid-October) brings rain to the area which is recorded to be maximum (747mm) during July. The climate is humid and relative humidity ranges between 29 and 96% (recorded at 0830hr). The study area extends over 10km² including Mahul and Tata Jetty till Sewri mudflats. The environs (c. 3km²) include reclaimed sites, fodder crop field, barren land and saltpans. Dominant vegetation in the study area recorded were mangroves, viz., *Avicennia marina*. The other mangrove species identified were *A. alba*, *A. officinalis*, *Rizophora mucronata*, *Bruguiera cylindrica*. The areas off sea are inundated at spring tides only and the

characteristic vegetations here are *Acanthus ilicifolius*, *Derris uliginosa*, *Sesuvium portulacastrum*, *Clerodendrum inerme*, *Salsola fruticosa*, *Pluchia arguta*, *Typha angustata*, *Lagera aurita*, *Aeluropus purpuria*, *Fimbristylis ferruginea*, *Salvadora persica*, *Excoecaria agallocha* and *Thespesia populnea*.

The environs include reclaimed sites where grasses, especially *Paspalum* sp., *Paspalidium* sp. and *Panicum* sp., are grown as fodder crop. The barren land has bushes, thickets of scattered grasses and plantation of *Casuarina equisetifolia* (c. 10m high). Saltpans spread over 1km², where migratory shorebirds arrive in mass congregation before saltworks start in December.

METHODOLOGY

Mammalian fauna was recorded by direct sightings. Birds were monitored 200m either side of a fixed road transect of ca. 3km weekly from July 2001 to December 2002 using binoculars (8x30) and telescope (20x). Intensive surveys in the potential habitats and mist netting of the birds were also attempted so as to cover as many number of bird species occurring in the area. The nomenclature used for bird species follows Manakadan & Pittie (2002). Benthos, especially marine annelids (polychaetes), molluscs and crustacea (crabs, prawns, shrimps) were collected by sieving mud samples with 0.5-mm sieve (Sutherland, 1996) and animals like barnacles were collected from tree barks and rock-stones. Fish were trapped in nets and were also collected from fishermen. In addition to direct observations, net sweeping was carried out for collecting insects for identification.

RESULTS

Both invertebrates and vertebrates were studied. Among invertebrates were marine annelids, molluscs and arthropods (crustaceans, insects). Vertebrates included fish, reptiles, birds and mammals.

Invertebrates

Marine Annelids (Benthic polychaetes): Two species of polychaetes which were commonly seen here being fed upon by small waders, were collected from the upper 5-10cm of mangrove sediments in the intertidal zone of the creek. They were *Lycastis indica* and *L. ouanaryensis*.

Molluscs: Molluscs recorded included 15 species of the orders Gastropoda (8), Bivalvia (5) and Pulmonata (2). They were *Telescopium telescopium*, *Nerita crepidularia*, *Potamides cingulatus*, *Thais carinifera*, *Melampus sinaporensis*, *M.*

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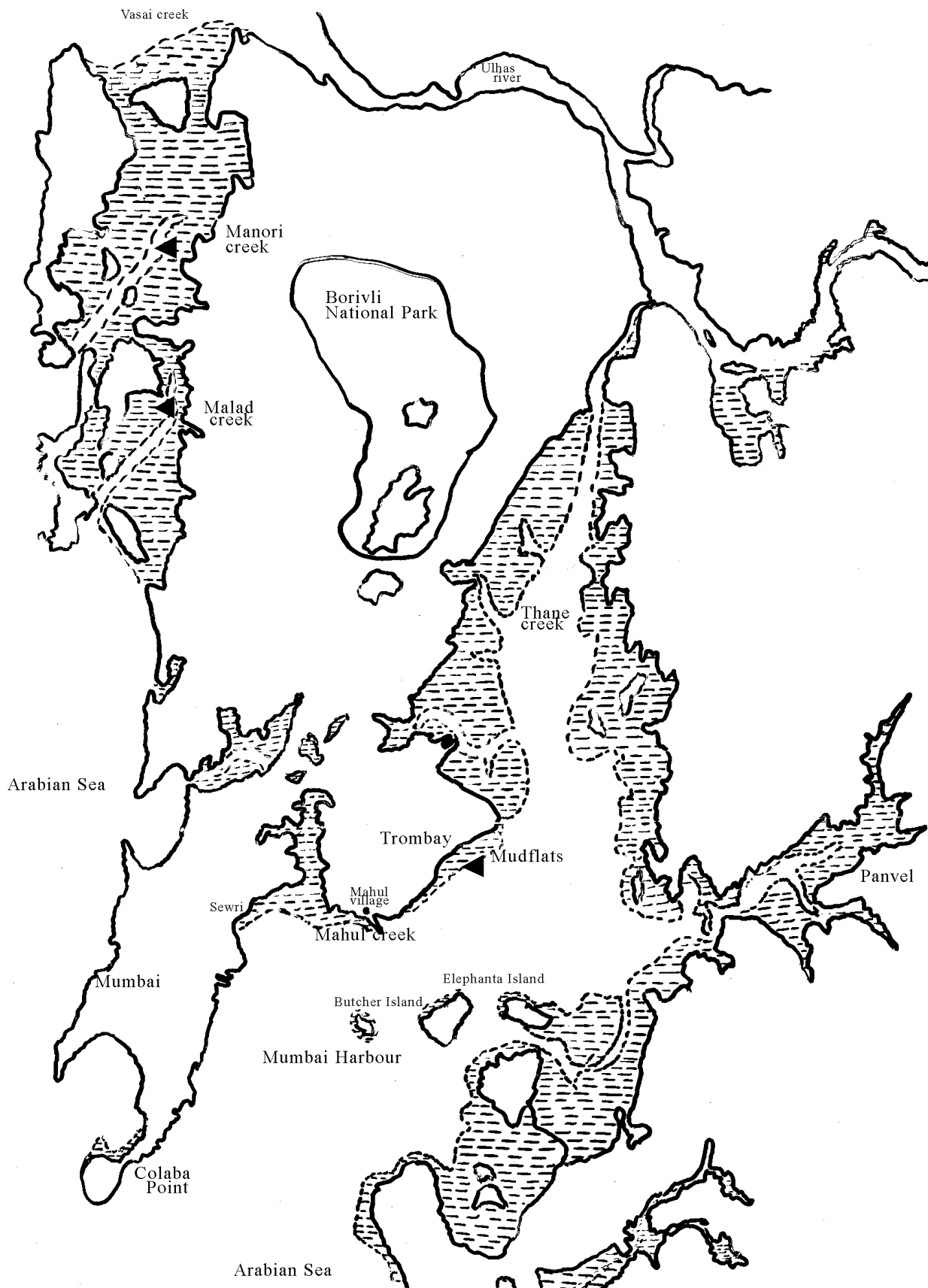


Figure 1. Map of Mumbai and its surrounding showing various creeks

fasciatus, *Littorina intermediata*, *Ellobium auris-jude*, *Anadara granosa*, *Dosinia prostata*, *Angulus sinuate*, *Crossosterus* sp., *Cuspidaria* sp., *Onchedium* sp., *Simperula maculata*. *Potamides cingulatus* was recorded as a common mollusc and were abundant during monsoon season.

Crustaceans: Crustaceans recorded were barnacles *Belanus* sp., crabs, prawns and shrimps (*Penaeus* sp., *Metapenaeus* sp., *Macrobrachium* sp.). Crabs were the most conspicuous among all crustaceans; five species representing four genera could be identified in the mangroves, which included *Scylla serrata* (Swimming Crab), *Uca vocans*, *Uca rosea* (Fiddler Crab), *Varuna litterata* (Swimming Crab), and *Sesarma* sp. Crabs of the genera *Sesarma* and *Uca* were very common. High mortality of *Sesarma* sp. (Leaf-eating Crab) was recorded near the nullah containing industrial effluents.

Insects: A rich insect fauna was identified. Insects recorded from the study area comprised butterflies, lacewings, moths, mealy bugs, flies, wasps, beetles, grasshoppers and dragonflies. Butterflies were studied in detail. A total of 28 species of butterflies were identified belonging to five families (Table 1). Tailed Jay *Graphium agamemnon*, Plain Tiger *Danaus chrysippus*, Common Emigrant *Catopsilia pomona*, Psyche *Leptosia nina*, Small Salmon Arab *Colotis amata*, Common Grass Yellow *Eurema hecabe*, Grey Pansy *Junonia atlites* and Common Castor *Ariadne merione* were commonly sighted in the mangroves, whereas Evening Brown *Melanitis* sp. was only observed for a short period in winter here. Except anecdotal observations no detailed studies have been made on insect fauna of mangroves so far.

Vertebrates

Fish: Seven species of fishes were recorded from the mangrove and the adjacent water bodies. They were Indian Tarpon *Megalops* sp, Guppy *Guppy poecila*, Catfish *Clarius* sp., Tilapia *Oreochromis mossambicus*, Mullet *Mugil cephalus*, Mud-skipper *Boleophthalmus bodderti*, *B. dussumieri*, and Eel *Anguilla* sp. Mud-skipper were common in the mangroves till December.

Reptiles: Reptiles recorded include snakes (7 species), lizards (1 species) and skinks (2 species). Snake species recorded were Common Kukri *Oligodon arnensis*, Common Krait *Bungarus caeruleus*, Dog-faced Water Snake *Cerberus rhyncops*, Common Indian Cobra *Naja naja*, Russel's Viper *Daboia russelli*, Common Green Vine Snake *Ahaetulla nasuta* and Common Rat Snake *Ptyas mucosus*. Except the Dog-faced Water Snake all other snakes were seen on the periphery of the creek in the dry habitat. The only species of lizard identified from dry areas bordering the mangroves was Common Garden Lizard *Calotes versicolor*. Two species of skinks recorded were Forest Skink *Mabuya macularia* and Common Skink *Mabuya carinata*.

Birds: Large number of migratory birds from as far as Arctic circle visited the area to winter here. They stayed till as late as March, however, most of them had left by January itself. There

Table 1. List of butterflies recorded at BPCL land and its environs

Common name	Scientific name	Status	Site
Papilionoidea			
Common Rose	<i>Pachliopta aristolochiae</i>	UC	M
Crimson Rose	<i>Pachliopta hector</i>	UC	M
Common Mormon	<i>Papilio polytes</i>	UC	A
Lime Butterfly	<i>Papilio demoleus</i>	UC	A
Tailed Jay	<i>Graphium agamemnon</i>	C	M
Common Blue Bottle	<i>Graphium sarpedon</i>	UC	A
Pieridae			
Common Emigrant	<i>Catopsilia pomona</i>	C	MA
Psyche	<i>Leptosia nina</i>	C	MG
Common Grass Yellow	<i>Eurema hecabe</i>	C	MG
Small Salmon Arab	<i>Colotis amata</i>	C	MA
Common Wonderer	<i>Pareronia valeria</i>	UC	M
Common Jezebell	<i>Delias eucharis</i>	UC	M
Nymphalidae			
Great Egg fly	<i>Hypolimnas bolina</i>	UC	A
Danaid Eggfly	<i>Hypolimnas misippus</i>	UC	A
Evening Brown	<i>Melanitis</i> sp.	S	MA
Common Crow	<i>Euploea core</i>	C	A
Plain Tiger	<i>Danaus chrysippus</i>	C	M
Striped Tiger	<i>Danaus genutia</i>	UC	A
Peacock Pansy	<i>Junonia almana</i>	UC	A
Grey Pansy	<i>Junonia atlites</i>	C	M
Common Castor	<i>Ariadne merione</i>	C	MA
Lycaenidae			
Pale Grass blue	<i>Pseudoizeeria maha</i>	C	MG
Common Cerulean	<i>Jamides celeno</i>	G	G
Gram Blue	<i>Euchrysops cnejus</i>	C	G
Striped Pierrot	<i>Tarucus nara</i>	UC	MG
Angled Sunbeam	<i>Curetis dentata</i>	UC	M
Hesperiidae			
Chestnut Bob	<i>Imbrix salsala</i>	UC	M
Plain Banded Owl	<i>Hasora vitta</i>	UC	A

*M - Mangroves; G - grasses; A - associate land; MA - mangrove and its associate land; MG - mangroves and its associate grasses; C - common; UC - uncommon; S - seasonal

was a seasonal movement of local birds also. The study area acts as staging, wintering and roosting ground for a large number of migratory bird species. It was identified as a big roosting site for flamingos (c. 5,000), gulls (c. 3,000), terns (c. 2,000), and waders (c. 10,000). The present study recorded a total of 149 species of birds belonging to 14 orders and 35 families. Maximum species belonged to the order Passeriformes followed by Charadriiformes (Table 2). However, of the number of individuals recorded of Charadriiformes was more. Of the 79 globally threatened bird species (BirdLife International 2001), Critically Endangered birds like White-backed Vulture, Endangered bird like Spotted Green Shank and Vulnerable birds like Greater Spotted Eagle, Imperial Eagle and Spoon-billed Sandpiper were sighted (Table 2). The marshes and salt pans adjoining the creek served as stopovers for ducks, which arrived after monsoon (Sept.-Oct.) when they were filled with rain and tidal waters having low salinity. Birds like Brown Shrike, Kestrel and White-cheeked Bulbul stayed in the mangrove patches during winter. Rosy starlings arrived late of all migrants in November and again in January to feed especially on the ripened fruits of the *Salvadora persica*. Marsh Harrier *Circus aeruginosus* and Greater Spotted Eagle *Aquila clanga* were sighted throughout the winter holding territories while other

raptors stayed for a shorter duration or were on passage migration further south.

Mammals: Seven species of mammals, both large and small were recorded here. They were Jackal *Canis aureus*, Wild Boar *Sus scrofa*, Common Mongoose *Herpestes edwardsi*, Small Indian Mongoose *Herpestes auropunctatus*, Bandicoot Rat *Bandicota indica*, Indian Mole-Rat *Bandicota bengalensis* and Bat *Pipistrellus* sp.

CONCLUSION AND RECOMMENDATIONS

The number and types of species of wildlife a habitat supports indicate its health. Mahul Creek supports a rich biodiversity evidenced by this preliminary study. Large congregation of shorebirds both migratory and local migratory such as sandpipers, plovers, stints, shanks, curlews, terns, gulls and flamingos are indicators of good habitat. The area not only serves as a wintering ground but also as a staging ground. The area is a large roost of flamingos, gulls, terns and small waders. During periods of adverse conditions such as drought in the breeding ground the creek serves as life saviour for flamingos - a local migrant from Kutch region, Gujarat.

About 8% of industries in the country are located around Mumbai and Thane Creek is among one of the recipients of a variety of wastes (Zingade, 2002) is connected to Mahul Creek. The Mahul Creek itself receives lot of organic sewage, effluents from oil refineries, nuclear wastes from Bhabha Atomic Research Centre (BARC), and wastes from Rashtriya Chemical Fertilizers (RCF). There is an urgent need for a detailed study to understand the impact of all this on the area's flora and fauna. Other threats include excessive fishing, bird poaching, and mangrove woodcutting affecting biodiversity adversely in the area. Land-filling (reclamation) is taking place at a rapid rate and about 68ha have been reclaimed within the Coastal Regulation Zone since 1990 to meet the various demands of increasing human population (Samant, 2002).

Recommendations

- 1) The area supports globally threatened avifauna and a large concentration of migratory and resident water birds and therefore should be declared as a Ramsar Site.
- 2) Birds are one of the bio-monitors of the health of environment therefore a detail study should be attempted on the migratory pattern of the birds, impact of developmental activities on their population and survival of birds. Understanding the needs of the birds at the wintering ground is important which affects their reproductive success at the breeding ground.
- 3) Scientific studies should be taken up to collect baseline information on the microbial fauna, phytoplankton and zooplankton. Their abundance, probably due to excessive sewage released here, attract large gatherings of flamingos, especially Lesser flamingos, which feed on algae and diatoms primarily. Similarly information on benthos which are the prey base for large number of migratory shore birds and other fauna, is lacking.
- 4) The impact of effluents from oil refineries, nuclear power

plants, and electric thermal power plants on the marine animals should be studied.

5) Certain areas along the creek can be managed as tourist spots and as environmental education centres along with the involvement of local community. Environmental awareness programme among the locals should be started for the conservation of biodiversity of the Mahul Creek. The area can be declared as a center for shore birds study, and also as an interpretation centre to create awareness about wildlife importance to the public.

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Table 2. List of bird species recorded in the BPCL mangroves and its environs during 2001-2002

Common name	Scientific name	Habitat types	Pop. status	Seasonalstatus
Phalacrocoracidae				
1. Little Cormorant	<i>Phalacrocorax niger</i>	Open water bodies	C	RM
2. Large Cormorant	<i>Phalacrocorax carbo</i>	Open water bodies	C	RM
Anhingidae				
3. Darter****	<i>Anhinga rufa</i>	Aquatic grasses, Marshes	R	RM
Ardeidae				
4. Little Egret	<i>Egretta garzetta</i>	Crops	MC	R
5. Western Reef-Egret	<i>Egretta gularis</i>	Creeks	C	RM
6. Grey Heron	<i>Ardea cinerea</i>	Creeks, marshes	C	RM
7. Purple Heron	<i>Ardea purpurea</i>	Aquatic grass	MC	R
8. Large Egret	<i>Ardea alba</i>	Marshes, Saltpan	C	RM
9. Median Egret	<i>Egretta intermedia</i>	Mangroves, Saltpan, marshes	C	RM
10. Cattle Egret	<i>Bubulcus ibis</i>	Crops, Aquatic grass, Marsh	VC	RM
11. Indian Pond-Heron	<i>Ardeola grayii</i>	Mangroves, saltpan, marsh, Aquatic grass	VC	R
12. Little Green Heron	<i>Butorides striatus</i>	Mangroves, Marsh	R	R
13. Black-crowned Night Heron	<i>Nycticorax nycticora</i>	Marsh	R	R
14. Black Bittern	<i>Ixobrychus flavicollis</i>	Mangroves, Marsh	MC	RM
Ciconiidae				
15. Asian Openbill-Stork	<i>Anastomus oscitans</i>	Aquatic grass, Marshes	R	R
Threskiornithidae				
16. Glossy Ibis	<i>Plegadis falcinellus</i>	Aquatic grass, Marshes	MC	RM
17. Oriental White Ibis	<i>Threskiornis melanocephalus</i>	Aquatic grass, Creeks, Mangroves	MC	R
Phoenicopteridae				
18. Greater Flamingo	<i>Phoenicopterus roseus</i>	Creeks, Saltpans	C	RM
19. Lesser Flamingo****	<i>Phoeniconaias minor</i>	Creek, Saltpan	VC	RM
Anatidae				
20. Comb Duck	<i>Sarkidiornis melanotos</i>	Saltpans	R	R
21. Spotbilled Duck	<i>Anas poecilorhycha</i>	Mangroves, Marshes	MC	RM
22. Northern Pintail	<i>Anas acuta</i>	Saltpans, Open water bodies	MC	M
23. Common Teal	<i>Anas crecca</i>	Saltpan, Openwater body	MC	M
Accipitridae				
24. Oriental Honey-Buzzard	<i>Pernis ptilorhynchus</i>	Mangroves	MC	RM
25. Black-shouldered Kite	<i>Elanus caeruleus</i>	Mangroves	R	R
26. Black Kite	<i>Milvus migrans</i>	Mangroves, Marshes, Saltpans	VC	R
27. Brahminy Kite	<i>Haliastur Indus</i>	Mangroves, Marshes, Saltpans	C	R
28. Indian White-backed Vulture*	<i>Gyps bengalensis</i>	Over mangroves	R	R
29. Western Marsh Harrier	<i>Circus aeruginosus</i>	Mangroves, Crops, Aquatic grasses, Marshes, Saltpans	C	M
30. Shikra	<i>Accipiter badius</i>	Woodland, Mangroves	MC	R
31. White-eyed Buzzard	<i>Butastur teesa</i>	Mangroves, Open fields, Woodland	MC	R
32. Long-legged Buzzard	<i>Buteo rufinus</i>	Mangroves, Open fields	R	RM
33. Greater Spotted Eagle***	<i>Aquila clanga</i>	Mangroves	C	RM
34. Steppe Eagle	<i>Aquila rapax</i>	Mangroves, Open fields	MC	M
35. Eastern Imperial Eagle***	<i>Aquila heliaca</i>	Mangroves, Open fields	R	RM
36. Booted Eagle	<i>Hieraaetus pennatus</i>	Mangroves, Open fields	MC	RM
Pandionidae				
37. Osprey	<i>Pandion haliaetus</i>	Creeks	MC	RM
Falconidae				
38. Common Kestrel	<i>Falco tinnunculus</i>	Mangroves	MC	RM
39. Eurasian Hobby	<i>Falco subbuteo</i>	Mangroves	MC	M ?
40. Laggar Falcon	<i>Falco juggar</i>	Mangroves	MC	?
Rallidae				
41. Blue-breasted Rail	<i>Gallirallus striatus</i>	Mangroves, Marshes	C	R
42. Water Rail	<i>Rallus aquaticus</i>	Mangroves, Marshes	MC	RM
43. White-breasted Waterhen	<i>Amauromis phoenicurus</i>	Mangroves	C	R
44. Ruddy-breasted Crake	<i>Porzana fusca</i>	Mangroves	MC	R
45. Common Coot	<i>Fulica atra</i>	Open water body	MC	RM
Rostratulidae				
46. Painted Snipe	<i>Rostratula benghalensis</i>	Mangroves	MC	R
Charadriidae				
47. Little Ringed Plover	<i>Charadrius dubius</i>	Marsh, Saltpans, Creeks	VC	RM
48. Kentish Plover	<i>Charadrius alexandrinus</i>	Marsh, Saltpan, Creek	MC	RM
49. Lesser Sand Plover	<i>Charadrius mongolus</i>	Marsh, Saltpan, Creek	C	RM
50. Redwattled Lapwing	<i>Vanellus indicus</i>	Marsh, Mangrove, Saltpans	C	R
51. White-tailed Lapwing	<i>Vanellus leucurus</i>	Along water bodies	MC	M
Scolopacidae				
52. Common Snipe	<i>Gallinago gallinago</i>	Marsh, Mangroves	C	M

Common name	Scientific name	Habitat types	Pop. status	Seasonalstatus
53. Black-tailed Godwit	<i>Limosa limosa</i>	Marsh, Saltpan, Creek	C	M
54. Whimbrel	<i>Numenius phaeopus</i>	Marsh, Saltpan, Creek	C	M
55. Eurasian Curlew	<i>Numenius arquata</i>	Saltpan, Creek	C	M
56. Spotted Redshank	<i>Tringa erythropus</i>	Marsh, Saltpan, Creek	C	M
57. Common Redshank	<i>Tringa tetanus</i>	Marsh, Saltpan, Creek	VC	RM
58. Marsh Sandpiper	<i>Tringa stagnatilis</i>	Marsh, Saltpan, Creek	VC	M
59. Common Greenshank	<i>Tringa nebularia</i>	Marsh, Saltpan, Creek	C	M
60. Nordmann's Greenshank**	<i>Tringa guttifer</i>	Creek	R	M
61. Green Sandpiper	<i>Tringa ochropus</i>	Marsh, Aquatic grasses	MC	M
62. Wood Sandpiper	<i>Tringa glareola</i>	Marsh, Saltpan, Creek	C	M
63. Terek Sandpiper	<i>Tringa terek</i>	Creek	MC	M
64. Common Sandpiper	<i>Tringa hypoleucos</i>	Marsh, Saltpan, Creek, Aquatic grasses	VC	RM
65. Spoon-billed Sandpiper***	<i>Calidris pygmeus</i>	Creeks	R	M
66. Little Stint	<i>Calidris minuta</i>	Marsh, Saltpan, Creek	VC	M
67. Temminck's Stint	<i>Calidris temminckii</i>	Marsh, Saltpan, Creek	C	M
68. Curlew Sandpiper	<i>Calidris testacea</i>	Creek	MC	M
69. Ruff	<i>Philomachus pugnax</i>	Marsh	MC	M
Recurvirostridae				
70. Blackwinged Stilt	<i>Himantopus himantopus</i>	Marsh, Saltpan, Creek	VC	R
71. Pied Avocet	<i>Recurvirostra avosetta</i>	Open waterbody	MC	RM
Glareolidae				
72. Small Pratincole	<i>Glareola lactea</i>	Mangroves, Marsh	MC	R?
Laridae				
73. Heuglin's Gull	<i>Larus heuglini</i>	Marsh, Saltpan, Creek	C	M?
74. Yellow-legged Gull	<i>Larus cachinnans</i>	Marsh, Saltpan, Creek	VC	M?
75. Brown-headed Gull	<i>Larus brunnicephalus</i>	Marsh, Saltpan, Creek	C	RM
76. Black-headed Gull	<i>Larus ridibundus</i>	Marsh, Saltpan, Creek	C	M
77. Gull-billed Tern	<i>Gelochelidon nilotica</i>	Marsh, Saltpan, Creek	VC	RM
78. Caspian Tern	<i>Hydroprogne caspia</i>	Creek	C	RM
79. Little Tern	<i>Sterna albifrons</i>	Marsh, Saltpan	C	R/LM
80. Black-bellied Tern****	<i>Sterna acuticauda</i>	Marsh, Saltpan	MC	?
81. Whiskered Tern	<i>Chlidonias hybridus</i>	Marsh, Saltpan	C	RM
Columbidae				
82. Blue Rock Pigeon	<i>Columba livia</i>	Woodland	C	R
83. Spotted Dove	<i>Streptopelia chinensis</i>	Mangroves, Woodland	MC	R
84. Eurasian Collared-Dove	<i>Streptopelia decaocta</i>	Woodland, Mangroves	C	R
Psittacidae				
85. Rose-ringed Parakeet	<i>Psittacula krameri</i>	Woodland	C	R
86. Blossom-headed Parakeet	<i>Psittacula roseata</i>	Woodland	MC	LM?
Cuculidae				
87. Pied Crested Cuckoo	<i>Clamator jacobinus</i>	Woodland, Mangroves	MC	RM
88. Small Cuckoo	<i>Cuculus poliocephalus</i>	Mangroves, Woodland	MC	RM
89. Asian Koel	<i>Eudynamys scolopacea</i>	Mangroves, Woodland	C	R
90. Greater Coucal	<i>Centropus sinensis</i>	Mangroves	C	R
Tytonidae				
91. Barn Owl	<i>Tyto alba</i>	Plantation	MC	R
Strigidae				
92. Spotted Owlet	<i>Athene brama</i>	Plantation	C	R
Apodidae				
93. Asian Palm-Swift	<i>Cypsiurus balasiensis</i>	Mangroves, Plantation	VC	R
Alcedinidae				
94. Small Blue Kingfisher	<i>Alcedo atthis</i>	Along water bodies	MC	R
95. White-breasted Kingfisher	<i>Halcyon smyrnensis</i>	Along water bodies	C	R
Meropidae				
96. Small Bee-eater	<i>Merops orientalis</i>	Plantation	C	R/LM
Coraciidae				
97. Indian Roller	<i>Coracias benghalensis</i>	Crops, Plantation	C	R
Upupidae				
98. Common Hoopoe	<i>Upupa epops</i>	Mangrove, grass	MC	RM
Capitonidae				
99. Coppersmith Barbet	<i>Megalaima haemacephala</i>	Plantation	MC	R
Alaudidae				
100. Eastern Skylark	<i>Alauda gulgula</i>	Grasses	MC	R
Hirundinidae				
101. Common Swallow	<i>Hirundo rustica</i>	Salt pans, Along Nullah, Mangroves	C	RM
102. Wire-tailed Swallow	<i>Hirundo smithii</i>	Salt pans, Along nullah, Mangrove	MC	LM?

Common name	Scientific name	Habitat types	Pop. status	Seasonalstatus
Motacillidae				
103. White Wagtail	<i>Motacilla alba</i>	Aquatic grasses, Near water bodies	C	RM
104. Large Pied Wagtail	<i>Motacilla maderaspatensis</i>	Aquatic grasses, Saltpans, Dry area	C	LM
105. Citrine Wagtail	<i>Motacilla citreola</i>	Aquatic grasses, Near water bodies	VC	M
106. Yellow Wagtail	<i>Motacilla flava</i>	Aquatic grasses, Near water bodies	VC	RM
107. Grey Wagtail	<i>Motacilla cinerea</i>	Grass near water	C	M
108. Paddyfield Pipit	<i>Anthus rufulus</i>	Grass near water	VC	R
109. Tawny Pipit	<i>Anthus campestris</i>	Grass	C	LM?
Pycnonotidae				
110. Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>	Mangroves	C	R
111. White-eared Bulbul	<i>Pycnonotus leucotis</i>	Mangroves	C	R
112. Red-vented Bulbul	<i>Pycnonotus cafer</i>	Mangroves	MC	R
Irenidae				
113. Common Iora	<i>Aegithina tiphia</i>	Mangroves	MC	R
Laniidae				
114. Brown Shrike	<i>Lanius cristatus</i>	Mangroves	C	M
115. Rufous-backed Shrike	<i>Lanius schch</i>	Mangroves	C	R
Turdidae				
116. Bluethroat	<i>Luscinia svecica</i>	Mangroves, Grasses	MC	M
117. Oriental Magpie-Robin	<i>Copsychus saularis</i>	Mangroves	C	R
118. Indian Robin	<i>Saxicoloides fulicata</i>	Bushes	C	R
119. Common Stone Chat	<i>Saxicola torquata</i>	Mangroves, grass	MC	RM
120. Pied Bush Chat	<i>Saxicola caprata</i>	Mangroves, grass	MC	R
Timaliidae				
121. Common Babbler	<i>Turdoides caudatus</i>	Mangroves	MC	R
122. Striated Babbler	<i>Turdoides earlei</i>	Mangroves	C	R
Sylviidae				
123. Streaked Fantail-Warber	<i>Cisticola juncidis</i>	Grass	C	R
124. Ashy Warbler	<i>Prinia socialis</i>	Mangroves, Grass	C	R
125. Plain Warbler	<i>Prinia subflava</i>	Grass, Mangroves	VC	R
126. Blyth's Reed Warbler	<i>Acrocephalus dumetorum</i>	Mangroves	MC	RM
127. Indian Great Reed- Warbler	<i>Acrocephalus stentoreus</i>	Mangroves	C	R
128. Common Tailorbird	<i>Orthotomus sutorius</i>	Mangroves	MC	R
129. Common Chiffchaff	<i>Phylloscopus collybita</i>	Woodland, Mangroves	MC	M
130. Common Lesser Whitethroat	<i>Sylvia curucca</i>	Woodland, Mangroves	MC	M
Rhipidurinae				
131. White-throated Fantail-Flycatcher	<i>Rhipidura albicollis</i>	Mangroves	C	R
Nectarinidae				
132. Purple-rumped Sunbird	<i>Nectarinia zeylonica</i>	Woodland, Mangroves	MC	R
133. Purple Sunbird	<i>Nectarinia asiatica</i>	Woodland, Mangroves	C	R
Estrildidae				
134. Red Munia	<i>Amandava amandava</i>	Mangroves, Woodland	C	R
135. White-throated Munia	<i>Lonchura malabarica</i>	Mangroves, Woodland	MC	R
136. Spotted Munia	<i>Lonchura punctulata</i>	Woodland	C	R
137. Black-headed Munia	<i>Lonchura Malacca</i>	Woodland	MC	R
Passeridae				
138. House Sparrow	<i>Passer domesticus</i>	Mangroves, woodland	C	R
139. Yellow-throated Sparrow	<i>Petronia xanthocollis</i>	Woodland	MC	R
Ploceidae				
140. Baya Weaver	<i>Ploceus philippinus</i>	Mangroves	MC	R
Sturnidae				
141. Grey-headed Starling	<i>Strunus malabaricus</i>	Woodland	MC	R
142. Brahminy Starling	<i>Stumus pagodarum</i>	Woodland	C	R
143. Rosy Starling	<i>Stumus roseus</i>	Mangroves, woodland	VC	M
144. Asian Pied Starling	<i>Stumus contra</i>	Grass, woodland	C	R
145. Common Myna	<i>Acridotheres tristis</i>	Grass, woodland, Mangroves	C	R
Oriolidae				
146. Eurasian Golden Oriole	<i>Oriolus oriolus</i>	Woodland	MC	RM
Dicruridae				
147. Black Drongo	<i>Dicrurus macrocercus</i>	Grass, woodland	C	R
Corvidae				
148. House Crow	<i>Corvus splendens</i>	Mangroves, woodland, grass	VC	R
149. Jungle Crow	<i>Corvus macrorhynchos</i>	Mangroves, woodland	MC	R

Critically endangered *, Endangered **, Vulnerable ***, Near threatened****; VC - Very common, C - Common, MC - Moderately common, R - Rare; M - Migrant, R - Resident, RM - Resident/Migran

