SUMMARY

The present study focused on the ecology and certain aspects of foraging & foraging behaviour of migrant shorebirds in Kadalundi-Vallikkunnu Community Reserves, one of the important Community Reserves in India and most important wintering and stop-over ground for many migrants in the West Coast of India. The study was carried out during 2010 to 2013 and the study area chosen were mudflats, shallow mudflats, mangroves, shallow mangroves and sand beaches. Eight hectors of mudflats which are exposed during low tide are important feeding grounds for the shorebirds. The mangroves are the second most important foraging grounds and the sand beaches are one of the best alternate foraging grounds for the migrant shorebirds during high tide.

During the study period, 31 species of migrant shorebirds were observed in different seasons. Data on the arrival and departure of shorebirds and the over-summering of nine species of shorebirds were recorded from the study area. The maximum number of shorebirds was observed from the mudflats followed by mangroves. The present study recorded high shorebird counts in relation to low rainfall. This is likely because of changes in food resources associated with the habitats as well as changes in the environment. Nutrient enrichment alters the diversity of benthic invertebrates through an increase in benthic infaunal biomass (due to an explosion of opportunistic species), followed by a decrease and disappearance of species.

Abiotic factors like pH, salinity, nitrate, PO$_4$, Potassium, Ca & Mg and their influence on the habitat selection of shorebirds were subjected for detailed investigations. Biotic factors and their influence on the habitat selection were also studied in detail. Nutrient analyses of preys were also studied. Seven types of invertebrates were recorded from Kadalundi-Vallikkunnu Community Reserve. The most abundant prey was polychaetes followed by small crabs, cosmonotous crabs, prawns, medium sized crabs, mantis shrimps and soft bivalves. The relationship between shorebird counts and prey abundance was elucidated using a simple linear regression, and the results showed that some prey having a strong positive relation with the number of shorebirds.

The present study also focused on the foraging behaviour of three species of shorebirds, ie Lesser Sand Plover, Common Redshank and Whimbrel, in KVCR. The
selection of these three shorebirds was made on the basis of types or size groups of shorebirds and their maximum availability in the study area during all migrating seasons. Diversity of foraging strategy and variation in foraging behaviour across the habitat when it goes from small shorebirds to larger shorebirds were also subjected for in-depth study.

Spacio-temporal variations, foraging success, prey consumption rate and foraging patterns were studied in three species of migrant shorebirds. The highest foraging rate was observed in Lesser Sand Plover and Whimbrel on the sand beaches. Shorebird diversity is highest at low water depth and correlated to hydrological diversity. The Lesser Sand Plovers were found consuming five prey items, Common Redshanks six types of prey items and Whimbrel five types of prey items. The main diets of shorebirds are crabs and polychaetes. Three types of foraging patterns were observed but they differed in different species. It was observed that sand beaches are one of the good alternate foraging grounds for all types of shorebirds during low tide.

Further, the study enumerated major environmental threats to the migrant shorebirds and their habitat. They are: sand mining, dumping of solid wastes, mangrove proliferations, tourists, mobile phone towers and the presence of domestic cats & dogs. Sand-mining in the study area resulted in salinity intrusion and reduction in the abundance of polychaetes & other invertebrates. Dumping of solid waste from poultry farm and slaughter houses have been increasing year after year, and resulted in a rapid rise in the potassium level and other water and soil variables. Disposal of domestic waste resulted in an increase in the number of crows and raptors visiting the KVCR. All these species cause considerable disturbance to shorebirds, affecting their active feeding and flock composition. The presence of dogs, cats and human beings were also found creating disturbances to the foraging shorebirds. The presence of tourists is another important threat to the migratory shorebirds, gulls and terns in the study area. There are two communication towers nearby KVCR. The mobile radiation may be another reason for the declining number of migrants. Proliferation of mangroves was observed to slowly wipe away the mudflats, the primary foraging ground of migrant shorebirds. Some recommendations for the conservation of migrant shorebirds have also been discussed.