



BIODIVERSITY AND SEASONAL VARIATION OF SEA GULL BIRDS AT KADALUNDI-VALLIKKUNNU COMMUNITY RESERVE, SOUTH INDIA

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ABSTRACT

Kadalundi community reserve area is a large wetland located at the mouth of the river Kadalundi which drains into the Arabian sea on the west coast of Kerala, which provides dwelling of different species of native water birds and migratory birds. The present study examines the habitat characteristic, present status and abundance of different species of migratory Gull birds such as Yellow-legged Gull *Larus cachinnans* Pallas, Brown-headed Gull, Black-headed Gull *Chroicocephalus ridibundus*, Pallas's gull *Ichthyaelus ichthyaelus*, Heuglin's gull *Larus heuglini* and native water birds like Grey Heron *Ardea cinerea* Linnaeus, Indian Pond-Heron *Ardeola grayii* Sykes, Western Reef-Heron *Egretta gularis* (Bosc), etc. The study conducted during the period of June 2015 to July 2016. The methodology was direct observation and counting by the help of binocular and observed birds were photographed. During the study 40 species of birds were recorded. Among them, 5 types of Gull species, and 15 other types were migrant and 19 species are residential. Gull species was recorded highest in number (10500) during the month of December. It revealed that maximum arrival of Gull species occurred in the year of 2015 than other past 10 years.

Keywords: Biodiversity, Sea gull birds, Community reserve, Conservation problem.

INTRODUCTION

The wetlands, a term which includes water bodies of different types ranging from lakes, estuarine area, and riparian flood plains to tidal mud-flats, play a vital role in ensuring both the quantity and quality of water and sediment control prevention of flood, etc. and are the important area for avian attraction (Sandilyan *et al.*, 2010). Wetland is the area of marsh, pond, swamps, permanent or temporary with water that is static or flowing, brackish, fresh, or salty, including areas of marine water the depth of which at low tide does not exceed six meters.

Kadalundi community reserve is a large wetland and best attractive place for different types of migratory gulls (Aarif *et al.*, 2015) like Yellow-legged Gull *Larus cachinnans* Pallas, Brown-headed Gull *Larus brunnicephalus* Jerdon, Black-headed Gull *Larus ridibundus* Linnaeus, Pallas's gull *Ichthyaelus ichthyaelus* Heuglin's gull *Larus heuglini*. Gulls otherwise called as sea gull or sea birds comes under family Laridae Gulls are medium to large in size Gulls are typically medium to large birds, usually grey or white, often with black markings on the head or wings. They typically have harsh wailing or

squawking calls, stout, longish beak, and webbed feet. Most gulls, particularly *Larus* species, are ground nesting carnivores, which take live food or scavenge opportunistically. Live food often includes crabs and small fish. Gulls have unhinging jaws which allow them to consume large prey. Apart from the kittiwakes gulls are typically coastal or inland species, rarely venturing far out to Sea. The large species take up to four years to attain full adult plumage, but two years is typical for small gulls. Large white-headed gulls are typically long-lived birds. The general pattern of plumage in adult gulls is a white body with a darker mantle; the extent to which the mantle is darker varies from pale grey to black. Pallas gulls or Great black headed gull *Ichthyaelus ichthyaelus* is the largest species of gull among all gulls which presented in Kadalundi wetland. The arrival of gull started during the month October and departure in April. Most of the species were observed and counted in December and least number in April. In the present study, the maximum number of gull species reported in 2015 in the month of December. These wintering species of birds got a better habitat and attractive place to Kadalundi wetland and its seasonal variation also understood. The present study was aimed to investigate the

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biodiversity and seasonal variation of sea gull birds at Kadalundi-Vallikkunnu community reserve.

MATERIALS AND METHODOLOGY

Study area: Kadalundi wetland is surrounded by saline water. Kadalundi-Vallikuunu is a community reserve in the coastal area with vast wetland around 1.5 sq. km at the mouth of river Kadalundi that drain into the Arabian sea west coast of Kerala. This wetland located in Tirur taluk of Malappuram (11°07'47.6"N 75°49'31.9"E). It spread over a cluster of islands.

Different species of native water birds and more than 50 species of migratory birds have been recorded in the wetland. Apart from various types of mangroves, the sanctuary consists of human habitation and coconut plants more than 7 ha of mudflats. Kadalundi-Vallikkunnu bird sanctuary consists of thousands of plant species with flowering plants and medicinal plants like teak, rosewood, vengal, bamboo, neem, vaka, vempu, chadachi, etc. Scattered mangroves are very attractive and these are the best shelter and primary foraging ground for different species of birds. Major varieties of mangroves are *Bruguiera cylindrical*, *Sonneratia alba*, *Rhizophora mucronata*, *Excoecaria agallocha*, *Acrostichum aureum* and *Acanthus ilicifolius*.

Most of the water birds are Gull species. They are in the crowd and observed in a small boat. These birds were found in a mud flat. Direct observation was made using a binocular (80 x 30) and photographed by a camera (NIKON-COOLPIX P610) the observation and data collected 4 days per month (morning 6.00 am-10 am, evening 4 pm- 6.30 pm). The study were started from June 2015- august 2016) for seasonal variation study it noted as winter (December to march), pre-monsoon (April to June) monsoon (July to September) and post-monsoon (October to November).

RESULTS AND DISCUSSION

Around 40 species of water birds including 19 migrants have been recorded. The sanctuary provides good habitats on Lesser Sand Plover (*Charadrius mongolus*), Whimbrel (*Numenius phaeopus*) and Common Redshank (*Tringa totanus*) Eurasian Curlew *Numenius arquata* Linnaeus are observed to over-winter.

A good regional population of gull birds were observed and they are as follows (Figure 1-2)

1. Yellow-legged Gull, *Larus cachinnans* Pallas
2. Brown-headed Gull, *Chroicocephalus brunnicephalus*
3. Black-headed Gull, *Chroicocephalus ridibundus*

4. Heuglin's gull, *Larus heuglini*
5. Pallas's gull, *Larus Ichthyæetus ichthyæetus*

1-Yellow-legged Gull, *Larus cachinnans* Pallas

Kingdom: Animalia, Phylum: Chordata, Class: Aves, Order: Charadriiformes, Family: Laridae, Genus *Larus*, Species: *L. michahellis*.

They are the duck-sized bird more or less than 60 cm in length. These are large gull with yellow leg and feet and a bright red patch near the tip of lower mandible. A white mirror on the chiefly black wing quills. In winter head and hind neck streaked with brown or with white with grey mantle. These are mostly distributed as winter visitor to the sea coast and harbour of Western India and peninsula. They have gregarious habitat a scavenger at seaport and fishing harbour. Their foods are fish offal, refuse, mollusc, crab, etc. Young and colonial nesting, seabird and by piracy. Their sound is a raucous creaking kee-ow kee-ow resembling the call of the fishing eagle. Their nesting is extralimital and circumpolar.

2-Brown-headed Gull, *Chroicocephalus brunnicephalus*

Kingdom: Animalia, Phylum: Chordata, Class: Aves, Order: Charadriiformes, Family: Laridae, Genus: *Chroicocephalus*, Species: *C. brunnicephalus*.

Their size is more than jungle crow. A typical gull, grey above and white below with coffee-brown head in summer and the head grayish white in winter. Distinguishable from the equally common somewhat smaller Black-headed gull (*L. ridibundus*) by the prominent white patches or "mirror" near tip of the all-black first primary. In *ridibundus* first primary all white, with black edges and tip. Gregariously on the sea coast sparingly on large rivers and heels, they distributed in western and the eastern seaboard of India and to lesser extend also in inland waters, Pakistan, Bangladesh, Sri Lanka Myanmar, etc. (Ali and Ripley, 1983). They are winter visitors, arrives about September/ October, depart end of April. Found in harbours and fishing villages, circling in effortless gliding flight round ship lying at anchor or fishing boats for scarp or garbage cast overboard. They are either scooped off the surface in flight, or the bird alighting on the water beside them with other gull species and pariah and Brahminy kite. In inland localities it eats insect, grubs, slugs and shoot of various crops. They produce a variety of loud raucous notes, one commonly heard being a querulous scream keeah rather like the raven's. Nesting and breeding as in colonies in Ladakh and Tibet, in bogs around Rhasmsto Manasarovar rakhas Tal other lakes in the month of June/July (Hario, 1985).

3-Black-headed Gull, *Chroicocephalus ridibundus*

Kingdom: Animalia, Phylum: Chordata, Class: Aves, Order: Charadriiformes, Family: Laridae, Genus: *Chroicocephalus*, Species: *ridibundus*

The size is more or less than House crow. They are very similar to Brown-headed gull but easily separated by the slightly smaller size and the leading edge of the wing being pure white within 'mirror' near tip of primaries. The dark coffee coloured head is assumed by end March prior to migration. Sexes are similar. They distributed in Indian sea board and lake in India Pakistan; Bangladesh Nepal, Sri Lanka as winter visitor in sea coast, estuaries, harbours, etc. Gregarious like the Brown headed Gull. They produce a loud scream ree-ah or loud ka-yek-ka-yek and their nesting is Extralimital

4-Heuglin's gull- *Larus heuglini*-

Kingdom: Animalia, Phylum: Chordata, Class: Aves, Order: Charadriiformes, Family: Laridae, Genus: *Larus*, Species: *L. heuglini*.

Heuglin's gull or Siberian gull (*Larus heuglini*) is a seabird in the genus *Larus*. It is closely related to the lesser black-backed gull (*Larus fuscus*) and is often classified as a subspecies of it. It has also been included within the herring gull (*Larus argentatus*).

Birds in the eastern part of Heuglin's gull's range are often paler grey above and are frequently considered to be a separate subspecies *Larus heuglini taimyrensis* (Taimyr gull). Another possibility is that they are a result of hybridization between Heuglin's gulls and Vega gulls

Heuglin's gulls breed in the tundra of northern Russia from the Kola Peninsula east to the Taymyr Peninsula. They are regularly reported from Finland and may breed there. They migrate south to winter in Southwest Asia the Indian Subcontinent, East Asia and East Africa. Small numbers are seen in Southeast Asia, it has been recorded in South Africa and it may occur as a vagrant in Western Europe.

They are large gulls with a rounded head, strong bill and long legs and wings. Length is from 53 to 70 cm (21 to 28 in), wingspan is from 138 to 158 cm (54 to 62 in) and body mass is from 745 to 1,360 g (1.642 to 2.998 lb). Among standard measurements, the wing chord is 40.5 to 46.9 cm (15.9 to 18.5 in), the bill is 4.5 to 6.5 cm (1.8 to 2.6 in) and the tarsus is 5.9 to 7.8 cm (2.3 to 3.1 in). The back and wings are dark grey, variable in shade but often similar to the gulls race of the slightly smaller lesser black-backed gull. In winter the head is only lightly streaked with brown but there is heavier streaking on the hindneck. The legs are usually yellow but can be pink.

Moulting takes place later than in most of their relatives so birds still have unstreaked heads and worn primaries in September and October. The primary feathers may not be fully grown until February or March when the head is still streaked.

They feed mainly on molluscs, worms, and crustaceans.

5-Pallas's gull-*Larus Ichthyaetus ichthyaetus* or great black-headed gull

Kingdom: Animalia, Phylum: Chordata, Class: Aves, Order: Charadriiformes, Family: Laridae, Genus: *Ichthyaetus*, Species: *Ichthyaetus*.

Their size is near or more than duck. Their field characters are following - Largest among the gulls, usually solitary, Bill yellow with a bright red patch at angle. In winter, head white with the brown streak, turns black by February. Mantle is grey in colour, Body is white (Bianki, 1967). Primaries are white with sub terminal black bands and white tips. Immature birds mottled pale brown with almost white head. Tail contain broad terminal blackish band. They are widely distributed as winter visitor to the coasts and larger rivers of the subcontinent, Sri Lanka, Nepal and occasionally inland rivers and lakes of Kutch Rajasthan. They are usually solitary, occasionally in small flocks, more a bird of the open sea than other gulls (Richard Grimmett *et al.*, 1998). Their food is fish and crustaceans also indulge in piracy. Their sound is a loud raucous kraa-a like that of a raven's, and they rarely heard in its winter quarters. Nesting is extralimital.

This wetland area was a better attractive place for migratory birds (Jayson, 2002). Before 2006, the arrival of seagull was nearly 4000-5000. This wetland declared as community reserve area in 2007, studies shows that after that there was gradual decreasing in bird's arrival. In the year 2013, there was a critical decline in the arrival of migratory birds (Muzaffar *et al.*, 2008).

Surrounding this wetland numbers of people are living with their fish, mussel, culturing and capturing and other agricultural practices. Pollution is the main threat to the arrival of invaders (Figure 4). These water bodies and mud flat are highly polluted with degradable and non-biodegradable wastes (Acharya, 2000). Degradable wastes such as poultry waste and other biodegradables such as plastic bags, rubber, disposable bottles and papers, etc.

Anyway during my study time the counting of seagulls were maximum in number than past ten years. Different varieties of sea gull were most attractive species and Whimbrel, Eurasian Curlew, Common Redshank, Marsh Sandpiper Common Greenshank, Green Sandpiper, Wood Sandpiper, Terek Sandpiper Common Sandpiper, Wood Snipe, Curlew Sandpiper, masked booby, bar-headed goose were the other migrant varieties. My study focused on mainly sea gulls arrival, by observing their colour of pattern, markings, sound, body size, leg colour, five species

of sea gulls are identified. The seagull species are given below.



Figure 1. Pallas gulls and Black headed gulls.



Figure 2. Heuglin gulls, Brown headed gulls, and Yellow legged Gulls.



Figure 3. Gulls in the plastic polluted area.

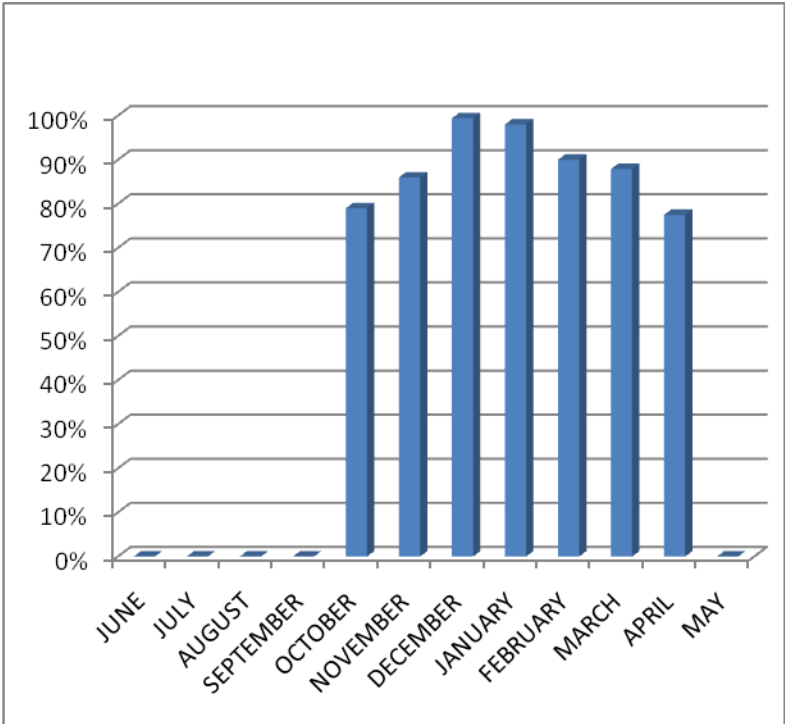


Figure 4. Premonsoon, monsoon, post monsoon and winter.

Table 1. List of birds observed at Kadalundi -Vallikkunnu wetland.

No.	Family	Common name	Scientific name	Status
1.	Sulidae	Masked Booby	<i>Sula dactylatra</i> Lesson	M
2.	Phalacrocoracidae	Little Cormorant	<i>Phalacrocorax niger</i> (Vieillot)	LM
		Indian Shag	<i>Phalacrocorax fuscicollis</i> Stephens	
		Grey Heron	<i>Ardea cinerea</i> Linnaeus	R
		Indian Pond-Heron	<i>Ardeola grayii</i> Sykes	R
3.	Ardeidae	Large Egret	<i>Casmerodius albus</i> (Linnaeus)	R
		Median Egret	<i>Mesophoyx intermedia</i> (Wagler)	R
		Little Egret	<i>Egretta garzetta</i> (Linnaeus)	R
		Western Reef-Heron	<i>Egretta gularis</i> (Bosc)	R
4.	Accipitridae	Black Kite	<i>Milvus migrans</i> (Boddaert)	R
		Brahminy Kite	<i>Haliastur indus</i> (Boddaert)	R
5.	Charadriidae	Kentish Plover	<i>Charadrius alexandrinus</i> Linnaeus	M
		Lesser Sand Plover	<i>Charadrius monogolus</i> Pallas	M
		Whimbrel	<i>Numenius phaeopus</i> (Linnaeus)	M
		Eurasian Curlew	<i>Numenius arquata</i> Linnaeus	M
		Common Redshank	<i>Tringa totanus</i> (Linnaeus)	M
		Marsh Sandpiper	<i>Tringa stagnatilis</i> (Bechstein)	M
		Common Greenshank	<i>Tringa nebularia</i> (Gunner)	M
6.	Scolopacidae	Green Sandpiper	<i>Tringa ochropus</i> Linnaeus	M
		Wood Sandpiper	<i>Tringa glareola</i> Linnaeus	M
		Terek Sandpiper	<i>Xenus cinereus</i> (Guldenstadt)	M
		Common Sandpiper	<i>Actitis hypoleucos</i> Linnaeus	M
		Wood Snipe	<i>Gallinago nemoricola</i> Hodgson	M
		Curlew Sandpiper	<i>Calidris ferruginea</i> (Pontoppidan)	M
		Yellow-legged Gull	<i>Larus cachinnans</i> Pallas	M
		Brown-headed Gull	<i>Chroicocephalus brunnicephalus</i>	M
		Black-headed Gull	<i>Chroicocephalus ridibundus</i>	M
7.	Laridae	Heuglin's gull	<i>Larus heuglini</i>	M
		Pallas's gull	<i>Ichthyiaetus ichthyiaetus</i>	M
		Gull-billed Tern	<i>Gelochelidon nilotica</i> (Gmelin)	
		Lesser Pied Kingfisher	<i>Ceryle rudis</i> (Linnaeus)	R
		Small Blue Kingfisher	<i>Alcedo atthis</i> (Linnaeus)	R
8.	Alcedinidae	Stork-billed Kingfisher	<i>Halcyon capensis</i> (Linnaeus)	R
		White-breasted Kingfisher	<i>Halcyon smyrnensis</i> (Linnaeus)	R
		Black-capped Kingfisher	<i>Halcyon pileata</i> (Boddaert)	R
9.	Turdinae	Oriental Magpie Robin	<i>Copsychus saularis</i> (Linnaeus)	R
10.	Dicruridae	Black Drongo	<i>Dicrurus macrocercus</i> Vieillot	R
11.	Corvidae	Indian Tree Pie	<i>Dendrocitta vagabunda</i> (Latham)	R
		House Crow	<i>Corvus splendens</i> Vieillot	R
12.	Anatidae	bar-headed goose	<i>Anser indicus</i>	R

Kadalundi community reserve wetland area provides shelter for a number of native birds and migratory birds. During my study period (June 2015- July 2016) I could observe numbers of migratory birds mainly sea gulls, varieties of sand pipers, Whimbrel, Curlew, etc. Gull species are the greatest species observed as wintering birds (Keij and Arts, 1998). Maximum numbers of (10500) gulls noted in December (2015). The arrival of sea gull started in the month of October and departed in May. The gull population increases in number in November (2000), January (4500), February (7000N), March (600) and April (270). Their arrival started in post monsoon season and number increased maximum in winter season. There was no gulls in the pre monsoon and seasons.

CONCLUSION

Gull *Larus Ichthyaetus ichthyaetus* is the largest gull among the total gull species and they are less in number among the total avian species in Kadalundi gull species are crowded in mud flat and by their characteristic features listed as Yellow-legged Gull, Brown-headed Gull, Black-headed Gull, Heuglin's gull, Pallas's gull, etc. Total gull species percentage in post monsoon season (Oct, Nov), winter season (December, January, February and March), post monsoon season (April), are 79%, 86%, 99.9%, 98%, 90%, 87.9%, 77.5% respectively.

Even though the wintering Sea Gulls arrival show a high peak Kadalundi community reserve area at the present status the community reserve is getting destructed by plastic pollution, poultry wastes, etc. Mangroves provide better shelter for avian species but by mud flat deposition and pollution causes destruction of mangroves by damaging its respiratory pattern. Coming years it may affect the arrival of migratory gulls and reduces the arrival. So for conserving avian species mangroves and habitat also protected and conserved (Folkestad, 1982).

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