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Introduction

Conservation of biodiversity has been a matter of global concern since the event of the World Summit in 1992 and the follow up of Rio+20 in 2012. In order to promote conservation efforts and provide a platform for bioevaluation, special areas of interest along the coasts are evaluated according to their capacity to support and harbour biological diversity. Assessment of biodiversity along the coasts of districts of Alapuzha, Ernakulam and Thrissur of central Kerala was undertaken to ascertain the provisional, regulatory, supporting and cultural services provided and to appraise their ecological sensitivity.

Methodology

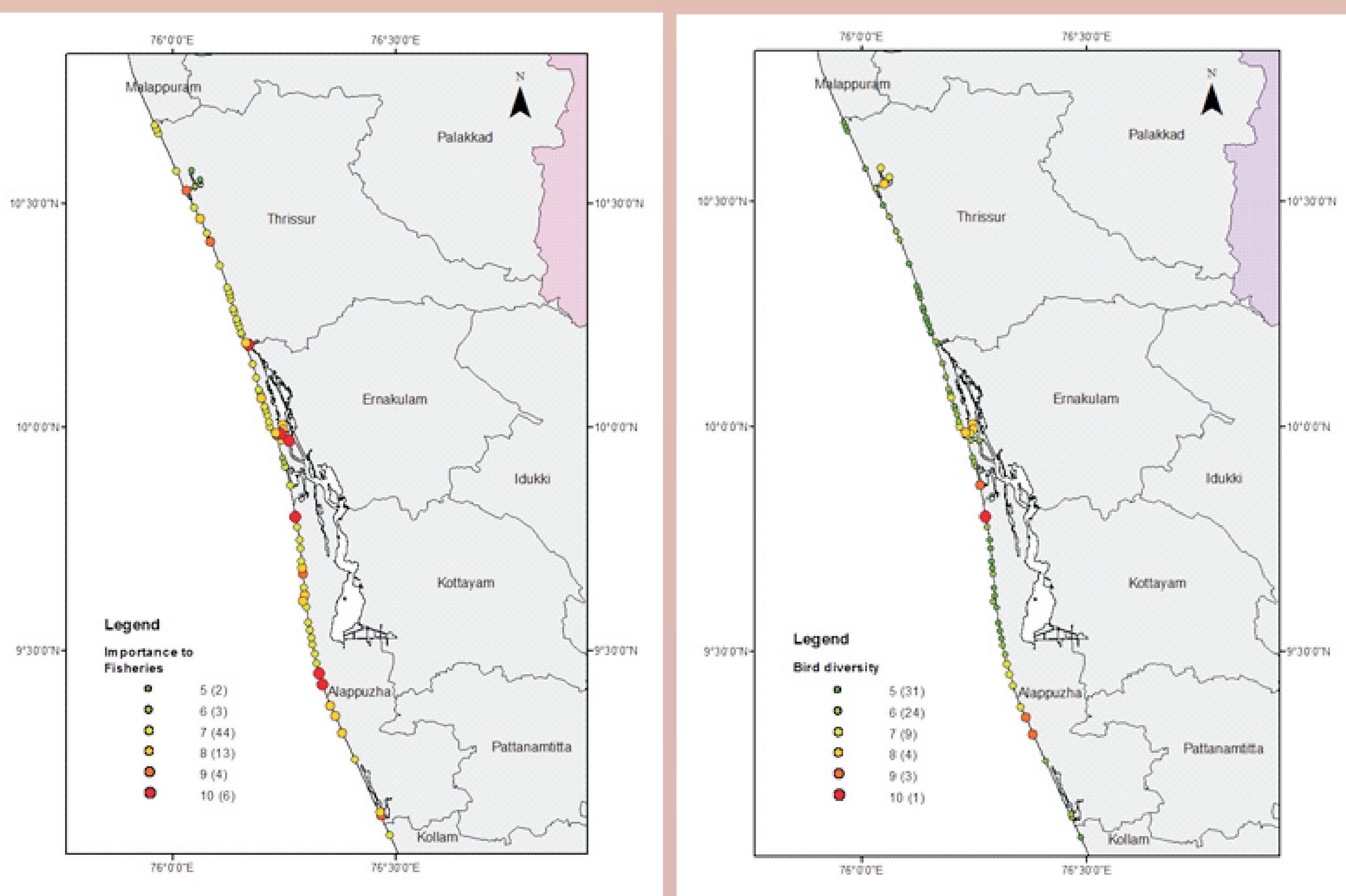
Primary data was collected through preliminary Rapid Biodiversity Assessment Survey (RBAS) conducted in 2015-16 in 58 locations along the coast and interviewing of 111 stakeholders as per a predesigned questionnaire. Secondary data was collected from published literature. Relative scoring of each location was done on the basis of:

- Importance of the area to fisheries- ascertained by determining the number of fishing crafts per landing centre and direct observation of landings and correlating the same with published data (Provisional services).
- Presence or absence of ecotones such as estuaries, rivermouths and beaches (Regulatory and Supporting services)
- Presence and status of mangroves (Regulatory and Supporting services)
- Occurrence of marine mammals and sea turtles (Supporting services)
- Presence of tourism activities-direct observation and published statistics (Cultural services)
- Habitat destruction and Pollution based on direct observation (Sensitivity index)
- Sea erosion based on direct observation (Sensitivity index)
- Interviewing of stakeholders on the status of all above criteria

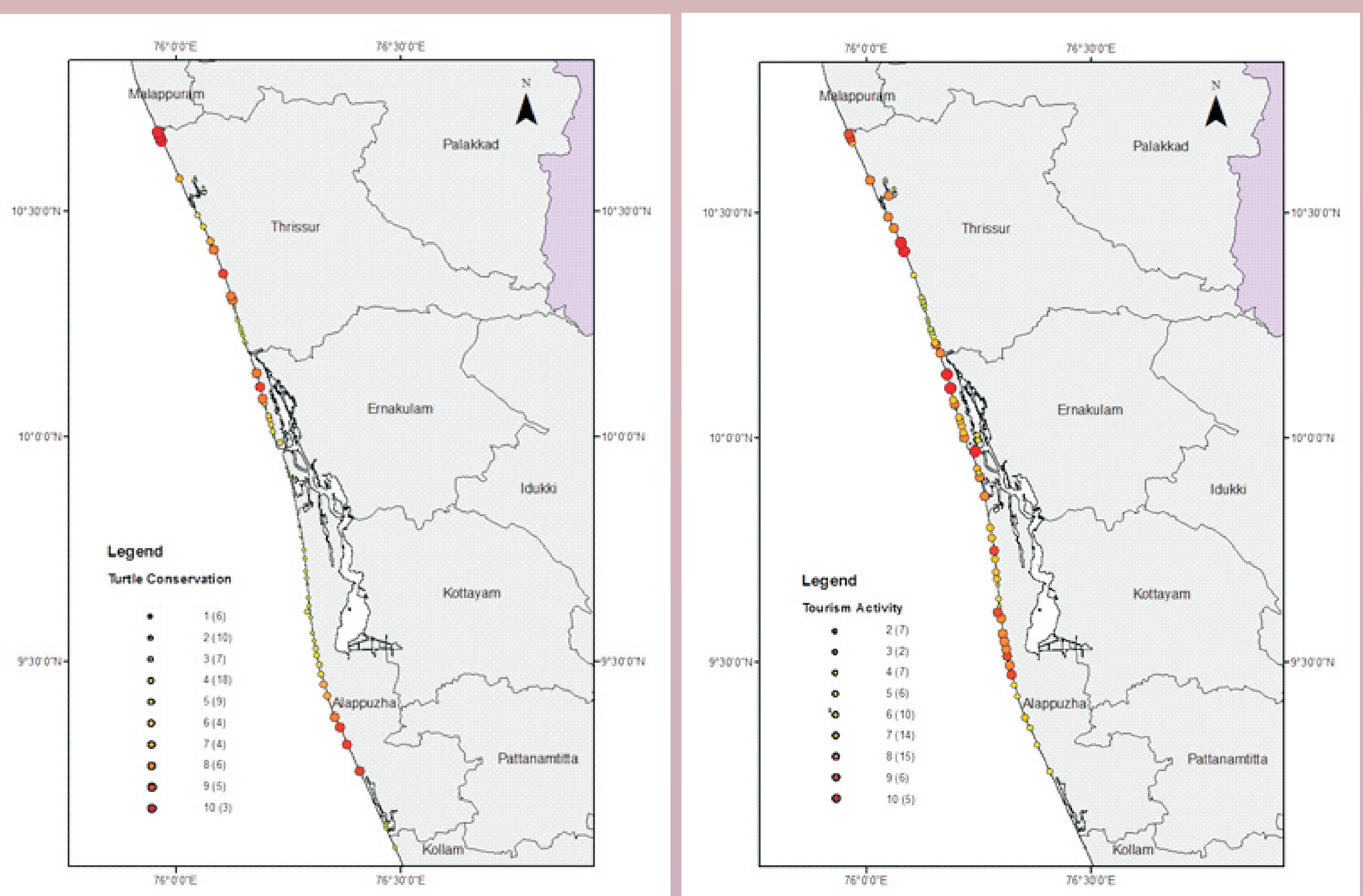
Areas obtaining high scores in RBAS were further assessed using CBD scientific criteria for Ecologically and Biologically Sensitive Area i.e., uniqueness or rarity, special importance for life history stages of species, importance for threatened, endangered or declining species and/or habitats, vulnerability, fragility, sensitivity, or slow recovery, biological productivity, biological diversity and naturalness

Results

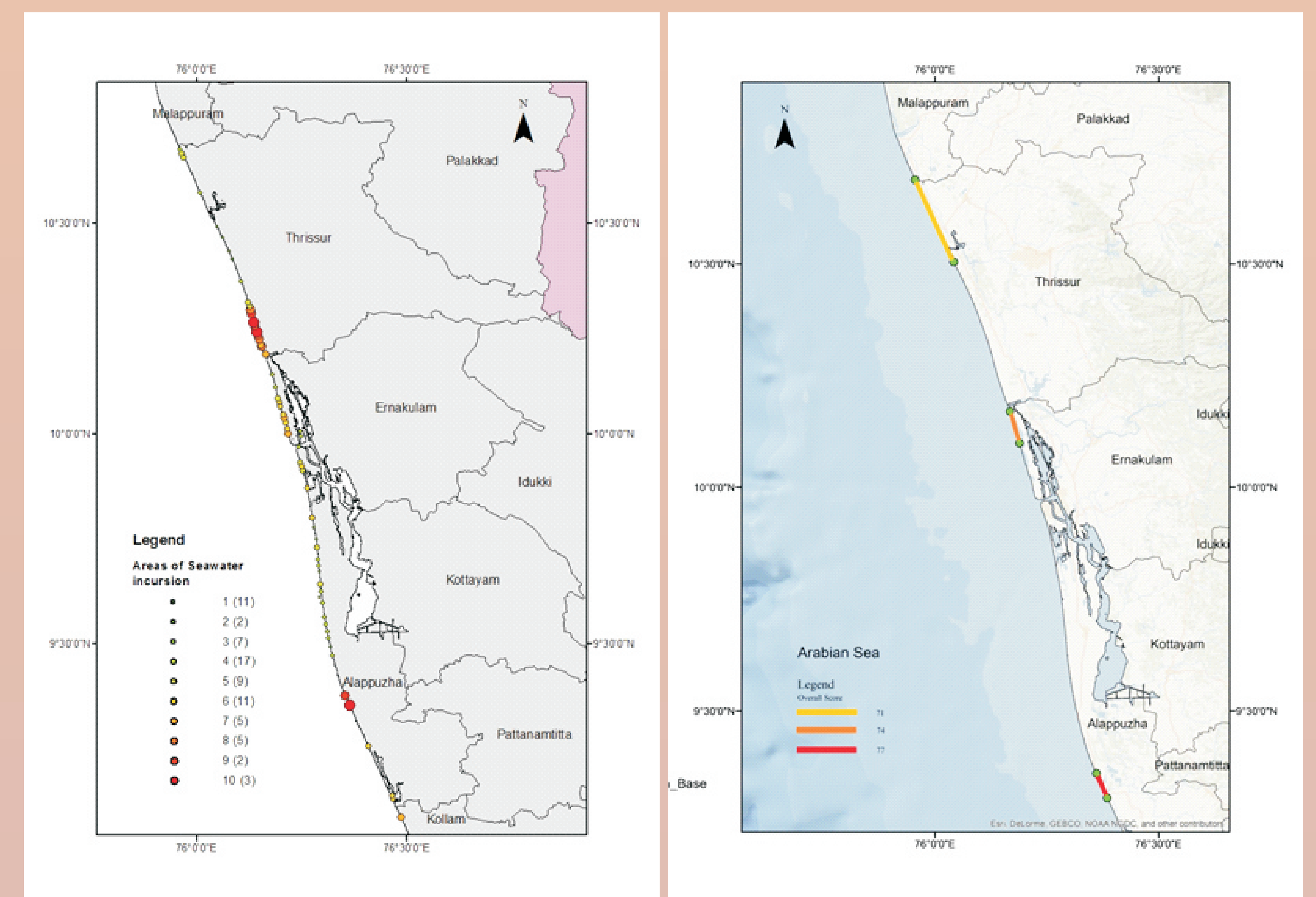
The areas most important to fisheries lay along Fort Kochi (108 species), Vypin (80 species) and Munambam (87 species) of Ernakulam district. During the postmonsoon the phenomenon of mud bank formation and resultant fishery was observed along Punnappara- Ambalapuzha coast of Alappuzha district.



The largest ecotones are present at Thottapilly (Alapuzha), Fort Kochi (Ernakulam), Chettuva and Azhikode (Thrissur). Mangrove regions in Alapuzha are in a highly degraded state. The largest stand of mangroves is found in Ernakulam district in the Puthuvype area (17 species). In Thrissur sizable stands of mangroves are seen in the Chettuva estuary, Chukkubazar and Chakkarakandom areas (16 species). Destruction by humans, conversion for developmental activities and pollution are the greatest threats to mangroves.



- Avian fauna was distributed along the coast with maximum congregations along the shoreline from Thottapally to Purakkad in Alapuzha. Coastal regions of Alapuzha were found to have maximum bird congregations with Ezhupunna-Changaram wetlands being hotspots (45 species). Kandakadavu, Panambukad and Kadamakkudy wetlands in Ernakulam district recorded 50, 36 and 39 species each.
- Dolphins were found distributed along the entire coastline with congregations of pods at Fort Cochin and Azhikode barmouths (*Most abundant species: Sousa chinensis*).
- Sea turtle nesting has been recorded from Thrikunnapuzha to Thottapally coast in Alapuzha (05 nests), Malipuram to Cherai in Ernakulam with maximum nesting at Kuzhupilly (05 nests) and Chettuva to Andathode in Thrissur with maximum concentration at Palapetty and Pappaly (09 nests). Peoples participation is highly evident in sea turtle conservation activity.
- All beaches along the coasts are frequented by local tourists. International tourism is concentrated in Thumboly-Mararikulam in Alapuzha, Fort Kochi to Cherai in Ernakulam and Natika to Snehatheeram in Thrissur. Homestay tourism is flourishing along the entire coastline. Thrissur has scope for greater development for tourism owing to natural resources and less incidence of pollution.
- Pollution especially by plastic debris is ubiquitous with maximum being observed in the beaches along the Fort Kochi barmouth. Water quality was found to be low at Chakkarakandom in Chettuva region of Thrissur.
- The sea water has ingressed along the entire coastline in the past thirty years as per the stakeholder interviewed with an average estimate of around 0.25 km. Pronounced incursion was seen along Purakkad to Ambalapuzha in Alapuzha and Bhajanamadom to Thattukadavu in Thrissur with human habitation being destroyed.



Areas obtaining maximum scores in RBAS:

- Thottapally N 9°18'17.8" E 76°23'05.6" to Purakkad N 9°21'34.7" E 76°21'40.2" (6.5 km) in Alapuzha district: 77
- Chettuva 10°30'13.0" E 76°02'31.0" to Periambalam 10°41'15.5" E 75°57' 20.4" (22.2 km) in Thrissur district: 74
- Kuzhupilly N 10°5'56.2" E 76°11'22.3" to Cherai 10°10'08.7" E 76°10'05.3" (8.4 km) in Ernakulam district: 71



Mangroves at Chettuva, Thrissur

Hatchling of Olive Ridley turtle (*Lepidochelys olivacea*)

Thottapally - Purakkad coastline



Brahminy kite (*Haliastur indus*)

Western reef egret (*Egretta gularis*)

Brown-headed gull (*Larus brunnicephalus*)

Conclusion

The coasts along Central Kerala harbour rich biodiversity and are susceptible to anthropogenic pressures and climate change factors. Of the areas surveyed, the coastline stretching from Thottapally to Purakkad, which is already part of the Ramsar Site of Kuttanad wetlands, is recommended for inclusion as an Ecologically and Biologically Sensitive Area along the coast owing to its high score (77) on the EBSA scale particularly since it supports sea turtle nesting sites and acts as staging grounds for migratory sea birds at the confluence of the Pampa rivermouth.