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Pelagic Bird's study along the Arabian sea of Udupi and Mangalore Coast

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***Abstract*– The coastline of Karnataka has been along the eastern shore of Arabian Sea. Any water in a sea or lake that is neither close to the bottom nor near the shore can be said to be in the pelagic zone. Pelagic birds, also called oceanic birds, live on the open sea, rather than around waters adjacent to land or around inland waters. Pelagic life decreases with increasing depth. It is affected by light intensity, pressure, temperature, salinity, the supply of dissolved oxygen and nutrients, and the submarine topography. The present work deals with a daylong survey to document the pelagic birds all along the Arabian Coast of Udupi to Mangalore. About 8 pelagic bird species were spotted during the study. The objective was to document the existing Pelagic Birds and to understand their pattern of presence from the shore to certain distances. From the study it is clear that the bird diversity decreases as we move from the coast into the pelagic zone. The presence of the pelagic birds at various nautical miles and depths indicates that these are specific to the availability of food and safety as there are quite less human activities except few fishermen with less disturbances. These birds migrant from far distance during winter from temperate to tropics to escape the harsh weather. Their arrival also indicates the change in climatic condition at the temperate countries. Their presence supports the favourable environment with less disturbances.**

INTRODUCTION

Karnataka's coastline called Karavali stretches 300 km between Mangalore in Dakshina Kannada district and Karwar in Uttara Kannada district. The coastline of Karnataka has been along the eastern shore of Arabian Sea. Any water in a sea or lake that is neither close to the bottom nor near the shore can be said to be in the pelagic zone. The word "pelagic" is derived from Greek *(pélagos)*, meaning "open sea". Pelagic birds, also called oceanic birds, live on the open sea, rather than around waters adjacent to land or around inland waters. Pelagic birds feed on planktonic crustaceans, squid and forage fish. Examples are the Atlantic puffin, macaroni penguins, sooty terns, shearwaters, and procellariiforms such as the albatross, procellariids and petrels. The pelagic zone occupies 1,330 million km^3 with a mean depth of 3.68 km and maximum depth of 11 km. Fish that live in the pelagic zone are called pelagic fish. Pelagic life decreases with increasing depth. It is affected by light intensity, pressure, temperature, salinity, the supply of dissolved oxygen and nutrients, and the submarine topography. Scua, Brown-headed Gull, Great Crested Tern, are some of the pelagic birds spotted in the Karnataka Coast. Unfortunately, the pelagic bird distribution off the coast of Karnataka is still sketchy (M. Shivashankar et al, 2011). A day long survey was conducted on 3rd January 2016 from 8.30 am to 6.30 pm. to document the pelagic birds all along the Arabian Coast of Udupi to Mangalore (Figure 1.). About 8 pelagic bird species were spotted during the study. The objective was to document the existing Pelagic Birds and to understand their pattern of presence from the shore to certain distances.

STUDY AREA

The study area is between Malpe shore of Udupi district and Mangalore port of Dakshina Kannada district with Latitude-Longitude: 12^0 55.812'N and 074^0 28.811'E. Malpe is a natural port about six kilometers to the west of Udupi, Karnataka, India. Close to the mainland of Malpe are four rocky islands. Maple is also an important port and fishing harbor on the Karnataka coast. It is a suburb in Udupi city. A considerable number of the population is engaged in fishing and in

fish industries. New Mangalore Port is a deep-water, all-weather port at Panambur, Mangalore in Karnataka state in India, which is also the deepest inner harbour on the west coast.[3] It is the only major port of Karnataka and is currently the seventh largest port in India. The port is situated at Panambur, Mangalore on the west coast of India. It is situated to north of confluence of Gurupura (Phalguni) river to Arabian Sea.

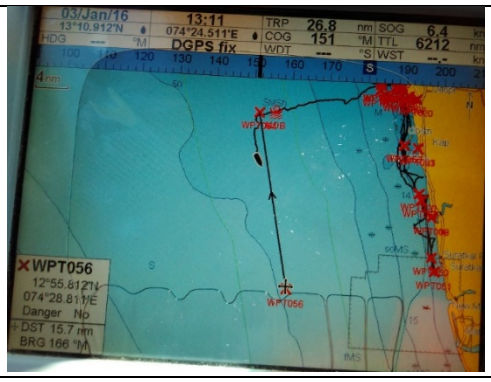

Figure1: The map of the pelagic survey direction as plotted on the screen of the boat device

The survey was from Maple shore towards the deep sea in the western direction up to 15.7 Nautical Miles and then turned towards southern direction up to 62 Nautical Miles, then moved towards eastern direction to reach Mangalore Port. The total study area was in between Maple and Mangalore at the deep sea of 15.7 Nautical mile. There were point reading noted at every 2 nautical miles and birds sighted were documented (Figure 2).

MATERIALS AND METHOD:

Materials: Binoculars, Spotting Scope, Field Guides, Digital Cameras.

Method: The sail was set at 8.30 am from Malpe Coast of Udupi District towards the sea up to 29 Nautical Miles (A *nautical mile* equals to 1.852 meters) and turned towards Mangalore approximately parallel to the coastal line and reached by 6.30 pm. At every 2 nautical miles, reading was noted and birds sighted were documented along with number of individuals and their activities.

RESULTS AND DISCUSSION:

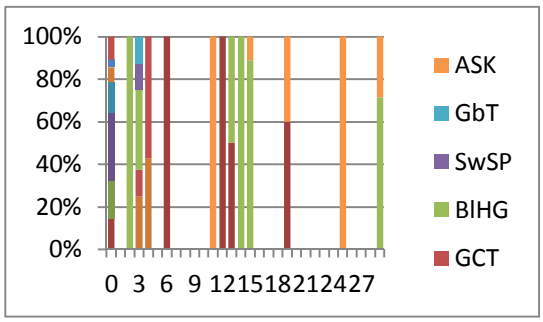

Figure 2: Represents the each bird species in different color codes. X-axis represents the Nautical miles and Y- axis represents the % abundance of each species at given Nautical mile.

Pelagic bird species spotted on 3rd January 2016 at West coast of India, from Malpe off 29 nautical miles to the Arabian Sea were documented. Total of 11 species of Birds were recorded during the pelagic survey of which 8 were pelagic birds like Brown headed gulls (BrHG), Black headed gulls (BlHG), HG(Heuglins's Gull), Whiskered tern (WT), GCT (Greater crested tern), SwSP(Swinhoe's storm petrels), GbT (Gul- billed tern), ASK (Arctic skua) and non-pelagic birds like Black kite (BlK), Brahminy kite (BrK), WRE(Western reef egret) (Annexure 1.). The survey was carried between latitudes of 13°20.972 N to 13°10.699 N and longitudes of 74°41.450 E to 74°24.172 E. Total of 7 species (28 individuals) were observed at zero nautical mile of which 4 (14.3 %) were BrHG and BlK, 5 (17.9 %) BrK, 9 (32.1%) WRE,2 (7.1 %) HgG, 1 (3.6 %) WT, GCT were about 3(10.7 %). There were no birds seen between 0 to 2 Naut miles. At 2 Nautical miles one BlHG was seen. At 3 nautical miles 5 bird species (8 individuals) were recorded which included 3 BlHG (37.5 %), 2 (25%) HG, 1 individual (12.5 %) of GCT, SwSP and GbT each. At 4 nautical miles only 2 bird species (7 individuals) were seen, of which GCT were 4 (57.1%) in number and HgG were 3(42.9 %) in number. There

were no birds seen between 5 and 6 nautical miles. At 6 nautical miles about 3 BrHG were seen. No birds were seen between 7 to 11 nautical miles. 1 Arctic skua was spotted at 11 nautical miles. At 12 nautical miles 2 individuals of BrHG were seen. At 13 nautical miles one individual of BrHG and BlHG was seen. Only one individual of BlHG was seen at 14 nautical miles. About 8 BlHG and 1 ASK were sighted at 15 nautical miles. No bird sightings between 16 to 19 nautical miles. At 19 nautical miles 6 BrHG and 4 ASK were seen. No pelagic bird activity between 20 to 25 nautical miles. At 25 nautical miles 3 ASKs were seen. No birds were seen upto 29 nautical miles. At 29 nautical miles about 10 individuals of BlHG and 4 individuals of ASKs were sighted. From these observations it is clear that the bird diversity decreases as we move from the coast into the pelagic zone. Bird species like BlK, BrK, WRE, and WT are seen close to the shoreline and they are not seen in pelagic zones. Whereas ASKs are purely pelagic birds which are seen at distances of 10 nautical miles and above. Other pelagic bird which is present at all zones of pelagic are BlHG and BrHG.

Of the total number of birds seen during the pelagic survey 27 % of them were BlHG followed by BrHG which formed about 18 % of the sightings, ASKs were about 14.6 %, WRE formed about 10.1 % total sightings followed by GCT which were 9 %, then HgG which were about 7.9 %, BrK were about 5.6 %, BlK were about 4.5 %, least were WT, GbT and SwSP each of which formed 1.1 % of the total sightings (Figure 2). The presence of the pelagic birds at various nautical miles and depths indicates that these are specific to the availability of food and safety as there are quite less human activities except few fishermen with less disturbances. During the study, awareness and interest regarding pelagic birds could be created among other staff which made them keenly observe throughout. Few interaction with the neighboring boat fishermen during the sail revealed that, these birds often scout for great fish catch and few dominate the rest for snatching the good catch. Fishermen also shared that, these birds indicate presence of fish in the vicinity and ease their fishing. As the study conducted was for a day, it might be difficult to assess their population dynamics and reasoning on the impacts. More samples through surveys might reveal interesting findings that might throw more light on their behavior, distribution pattern, disturbance impacts, etc.

CONCLUSION:

Pelagic birds are quite an interesting subject and is a hectic exercise as it requires travel on the sea offshore for long duration, need constant observation and most importantly appropriate weather condition for sailing the boat. These birds migrant from far distance during winter from temperate to tropics to escape the harsh weather. Their arrival also indicates the change in climatic condition at the temperate countries. Their presence supports the favourable environment with less disturbances. Most importantly, they also can indicate the presence of planktons, fish etc and less disturbed areas. The authors feel that, more such expeditions are required to assess the pelagic bird population and also other interesting possible findings that might throw more light on their behavior and migration pattern which helps to understand in depth. There is also a need to protect these birds and maintain the sea ecosystem clean and pure from pollution.

Annexure 1: Bird Checklist:

Common Name	Abbreviation	Scientific Name	Pelagic (P) /NonPelagic (NP)
Brown headed gull	(BrHG)	*Chroicocephalus brunnicephalus*	*P*
Black headed gull	(BlHG	*Chroicocephalus ridibundus*	*P*
Heuglins's Gull	(HG)	*Larus heuglini*	*P*
Whiskered tern	(WT)	*Chlidonias hybrida*	*P*

Greater crested tern	(GCT)	*Thalasseus bergii*	*P*
Swinhoe's storm petrels	(SwSP)	*Hydrobates monorhis*	*P*
Gul- billed tern	(GbT)	*Gelochelidon nilotica*	*P*
Arctic skua	(ASK)	*Stercorarius parasiticus*	*P*
Black Kite	(BlK)	*Milvus migrans*	*NP*
Brahminy Kite	(BrK)	*Haliastur indus*	*NP*
Western Reef Egret	(WRE)	*Egretta gularis*	*NP*

Photographs:

Black headed Gull *(Chroicocephalus ridibundus)*

Arctic skua *(Stercorarius parasiticus)*

Greater crested tern (*Thalasseus bergii)*

Swinhoe's storm petrels *(Hydrobates monorhis)*

Black headed and Brown headed gulls

Arctic chasing the Greater crested tern

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