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Abundance of Coastal Birds at the coast of Bhavnagar, Gulf of Khambhat

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ABSTRACT

The lists of globally threatened bird species or of species of conservation concern in individual continents, countries or regions are based largely on information on population size. In addition, surveys can be used to collect information on where birds are in relation to different habitats, and so assess habitat associations. Bhavnagar district is in Saurashtra region also known as Kathiawad, a part of Gujarat. The present study was conducted to know the status of coastal bird diversity on the coastal area of Bhavnagar during August 2009 to May 2010. The arrival of Coastal migratory birds starts, in late August and by October most of the winter, migratory bird has found arrived in Bhavnagar. We selected six different sites on the coast of Bhavnagar for the present study, each site has unique characteristic and they differ from each other. Total 31 Families are abundant on the coast of Bhavnagar.

KEYWORDS: bird species, ecosystems, Bhavnagar, migratory bird

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INTRODUCTION

The lists of globally threatened bird species (BirdLife International 2000) or of species of conservation concern in individual continents, countries or regions (Carter *et al.* 2000; Gregory *et al.* 2002; www.partnersinflight.org)¹, are based largely on information on population size. In addition, surveys can be used to collect information on where birds are in relation to different habitats, and to assess habitat associations.

Seabirds and coastal birds are an integral part of marine and coastal ecosystems, usually as predators at the top of the food chain. They link into ecosystems at a number of trophic levels (Tasker and Reid 1997)². For instance gulls, ducks and waders play an important role in the mass and energy fluxes of food webs, as well as in food web control (Moreira 1997; Eybert *et al.* 2003)³.

Seabirds have been regarded as good indicators of contaminants (Becker 1989), but they may also be potential indicators of other aspects of the marine environment (Furness and Camphuysen 1997; Article III)⁴. In addition, seabirds and coastal birds may provide means to monitor changes at lower trophic levels.

MATERIAL AND METHOD

To study the seasonal population fluctuations of birds on Bhavnagar coast, monthly census was conducted. For the study of present work, one year observations were recorded during August' 2009 to May' 2010. The observations of birds were made with the help of a pair Binocular (8x40), the birds were observed from a safe distance to prevent the disturbance. The birds in flight were not included in the counts and care was taken to avoid overlapping of bird count. Direct count method was adopted to record the abundance of each species (Bibby, *et al.*, 1992)⁵. The identification of birds was carried out with the help of standard field guide (Ali. S., S.D. Ripley. (1983), Ali. S. (2002), Grimmett. And Inskipp, (1998). For the further confirmation, particularly in case of waders, the help of experienced bird watcher was taken. Scientific nomenclature and local names was adopted according to Parasharya, *et al.*, (2004)⁶.

AIM

To know the status of Coastal birds at the few coastal area of Bhavnagar District.

STUDY AREA

Bhavnagar district is in Saurashtra region also known as Kathiawad, a part of Gujarat. Bhavnagar District is situated at latitudes 20°41' to 20°25'N and longitudes 69°5' to 70°25'E. Bhavnagar is located on the eastern parts of Saurashtra with north-south length of 352 km and east-west breadth of 264 km with an area of 35,200 sq. km.

Bhavnagar has long coastal area lies on Gulf of Khambhat. Bhavnagar is climatically semi arid having three distinct seasons viz. winter, summer, and monsoon (June to September).Coastline of Bhavnagar is 156 km long. Bhavnagar has long coastal wetlands, which are economically suitable for water fowls. The coastline of Bhavnagar is muddy and rocky.

Bhavnagar city is well known for its Painted Stork (*Mycteria leucocephala*) and other Ciconiforms nesting colonies. The *Victoria Park* and *Gauri Shankar Lake (Bortalav)* are the other famous birding places in the city.

For the present study we select total 5 sites of coastal area i.e., Gadhula, Alalng-Sosiya (as disturbed area), Mithiviradi (Proposed atomic power station site), Hathab, Ghogha (proposed fairy service), and Kumbharvada (IBA site). The all the selected sites have their unique characteristic.

RESULT AND DISCUSSION

The present study was conducted to know the status of coastal bird diversity on the coastal area of Bhavnagar during August 2009 to May 2010. The arrival of Coastal migratory birds starts, in late August and by October most of the winter, migratory birds have found arrived in Bhavnagar. We selected six different sites on the coast of Bhavnagar for the present study, each site has unique characteristic and they differ from each other. Total 31 Families are abundant on the coast of Bhavnagar.

The coastline of Bhavnagar is 156 km Long and has Sandy shore line and muddy intertidal zone with some rocky patches. They provide a good habitat for intertidal diversity.

Gadhula

Gadhula is a small fishing village, situated on 66 km southward from Bhavnagar district. Near about 800m away a Shetrunji delta forms mudflat which provides good habitat, quite long and undisturbed area for shore birds. Mudflats are rich with nutrients with eroding material and diversity especially small fishes, crabs, and mudskippers. During the study period total 56 Coastal bird species were recorded from 17 families. Total 11.09 sq. km. area was covered during the study. Out of total 56 bird species, 35 species were migratory while 21 species were residential. Large flock of Greater Flamingo, Lesser Flamingo with juvenile, and Pied Avocet were observed.

Mithiviradi

Mithiviradi is 46.2 km southward from Bhavnagar City. Govt. of India planning to establish atomic power station at the coast of *Mithiviradi*. The intertidal area of *Mithiviradi* is muddy with some sandy patches. The world famous Alang-Recycling Yard situated just 13 km away from *Mithiviradi*. Garbage and oil pollution from Alang-Sosiya recycling yard stranded over the coast of *Mithiviradi*. But the coastal area attracted 65 Coastal birds species from 18 families. Total 2.36 sq. Km. Area covered during study. Out of 65 bird species 39 species are migratory while 26 species are residential. Blue Cheeked Bee-eater, flocks of (name the plovers) Plovers and Gulls were observed during their winter migration.

Hathab

Hathab is 27 km southward from Bhavnagar city. Compare to other places it is a quite undisturbed area with long sandy shore and muddy intertidal zone with sandy patches. The nearest palace is NishkalankMahadev just 6.9 km away from Hathab bungalow. It is a famous worship place for local people. During a local fair tonnes of plastic pollution added on the coast of Hathab and Nishkalank. The coastal area attracted 67 Coastal birds species from 19 families. Total 3.90 sq. km area was covered during the study. Out of 67 bird species, 39 species area migratory while 28 were residential. Large flock of Lesser Flamingo and Greater Flamingo with juvenile were observed during the study period.

Ghogha

Ghogha is 17 km Southward from Bhavnagar city. It is a proposed side for *RO-RO* ferry service. Dense Mangrove plants were observed on the coast of Ghogha. Intertidal zone is muddy and rocky. The famous Modest Infrastructure Ltd. Is situated on the coast of Ghogha. The mangrove habitat attracts 33 Coastal birds species from 15 families. Out of 33 birds species 12 species were migratory while 21 were residential. Total 0.56 sq. km area was covered during study period. The coastal area of Ghogha is quite disturbed from fishing boats and transportation boats and construction activities.

Kumbharwada Salt Pans

Kumbharwada Salt Pans is 5.6 km northward from Bhavnagar city. It is the most productive wetland of Bhavnagar city. The site's having many different habitats that is Submerge grass part, Saltpan area, Muddy land, Semi-muddy and dry area. The salt pans provides good habitat for waders. The largest number of birds observed at Kumbharwada salt pans. Total 71 bird species from 27

families were observed during the study period. Out of them 33 bird species were migratory while 38 bird species were residential. Total 0.31 sq. km area was covered during the study. A large amount of Lesser Flamingo (More than 5000), Greater Flamingo (approximately 5000) with Juvenile, Pied Avocet, Ruddy shell duck and other were observed. The area of salt pans is highly disturbed with continuous movement of cattle, plying of trucks and movement of people, even though a large number of birds were observed.

CONCLUSSION

The coastal area of Bhavnagar is muddy and rocky and sandy coastline. All sites except Alang have excellent avian diversity. The migratory birds on the coast of Bhavnagarspent their migration period without any disturbance. Mithiviradi, Hathab, Ghogha and Gadhulawere found quite undisturbed area with muddy intertidal zone while, Kumbharvada salt pan have some disturbance of vehicles because of transport of salts, but the diversity of birds was excellent. Alang was found to be highly disturbed area and due to very high disturbance level thebird sighting was rare.

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Table No 1: Checklist of Birds Observed at Study Sites of Bhavnagar Coast.

No.	English Name	Scientific Name	Gadhula	Mithivirdi	Hathab	Ghogha	Kumbhar vada	Alang
1	Great Crested Grebe	<i>Podiceps cristatus</i>	-	-	-	-	+	-
2	Little Grebe	<i>Tachybaptus ruficollis</i>	-	-	-	-	+	-
3	Great White Pelican	<i>Pelecanus onocrotalus</i>	+	-	-	-	+	-
4	Dalmatian Pelican	<i>Pelecanus crispus</i>	+	+	+	+	+	-
5	Indian Shag	<i>Phalacrocorax fuscicollis</i>	+	+	+	+	+	-
6	Little Cormorant	<i>Phalacrocorax niger</i>	+	+	+	+	+	-
7	Grey Heron	<i>Ardeacinerea</i>	+	+	+	+	+	-
8	Purple Heron	<i>Ardeapurpurea</i>	+	+	+	+	+	-
9	Indian Pond Heron	<i>Ardeolagrayii</i>	+	+	+	+	+	-
10	Cattle Egret	<i>Bubulcus ibis</i>	-	+	+	+	+	-
11	Large Egret	<i>Casmerodius albus</i>	+	+	+	+	+	-
12	Median Egret	<i>Mesophoyx intermedia</i>	+	+	+	+	+	-
13	Little Egret	<i>Egretta garzetta</i>	+	+	+	+	+	-
14	Western Reef Egret	<i>Egretta alularis</i>	+	+	+	+	+	-
15	Painted Stork	<i>Mycteria leucocephala</i>	+	+	+	+	+	-
16	Oriental White Ibis	<i>Threskiornis melanoleuca</i>	+	+	+	+	+	-
17	Black Ibis	<i>Pseudibis papillosa</i>	+	+	+	+	+	-
18	Glossy Ibis	<i>Plegadis falcinellus</i>	+	+	+	+	+	-
19	Eurasian Spoonbill	<i>Platalea leucorodia</i>	+	+	+	+	+	-
20	Greater Flamingo	<i>Phoenicopterus ruber</i>	+	+	+	-	+	-
21	Lesser Flamingo	<i>Phoenicopterus minor</i>	+	+	+	-	+	-
22	Lesser Whistling Teal	<i>Dendrocygna javanica</i>	-	-	-	-	+	-
23	Brahminy Shelduck	<i>Tadorna ferruginea</i>	-	-	-	-	+	-
24	Northern Pintail	<i>Anas acuta</i>	-	-	-	-	+	-
25	Spot-billed Duck	<i>Anas poecilorhyncha</i>	-	-	-	-	+	-
26	Gadwall	<i>Anas strepera</i>	-	-	-	-	+	-
27	Eurasian Wigeon	<i>Anas penelope</i>	-	-	-	-	+	-
No.	English Name	Scientific Name	Gadhula	Mithivirdi	Hathab	Ghogha	Kumbhar vada	Alang

28	Garganey	<i>Anasquerquedula</i>	-	-	-	-	+	-
29	Northern Shoveller	<i>Anasclypeata</i>	-	-	-	-	+	-
30	Cotton Teal	<i>NettapusCoromandeli anus</i>	-	-	-	-	+	-
31	Comb Duck	<i>Sarkidiornismelanotos</i>	-	-	-	-	+	-
32	Black Kite	<i>Milvus migrans</i>	+	+	+	+	+	-
33	Brahminy Kite	<i>Haliastur Indus</i>	+	+	+	+	+	-
34	Western Marsh- Harrier	<i>Circus aeruginosus</i>	+	+	+	-	+	-
35	Common Crane	<i>Grus grus</i>	+	-	-	+	+	-
36	Demoiselle Crane	<i>Grus virgo</i>	+	-	-	-	+	-
37	White-breasted Waterhen	<i>Amaurornisphoenicurus</i>	-	-	-	-	+	-
38	Common Moorhen	<i>Gallinulachloropus</i>	-	-	-	-	+	-
39	Purple Moorhen	<i>Porphyrioporphyrus</i>	-	-	-	-	+	-
40	Common Coot	<i>Fulicaatra</i>	-	-	-	-	+	-
41	Pheasant-tailed Jacana	<i>Hydrophasianuschirurus</i>	-	-	-	-	+	-
42	Red-wattled Lapwing	<i>Vanellusindicus</i>	+	+	+	+	+	-
43	Grey Plover	<i>Pluvialisquatarola</i>	+	+	+	+	+	-
44	Little Ringed Plover	<i>Charadriusdubius</i>	+	+	+	-	+	-
45	Common Ringed Plover	<i>Charadriushiaticula</i>	+	+	+	-	-	-
46	Kentish Plover	<i>Charadriusalexandrinus</i>	+	+	+	-	-	-
47	Lesser Sand Plover	<i>Charadriusmongolus</i>	+	+	+	-	-	-
48	Whimbrel	<i>Numeniusphaeopus</i>	+	+	+	-	-	-
49	Eurasian Curlew	<i>Numeniusarquata</i>	+	+	+	+	+	-
50	Black-tailed Godwit	<i>Limosalimosa</i>	+	+	+	-	+	-
51	Common Redshank	<i>Tringa tetanus</i>	+	+	+	+	+	-
52	Marsh Sandpiper	<i>Tringastagnatilis</i>	+	+	+	-	-	-
53	Common Greenshank	<i>Tringanebularis</i>	-	+	+	-	-	-
54	Green Sandpiper	<i>Tringaochropus</i>	-	+	+	-	-	-
55	Terek Sandpiper	<i>Xenuscinereus</i>	-	+	+	-	-	-
No.	English Name	Scientific Name	Gadhula	Mithivirdi	Hathab	Ghogha	Kumbhar vada	Alang

56	Common Sandpiper	<i>Actithypoleucos</i>	+	+	+	-	+	-
57	Sanderling	<i>Calidris alba</i>	+	+	+	-	-	-
58	Little Stint	<i>Calidris minuta</i>	+	+	+	-	-	-
59	Dunlin	<i>Calidris alpina</i>	+	+	+	-	-	-
60	Curlew Sandpiper	<i>Calidris ferruginea</i>	-	+	+	-	-	-
61	Ruff	<i>Philomachus pugnax</i>	+	-	-	-	+	-
62	Black-winged Stilt	<i>Himantopus himantopus</i>	+	+	+	+	+	-
63	Pied Avocet	<i>Recurvirostra avosetta</i>	+	+	+	-	+	-
64	Great Stone Plover	<i>Esacus recurvirostris</i>	-	-	+	-	-	-
65	Heuglin's Gull	<i>Larus heuglini</i>	-	+	+	-	-	-
66	Yellow-legged Gull	<i>Larus cachinnans</i>	-	+	+	-	-	-
67	Pallas's Gull	<i>Larus ichthyaetus</i>	+	+	+	-	-	-
68	Brown-headed Gull	<i>Larus brunicephalus</i>	+	+	+	-	-	-
69	Black-headed Gull	<i>Larus ridibundus</i>	+	+	+	-	-	-
70	Little Gull	<i>Larus minutus</i>	-	+	+	-	-	-
71	Lesser Black Backed Gull	<i>Larus fuscus</i>	-	+	+	-	-	-
72	Gull-billed Tern	<i>Gelochelidon nilotica</i>	+	+	+	+	+	-
73	Caspian Tern	<i>Sterna caspia</i>	+	+	+	-	+	-
74	Common Tern	<i>Sterna hirundo</i>	+	+	+	-	-	-
75	Little Tern	<i>Sterna albifrons</i>	+	+	+	-	+	-
76	Eurasian Collared-Dove	<i>Streptopelia decaocto</i>	-	+	+	-	-	-
77	Red Collared-Dove	<i>Streptopelia tranquebarica</i>	-	+	+	-	-	-
78	Rose-ringed Parakeet	<i>Psittacula krameri</i>	-	+	+	-	-	-
79	House Swift	<i>Apus affinis</i>	-	-	-	-	+	-
80	Small Blue Kingfisher	<i>Alcedo atthis</i>	-	-	+	-	-	-
81	White-breasted Kingfisher	<i>Halcyon smyrnensis</i>	+	+	+	+	+	-
82	Small Bee-eater	<i>Merops orientalis</i>	+	+	+	+	+	-
83	Blue-cheeked Bee-eater	<i>Merops persicus</i>	-	+	+	-	-	-
No.	English Name	Scientific Name	Gadhula	Mithivirdi	Hathab	Ghogha	Kumbhar vada	Alang

84	Indian Roller	<i>Coraciasbenghalensis</i>	-	-	-	-	+	-
85	Ashy-crowned Sparrow-Lark	<i>Eremopterixgrisea</i>	-	-	-	-	+	-
86	Red-winged Bush-Lark	<i>Mirafraerythroptera</i>	-	-	-	-	+	-
87	Common Crested Lark	<i>Galeridacristata</i>	-	-	-	-	+	-
88	Common Swallow	<i>Hirundorustica</i>	-	-	-	-	+	-
89	Wire-tailed Swallow	<i>Hirundosmithii</i>	-	-	-	-	+	-
90	Red-rumped Swallow	<i>Hirundodaurica</i>	-	-	-	-	+	-
91	Rufous-backed Shrike	<i>Laniusschach</i>	-	-	-	-	+	-
92	Black Drongo	<i>Dicrurusmacrocerus</i>	+	+	+	+	+	-
93	Red-vented Bulbul	<i>Pycnonotuscafer</i>	-	-	-	-	+	-
94	Yellow Wagtail	<i>Motacillaflava</i>	+	+	+	+	+	-
95	Citrine Wagtail	<i>Motacillacitreola</i>	+	+	+	+	+	-
96	Grey Wagtail	<i>Motacillacinerea</i>	+	+	+	+	+	-
97	White Wagtail	<i>Motacilla alba</i>	+	+	+	+	-	-
98	Purple Sunbird	<i>Nectariniaasiatica</i>	+	+	+	+	+	-