

**OCCASIONAL PAPER No. 303**

**Records of the  
Zoological Survey of India**

**Coastal Birds of Tamil Nadu**

**C. VENKATRAMAN  
V. GOKULA**

**ZOOLOGICAL SURVEY OF INDIA**

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**Coastal Birds of Tamil Nadu**

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## INTRODUCTION

Costal birds are birds that exploit coastal habitats (marshes, swamps, biches and open water along the coast) to perform any one or more of the behavioural activities like feeding, breeding and roosting. These are small to medium sized, characterized by slender, probing bills and longish legs. Moreover, they are among the world's greatest migrants and an important biological component of coastal wetland ecosystem that plays greater aesthetic, sporting and economic values. Hence, they are the biological indicators of the state of the world's health. In general, more than 214 & 149 species of birds have so far been identified as coastal birds that comb the beaches, mudflats, marshes, and plains of the world and India respectively.

The Coromandel Coast (East-Coast) of India is one of the important areas because of the diversity in coastal wetlands and other water bodies, such as estuaries, backwaters, coral reefs and mangroves which are most productive ecosystems. Besides these, sandy beaches and rocky substratum are also available. Hence most of the migrating water birds often form large mixed species aggregation and feed along the coastal beaches, mud and sand flats, estuaries, marshes and adjacent in landwater bodies (Nagarajan and Thiayagesan, 1996). The coastal wetlands are especially important in the context that they serve as wintering areas for birds of appreciable number of many species that annually migrate from Arctic Siberia to wintering grounds in India enroute passage to Australia (Sampath and Krishnamoorthy, 1993). Their presence along the East-Coast, a major wintering and migratory staging area is largely seasonal. Coastal wetlands often showed seasonal difference among bird species, they are divided into four groups

1. Summer (breeding) residents
2. Winter residents (occurring throughout winter).
3. Transients (passing through during either fall or spring migrations or both) and
4. Permanent residents (Balachandran, 2007).

During the annual migrations, these birds exploit all variety of habitats such as grasslands, rivers, estuaries, lakes, marshes, sandy beaches, inter-tidal mud flats, coral reefs, atolls, and mangroves. However, most of them prefer wetlands than forested areas. The status and distribution of coastal birds often indicate the stability, quality and heterogeneity of coastal wetlands. Birds are vulnerable to even slightest changes in structural and functional aspects of an ecosystem. Food, shelter, and human-disturbance are the prime factors often determine the avian population density and diversity (Ramesh and Ramachandran, 2005). Thus, the knowledge on avian diversity and density of a habitat may be useful to predict the status of a habitat.

Coastal birds are declining alarmingly all around the world mostly due to deterioration of the habitats used for winter migration. Such deteriorations are due to anthropogenic activities and natural changes. In India natural changes include decreasing water depths due to uplifting process, and anthropogenic activities include the conversion of lagoons into industrial land (Ramesh and Ramachandran, 2005). This may have a great impact on the global population of wetland species. Hence, populations of coastal birds should be monitored for their conservation and management. Drastic decline of population of coastal birds around the world in recent years and lack of research (mostly year old) on coastal birds in India particularly east-coast have become the prime cause for launching the present study.

## REVIEW OF LITERATURE

Information on coastal birds of India are very scanty and even some of the available qualitative information on coastal bird populations are also largely confined to well known protected areas like Point Calimere and Gulf of Mannar. A series of papers were published from the East-Coast of India on birds by Biddulph (1938), Daniel and Somane (1975), Faizi (1984), Lal Mohan (1985, 1986), Ravi (1985), Sankar (1986), Sampath (1989), Perennou and Santharam (1990), Balachandran (1990a,b, 1991, 1995, 1998, 2006 and 2007), Sampath and Krishnamoorthy (1993), Nirmala Devi (1994), Sivasubramanian *et al.*, (1995), Manakandan (1995), Nagarajan and Thiyagesan (1995, 1996, 2006), Thiyagesan and Nagarajan (1995, 1997), Balamurugan (1998), Ramachandran *et al* (1998), Oswin (1999), Pandiyan (1999), Prakash (2001), Rajaraman (2001), Girija (2002), Deepa (2005), Baruah (2005), Bhattacharya *et al.* (2006), Sivasubramanian (2007) and Venkatraman (2008).

## DESCRIPTION OF STUDY AREAS

### Tamil Nadu : Geography

Tamil Nadu (8° 04' N and 76° 14' E) is one of the largest states in India, situated on the southeastern side of the Indian peninsula (Fig 1). It has a geographical area of 1, 30,058 km<sup>2</sup> which constitutes about 4% of the land area of the country. The State is divided into 30 administrative districts. Tamil Nadu can be divided into three physiographic regions namely, the eastern coastal region, the western hilly region and the coastal plains. The coastal plains run North to South. Karnataka and Andhra Pradesh surround Tamil Nadu on the North while Kerala lies to the West. The waters of the Bay of Bengal and the Indian Ocean surround the coastal eastern and southern boundaries of the state. The northern extreme of Tamil Nadu is Pulicat Lake while the southernmost tip is Cape Comorin or Kanyakumari.

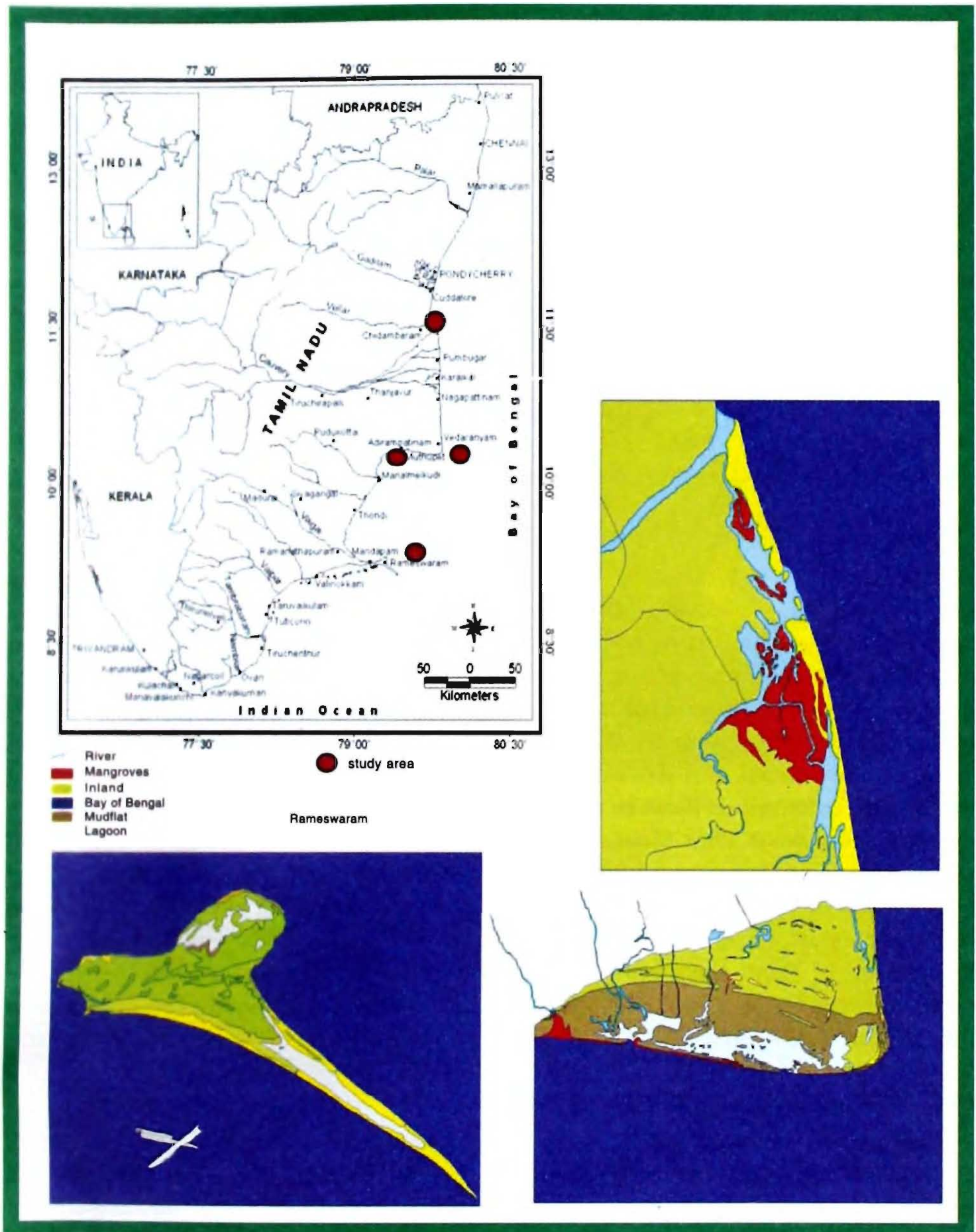


Fig. 1 : Location map of study area

Tamil Nadu has a long coastline of about 999 km (Ramakrishna and Venkataraman 2002), comprising of 574 km sandy coast, 31 km rocky coast, and 394 km muddy coast. This is mostly on the east coast and constitutes 18.9% of the coastline of India. Apart from the extensive fishery in inshore and offshore regions of Tamil Nadu the coastal habitat is of great importance for its many special features, particularly the estuaries and wetlands with their complex and dynamic ecosystems. The following major estuaries are found in the State: Edayar, Ennore, Cooum, Adayar, Uppanar, Vellar, Kollidam, Cauvery (= Kavery), Agniyar and Kallar (Fig. 1). Tamil Nadu has only a very small representation of mangroves, a mere 2,640 ha (0.46% of the total mangrove area in India). The main mangrove formations in the State are at Pichavaram at the northern extremity of the Cauvery delta in the Cuddalore district, in the areas of Chatram, Adhirampattinam, Point Calimere and Muthupet of Nagapatinam district, and in the Thanjavur (Tanjore) districts. These are considered ecologically sensitive areas of the east coast of Tamil Nadu. Some of the important areas of bird observations like marine biosphere reserve, bird sanctuary, mangroves, and marshes have also been described further.

### **Weather**

The geographical location of Tamil Nadu is such that the climatic condition shows only slight seasonal variations. Due to close proximity to the Sea, the temperatures and humidity remain relatively high all the year round. The climate of Tamil Nadu is tropical in nature with little variation in summer and winter temperatures. While April-June is the hottest summer period (with the temperature rising up to the 40°C), November-February is the coolest winter period (with temperatures hovering around 20°C), making the climate quite pleasant. It is interesting to note that Tamil Nadu gets most of its rains from the North-East monsoon between October and December while the state remains largely dry during the South West Monsoon season. The average annual rainfall in Tamil Nadu ranges between 635 mm and 1,905 mm in a year. During summers (April to June), the coastal areas of Tamil Nadu become awkwardly warm and humid, but the nights become cool and pleasant due to sea breeze in the afternoon. During the hot season, the charming hill stations of Tamil Nadu provide much needed respite from heat and humidity. The period between October to March (when the climate becomes pleasantly cool) is the ideal time to visit Tamil Nadu.

### **Gulf of Mannar Marine Biosphere Reserve**

Gulf of Mannar Biosphere Reserve extends from Rameswaram island to Tuticorin in direction and lies between 8° 45' N - 9° 25' N and 78° 5' E - 79° 30' E, extends to a distance of 140 km. There are 21 islands running almost parallel to the coastline of Mannar. These island lies between 8° 47' N - 9° 15' N and 78° 12' E - 79° 14' E. These islands are situated at an average distance of about 8km from the coastline of Gulf of Mannar. It is bounded by Palk Bay, Rameshwaram island in the north side; by

**Ramanathapuram** district in the northwest and west Tuticorin district in the south and by **Bay of Bengal** in the east (Fig. 2). It is endowed with three distinct ecosystems namely corals, sea grass and mangroves.



**Fig. 2** : Location of all the 21 islands of Gulf of Mannar Biosphere Reserve

Gulf of Mannar experiences a tropical climate under the spell of both South West and North East monsoons. The South West monsoon contributes only very little total rainfall. Rainfall is moderate to heavy during October to mid-December under the North East monsoon, with occasional gales. The mean annual rainfall varies from 762 mm to 1270 mm. The period from January to May is marked by unusually hot climate. The month is December with temperature dropping to a minimum of 25 C.

The velocity of the wind is generally high in the coastal plains of Gulf of Mannar region. Wind direction is North-northeasterly from June to December and changes to Westerly during the period. The wind speed is lowest in November and highest in August.

The Ocean currents in Gulf of Mannar area are swift. The sea is rough between April and August, calm during September and stormy during June to August. Tidal

amplitude area is about half the meter. At Pamban the tides are irregular, owing to the wind force.

The drainage system in the coastal part of Gulf of Mannar consists of Vaigai, Kappali, Kottanguli River, Gundar, Vembar and Kallar and its tributaries. The trend of the river from NW to SE. Vaigai and Vaippar are the biggest Rivers in the study area. All rivers in study area are non-perennial and get water only during rain.

### Muthupet Mangroves

Pichavaram and Muthupet are the only two regions in Tamil Nadu Coast, which have fairly well developed salt marsh-mangrove complexes. The luxuriant patch of Muthupet



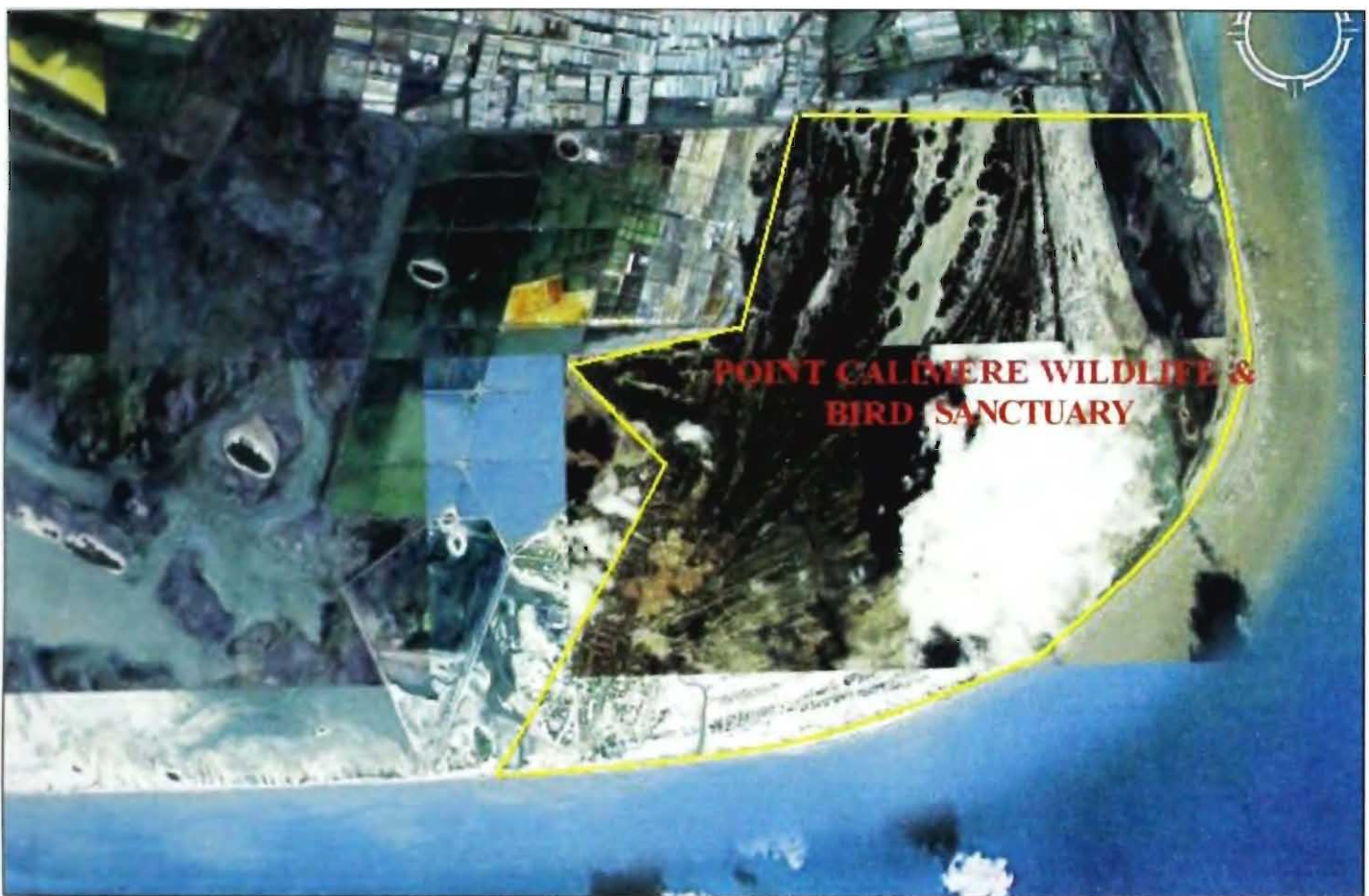
**Fig. 3 :** Satellite imagery of Muthupet mangroves

mangrove forest extends to an area of 68.03 km<sup>2</sup>. Muthupet is situated 400 km South of Chennai city and lies close to Point Calimere Birds and wildlife sanctuary on the South East Coast of Peninsular India (10° 46' N and 79° 51' E). The dry seasons extends over 6-7 months from February to August (Fig. 3). As summer advances the water and soil salinity shoots up even to 47 and 60ppt respectively. During peak summer the water in the mud flats totally evaporates leaving hand pecked mud. The rainy season commences with the on set of the North East monsoon, which lasts till December. The soil in the forest is clayey-silt and towards the landward side it is silty clay due to fresh silt deposits.

Muthupet mangrove swamp is in close association with the coastal wetlands and Vedharanyam spreading an area of approximately 6800 ha, of which 77.20 ha is occupied by well grown mangroves and the remaining area is covered by poorly grown mangrove vegetation. Mangrove zone of the forest is restricted to the edges of the brackish water lagoon when mangrove species are distributed in varying degree of abundance.

### **Point Calimere Wildlife & Bird Sanctuary**

Point Calimere Wildlife & Bird Sanctuary (10° 18' N and 79° 51' E) is one of the coastal blocks of Nagappattinam district. It is situated on a low promontory on the Coromandel Coast in the Bay of Bengal. The Great Vedaranyam Swamp stretches



**Fig. 4 :** Satellite imagery of Point Calimere Wildlife & Bird Sanctuary

parallel to the Palk Strait for about 48 km and is separated from it by a sand bank (Fig. 4). Its North to South dimensions varies from about 10 km at its broadest in the East, to about 8 km in the central part and about 6km in its western portion. Five freshwater channels, connected to the Cauvery river, empty into the swamp. In total, it has an area of about 349 km<sup>2</sup>. It has a tropical climate which is characterized by monthly

average temperature above 27°C. Total annual rainfall varies from 1000 to 1500 mm with a dry period of 5 to 6 months.

### Pichavaram Mangroves

The Pichavaram (11° 25' N and 74° 47' E) mangroves are located at the mouth of the Vellar, Coleroon and Upanar rivers in Cuddalore district and are about 190 km south of Chennai on the East Coast of Southern India. Now they are the sole large area of



Fig. 5 : Satellite imagery of Pichavaram Mangroves

mangroves with 51 islets separated by a complex network of creeks and channels and cover an area of 11,000 ha of mangrove forests (Fig. 5). The climatic conditions of Pichavaram are typical of areas exposed to tropical monsoons. This region is subjected to the Northeast monsoon with most of the rainfall occurring between October and December. It is regarded as one of the richest mangrove forests in India.

## MATERIAL AND METHODS

The study was conducted during late winter in 2005-2007. Based on the accessibility to the habitats, different techniques were used to estimate the abundance of birds. Area known for higher concentration of birds was measured by direct counts (Spindler *et al.* 1981). In marshy areas and open waters, the total number of birds was estimated from boat (Bailey & Titman, 1984, Sjoberg, 1989). In order to avoid double counting or missing birds a vantage point was used. There was a possibility of missing birds reported here were usually found on the edges of the vegetation i.e on the open water vegetation interface. Birds were identified and counted with the help of binocular during early and late hours of the day. Boat was also used wherever it is possible. Counts were not made on days with rain, strong wind or extreme temperatures to minimize the bias caused by effects of weather (Verner, 1985).

The bird species diversity was calculated using the Shannon-Weaver index (1949)

$$H' = -\sum p_i \log p_i$$

(Where  $H'$  = diversity and  $p_i$  = the proportion of observation in subset  $i$ ).

To find out the similarity in bird species composition and abundance between the habitat types, the Jaccard's (1904) similarity index was applied. This index refers to the ratio of number of species shared to total species among the various entities compared.

$$J = \frac{NC}{N1 + N2 - NC}$$

NC = Number of species in common

N1 = Number of species in the first habitat

N2 = Number of species in the second habitat.

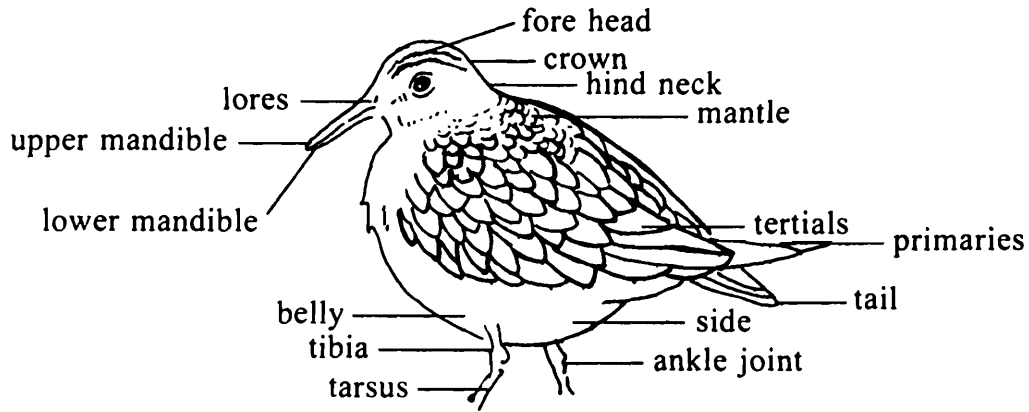
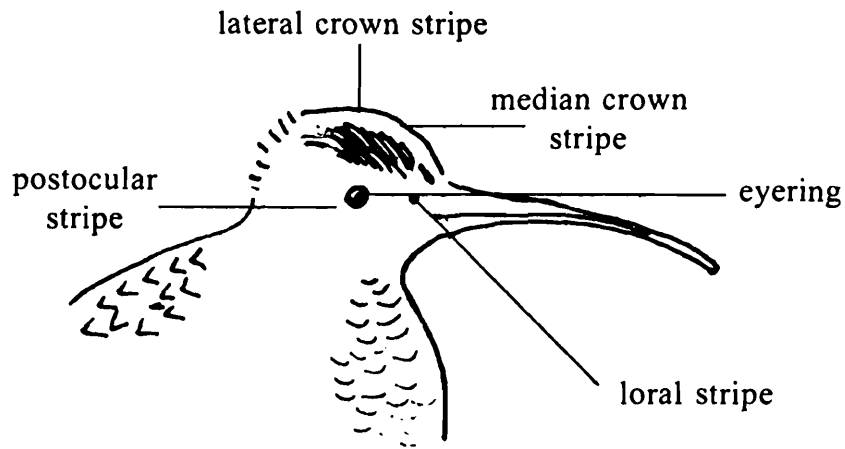


Fig. 6 : Topography of a bird



Head anatomy of Whimbrel

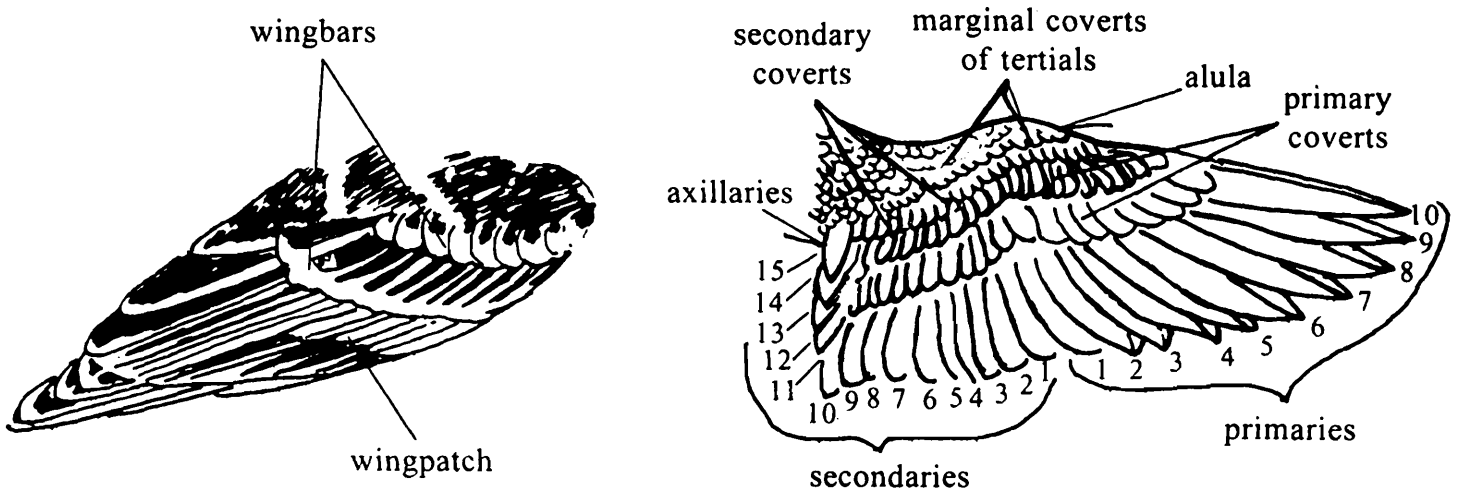


Table 1 : Systematic List of Bird Species

Sl. No.	Common Name	Scientific Name
<b>Order : Pelicaniformes</b>		
<b>Family : Pelecanidae</b>		
1.	Spot-billed Pelican	<i>Pelecanus philippensis</i> Gmelin, 1789
<b>Family : Phalacrocoracidae</b>		
2.	Little Cormorant	<i>Phalacrocorax niger</i> (Vieillot, 1817)
<b>Family : Anhingidae</b>		
3.	Darter	<i>Anhinga melanogaster</i> Pennant, 1769
<b>Order : Ciconiformes</b>		
<b>Family Ardeidae</b>		
4.	Little Egret	<i>Egretta garzetta</i> (Linnaeus, 1766)
5.	Western Reef-Egret	<i>E. gularis</i> (Bosc, 1792)
6.	Grey Heron	<i>Ardea cinerea</i> Linnaeus, 1758
7.	Purple Heron	<i>A. purpurea</i> Linnaeus, 1766
8.	Large Egret	<i>Casmerodius albus</i> (Linnaeus, 1758)
9.	Median Egret	<i>Mesophoyx intermedia</i> (Wagler, 1829)
10.	Cattle Egret	<i>Bubulcus ibis</i> (Linnaeus, 1758)
11.	Indian Pond-Heron	<i>Ardeola grayii</i> (Sykes, 1832)
12.	Little Green Heron	<i>Butorides striatus</i> (Linnaeus, 1758)
13.	Black-crowned Night-Heron	<i>Nycticorax nycticorax</i> (Linnaeus, 1758)
14.	Chestnut Bittern	<i>Ixobrychus cinnamomeus</i> (Gmelin, 1789)
15.	Black Bittern	<i>Dupetor flavicollis</i> (Latham, 1790)
<b>Family : Ciconiidae</b>		
16.	Painted Stork	<i>Mycteria leucocephala</i> (Pennant, 1769)
17.	Asian Openbill-Stork	<i>Anastomus oscitans</i> (Boddaert, 1783)
<b>Family : Threskiornithidae</b>		
18.	Glossy Ibis	<i>Plegadis falcinellus</i> (Linnaeus, 1766)
19.	Oriental White Ibis	<i>Threskiornis melanocephalus</i> (Latham, 1790)
20.	Black Ibis	<i>Pseudibis papillosa</i> (Temminck, 1824)
21.	Eurasian Spoonbill	<i>Platalea leucorodia</i> Linnaeus, 1758

Sl. No.	Common Name	Scientific Name
<b>Order : Phoenicopteriformes</b>		
<b>Family : Phoenicopteridae</b>		
22.	Greater Flamingo	<i>Phoenicopterus ruber</i> Linnaeus, 1758
<b>Order : Anseriformes</b>		
<b>Family : Anatidae</b>		
23.	Northern Shoveller	<i>Anas clypeata</i> Linnaeus, 1758
24.	Northern Pintail	<i>A. acuta</i> Linnaeus, 1758
<b>Order : Falconiformes</b>		
<b>Family : Accipitridae</b>		
25.	Black Kite	<i>Milvus migrans</i> (Boddaert, 1783)
26.	Brahminy Kite	<i>Haliastur indus</i> (Boddaert, 1783)
27.	White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i> (Gmelin, 1788)
<b>Family : Pandionidae</b>		
28.	Osprey	<i>Pandion haliaetus</i> (Linnaeus, 1758)
<b>Order : Charadriiformes</b>		
<b>Family : Rostratulidae</b>		
29.	Greater Painted Snipe	<i>Rostratula benghalensis</i> (Linnaeus, 1758)
<b>Family : Haematopodidae</b>		
30.	Eurasian Oystercatcher	<i>Haematopus ostralegus</i> Linnaeus, 1758
<b>Family : Charadriidae</b>		
31.	Grey Plover	<i>Pluvialis squatarola</i> (Linnaeus, 1758)
32.	Common Ringed Plover	<i>Charadrius hiaticula</i> Linnaeus, 1758
33.	Long-billed Ringed Plover	<i>C. placidus</i> J.E. Gray, 1863
34.	Little Ringed Plover	<i>C. dubius</i> Scopoli, 1786
35.	Kentish Plover	<i>C. alexandrinus</i> Linnaeus, 1758
36.	Lesser Sand Plover	<i>C. mongolus</i> Pallas, 1776
37.	Greater Sand Plover	<i>C. leschenaultii</i> Lesson, 1826
38.	Yellow-wattled Lapwing	<i>Vanellus malabaricus</i> (Boddaert, 1783)
39.	Red-wattled Lapwing	<i>V. indicus</i> (Boddaert, 1783)

Sl. No.	Common Name	Scientific Name
<b>Family : Scolopacidae</b>		
40.	Pintail Snipe	<i>Gallinago stenura</i> (Bonaparte, 1830)
41.	Swinhoe's Snipe	<i>G. megala</i> Swinhoe, 1861
42.	Common Snipe	<i>G. gallinago</i> (Linnaeus, 1758)
43.	Black-tailed Godwit	<i>Limosa limosa</i> (Linnaeus, 1758)
44.	Bar-tailed Godwit	<i>L. lapponica</i> (Linnaeus, 1758)
45.	Whimbrel	<i>Numenius phaeopus</i> (Linnaeus, 1758)
46.	Eurasian Curlew	<i>N. arquata</i> (Linnaeus, 1758)
47.	Spotted Redshank	<i>Tringa erythropus</i> (Pallas, 1764)
48.	Common Redshank	<i>T. totanus</i> (Linnaeus, 1758)
49.	Marsh Sandpiper	<i>T. stagnatilis</i> (Bechstein, 1803)
50.	Common Greenshank	<i>T. nebularia</i> (Gunner, 1767)
51.	Nordmann's Greenshank	<i>T. guttifer</i> (Nordmann, 1835)
52.	Green Sandpiper	<i>T. ochropus</i> Linnaeus, 1758
53.	Wood Sandpiper	<i>T. glareola</i> Linnaeus, 1758
54.	Terek Sandpiper	<i>Xenus cinereus</i> (Guldenstadt, 1774)
55.	Common Sandpiper	<i>Actitis hypoleucos</i> Linnaeus, 1758
56.	Ruddy Turnstone	<i>Arenaria interpres</i> (Linnaeus, 1758)
57.	Asian Dowitcher	<i>Limnodromus semipalmatus</i> (Blyth, 1848)
58.	Great Knot	<i>Calidris tenuirostris</i> (Horsfield, 1821)
59.	Red Knot	<i>C. canutus</i> (Linnaeus, 1758)
60.	Sanderling	<i>C. alba</i> (Pallas, 1764)
61.	Little Stint	<i>C. minuta</i> (Leisler, 1812)
62.	Rufous-necked Stint	<i>C. ruficollis</i> (Pallas, 1776)
63.	Long-toed Stint	<i>C. subminuta</i> (Middendorff, 1853)
64.	Temminck's Stint	<i>C. temminckii</i> (Leisler, 1812)
65.	Dunlin	<i>C. alpina</i> (Linnaeus, 1758)
66.	Curlew Sandpiper	<i>C. ferruginea</i> (Pontoppidan, 1813)
67.	Broad-billed Sandpiper	<i>Limicola falcinellus</i> (Pontoppidan, 1763)

Sl. No.	Common Name	Scientific Name
<b>Family : Recurvirostridae</b>		
68.	Black-winged Stilt	<i>Himantopus himantopus</i> (Linnaeus, 1758)
69.	Pied Avocet	<i>Recurvirostra avosetta</i> Linnaeus, 1758
<b>Family : Phalaropidae</b>		
70.	Red-necked Phalarope	<i>Phalaropus lobatus</i> (Linnaeus, 1758)
<b>Family : Dromadidae</b>		
71.	Crab-Plover	<i>Dromas ardeola</i> Paykull, 1805
<b>Family : Burhinidae</b>		
72.	Great Stone-Plover	<i>Esacus recurvirostris</i> (Cuvier, 1829)
73.	Beach Stone-Plover	<i>Esacus magnirostris</i> (Vieillot, 1818)
<b>Family : Laridae</b>		
74.	Heuglin's Gull	<i>Larus heuglini</i> Bree, 1876
75.	Palla's Gull	<i>L. icthyaetus</i> Pallas 1773
76.	Brown-headed Gull	<i>L. brunnicephalus</i> Jerdon, 1840
77.	Black-headed Gull	<i>L. ridibundus</i> Linnaeus, 1766
78.	Gull-billed Tern	<i>Gelochelidon nilotica</i> (Gmelin, 1789)
79.	Caspian Tern	<i>Sterna caspia</i> Pallas, 1770
80.	River Tern	<i>S. aurantia</i> J.E. Gray, 1831
81.	Lesser Crested Tern	<i>S. bengalensis</i> Lesson, 1831
82.	Large Crested Tern	<i>S. bergii</i> Lichtenstein, 1823
83.	Common Tern	<i>S. hirundo</i> Linnaeus, 1758
84.	Little Tern	<i>S. albifrons</i> Pallas, 1764
85.	Roseate Tern	<i>S. dougallii</i> Montagu, 1813
86.	Black-bellied Tern	<i>S. acuticauda</i> J.E. Gray, 1831
87.	Bridled Tern	<i>S. anaethetus</i> Scopoli, 1786
88.	Sooty Tern	<i>S. fuscata</i> Linnaeus, 1766
89.	Sandwich Tern	<i>S. sandvicensis</i> Latham, 1787
90.	Whiskered Tern	<i>Chlidonias hybridus</i> (Pallas, 1811)
91.	White-winged Black Tern	<i>C. leucopterus</i> (Temminck, 1815)
92.	Black Tern	<i>C. niger</i> (Linnaeus, 1758)
93.	Brown Noddy	<i>Anous stolidus</i> (Linnaeus, 1758)

## DESCRIPTION OF THE SPECIES

Order PELICANIFORMES

Family PELECANIDAE

### 1. *Pelecanus philippensis* Gmelin, 1789

#### Spot-billed Pelican

*Description* : Much smaller than rest of the two pelicans in India (Great white and Dalmatian). Silvery-white/grey coloured bird with short brownish crest. Legs are grey and pouch and bill are pinkish with brownish spots. Sexes are alike. *Size* : 140 cm. *Habits* : Rarest among the pelican family. Being a heavier bird, it requires large amount of food and larger trees to nest as well. *Habitat* : Inlands and coastal areas. *Nest* : Made of vegetation. *Eggs* : 2 to 3, White coloured. *Food* : Mainly Fish.

*Status and Distribution* : Near threatened. Locally common during breeding season in Assam, Karnataka, Andhra Pradesh and Tamil Nadu; Nepal; Bangladesh; Sri Lanka; Maldives.

*Observation localities* : Point Calimere.

*Remarks* : Use of pesticides and deforestation has drastically affected the global population.

Family PHALACROCORACIDAE

### 2. *Phalacrocorax niger* (Vieillot, 1817)

#### Little Cormorant

*Description* : Similar to other cormorants in appearance but small in size. It has shorter bill, rectangular-shaped head and shorter neck. Yellow gular pouch is absent. Normally, it is brownish black bird with white chin but develops few white plumes during breeding on the forecrown and remainder all black. *Size* : 51 cm. *Habits* : It dives and chases the fish underwater while foraging. It nests in colony. It can have a life expectancy nearing 15-20 years. *Habitat* : Inland and coastal waters. *Nest* : Made of vegetation and other flotsam. *Eggs* : 2-4, white. *Food* : Fish and invertebrates.

*Status and Distribution* : Resident. Widespread and common in plains of India; Pakistan; Nepal; Bhutan; Bangladesh; Sri Lanka; SE Asia.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere.

## Family ANHINGIDAE

3. *Anhinga melanogaster* Pennant, 1769**Darter**

*Description* : The shape of the bird's body in the water has led these birds being known as snakebird. It is predominantly black plumage with green iridescence. Silverfish white markings are on the wings. During breeding season, it develops some fine plumes on the back of the neck and develops brighter coloured facial skin. *Size* : 95 cm. *Habits* : It swims with the body submerged and the long narrow neck above the water that gives the impression of a snake. As feathers are not waterproof, it is seen often with wings held out to dry on the branches/rocks near water. It catches fish by stabbing using the pointed bill. *Habitat* : Mainly Inland and coastal waters. *Nest* : Sticks with leaf lining. *Eggs* : 3-5. *Food* : Mainly fish and occasionally, amphibians, reptiles.

*Status and Distribution* : Near threatened. Resident species throughout India. Locally common in Assam, uncommon elsewhere

*Remarks* : It is primarily threatened by habitat loss, disturbance, hunting and pollution.

*Observation localities* : Pichavaram.

## Order CICONIFORMES

## Family ARDEIDAE

4. *Egretta garzetta* (Linnaeus, 1766)**Little Egret**

*Description* : A very slim bird with black bill and legs, yellow feet, and grayish lores. Lores become reddish during breeding season. Some can be very similar to Western Reef. Sexes are alike. *Size* 55-65 cm. *Habits* : It forms small to medium aggregation. The sharp bill of the bird enables it to catch the prey easily. It is capable of flying long distances. *Habitat* Inland and coastal waters. *Nest* : Platform nest built in trees. *Eggs* 2-5. *Food* : Invertebrates.

*Status and Distribution* : Resident throughout India except NW and NE.

*Observation localities* Gulf of Mannar, Muthupet, Point Calimere.

### 5. *Egretta gularis* (Bosc, 1792)

#### Western Reef-Egret

*Description* : A white and dark morph is available. Legs are slightly shorter and olive-yellow and bill is yellowish brown, longer, stouter and very slightly downcurved. It loses its distinctive long plumes, which extends downwards at the back of the head when not in breeding. *Size* : 55-65 cm. *Habits* : It is closely related to little egret. It solitary in nature, and do not generally form large groups. It prefers an inaccessible area for nesting. *Habitat* : Coastal waters. *Nest* : Platform of sticks built in trees. *Eggs* : 2-3, Pale blue. *Food* : Crustaceans, other invertebrates and fishes.

*Status and Distribution* : Resident throughout India.

*Observation localities* : Gulf of Mannar, Muthupet.

### 6. *Ardea cinerea* Linnaeus, 1758

#### Grey Heron

*Description* : Grey coloured bird with black above the eyes, and white head and belly. Bill and legs are yellow. In breeding season, it develops whitish scapular plumes and orange bill and legs. Immature has dark cap with variable crest, and greyer neck; lacks or has reduced black on belly. *Size* : 90-98 cm. *Habits* : A very patient predator. It stands motionless, looks closely for any sign of movement in the water then lunge quickly with its powerful bills to grab any prey. *Habitat* : Inland and coastal waters. *Nest* : Platform of sticks built in trees. *Eggs* : 3-5 Chalky-blue. *Food* : Aquatic invertebrates and fish.

*Status and Distribution* : Resident throughout India, winter migrant in small pockets; locally common.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

### 7. *Ardea purpurea* Linnaeus, 1766

#### Purple Heron

*Description* : Chestnut colour predominate the bird: head, neck, belly and underwing coverts. Rest of the body are grey coloured. Very pronounced recoiled neck, protruding large feet are seen in flight. Juvenile has black crown, buffish neck, and brownish mantle and upperwing-coverts with rufous-buff fringes. *Size* : 78-90 cm. *Habitat* : Mainly inland waters with tall cover. *Nest* : Platform of sticks built in trees. *Eggs* : 3-5. *Food* : Fish and any other aquatic invertebrates.

*Status and Distribution* : Resident throughout India.

*Observation localities* : Muthupet, Point Calimere, Pichavaram.

8. *Casmerodius albus* (Linnaeus, 1758)**Large Egret**

*Description* : It is the largest among egrets. It has a long neck and large bill. Black line of gape extends behind eye. Bill becomes black, lores become blue and tibia becomes reddish in breeding season. In non-breeding season, bill is yellow and lores are pale green. *Size* : 90-102 cm. *Habits* Colonial bird. *Habitat* : Inland and coastal waters. *Nest* Builds a flimsy nest of twigs in trees. *Eggs* : 2-4. *Food* : Invertebrates and fish.

*Status* : Resident throughout India.

*Observation localities* : Gulf of Mannar, Muthupet.

9. *Mesophoyx intermedia* (Wagler, 1829)**Median Egret**

*Description* : It is smaller than Great egret, with shorter bill and neck. Black gape-line does not extend beyond eye. Bill is black and lores are yellow-green during breeding season. Bill becomes yellow with black-tipped and lores become completely yellow in non-breeding season. *Size* : 65-72 cm. *Habits* : Similar to other egrets. *Habitat* : Inland and coastal waters. *Nest* : Builds a flimsy nest of twigs in trees. *Eggs* : 2-4. *Food* : Invertebrates.

*Status and Distribution* : Resident throughout India.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere.

10. *Bubulcus ibis* (Linnaeus, 1758)**Cattle Egret**

*Description* : A white bird with Pale yellow colouration on the head and throat, extending down to the breast; also on the back and rump. Bill, legs and feet are yellow. Sexes are alike. *Size* : 48-53 cm. *Habits* : The sharp bill of the bird enables it to catch the prey easily. It is seen on paddy fields even in urban areas. It is capable of flying long distances. *Habitat* : Damp areas, paddy-fields, inland and coastal waters. *Nest* : Builds a flimsy nest of twigs in trees. *Eggs* : 2-5 Pale blue *Food*: Invertebrates.

*Status and Distribution* : Resident throughout India.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

11. *Ardeola grayii* (Sykes, 1832)**Indian Pond-Heron**

*Description* A white bird with whitish wings contrast with dark saddle. It develops yellowish-buff plumage on head and neck and maroon-brown plumage on mantle /

scapulars during breeding season. In non-breeding season, streaks and spots are on head, neck and breast. *Size* : 42-45 cm. *Habits* : A very patient predator. It stands motionless and moves slowly from place to place in search of food, looks closely for any sign of movement in the water then lunge quickly with its powerful bills to grab any prey. *Habitat* : Inland and coastal wetlands. *Nest* : An untidy twig platform in trees. *Eggs* : 3-5. *Food* : Aquatic invertebrates and fish.

*Status and Distribution* : A common widespread resident species throughout India.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

## 12. *Butorides striatus* (Linnaeus, 1758)

### Little Green Heron

*Description* : A green heron with grayish under parts. Juvenile has buff streaking on upperparts and dark-streaked under parts. Bill is blackish above, and yellowish beneath. Sexes are alike. *Size* : 40-48 cm. *Habits* : Their shy nature is also reflected in their feeding habits. They often prefer to seek food at night, if the tide is favorable. *Habitat* : Inland waters with dense shrub cover, and mangroves. *Nest* : Built of twigs in a tree. *Eggs* : 2-5, Pale blue. *Food* : Fish and other aquatic life, reptiles and mice.

*Status and Distribution* : Resident, widely spread throughout India.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere.

*Remarks* : Very variable, even between members of the same race that has led to more than 30 distinctive races being recognized by the taxonomists.

## 13. *Nycticorax nycticorax* (Linnaeus, 1758)

### Black-Crowned Night-Heron

*Description* : A grey predominant bird with black crown and mantle. A thin white streak runs above the bill extending above the eyes. Bill is black and legs are yellow. Young are streaked and mottled and immature lacks the streaks and brown plumaged. Females are smaller than male. *Size* : 58-65 cm. *Habits* : A very patient predator. It stands motionless, looks closely for any sign of movement in the water then lunge quickly with its powerful bills to grab any prey. *Habitat* : Inland and coastal waters. *Nest* : Platform of sticks in trees. *Eggs* : 3-5. *Food* : Fish and other aquatic vertebrates.

*Status and Distribution* : Resident, nomadic patchily distributed throughout India.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

14. *Ixobrychus cinnamomeus* (Gmelin, 1789)**Chestnut Bittern**

*Description* : Male has brown or cinnamon upper part and pale underparts with paler streaks on breast while female has much dark brownish upperparts and predominant dark streaks on breast. *Size* 38 cm. *Habits* It is a solitary and crepuscular bird, and seen also in the day time when weather is cloudy. It spends the day time inside the thick vegetation especially in reeds. *Habitat* : Mainly Inland and occasionally coastal waters. *Nest* A small twig platform among reeds in a swamp at the edge of a monsoon filled pond. *Eggs* : 3. *Food* : invertebrates.

*Status* Resident. Patchily distributed throughout India.

*Observation localities* Pichavaram.

15. *Dupetor flavicollis* (Latham, 1790)**Black Bittern**

*Description* : It has blackish upperparts and whitish yellow underparts with black prominent streaks. *Size* 58 cm. *Habits* : It is a solitary and crepuscular bird, and seen also in the day time when weather is cloudy. It spends the day time inside the thick vegetation especially in reeds. *Habitat* : Mainly Inland and occasionally coastal waters. *Nest* A small twig platform among reeds in a swamp at the edge of a monsoon filled pond. *Eggs* : 3. *Food* : Invertebrates.

*Status* : Resident, Widespread throughout India.

*Observation localities* : Pichavaram.

## Family CICONIIDAE

16. *Mycteria leucocephala* (Pennant, 1769)**Painted Stork**

*Description* : Yellow billed with down curve, bare-orange headed and red legged bird. Flight feathers are black with white barring and tertials are pink. Red-headed and brilliant white plumaged bird during breeding season. *Size* : 93-100 cm. *Habits* : Largely seen singly and occasionally in small flocks while foraging but gregariously roost. Partly submerges the head into the shallow water and probes for food. Disturbs the water by the foot and catches the prey. *Habitat* : Inlands and costal wetlands. *Nest* : Constructs nests on trees using small branches, twigs etc. Often prefers trees near water. *Eggs* : 2 to 4. *Food* Largely invertebrates.

*Status and Distribution* : Resident, nomadic widespread throughout India.

*Remarks* : Human disturbance, habitat loss, pollution and collection of eggs and nestlings from colonies are cause for concern.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

### 17. *Anastomus oscitans* (Boddaert, 1783)

#### Asian Openbill-Stork

*Description* : A black and white bird; flight and tail feathers and back are black, rest are white. Dull white becomes brilliant during breeding season. Bill is very stout and open-billed (Distinctive gap between upper and lower bill usually not apparent in young). Legs are usually pinkish becomes brighter in breeding season. Sexes are alike. *Size* : 68 cm. *Habits* : Largely seen singly and occasionally in small flocks. Submerges entire head into the shallow water and probes the bottom for food. *Habitat* : Mainly inland wetlands. *Nest* : Constructs nests on trees using small branches, twigs etc. Often prefers trees near water. *Eggs* : 2 to 4. *Food* : Largely mollusks.

*Status and Distribution* : Resident, widely spread in India.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

#### Family THRESKIORNITHIDAE

### 18. *Plegadis falcinellus* (Linnaeus, 1766)

#### Glossy Ibis

*Description* : A small sized brownish ibis with green rump and wings. All colours are brighter and glossy during breeding season. Bill is down curved. *Size* : 55-65 cm. *Habitat* : Inland wetlands. *Habits* : Generally gregarious. *Nest* : Large cup shaped, of twigs lined with straw, feathers, etc, in a tree. *Eggs* : 2-4, Deep green to blue. *Food* : Invertebrates.

*Status and Distribution* : Resident and partly winter migrant; occurs mainly in S.India.

*Observation localities* : Muthupet.

### 19. *Threskiornis melanocephalus* (Latham, 1790)

#### Oriental White Ibis

*Description* : A black headed and necked white ibis with stout down curved black bill. It develops pale yellow plumage on mantle and breast during breeding season. Adult non-breeding has all-white body and lacks neck plumes. *Size* : 75 cm. *Habits* : It prefers to feed by probing into the mud with the tips of sensitive bills,

enabling it to grab prey easily even if the water is muddy. It also uses its leg to pursue prey. *Habitat* : Inland and coastal wetlands. *Nest* Construct platform nests with stick in trees. *Eggs* : 2-5. *Food* : invertebrates.

*Status and Distribution* : Resident, nomadic, uncommon, widespread and locally common in the western part of India.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere.

## 20. *Pseudibis papillosa* (Temminck, 1824)

### Black Ibis

*Description* : A stout, red crowned and napped, black headed, brown necked and breasted bird. A white shoulder patch is seen. Bill is dull black and curved. *Size* : 68 cm. *Habits* : It uses its long curved bill to probe underwater predominantly for crabs. It is seen in groups in foraging and roosting. *Habitat* : Marshes, lakes and fields. *Nest* : Construct platform nests with sticks. *Eggs* : 2-3, Bluish green with dark blotches. *Food* : Largely crabs, occasionally other invertebrates.

*Status and Distribution* : Resident, widespread in India.

*Observation localities* : Gulf of Mannar.

## 21. *Platalea leucorodia* Linnaeus, 1758

### Eurasian Spoonbill

*Description* : A white bird with yellow edged spoon - or spatula like bill. It develops yellow coloured plumage around breast during breeding season. Crest of feathers on the back of the neck are longer in males in breeding. Juvenile has dull pink coloured bill with fewer enlargements at the tip. *Size* 80-90 cm. *Habits* : Moves the head from side to side that enables the bird to catch the prey very easily as the surface area of the bill is large. It largely perch on one leg and tuck its bills over the back. Life span is around 30 years. *Habitat* Mainly inland wetlands. *Nest* : Construct nests on trees or on any platform that are off the ground. *Eggs* : 3-4, White with brown marking. *Food* : Fish, invertebrates and vegetation.

*Status and Distribution* Mainly resident. Except C and E. India distributed locally.

*Observation localities* : Muthupet, Point Calimere.

## Order PHOENICOPTERIFORMES

## Family PHOENICOPTERIDAE

22. *Phoenicopterus ruber* Linnaeus, 1758**Greater Flamingo**

**Description** : A pale or dull pinkish white bird with pinkish bill with a black tip and pinkish flight feathers. Females are slightly smaller than male. Young birds change from brown to pink plumage over approximately three years. It is the tallest among other species of flamingoes. **Size** : 145 cm. **Habits** : It is seen always in large flocks. Groups are often referred "skeins" It feeds by sieving microscopic crustaceans from the salt water using plates in its bills It is this food source that gives the birds their distinctive reddish colouration. It breeds communally on the salt pans, with the female constructing the raised cone-shaped nest above water. **Habitat** : Coastal waters. **Nest** : Built on mud. **Eggs** : 1-2, white. **Food** : Tiny crustaceans and planktons.

**Status and Distribution** : Local resident. Widespread but uncommon from E of Pakistan to Uttar Pradesh; common in the coastal and inland regions of Gujarat, salt pans, Gulf of Kutch and Gulf of Khambhat. Also about two thousand birds visit Pulicat lake and Chilka lake. A few birds occasionally recorded from Keoladeo National Park; the species has also been visiting Sambhar lake regularly; Pakistan; Nepal; Bangladesh; Sri Lanka; Maldives; E Mediterranean, SW Asia.

**Observation localities** : Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

## Order ANSERIFORMES

## Family ANATIDAE

23. *Anas clypeata* Linnaeus, 1758**Northern Shoveller**

**Description** : Long spatulate bill is the characteristic feature of the bird. A bird with dark metallic green head, white chest, chestnut-brown flanks and belly, black area around the tail and orange eye. Hens are predominantly brownish, but with darker blotching. **Size** : 45-52 cm. **Habits** : Spatulate bill enables the bird to feed more easily in shallow water. They often swim with their bill open, trailing it through the water to catch invertebrates, although they also forage both by upending and by catching insects on reeds. It is often seen in small parties or pairs. **Habitat** : Freshwater wetlands and brackish lagoons. **Food** : Aquatic vegetation, small aquatic invertebrates.

**Status and Distribution** : Widespread winter visitor to whole of India.

*Remarks* : It arrives much earlier and leaves very late. It may be seen even in early August and July as well.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere.

#### 24. *Anas acuta* Linnaeus, 1758

##### Northern Pintail

*Description* : Long and narrow black tail is the easily distinguishable feature from other species. Male has chocolate-brown or blackish head, white striped breast, grey flanks and prominently striped grayish wings. Hen is with uniform buffish head, slender grey bill, darkly patterned all over the body and a long-pointed tail with white edge to wings in flight. *Size* 51-56 cm. *Habits* : Actively feeds in the early morning and evening hours. May even be seen foraging on nearby lands. *Habitat* : Freshwater wetlands and brackish lagoons. *Food* : Aquatic vegetation, small aquatic invertebrates.

*Status and Distribution* Commonly and widely distributed winter visitor to India.

*Remarks* Arrives in early September or October and leaves by early April.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere.

#### Order FALCONIFORMES

##### Family ACCIPITRIDAE

#### 25. *Milvus migrans* (Boddaert, 1783)

##### Black Kite

*Description* A brown coloured bird with pale white marks on the bases of the underwing primaries and pale band across median coverts on upperwing. Juvenile has more white streaks and patches all over the body. *Size* : 55-68.5 cm. *Habits* : Like Brahminy kite, it is commonly seen in the inlands and coastal. *Habitat* : Coastal and inlands. *Nest* : Platform nests on trees. *Eggs* : 1-4. *Food* Small birds, carrions, waste from slaughter house and some times even rotten vegetables.

*Status and Distribution* : Resident throughout India.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

#### 26. *Haliastur indus* (Boddaert, 1783)

##### Brahminy Kite

*Description* It is brick red coloured raptor with white head, neck and breast and black wing tips. Black streaks may be visible in a closer look on breast. Juvenile is pale

brown with much streaks on head and breast than the adult. *Size* : 48 cm. *Habits* : Highly adaptable. It shares the urban areas with black kites apart from the coastal habitats. *Habitat* : Inland and coastal areas. *Nest* : Platform nests on trees. *Eggs* : 1-4. *Food* : Fish, frog, crabs and waste thrown from the slaughter house.

*Status and Distribution* : Resident; undertakes local movements; widespread and locally common.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

### 27. *Haliaeetus leucogaster* (Gmelin, 1788)

#### White-Bellied Sea-Eagle

*Description* : A raptor with whitish underparts from head to tail, dark grayish upperparts and wings in adult. Juvenile has brown wings and brown streaks on breast and belly. *Size* : 66-71 cm. *Habits* : It is seen often perching on a tree/stump near water than soaring. It prefers largely sea snakes followed by fishes and other aquatic animals. Solitary in nature and can be seen in pairs some times. *Habitat* : Coastal areas. *Nest* : It constructs large platform shaped nest on trees near water. *Eggs* : 1-3. *Food* : Sea snakes and fish.

*Status and Distribution* : Mainly winter visitor throughout the subcontinent.

*Observation localities* : Gulf of Mannar, Muthupet.

#### Family PANDIONIDAE

### 28. *Pandion haliaetus* (Linnaeus, 1758)

#### Osprey

*Description* : A raptor with brownish upperparts and white underparts. Brown stripes running across the eyes down over the back and wings. Breast has brownish striations and greyish legs. Female is heavier and larger than male. *Size* : 58 cm. *Habits* : Most widely distributed bird and adapted to exploit all sorts of waters from freshwater to open ocean. It is capable of carrying fish amazingly weighing up to 300 g. *Habitat* : Inland and coastal waters. *Nest* : It constructs large platform shaped nest on trees near water. *Eggs* : 1-3, White with markings. *Food* : Fish exclusively.

*Status and Distribution* : Breeds in Ladakh, Kashmir, North UP and Assam. Winters throughout much of the sub continent except Central India.

*Observation localities* : Pichavaram.

## Order CHARADRIFORMES

## Family ROSTRATULIDAE

29. *Rostratula benghalensis* (Linnaeus, 1758)**Greater Painted Snipe**

*Description* : A wader with white underparts from the breast, white streak around the eyes and a black ring separates the pale-brownish breast in male and dark brownish breast in female from the white belly. The white underparts extend around the shoulder in both the sexes. Rest of the body is greyish brown in male with lots of speckles and barrings and dark greenish brown in female with very less or no markings. Yellowish V shaped markings on mantle. Bill is long, yellowish and curved at the edge. *Size* 25 cm. *Habits* : It moves the bill from side to side in water and probe the earth for prey. It is nocturnal in habit and very secretive. *Habitat* : Freshwater to coastal areas. *Nest* : On the ground. *Eggs* : 2-5. *Food* : Invertebrates and seed.

*Status and Distribution* : Resident, but locally common species almost throughout India.

*Observation localities* : Point Calimere.

## Family HAEMATOPODIDAE

30. *Haematopus ostralegus* Linnaeus, 1758**Eurasian Oystercatcher**

*Description* It has blackish head, upper chest and wings. Bill is orangish-red and the legs are reddish. A white stripe is prominently found on the wings. Sexes are alike. It develops white collar in non-breeding season. *Size* 44 cm. *Habits* : It is a noisy and conspicuous bird. The powerful bill enables the bird to tear mussel shells apart, hammer the limpets and prey the crabs. *Habitat* : Coastal areas. *Food* : Mussels, limpets and crabs.

*Status and Distribution* : Winter visitor; Sri Lanka; Maldives; Bangladesh; Nepal; Pakistan.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

## Family CHARADRIIDAE

31. *Pluvialis squatarola* (Linnaeus, 1758)**Grey Plover**

*Description* : It has white underwing, and black axillaries. It is chunky bird with sturdy bill and shorter legs. It has white rump, grey upperparts and prominent white

wing-bar. It has several grey stripes on the breast. In the breeding season, except vent, entire underpart becomes black. Upperparts are peppered with white and black. *Size* : 27-30 cm. *Habitat* : Sandy shores, mudflats and tidal creeks. *Food* : Chiefly carnivorous (Insects, small mollusks and crustaceans), occasionally seeds of marshy plants.

*Status and Distribution* : A widespread winter migrant; common in Sri Lanka; Maldives; Bangladesh; Nepal; Pakistan.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere.

### 32. *Charadrius hiaticula* Linnaeus, 1758

#### Common Ringed Plover

*Description* : It has a brownish upperparts, whitish underparts, brown breast band and white supercilium in the non-breeding season. In the breeding season, it develops black breast band and black bar between eyes and over the eyes. The bill becomes yellowish orange at the base and black at the tip. Non-breeding and juvenile have prominent whitish supercilium and forehead compared with Little Ringed. *Size* : 18-20 cm. *Habitat* : Mud banks of fresh-water and coastal wetlands. *Food* : Invertebrates.

*Status and Distribution* : Rare winter visitor in India; E to Pakistan; Bangladesh; Sri Lanka; Maldives.

*Observation localities* : Muthupet, Point Calimere, Pichavaram.

### 33. *Charadrius placidus* J.E. Gray, 1863

#### Long-billed Ringed Plover

*Description* : It is bigger than little ringed plover. It has brownish upperparts and whitish underparts. A brown band separates the throat and belly. An indistinctive white supercilium is present. In the breeding season, blackish band appears on the breast and between eyes. Yellowish red ring around the eyes are prominent. *Size* : 20 cm. *Habits* : It has very strong migratory instincts despite being small in size. *Habitat* : Freshwater and coastal wetlands. *Food* : Invertebrates.

*Status and Distribution* : Winter visitor to N and NE India, rare but regular; Nepal; Bhutan; Bangladesh; and Sri Lanka.

*Observation localities* : Point Calimere, Pichavaram.

### 34. *Charadrius dubius* Scopoli, 1786

#### Little Ringed Plover

*Description* : It is a small sized bird. It has brownish upperparts and whitish underparts. A brown band separates the throat and belly. An indistinctive white

supercilium is present. In the breeding season, blackish band appears on the breast and between eyes. A red spot appears at the base of the bill. Yellowish red ring around the eyes are prominent. Adult non-breeding and juvenile have less distinct head pattern. *Size* 14-17 cm. *Habits* : Generally mixed with other waders. *Habitat* : Freshwater and coastal wetlands *Food* Invertebrates.

*Status and Distribution* : Widespread resident and partly winter visitor; Pakistan; Nepal; Bhutan; Sri Lanka and Pakistan.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

### 35. *Charadrius alexandrinus* Linnaeus, 1758

#### Kentish Plover

*Description* It is a small sized chunky bird. In the non-breeding season, it has white hind-collar and supercilium, brownish grey upperparts and white underparts. In the breeding season, rufous plumes replace the grey plumes in the breast and cap, and a black band appears between eyes. *Size* : 15-17 cm. *Habitat* : Sandy seashores, sandy banks of freshwater wetlands and saltpans. *Food* : Invertebrates.

*Status and Distribution* Resident and widespread winter visitor, locally common in India.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

### 36. *Charadrius mongolus* Pallas, 1776.

#### Lesser Sand Plover

*Description* : It is smaller than greater sand plover. It has small and stout bill with blunt tip and brownish green legs. Legs usually do not extend beyond tail in flight and white wing-bar is narrower across primaries. Breeding male typically shows full black mask and forehead and more extensive rufous on breast compared. *Size* : 19-21 cm. *Habitat* Coastal wetlands. *Nest* : Scrape on the ground. *Eggs* : 4. *Food* : Invertebrates.

*Status and Distribution* : Breeds in Himalayas, Winter visitor; Pakistan; Nepal; Bangladesh; Sri Lanka; Maldives; C Asia.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

### 37. *Charadrius leschenaultii* Lesson, 1826

#### Greater Sand Plover

*Description* It is heavier than lesser Sand plover. It has longer and larger bill, usually with pronounced gonys and more pointed tip. Legs are yellowish green and long. *Size* 22-25 cm. *Habitat* : Coastal wetlands. *Food* : Invertebrates.

**Status and Distribution** : Winter migrant to Indian seaboard; Pakistan; Nepal; Bangladesh; Sri Lanka and Maldives.

**Observation localities** : Muthupet, Point Calimere, Pichavaram.

38. *Vanellus malarbaricus* (Boddaert, 1783)

**Yellow-wattled Lapwing**

**Description** : It has black cap, pale brownish upperparts, breast in underparts, white belly and supercilium, and yellow legs. Juvenile lacks the black cap. **Size** : 26-28 cm. **Habits** : A very noisy bird during breeding season. It calls as soon as anyone / anything intrudes its nesting ground. It is seen in pairs. **Habitat** : Inlands and coastal areas. **Nest** : Scrape on the ground. **Eggs** : 4. **Food** : Mainly invertebrates.

**Status and Distribution** : Resident throughout India.

**Observation localities** : Muthupet, Point Calimere, Pichavaram.

39. *Vanellus indicus* (Boddaert, 1783)

**Red-wattled Lapwing**

**Description** : It has black cap runs down from head to mantle on the upperside and head to breast on the underside, red bill with black tip, white cheeks and belly, yellow legs and black flight feathers. **Size** : 32-35 cm. **Habits** : A very noisy bird during breeding season. It calls as soon as anyone/anything intrudes its nesting ground. It is seen in pairs. **Habitat** : Inlands and coastal areas. **Nest** : Scrape on the ground. **Eggs** : 4. **Food** : Mainly invertebrates.

**Status and Distribution** Resident throughout India.

**Observation localities** : Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

Family SCOLOPACIDAE

40. *Gallinago stenura* (Bonaparte, 1830)

**Pintail Snipe**

**Description** : It has white belly and rest of the body is pale brown with heavily speckled and streaked in blackish brown. **Habits** : It is both nocturnal and crepuscular in nature. It is rarely seen in groups. **Size** : 27 cm. **Habitat** : Marshes. **Food** : Invertebrates.

*Status and Distribution* A locally common winter migrant to India including Andaman & Nicobar islands except northwestern and northwestern parts and Himalaya; Pakistan; Nepal; Bangladesh; Sri Lanka and Maldives.

*Observation localities* : Gulf of Mannar.

#### 41. *Gallinago megala* Swinhoe, 1861

##### **Swinhoe's Snipe**

*Description* : It has white belly and rest of the body is pale brown with heavily speckled and streaked in blackish brown. *Habits* : It is both nocturnal and crepuscular in nature. It is rarely seen in groups. *Size* : 27 cm. *Habitat* : Marshes, paddy stubbles and brackish lagoons offering plenty of concealments. *Nest* : On the ground, well hidden and lined with leaves. *Eggs* : 3. *Food* : Invertebrates.

*Status and Distribution* : A rare winter migrant to S and E India.

*Observation localities* : Point Calimere.

#### 42. *Gallinago gallinago* (Linnaeus, 1758)

##### **Common Snipe**

*Description* : A pale buff stripe runs down the centre of the crown while pale stripes are above and below the eyes. Chest and wings are mottled in dark plumage. Both sides of the body are striped in black and underparts are white. It has white striped wings, rufous tail and long pointed bill. Sexes are alike. *Size* : 25-27 cm. *Habits* : It is both nocturnal and crepuscular in nature. It is rarely seen in groups. During migration they largely fly in flocks under cover of darkness and subsequently split up and forage separately. It probes the ground with jerky movements of its sturdy bill. *Habitat* : Marshes, paddy stubbles and brackish lagoons offering plenty of concealments. *Nest* : Well hidden shallow depression lined with grasses. *Eggs* : 4, Olive-brown with spots. *Food* : Mainly invertebrates.

*Status and Distribution* : Breeds in NW Himalayas; wide-spread winter visitor.

*Observation localities* : Point Calimere.

*Remarks* : Sense of touch is extraordinarily more developed in the *Gallinago* species than others. The long bills pick up tiny vibrations caused by their prey. Vibrations that could suggest approaching danger can also register via corpuscles located particularly in the legs, so that the bird has a sensory awareness even it is resting on a branch.

43. *Limosa limosa* (Linnaeus, 1758)**Black-Tailed Godwit**

*Description* : Dark stripe runs through each eye, with a white streak above. Chestnut coloured neck and upper breast. Lower chest is mottled with black streaks. Under parts are white. Wings are brownish-grey with black markings. It has a Long, narrow bill with pinkish at the base and black at the tip. Chestnut disappears from both the sexes in non-breeding season. Hens are brightly coloured and larger than cocks. *Size* : 36-44 cm. *Habits* : It is a prober and surface feeder as well. Unlike other waders, it feeds in deeper water. *Habitat* : Frequently freshwater habitats and infrequently coastal areas. *Food* : Mainly invertebrates.

*Status and Distribution* : Locally common widespread winter migrant to India extending eastward up to W. Bengal.

*Observation localities* : Gulf of Mannar and Point Calimere.

*Remarks* : When feeding in water they vibrate the water to disturb the aquatic invertebrates.

44. *Limosa lapponica* (Linnaeus, 1758)**Bar-Tailed Godwit**

*Description* : Dark stripe runs through each eye. Bill is long and up-curved, paler at its base and dark at the tip. Breeding male has chestnut-red underparts while female develops pale chestnut on neck. However, like the male some develop brighter chestnut in the underparts and some remains in the non-breeding plumage. Non-breeding has dark streaking on breast and streaked appearance to upperparts. *Size* : 37-41 cm. *Habits* : It is a prober and surface feeder as well. Unlike Black-tailed Godwit, it feeds in shallow water. *Habitat* : Frequently in coastal habitats and infrequently in inland habitats. *Food* : Mainly invertebrates.

*Status and Distribution* : Winter migrant, more frequent in NW India.

*Observation localities* : Muthupet, Point Calimere, Pichavaram.

45. *Numenius phaeopus* (Linnaeus, 1758)**Whimbrel**

*Description* : Looks like curlews but rather small sized bird with shorter bill. It has brown crown with lighter central stripe. Dull brown line runs through eyes. Brown streaks on silvery background on rest of the body. Back and wings are darker brown.

Sexes are alike. Young have straight and short bill. *Size* : 40-46 cm. *Habits* : It often snatches crabs scampering across the sand and occasionally probe for food. *Habitat* : Estuaries, tidal creeks and mangroves. *Food* Largely invertebrates.

*Status and Distribution* : Winter migrant, mainly to Indian coasts.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

#### 46. *Numenius arquata* (Linnaeus, 1758)

##### **Eurasian Curlew**

*Description* : Looks like whimbrel but rather large sized bird with longer bill. Plumage is streaked with pale muddy colour on the throat and buff chest. Larger dark patterning is on the wings. Underparts and rump are white. Cocks have plain-coloured heads, but hens' heads usually show a trace of a white stripe running down over the crown. Hens are also distinguished by their longer bills, which can be up to 15 cm in length. Curlew has grey rather than buff plumage during non-breeding season. *Size* : 50-60 cm. *Habits* Large sized wader and the long, narrow bill help to probe in the sand for food. It shows strong site-fidelity and lives for more than 30 years. Legs are so long that the toes protrude beyond the tip of the tail in flight. *Habitat* : Estuaries, tidal creeks and mangroves. *Food* : Mainly invertebrates but eat aquatic vegetation also.

*Status and Distribution* Widespread winter migrant, mainly to coastal areas; Pakistan, Nepal.

*Observation localities* : Gulf of Mannar, Muthupet, Pichavaram.

#### 47. *Tringa erythropus* (Pallas, 1764)

##### **Spotted Redshank**

*Description* A medium sized wader with red legs and straight bill with red at the base. Looks like Redshank but bill and legs are rather larger than Redshank. Breeding adult is black overall with white spots above. Non-breeding plumage is paler grey above and whiter below. Juvenile has grey barring on underparts. Sexes are alike. *Size* : 29-32 cm. *Habits* It is seen singly or in small groups. *Habitat* : Mainly freshwater habitat and also coastal habitats. *Food* Mainly invertebrates.

*Status and Distribution* : Widespread winter migrant including Kashmir.

*Observation localities* Muthupet, Point Calimere, Pichavaram.

48. *Tringa totanus* (Linnaeus, 1758)**Common Redshank**

*Species description* : It resembles the spotted redshank in appearance. It has black bill with orange-red at the base, orange-red legs, and broad white trailing edge to wing. In non-breeding season, the adult has greyish brown upperparts and white underparts. Neck and underparts heavily streaked in breeding plumage; upperparts with grey and dark brown and cinnamon markings. Juvenile has brown upperparts with buff spotting and fringes. *Size* : 27-29 cm. *Habits* : It is seen singly or in groups. *Habitat* : Fresh and coastal waters. *Food* : Mainly invertebrates.

*Status and Distribution* : Breeds in Himalayas, widespread winter visitor except C and E India and part of Himalaya.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

49. *Tringa stagnatilis* (Bechstein, 1803)**Marsh Sandpiper**

*Description* : A small bird with longer legs and finer bill than Greenshank. Legs are yellowish green. In non-breeding season, it has whitish underparts and brownish grey upperparts. In the breeding season, it develops several streaks and blotches on the upperparts. *Size* : 22-25 cm. *Habits* : It is seen singly as well as in small groups. *Habitat* : Mainly freshwater wetlands. *Food* : Mainly invertebrates.

*Status and Distribution* : Locally common and widespread winter migrant to India; Pakistan; Nepal; Bangladesh; Srilanka.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

50. *Tringa nebularia* (Gunner, 1767)**Common Greenshank**

*Description* : It has a long and stout bill and long and stout greenish legs. In non-breeding season, it has greyish upperparts while in breeding plumage, it has streaked upperparts. *Size* : 30-34 cm. *Habits* : It is seen singly or in groups. *Habitat* : Fresh and coastal waters. *Food* : Mainly invertebrates.

*Status and Distribution* : Locally common and widespread winter migrant to India; Pakistan; Nepal; Bangladesh; Srilanka; Maldives.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

51. *Tringa guttifer* (Nordmann, 1835)**Nordmann's Greenshank**

*Description* : It has short yellowish legs and pale-bluish bill with blackish tip. In the breeding, it develops bluish-grey wings, mantle, rump with heavily speckled. Head and neck and throat are white with numerous uniform speckles. Belly is white. In the non breeding, it lacks speckles and replaces the grey with pale brown. *Size* : 32 cm. *Habits* : *Habitat* : Freshwater and coastal wetlands. *Food* : Invertebrates.

*Status and Distribution* : Globally threatened/endangered. A vagrant winter visitor to India.

*Observation localities* : Point Calimere.

52. *Tringa Ochropus* Linnaeus, 1758**Green Sandpiper**

*Description* : It has white rump, very dark brownish upperparts with white parts and upperwing lacks wing-bar. It has an indistinct (or non-existent) supercilium behind eye and darker upperparts. *Size* : 21-24 cm. *Habits* : One of the commonest waders. *Habitat* : Fresh and coastal waters. *Food* : Invertebrates.

*Status and Distribution* : A locally common widespread winter and passage migrant to India.

*Observation localities* : Muthupet, Point Calimere, Pichavaram.

53. *Tringa glareola* Linnaeus, 1758**Wood Sandpiper**

*Description* : It has white rump, and dark upperwing. It has yellowish legs, prominent supercilium, and heavily spotted upperparts. *Size* : 18-21 cm. *Habits* : Gregarious, often in flocks of 20-30. *Habitat* : Fresh and coastal waters. *Nest* : Scrape on the ground. *Eggs* : 4. *Food*: Invertebrates.

*Status and Distribution* : A locally common winter migrant..

*Observation localities* : Muthupet, Point Calimere, Pichavaram.

54. *Xenus cinereus* (Guldenstadt, 1774)**Terek Sandpiper**

*Status* : Widespread winter visitor, mainly to coasts, also inland.

*Species description* : Head and back are brownish and breast is streaked. Underparts are white and wings are with contrasting black markings. Upperparts are grayish in non-

breeding season. Bill is rather long, brownish and upturned. Legs and feet are slightly orange in adults and yellowish in young. Sexes are alike. *Size* : 22-25 cm. *Habits* : It uses their bill both to grab and to probe for invertebrates, on land and in shallow water, preferring to feed when the tide is out. They are very agile, able to move quickly to snap up prey before it can escape. *Habitat* : Both inland coasts. *Nest* : A scrape line with vegetation on the ground. *Eggs* : 2-5, Greenish-brown with dark spots. *Food* : Mainly invertebrates.

*Status and Distribution* : Widespread winter visitor, mainly to coasts, also inland of India.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

### 55. *Actitis hypoleucos* Linnaeus, 1758

#### Common Sandpiper

*Description* : Breeding adult is brown above with dark barring and streaking; white below; upper breast finely streaked. Streaking and barring are lacking in non-breeding. White wing-bar and brown rump and centre of tail are seen in flight. Breeds by mountain streams and rivers; winters at freshwater and coastal wetlands. *Size* : 19-21 cm. *Habits* : It often probes into the land and shallow water for invertebrates and also grabs the prey. *Habitat* : Both in inland and coasts. *Nest* : A scrape on the ground. *Eggs* : 2-4. *Food* : Mainly invertebrates.

*Status and Distribution* : Breeds in Himalayas; locally common winter migrant to all over India.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere.

### 56. *Arenaria interpres* (Linnaeus, 1758)

#### Ruddy Turnstone

*Description* : Wings are ruddy coloured with black patches during the breeding season. Black markings run around the eye down on to the chest. Rest of the parts is white. Bill is black and legs are reddish. Hens are not as brightly coloured. In winter, brown and blackish streaks appear on head and back, with black wing patch and bib unaltered. Young birds have browner heads. In flight, shows white stripes on wings and back and clack tail. In breeding plumage, has complex black-and-white neck and breast pattern and much chestnut-red on upperparts; duller and less strikingly patterned in non-breeding plumage. Juvenile has buff fringes to upperparts, and blackish breast. *Size* : 23 cm. *Habits* : In addition to usual feeding techniques, it also digs the sandy areas

for food and scavenges on the remains of food left over by other birds. *Habitat* : Rocky coasts and tidal mudflats. *Food* : Invertebrates.

*Status and Distribution* : Widespread winter visitor to coasts, inland vagrant in India.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere.

*Remarks* As the name suggests, ruddy turnstones use the strong neck and bill to flip over small rocks, shells, and seaweed on the beach.

### 57. *Limnodromus semipalmatus* (Blyth, 1848)

#### Asian Dowitcher

*Description* Crown becomes darker and underparts become pale orange with speckles in breeding season. Both the colour disappears in non-breeding season and becomes completely a grey and white or silver-grey bird. Wings are greyish black with pale edges. Sexes are similar. *Size* : 34-36 cm. *Habits* : It feeds by probing with its bills for prey underwater, often submerging its heads while doing so. *Habitat* : Marshy areas. *Food* : Mainly invertebrates.

*Status and Distribution* : Rare winter visitor to coasts of India, Bangladesh and Sri Lanka.

*Observation localities* : Muthupet, Point Calimere.

### 58. *Calidris tenuirostris* (Horsfield, 1821)

#### Great Knot

*Description* : Except the vent, all parts of the body are heavily speckled with black in the breeding and scapulars are chestnut coloured. It removes the chestnut colour and replaces the heavily black coloured speckles with brown coloured less numerous speckles. *Size* : 28 cm. *Habits* : Gregarious. *Habitat* : Coastal wetlands. *Food* : Invertebrates.

*Status and Distribution* : Uncommon winter visitor to the Indian coasts, rare inland.

*Observation localities* : Gulf of Mannar.

### 59. *Calidris canuta* (Linnaeus, 1758)

#### Red Knot

*Description* It has orange-brownish underparts and head with speckles on the forehead. The mantle and wings are brownish with speckles in the breeding season. It lacks the orange-brown in the non-breeding season. Bill is pale black and short.

*Size* : 25 cm. *Habits* : Gregarious, feeds by probing in to soft mud. *Habitat* : Coastal wetlands. *Food* : Invertebrates.

*Status and Distribution* : A vagrant winter visitor to the coastal areas of India.

*Observation localities* : Gulf of Mannar.

60. *Calidris alba* (Pallas, 1764)

**Sanderling**

*Description* : It is a small sized bird. It has white belly and brownish upperparts, throat and breast with speckles in the breeding season. *Size* : 20 cm. *Habits* : Forages in mixed flocks with other small waders. *Habitat* : Coastal wetlands. *Food* : Invertebrates.

*Status and Distribution* : winter visitor, very rare inland.

*Observation localities* : Gulf of Mannar.

61. *Calidris minuta* (Leisler, 1812)

**Little Stint**

*Description* : Over the back and wings are mottled with pale and dark brown while striped pattern appears on the sides of the wing in the breeding season. Underparts are white, and the narrow bill is black. Legs and feet are dark. Sexes are alike. Non-breeding plumage lacks brown and tidy mottled/streaked appearance. *Size* : 13-15 cm. *Habits* : It is sociable in nature and form small to large groups when feeding. *Habitat* : Freshwater and coastal wetlands. *Food* : Invertebrates

*Status and Distribution* : A widespread winter visitor to both the coast of India and inland, except higher Himalaya.

*Observation localities* : Gulf of Mannar, Point Calimere.

62. *Calidris ruficollis* (Pallas, 1776)

**Rufous-necked Stint**

*Description* : It is a small sized bird. In the breeding season, it has brownish head and throat with simple blackish streaks on the head but not on the throat and whitish underparts. The mantle, rump and wings are grayish with speckles. During non-breeding, it has grayish upperparts and dirty whitish underparts. *Size* : 16 cm. *Habits* : Gregarious. *Habitat* : Mainly coastal wetlands. *Food* : Invertebrates.

*Status and Distribution* : Rare winter migrant chiefly to East-coast.

*Observation localities* : Gulf of Mannar.

63. *Calidris temminckii* (Leisler, 1812)**Temminck's Stint**

*Description* : It resembles the little stint in all aspects but differs by elongated appearance. Much duller than little stint in the colour and mottles/speckles over the body as well. Legs are pale yellowish or pale greenish. Underparts are tidy white. It lacks v shape markings on the mantle. During breeding season, it develops brownish-grey plumage on upperparts and breast. *Size* : 13-15 cm. *Habits* : It is sociable in nature and form small to large groups when feeding. *Habitat* : Freshwater and coastal wetlands. *Food* : Invertebrates.

*Status and Distribution* : A widespread winter migrant to all over India, except part of Himalaya.

*Observation localities* : Muthupet, Pichavaram.

64. *Calidris subminuta* (Middendorff, 1853)**Long-toed Stint**

*Description* : It is a small sized bird with pale brownish body except white throat and belly in the breeding season. Breast and forehead are heavily streaked. Grey plumage replaces the pale-brown in the non-breeding season. *Size* : 15 cm. *Habits* : Forages with other stints. *Habitat* : Freshwater and coastal wetlands. *Food* : Invertebrates.

*Status and Distribution* : Uncommon but widespread winter visitor along East Coast, Gujarat and Eastern India.

*Observation localities* : Gulf of Mannar.

65. *Calidris alpina* (Linnaeus, 1758)**Dunlin**

*Description* Generally grayish head and wings in non-breeding season, with streaking on the breast. In breeding season, underparts display black streaking, with brownish and black on wings. Centre of abdomen is black and flanks are white. Sexes are alike. *Size* : 16-22 cm. *Habits* It prefers muddy estuaries rather than sandy coasts. It feed by probing repeatedly in one area, then dart off and begin probing again nearby, a distinctive feeding method that enables it to be identified from a distance. *Habitat* Mainly coastal wetlands also flooded fields. *Food* : Chiefly invertebrates.

*Status and Distribution* Winter visitor, mainly to W coasts, also occasionally inland.

*Observation localities* Muthupet, Point Calimere, Pichavaram.

66. *Calidris ferruginea* (Pontoppidan, 1813)**Curlew Sandpiper**

*Description* : It has a long downcurved bill. It develops brown plumage on head, chest and belly during the breeding season. In non-breeding season, it has white throat, supercilium, belly and cheek and the remainder is grey. *Size* : 18-23 cm. *Habits* : It is seen in small groups and feeds like dunlin. It wades also in deeper water. *Habitat* : Mainly coastal wetlands, also inland waters. *Food* : Invertebrates.

*Status and Distribution* : Uncommon winter visitor chiefly to the coasts.

*Observation localities* : Muthupet, Point Calimere, Pichavaram.

67. *Limicola falcinellus* (Pontoppidan, 1763)**Broad-Billed Sandpiper**

*Description* : It has a black spot in front of the eyes, pale brownish supercilium, heavily speckled in brown all over the body except belly during breeding season. In non breeding, it lacks the brown colour and replaces it with grey with less speckled. Bill is black, legs and feet are yellowish grey. Sexes are alike. *Size* : 16-18 cm. *Habits* : Commonly seen singly and occasionally form small groups *Habitat* : Mainly coastal wetlands, also inland waters. *Food* : Invertebrates.

*Status and Distribution* : Uncommon winter migrant to coasts.

*Observation localities* : Muthupet, Point Calimere, Pichavaram.

## Family : RECURVIROSTRIDAE

68. *Himantopus himantopus* (Linnaeus, 1758)**Black-winged stilt**

*Description* : It is very slim in appearance. It has black head and nape, long pinkish legs, and fine straight bill. Its legs extend a long way behind tail in flight. *Size* : 35-40 cm. *Habits* : It forages very slowly on the mudflats by wading. Sometimes breeds in colonies. *Habitat* : Inland wetlands to coastal areas. *Nest* : Scrape on the ground. *Eggs* : 2-4. *Food* : Invertebrates.

*Status and Distribution* : A common resident species throughout India.

*Observation localities* : Gulf of Mannar, Pichavaram.

69. *Recurvirostra avosetta* Linnaeus, 1758

**Pied Avocet**

*Description* : It has long and slender pale blue legs. It has a black cap on the head extends down to the nape of the neck, black flight feathers, and thin black bill curved upwards. Zebra pattern is seen on wings in flight. *Size* : 42-45 cm. *Habits* : The upcurved bill enables the bird to feed by sweeping the bill from side to side in the water. *Habitat* : coastal wetlands. *Nest* : Scrape on the ground. *Eggs* : 4. Pale brown with faint markings. *Food* : Small crustaceans and other invertebrates.

*Status and Distribution* : Breeds in Pakistan and Kachchh; winter visitor to Tamil Nadu coast.

*Observation localities* : Pichavaram.

Family : PHALAROPIDAE

70. *Phalaropus lobatus* (Linnaeus, 1758)

**Red-necked Phalarope**

*Description* : It is smaller than Red Phalarope. In the breeding season, it has an orange buff runs from the cheek to breast. White throat and orange breast is separated by a thin black ring runs from either side of the blackish head. Belly is white and the mantle and side are bluish black. In the non-breeding season, it has grayish wings, mantle, rump and back of the neck and rest is white. Black patch is seen on the top of the head and around the eyes. *Size* : 19 cm. *Habits* : The upcurved bill enables the bird to feed by sweeping the bill from side to side in the water. *Habitat* : Coastal wetlands. *Nest* : Scrape on the ground. *Eggs* : 4. Pale brown with faint markings. *Food* : Small crustaceans and other invertebrates.

*Status and Distribution* : An uncommon winter migrant along the western Gujarat and Tamil Nadu, very rare passage migrant.

*Observation localities* : Gulf of Mannar.

Family : DROMADIDAE

71. *Dromas ardeola* Paykull, 1805

**Crab-Plover**

*Description* : It has white body with black back and flight feathers. The bill is very thick and black and the legs are long and grey. *Size* : 38-41 cm. *Habits* : Found singly, in pairs and in small parties. *Habitat* : Inter-tidal mudflats, coral reefs and coastal rocks. *Food* : Invertebrates particularly crab also mudskippers and crustaceans.

*Status and Distribution* : Winter visitor to coastal region with special concentration in Gulf of Kachchh in Gujarat; breeds in Sri Lanka.

*Observation localities* : Gulf of Mannar, Point Calimere.

Family : BURHINIDAE

72. *Esacus recurvirostris* (Cuvier, 1829)

**Stone-Plover**

*Description* : It has pale brown body with uniform streaks except white belly. It has long yellowish legs, black tipped yellowish bill and yellowish iris. Primaries, secondaries and primary coverts are blackish brown with few white patches seen in flight. *Size* : 44 cm. *Habits* : Usually in pairs, also in small groups. Usually rests during the day in full sun close to the water's edge. *Habitat* : Open dry inland habitats to coastal areas. *Nest* : Underground tunnel. *Eggs* : 2-4. *Food* : Invertebrates particularly crab.

*Status and Distribution* : A widespread but un-common resident species all over India.

*Observation localities* : Muthupet.

73. *Esacus magniostris* (Vieillot, 1818)

**Beach Stone-plover**

*Description* : It has white supercilium, pale greenish brown upperparts, dull white underparts, black flight feathers, and black marks just above and below the supercilium. It has a very thick black tipped yellow bill. *Size* : 53-57cm. *Habits* : It is mainly crepuscular in nature. *Habitat* : Inland wetlands to coastal areas. *Nest* : Scrape on the ground. *Eggs* : 2-4. *Food* : Invertebrates and vertebrates.

*Status and Distribution* : A near threatened widespread locally common resident.

*Observation localities* : Muthupet.

Family : LARIDAE

74. *Larus heuglini* Bree, 1876

**Heuglin's Gull**

*Description* : A brownish grey gull. It has grey upperparts, Yellow-legged; head and upperparts are heavily streaked and speckled in non-breeding plumage. In breeding season, it is less speckled and with white patches on flight feathers. *Size* : 58-65 cm. *Habits* : It is frequently seen around fishing boats, scavenging near shore for fishes. *Habitat* : Coasts and inland waters. *Food* : Fish and carrion.

*Status and Distribution* : A winter visitor to the sub continent.

*Observation localities* : Gulf of Mannar, Point Calimere, Pichavaram.

75. *Larus ichthyaetus* Pallas, 1773**Pallas's Gull**

*Description* A large sized gull with angular head. It has black head, dark brown tipped yellow bill black patched primaries and remainder is dull white during breeding season. It loses the black plumes on the head and develops several speckles on tail and tips during non-breeding. *Size* : 69 cm. *Habits* : It is frequently seen around fishing boats, scavenging near shore for fishes. *Habitat* : Coasts and inland lakes and large rivers. *Food* : Fish and carrion.

*Status and Distribution* : A common winter visitor to Indian sub continent.

*Observation localities* : Pichavaram.

76. *Larus brunnicephalus* Jerdon, 1840**Brown-headed Gull**

*Description* : It is larger than Black-headed, with more rounded wing-tips, and broader bill. Compared to Black-headed, It has distinctive black wing-tips, white patch on outer primaries and primary coverts, black underside to primaries and much greyish underwing-coverts. It develops pale brown plumes on the head during breeding. *Size* : 42 cm. *Habits* : It seeks food in small groups, diving under the waves to catch prey rather than scavenging. *Habitat* : Coasts and large inland lakes and rivers. *Nest* : Scrape on the ground lined with vegetation *Eggs* : 2-3, Pale blue to brown with dark markings. *Food* : Fish and carrion.

*Status and Distribution* : Breeds in Ladakh, winter visitor and passage migrant.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

77. *Larus ridibundus* Linnaeus, 1766**Black-headed Gull**

*Description* : It is smaller than brown headed gull and has brownish black head, sturdy bill, greyish wings, and blackish flight feathers in the breeding season. It develops more white on head and leaves a dark ear-covert patch during non-breeding season. *Size* 38 cm. *Habits* : It is common not only in coastal areas but also in the towns situated near coastal areas or areas with lakes. It is noisy bird and nest in colonies. *Habitat* : Coasts and large inland lakes and rivers. *Food* : Fish and carrion.

*Status and Distribution* : Winter visitor and passage migrant.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

78. *Gelochelidon nilotica* (Gmelin, 1789)**Gull-Billed Tern**

*Description* : It resembles gull in appearance. It has black cap, grey rump and black tail. Juvenile has less mark on upperparts. *Size* : 35-38 cm. *Habits* : Gregarious. *Habitat* : Inland waters to coastal waters. *Nest* : Scrape on shore. *Eggs* : 2-4. *Food* : Fish to invertebrates.

*Status and Distribution* : Breeds locally in Pakistan and N. India; widespread in winter.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

79. *Sterna caspia* Pallas, 1770**Caspian Tern**

*Description* : It has black cap, grey wings and white chest and underparts. Sexes are alike. It has large red bill with a black tip. *Size* : 47-54 cm. *Habits* : Gregarious during breeding season. *Habitat* : Inland waters to coastal waters. *Food* : Fish to invertebrates.

*Status and Distribution* : Winter visitor to Indian coasts.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

80. *Sterna aurantia* J.E. Gray, 1831**River Tern**

*Description* : It has black cap, orange-yellow bill, grayish-white underparts, and long grayish-white outer tail feathers during breeding season. It loses its long outer tail feathers and develops black mask on head during non-breeding season. *Size* : 38-46 cm. *Habitat* : Inland waters to coastal waters. *Nest* : Scrape on shore. *Eggs* : 2-4. *Food* : Fish to invertebrates.

*Status and Distribution* : A locally common resident species except Himalaya.

*Observation localities* : Point Calimere, Pichavaram.

81. *Sterna bengalensis* Lesson, 1831**Lesser Crested Tern**

*Description* : Similar to Greater crested Tern but smaller in size. It has a black top with crest, Lime-green to cold yellow bill, greyish wings, rump and upperparts and the remainder of the plumage is white. *Size* : 35-37 cm. *Habits* : It breeds in colony; sometimes the colony comprises 20000 individuals. It prefers to seek food sheltered bays

rather than over the open seas. *Habitat* : Mainly offshore waters; also tidal channels. *Nest* Scrape on the shore. *Eggs* : 1-2 Brownish with dark markings. *Food* : Fish to invertebrates.

*Status and Distribution* : Resident. Occur offshore almost all year; breeds in Pakistan.

*Observation localities* : Muthupet, Point Calimere, Pichavaram.

### 82. *Sterna bergii* Lichtenstein, 1823

#### Large Crested Tern

*Description* : It has a black top with crest, Lime-green to cold yellow bill, greyish wings, rump and upperparts and the reminder of the plumage is white. *Size* : 46-49 cm.

*Habits* : It prefers bays than open sea. *Habitat* : Mainly offshore waters; also tidal channels. *Nest* : scrape on the shore. *Eggs* : 1-2 Brownish with dark markings. *Food* : Fish to invertebrates.

*Status and Distribution* : Breeding resident on offshore islands along the coast of India.

*Observation localities* : Muthupet, Point Calimere, Pichavaram.

### 83. *Sterna hirundo* Linnaeus, 1758

#### Common Tern

*Description* : It has a black top, white rump and underparts and greyish mantle. It has reddish orange bill and legs. *Size* : 35 cm. *Habits* : It prefers bays than open sea. *Habitat* : Mainly offshore waters; also inland waters. *Nest* : Scrape on the shore. *Eggs* : 1-2. *Food* : Fish to invertebrates.

*Status and Distribution* : Winter visitor, breeds in Ladakh.

*Observation localities* : Muthupet, Point Calimere, Pichavaram.

### 84. *Sterna albifrons* Pallas, 1764

#### Little Tern

*Description* : Fast flight with rapid wing beats, long bill, and narrow-based wings. Adult breeding has white forehead and black-tipped yellow bill. Adult non-breeding and immature have blackish bill, and black mask and nape band. Juvenile has dark sub-terminal marks to upperpart feathers. *S. a sinensis*, of W coast of peninsula and Sri Lanka, has longer tail and white primary shafts. *Size* : 22-24 cm. *Habits* : It is highly adaptable and nest in colonies. *Habitat* : Mainly freshwater lakes and rivers, also coastal waters. *Nest* Scrape on the shore. *Eggs* : 2-3, Brownish with dark markings. *Food* Fish and invertebrates.

*Status and Distribution* : Resident.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

85. *Sterna dougallii* Montagu, 1813

**Roseate Tern**

*Description* : The tern gets its name from the slight pinkish suffusion on its whitish underparts during the breeding season. It has long tails streamers and short wings. It has black bill with red base in breeding. Sexes are alike. *Size* : 36 cm. *Habits* : It is commonly seen in shallow shore regions. *Habitat* : Coastal waters. *Nest* : Scrape on the ground. *Eggs* : 1-2. *Food* : Mainly fish.

*Status and Distribution* : Breeding summer visitor. Wintering Indian ocean.

*Observation localities* : Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

86. *Sterna acuticauda* J.E. Gray, 1831

**Black-bellied Tern**

*Description* : It has reddish orange bill and legs. In breeding season, it develops black plumage on top of the head, belly and vent and greyish plumage on breast. *Size* : 33 cm. *Habits* : Gregarious. *Habitat* : Coastal waters. *Nest* : Scrape on the ground. *Eggs* : 1-2. *Food* : Mainly fish.

*Status and Distribution* : Near threatened resident, except Himalaya.

*Observation localities* : Point Calimere.

87. *Sterna anaethetus* Scopoli, 1786

**Bridled Tern**

*Description* : During breeding, it has black at the top of the head and entire upper parts and white underparts. Everything becomes duller in colour in non-breeding season. *Size* : 33 cm. *Habits* : Often seen in blocks with other sea birds over shoals of fish, dips down to pick fish and plankton from the surface. *Habitat* : Coastal waters. *Nest* : Scrape on the ground. *Eggs* : 1-2. *Food* : Aquatic vertebrates to invertebrates

*Status and Distribution* : Breeds in Maharashtra coast, offshore coastal waters of W. India, Pakistan, Srilanka, Tropical Indian ocean.

*Observation localities* : Point Calimere.

88. *Sterna fuscata* Linnaeus, 1766**Sooty Tern**

*Description* : It has black plumage extends from the side of the bill that runs through eyes and joins the black cap on the head. The black cap on the top extends over the back and wings. It has forked black tail and white underparts. *Size* : 45 cm. *Habits* : It prefers mostly inaccessible areas to breed. It breeds in much larger colonies. It even preys in the night hours and lives for over 30 years. *Habitat* : Coastal waters. *Nest* : Scrape on the ground. *Eggs* : 1. *Food* : Largely fish.

*Status and Distribution* Breeds in Maharashtra coast, also Lakshadweep. During non breeding season it disperses to adjacent breeding islands.

*Observation localities* Point Calimere.

89. *Sterna sandvicensis* Latham, 1787**Sandwich Tern**

*Description* : It is a white bird with greyish bar runs from eye to eye. During breeding, the top of the head becomes black. Sexes are alike. The bill is black with yellow tip. Wings are grey. *Size* 43 cm. *Habits* It is a noisy and good diving and skimming bird. It breeds in colonies in the open on sand bars. *Habitat* : Coastal waters. *Eggs* : 1-2. *Food* Fishes.

*Status and Distribution* : Winter visitor to W coast to Gulf of Kutch, rare inland.

*Observation localities* Gulf of Mannar.

90. *Chlidonias hybridus* (Pallas, 1811)**Whiskered Tern**

*Description* Male has a black cap with white on the sides of the face and grey body in the breeding season. During non-breeding season, body is mostly speckled. *Size* 23-25 cm. *Habitat* : Coastal waters. *Food* Aquatic vertebrates to invertebrates.

*Status and Distribution* : Winter visitor, breeds in Kashmir and Assam.

*Observation localities* Gulf of Mannar, Muthupet, Point Calimere, Pichavaram.

91. *Chlidonias leucopterus* (Temminck, 1815)**White-winged Black Tern**

*Description* It has white underparts and greyish or dirty white wings and tail. During breeding season it develops black plumage on top of the head, pale upperwing-coverts

and black underwing-coverts. *Size* : 20-23 cm. *Habits* : Gregarious. *Habitat* : Mainly fresh water and occasionally coastal waters. *Food* : Aquatic vertebrates to invertebrates.

*Status and Distribution* : Local winter visitor to India.

*Observation localities* : Point Calimere.

## 92. *Chlidonias niger* (Linnaeus, 1758)

### **Black Tern**

*Description* : Greyish upperparts and white underparts with some dark black or greyish speckles on the head and cheek. In breeding, it develops black plumage on entire head, breast, upperwing and underwing coverts. *Size* : 28 cm. *Habits* : Gregarious. *Habitat* : Found on lakes, marshes, paddy fields and pools. *Food* : Aquatic vertebrates to invertebrates.

*Status and Distribution* : A vagrant passage migrant to India.

*Observation localities* : Point Calimere.

## 93. *Anous stolidus* (Linnaeus, 1758)

### **Brown Noddy**

*Description* : Dark chocolate-brown coloured bird with greyish-white on the crown and a narrow broken area of white plumage around the eyes. It has a long pointed black bill and black legs and feet. Sexes are alike. It breeds in Lakshadweep and Maldives. *Size* : 45 cm. *Habits* : Do not plunge for fish, feed largely by following schools of small fish which are being attacked by some submarine predator. *Habitat* : Coastal waters. *Nest* : Scrape on the shore. *Eggs* : 1-3. *Food* : Fish and aquatic invertebrates.

*Status and Distribution* : Recorded off coasts of Pakistan, Andaman and Nicobar islands and Srilanka. Common in Lakshadweep.

*Observation localities* : Gulf of Mannar.

## **OBSERVATION AND RESULTS**

The present study was divided into three phases : preliminary survey, intensive survey I and intensive survey II. Preliminary survey was conducted all along the coastal region of Tamil Nadu in September 2005 to identify the important sites for the next two phases. Based on the survey results, existing literature and informal interview with local ornithologists, four areas such as Gulf of Mannar Marine Biosphere Reserve, Muthupet, Point Calimere Bird Sanctuary and Pichavaram were chosen for the intensive survey.

All the four places were surveyed (intensive survey I & II) for the birds in March 2006 and in February 2007. In general, 68 species of birds belonging to 16 families were recorded in March 2006 survey while it was 83 species of birds belonging to 18 families in February 2007 survey. Apart from the four areas, in order to get a comprehensive checklist entire coastal areas of Tamilnadu was surveyed during September 2005, March 2006 and February 2007. In total, 93 species of birds belonging to 19 families were recorded.

Recorded species of birds have been tabulated in the form of systemic list in Table-1). The Table-2 indicates the status and distribution, observed localities and residential status of each species. This is being followed by a systematic description of all these 95 bird species from Tamilnadu coast along with their field identification, habit, habitat, distribution, food etc. In March 2006, among the four selected areas more number of species was recorded in Point calimere (54) followed by Muthupet (48). Similar trend was observed in the subsequent year also (Fig. 7). Similarly, diversity of species was also more in the above said places in both the years (Fig. 8). Pichavaram showed the lowest number and diversity of species of birds in both the years.

Residential status of birds of Tamil Nadu coast (Fig. 9) showed that only 20 species of birds were resident while 13 and 62 were local-migrant and migrant respectively.

In total, 11 species of birds recorded for the Tamil Nadu Coast comes under different categories of IUCN (Birdlife International, 2007) and schedule I, part III of Wildlife (Protection) Act. 1972 / amended Act 2002 (16/2003) (Table 3).

**Table 2 : Status and distribution of coastal birds in Tamil Nadu**

Sl. No.	Common Name	Scientific Name	Status	Distribution			
				1	2	3	4
	<b>Order : Pelicaniformes</b>	<b>Family : Pelecanidae</b>					
1.	Spot-billed Pelican	<i>Pelecanus philippensis</i>	M	*	—	*	—
		<b>Family : Phalacrocoracidae</b>					
2.	Little Cormorant	<i>Phalacrocorax niger</i>	LM	*	*	*	—
3.	Darter	<i>Anhinga rufa</i>	LM				*
	<b>Order : Ciconiformes</b>	<b>Family Ardeidae</b>					
4.	Little Egret	<i>Egretta garzetta</i>	R, C	*	*	*	
5.	Western Reef-Egret	<i>E. gularis</i>	R, U	*	*		
6.	Grey Heron	<i>Ardea cinerea</i>	R, C	*	*	*	
7.	Purple Heron	<i>A. purpurea</i>	R, C		*	*	*
8.	Large Egret	<i>Casmerodius albus</i>	R, C		*		
9.	Median Egret	<i>Mesophoyx intermedia</i>	R, C	*	*	*	
10.	Cattle Egret	<i>Bubulcus ibis</i>	R, C	*	*	*	
11.	Indian Pond-Heron	<i>Ardeola grayii</i>	R, C	*	*		
12.	Little Green Heron	<i>Butorides striatus</i>	R, C	*	*	*	
13.	Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	LM, C		*	*	
14.	Chestnut Bittern	<i>Ixobrychus cinnamomeus</i>	R, U				*
15.	Black Bittern	<i>Dupetor flavicollis</i>	R, U				*
		<b>Family : Ciconiidae</b>					

Sl. No.	Common Name	Scientific Name	Status	Distribution			
				1	2	3	4
16.	Painted Stork	<i>Mycteria leucocephala</i>	LM		*	*	*
17.	Asian Openbill-Stork	<i>Anastomus oscitans</i>	LM	*	*	*	
		<b>Family : Threskiornithidae</b>					
18.	Glossy Ibis	<i>Plegadis falcinellus</i>	LM		*		
19.	Oriental White Ibis	<i>Threskiornis melanocephalus</i>	LM		*	*	
20.	Black Ibis	<i>Pseudibis papillosa</i>	LM	*			
21.	Eurasian Spoonbill	<i>Platalea leucorodia</i>	LM		*	*	
	<b>Order : Phoenicopteriformes</b>	<b>Family : Phoenicopteridae</b>					
22.	Greater Flamingo	<i>Phoenicopterus ruber</i>	LM	*	*	*	*
	<b>Order : Anseriformes</b>	<b>Family : Anatidae</b>					
23.	Northern Shoveller	<i>Anas clypeata</i>	M	*	*	*	
24.	Northern Pintail	<i>A. acuta</i>	M	*	*	*	
	<b>Order : Falconiformes</b>	<b>Family : Accipitridae</b>					
25.	Black Kite	<i>Milvus migrans</i>	R, C		*	*	
26.	Brahminy Kite	<i>Haliastur indus</i>	R, C	*	*	*	
27.	White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	LM	*	*		
		<b>Family : Pandionidae</b>					
28.	Osprey	<i>Pandion haliaetus</i>	M			*	
	<b>Order : Charadriiformes</b>	<b>Family : Rostratulidae</b>					
29.	Greater Painted Snipe	<i>Rostratula benghalensis</i>	M, U			*	

Sl. No.	Common Name	Scientific Name	Status	Distribution			
				1	2	3	4
		<b>Family : Haematopodidae</b>					
30.	Eurasian Oystercatcher	<i>Haematopus ostralegus</i>	M, U	*	*	*	*
		<b>Family : Charadriidae</b>					
31	Grey Plover	<i>Pluvialis squatarola</i>	M, C	*	*	*	
32.	Common Ringed Plover	<i>Charadrius hiaticula</i>	M, U		*	*	*
33.	Long-billed Ringed Plover	<i>C. placidus</i>	M, U			*	*
34.	Little Ringed Plover	<i>C. dubius</i>	R, C	*	*	*	*
35.	Kentish Plover	<i>C. alexandrinus</i>	R, C	*	*	*	*
36.	Lesser Sand Plover	<i>C. mongolus</i>	M, C	*	*	*	*
37.	Greater Sand Plover	<i>C. leschenaultii</i>	M, U		*	*	*
38.	Yellow-wattled Lapwing	<i>Vanellus malabaricus</i>	R, C		*	*	*
39.	Red-wattled Lapwing	<i>V. indicus</i>	R, C	*	*	*	*
		<b>Family : Scolopacidae</b>					
40.	Pintail Snipe	<i>Gallinago stenura</i>	M, C	*			
41.	Swinhoe's Snipe	<i>G. megala</i>	M, U			*	
42.	Common Snipe	<i>G. gallinago</i>	M, C			*	
43.	Black-tailed Godwit	<i>Limosa limosa</i>	M, C		*	*	*
44.	Bar-tailed Godwit	<i>L. lapponica</i>	M, C		*	*	*
45.	Whimbrel	<i>Numenius phaeopus</i>	M, C	*	*	*	*
46.	Eurasian Curlew	<i>N. arquata</i>	M, C	*	*		*

Sl. No.	Common Name	Scientific Name	Status	Distribution			
				1	2	3	4
47.	Spotted Redshank	<i>Tringa erythropus</i>	M		*	*	*
48.	Common Redshank	<i>T. totanus</i>	M	*	*	*	*
49.	Marsh Sandpiper	<i>T. stagnatilis</i>	M	*	*	*	*
50.	Common Greenshank	<i>T. nebularia</i>	M	*	*	*	*
51.	Nordmann's Greenshank	<i>T. guttifer</i>	M			*	
52.	Green Sandpiper	<i>T. ochropus</i>	M		*	*	*
53.	Wood Sandpiper	<i>T. glareola</i>	M		*	*	*
54.	Terek Sandpiper	<i>Xenus cinereus</i>	M	*	*	*	*
55.	Common Sandpiper	<i>Actitis hypoleucos</i>	M	*	*	*	
56.	Ruddy Turnstone	<i>Arenaria interpres</i>	M	*	*	*	
57.	Asian Dowitcher	<i>Limnodromus semipalmatus</i>	M		*	*	
58.	Great Knot	<i>Calidris tenuirostris</i>	M	*			
59.	Red Knot	<i>C. canuta</i>	M	*			
60.	Sanderling	<i>C. alba</i>	M	*			
61.	Little Stint	<i>C. minuta</i>	M, C		*	*	
62.	Rufous-necked Stint	<i>C. ruficollis</i>	M	*			
63.	Long-toed Stint	<i>C. subminuta</i>	M	*			
64.	Temminck's Stint	<i>C. temminckii</i>	M		*		*
65.	Dunlin	<i>C. alpina</i>	M		*	*	*
66.	Curlew Sandpiper	<i>C. ferruginea</i>	M, C		*	*	*

Sl. No.	Common Name	Scientific Name	Status	Distribution			
				1	2	3	4
67.	Broad-billed Sandpiper	<i>Limicola falcinellus</i>	M, U		*	*	*
		<b>Family : Recurvirostridae</b>					
68.	Black-winged Stilt	<i>Himantopus himantopus</i>	LM, C				*
69.	Pied Avocet	<i>Recurvirostra avosetta</i>	M				*
70.	Red-necked Phalarope	<i>Phalaropus lobatus</i>	M, UC	*			
		<b>Family : Dromadidae</b>					
71.	Crab-Plover	<i>Dromas ardeola</i>	M	*		*	
		<b>Family : Burhinidae</b>					
72.	Stone-Curlew	<i>Burhinus oedicnemus</i>	R, U		*		
73.	Beach Stone-Plover	<i>Esacus magnirostris</i>	R, U		*		
		<b>Family : Laridae</b>					
74.	Heuglin's Gull	<i>Larus heuglini</i>	M, C	*		*	*
75.	Palla's Gull	<i>L. icthyaetus</i>	M, C	*			*
76.	Brown-headed Gull	<i>L. brunnicephalus</i>	M, C	*	*	*	*
77.	Black-headed Gull	<i>L. ridibundus</i>	M, C	*	*	*	*
78.	Gull-billed Tern	<i>Gelochelidon nilotica</i>	M, C	*	*	*	*
79.	Caspian Tern	<i>Styerna caspia</i>	M, C	*	*	*	*
80.	River Tern	<i>S. aurantia</i>	LM, O			*	*
81.	Lesser Crested Tern	<i>S. bengalensis</i>	M, C		*	*	*
82.	Large Crested Tern	<i>S. bergii</i>	M, U		*	*	*

Sl. No.	Common Name	Scientific Name	Status	Distribution			
				1	2	3	4
83.	Common Tern	<i>S. hirundo</i>	M, C		*	*	*
84.	Little Tern	<i>S. albifrons</i>	R, C	*	*	*	*
85.	Rosy Tern	<i>Sterna dougallii</i>	M			*	
86.	Blackbellied Tern	<i>S. acuticauda</i>	M			*	
87.	Bridled Tern	<i>S. anaethetus</i>	M			*	
88.	Sooty Tern	<i>S. fuscata</i>	M			*	
89.	Sandwich Tern	<i>S. sandvicensis</i>	M	*			
90.	Whiskered Tern	<i>Chlidonias hybridus</i>	M, C	*	*	*	*
91.	Whitewinged Tern	<i>C. leucopterus</i>	M, C			*	
92.	Black Tern	<i>C. niger</i>	M			*	
93.	Brown Noddy	<i>Anous stolidus</i>	M	*			

\* – Indicates the presence of species in the respective areas.

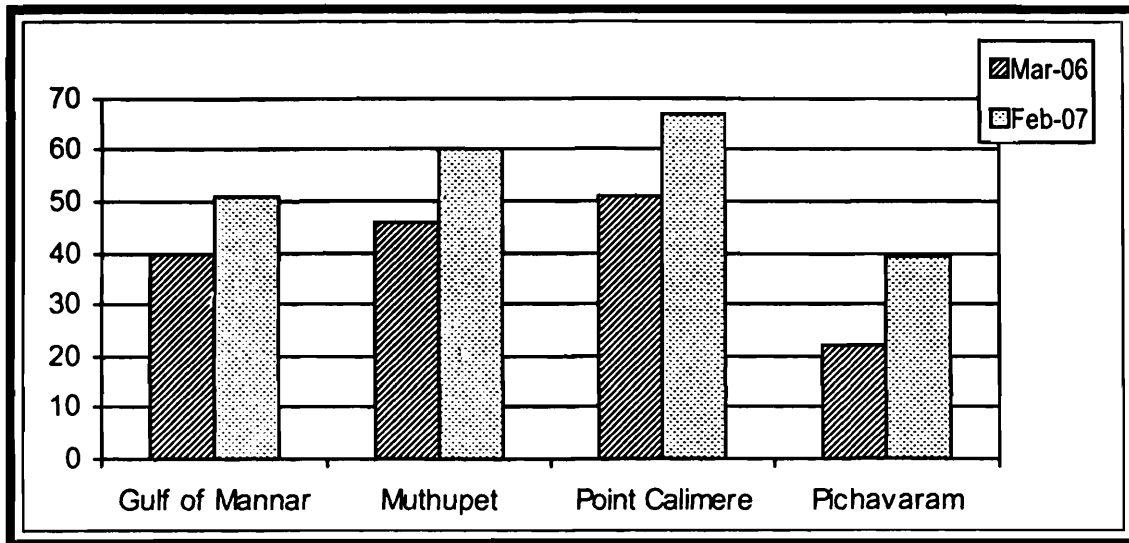
1 = GOMB

2 = Muthupet

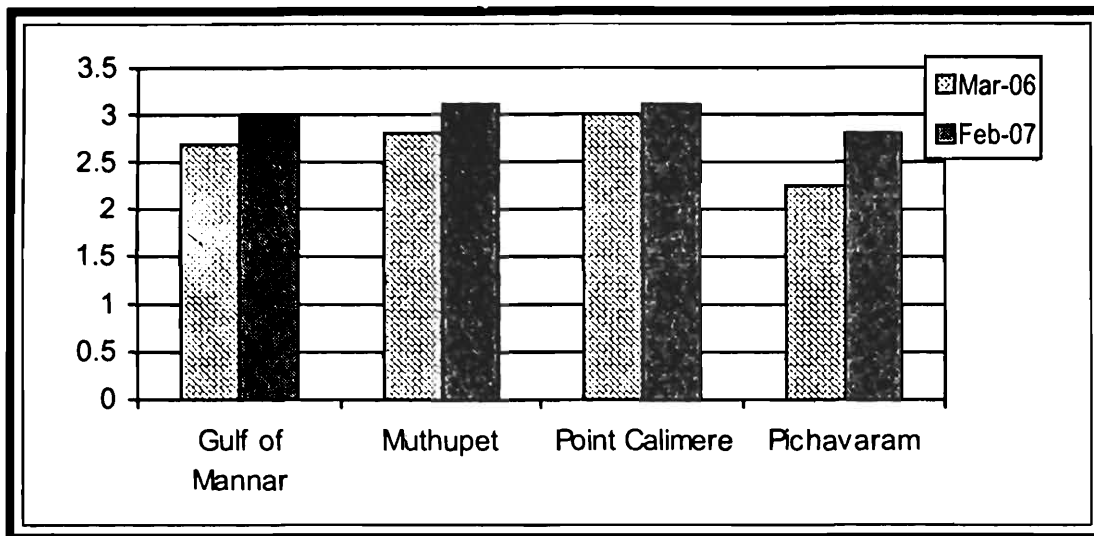
3 = Pt Calimere

4 = Pichavaram

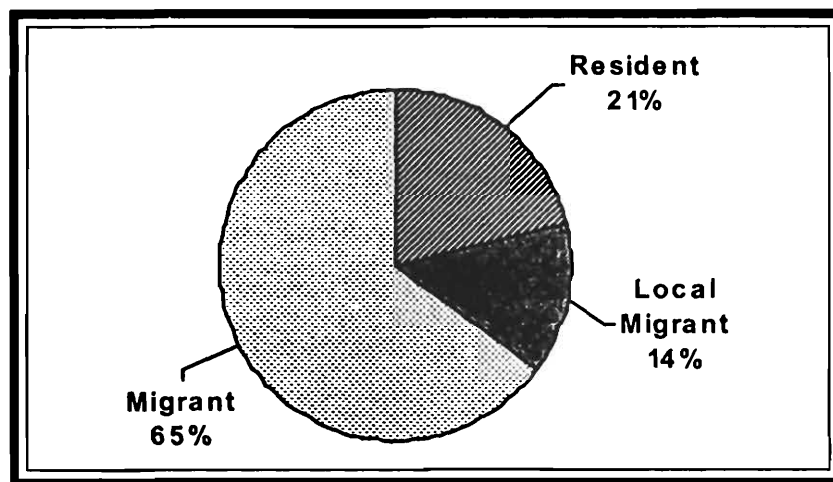
In the list following codes are used : B – Breeding, C – Common, Ra – Rare, R – Resident, LM – Local Migrant, M – Migrant, U – Uncommon



**Fig. 7 :** Abundance of bird species in the study area



**Fig. 8 :** Diversity of birds observed in the study area



**Fig. 9 :** Status of bird species in Tamil Nadu coast

**Table 3 : Conservation importance of bird species recorded**

S.No.	Species	IUCN category	WL (P) A, 1972
1	Spot-billed Pelican <i>Pelecanus philippensis</i>	Near threatened	
2	Darter <i>Anhinga melanogaster</i>	Near threatened	
3	Painted Stork <i>Mycteria leucocephala</i>	Near threatened	
4	Oriental White Ibis <i>Threskiornis melanocephalus</i>	Near threatened	
5	Eurasian Spoonbill <i>Platalea leucorodia</i>		Schedule I, Part III
6	White-bellied Sea Eagle <i>Haliaeetus leucogastus</i>		Schedule I, Part III
7	Osprey <i>Pandion haliaetus</i>		Schedule I, Part III
8	Nordmann's Greenshank <i>Tringa guttifer</i>	Endangered	
9	Asian Dowitcher <i>Limnodromus semipalmatus</i>	Near threatened	
10	Beach Stone-Plover <i>Esacus magnirostris</i>	Near threatened	
11	Black-bellied Tern <i>Sterna acuticauda</i>	Near threatened	

Among the four areas, the Gulf of Mannar Biosphere Reserve (GoMBR) being a Marine Biosphere Reserve, an aquatic habitat to support over 50, 000 individuals of shorebirds, and poorly explored in terms of birds was selected for a further detailed study (intensive survey I) in various habitats available in the mainland and in islands during March 2006. A total of 75 species of birds was observed for the entire coastal region of GoMBR. However, 54 species of birds were only recorded for the 12 habitats studied (5 in mainland and 7 in islands). Among the mainland habitats, highest number of bird species was observed in Thermal station, Tuticorin (23) followed by Valinokkam (21) and lowest number of bird species was observed in Munaikadu (11). Among the birds observed, Greater Flamingo, Whiskered Tern and Gull billed Tern were the dominant species of birds in terms of its numbers (Table-4).

**Table 4 : Species richness and abundance of birds recorded in 12 habitats**

Mainlands			Islands		
Stations	Species Richness	Abundance	Stations	Species Richness	Abundance
Thermal, station Tuticorin	23	682	Kurusadi	12	71
Mandapam	13	651	Pullivasal & Poomarichan	17	313
Munaikadu	11	285	Manoli	20	3330
Kothandaramar lagoon	19	7856	Thalayari & Appa	6	75
Valinokkam	21	850	Nalla thanni	12	41
<b>Total</b>	46	10324	Hare	10	1090
			Shingle	4	72
			<b>Total</b>	54	4992

Among the Islands, highest number of bird species was observed in Manoli (20) followed by Pullivasal & Poomarichan (17) and the lowest was observed in Shingle Island. Gulls and Terns were the dominant species in the islands. In general, Kothandaramar Kovil lagoon supported the maximum number of individuals (largely Greater Flamingoes) in Mainlands and Manoli islands (3330 individuals) in islands studied. The Manoli Island is about 2 km long and 50 m wide, covering an area of 24 hectares with small water pools and open mud flats. The small creeks inside the islands are fringed with mangrove vegetation and coarse grass. The shore is sandy and inshore areas are exposed during the low tide and attract a huge congregation of gulls and terns. Small areas are essential to guarantee that shorebirds can access all the tidal flats where they usually feed at low tide.

**Species diversity :** Diversity was recorded maximum in Thermal station, Tuticorin (2.1994) and lowest in Mandapam (0.9898) in mainland (Table-5). Among islands, Manoli showed the maximum diversity (2.4377) and Shingle showed the lowest (0.8476). In general, diversity was more in island (3.2424) than in mainland (2.1308).

**Table 5 : Diversity (H') of bird species recorded in 12 habitat types**

<b>Mainlands</b>		<b>Islands</b>	
<b>Stations</b>	<b>H'</b>	<b>Stations</b>	<b>H'</b>
Thermal station, Tuticorin	2.1994	Kurusadi	2.0863
Mandapam	0.9818	Pullivasal & Poomarichan	2.4185
Munaikadu	2.0286	Manoli	2.4377
Kothandaramar lagoon	1.1582	Thalayari & Appa	1.6171
Valinokkam	1.1589	Nalla thanni	2.1946
<b>Overall</b>	<b>2.1308</b>	Hare	1.7414
		Shingle	0.8476
		<b>Overall</b>	<b>3.2424</b>

**Similarity in bird species composition between the habitat types :** Similarity index of mainland varied from 0.01 to 0.41 and island varied from 0.06 to 0.57 (Table 6). The maximum similarity of birds was observed between Mandapam and Munaikadu and the lowest between Kothandaramar lagoon and Valinokkam among mainlands. Birds such as Median Egret, Little Egret, Grey Heron, Common Sandpiper, Little Ringed Plover and Little Cormorant were common among mainland habitats. Among the islands, maximum similarity was observed between Kurusadi and Hare and lowest was between Kurusadi & Thalayari and Appa habitats. Western Reef Egret and Gull billed Tern were common among island habitats. This indicated that these species were highly adaptable. Among birds, Grey Plover, Blackheaded Gull, Common Sandpiper, Sand Plover, Marsh Sand Piper, Grab Plover, Eurasian Oystercatcher, and Terek Sandpiper were largely observed in Island habitats.

**Table 6 : Similarity of bird species between the habitat types**

	Main land habitats					Island habitats						
	1	2	3	4	5	6	7	8	9	10	11	12
1	-											
2	0.38	-										
3	0.36	0.41	-									
4	0.20	0.14	0.30	-								
5	0.33	0.21	0.28	0.14	-							
6	0.13	0.04	0.01	0.11	0.22	-						
7	0.21	0.20	0.27	0.16	0.27	0.45	-					
8	0.19	0.22	0.24	0.26	0.21	0.33	0.37	-				
9	0.16	0.06	0.13	0.14	0.08	0.06	0.10	0.13	-			
10	0.13	0.14	0.05	0.11	0.18	0.14	0.16	0.19	0.20	-		
11	0.18	0.01	0.17	0.16	0.24	0.57	0.42	0.36	0.14	0.22	-	
12	0.04	0.00	0.07	0.15	0.04	0.00	0.00	0.09	0.11	0.00	0.00	-

1. Thermal station, Tuticorin, 2. Mandapam, 3. Munaikadu, 4. Kothandaramar lagoon, 5. Valinokkam, 6. Kurusadi, 7. Pullivasal & Poomarichan, 8. Manoli, 9. Thalayari & Appa, 10. Nalla thanni, 11. Hare, 12. Shingle

It is evident from the present study that the majority of the coastal birds prefer island habitats than the mainland in GoMBR. Shorebirds were preferentially selecting areas further from forest cover that may have lower predation risk. In GoMBR, islands are comparatively less disturbed than the mainland by human and thus it could be the main reason islands are richer in avifaunal diversity than mainland. As the availability of feeding grounds and prey are richer in Islands than mainland habitats, it could also be one of the reasons for the richness of birds in island. Moreover, the abundance of benthic fauna (prey) is also higher in muddy flats than the other habitats (sandy and sediments).

## CONCLUSION

Reduction in overall flyway population for the coastal birds was evident as their numbers are on the decline globally. Most of the threats are either at the wintering and staging/refueling sites whereas threats (natural and human-induced) at the breeding grounds are negligible due to the inaccessibility. Although the present study highlighted the role of four sites in determining the populations of birds in the coastal region of

Tamilnadu, like any other sites all the four sites have been affected severely by the change in land use pattern (conversion of wetlands into aquaculture ponds), depletion of ground water and saltwater intrusion and this in turn indirectly affects the bird population. In addition, trapping of coastal birds using claptrap, mesh-nets (like gill nets operated during night), and nooses was also observed in the select sites. All the above said factors can very well be minimized when the local community is made aware about the importance of birds, wetlands and coastal areas. In addition, initiation of a comprehensive research on monitoring the entire coastal bird population all along the Tamilnadu Coast would also strengthen the community awareness programme.

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