Mersing Archipelago IMMA

Summary, continued.

dugon) in Peninsular Malaysia. Ongoing research on the dugongs since 2014 has revealed a small but reproductive population that feed on the seagrasses in the meadows, breed and socialise in this IMMA year-round.

Description

The area covers shallow coastal (mainland) waters and adjacent tropical islands (~6 nm from the mainland coast) along the east coast of Johor state in Peninsular Malaysia, starting from Air Papan in the north and going south to just north of Sedili Cape. The islands have extensive subtidal seagrass meadows on the leeward sides, with the largest meadows found at Sibu and Tinggi Islands (Ooi et al., 2011; Heng et al., 2022). There are also mangroves, coral reefs, rocky shores and coastal mudflats. Due to their geological significance, the islands are part of the larger Mersing District region that is currently being proposed as a national Geopark as of 2018, with eventual plans to attain UNESCO Geopark status (Said et al., 2021). The shallow waters in the area (<35 m, 6 - 15 m depth on average) are habitats to a large array of marine biodiversity, including sea turtles, syngnathids (seahorses, pipehorses, pipefishes), invertebrates, pelagic fish, elasmobranchs and marine mammals (Ponnampalam et al., 2015; Ponnampalam, 2017).

With regards to marine mammals, small cetaceans that are found in the IMMA are Indo-Pacific finless porpoises (Neophocaena phocaenoides), Indo-Pacific humpback dolphins (Sousa chinensis), Irrawaddy dolphins (Orcaella brevirostris), long-beaked common...
The islands are legally protected as a nationally gazetted Marine Park, which covers the area around each island extending from the low water mark to 2 nm being designated as no-take zones. A larger area of 150,000 hectares was proposed in 2016 and is currently pending official recognition as a Dugong Sanctuary (Kili, 2016; The Star, 2016). The boundary delineation where the proposed Sanctuary area will be zoned was based on the data available on seagrass distribution, dugong distribution and habitat use, and human use (Fairul Izmal, pers comm).

**Criterion A: Species or Population Vulnerability**

Dugongs are listed as VU on the IUCN Red List of Threatened Species, and the species is also listed as a Marine Endangered Species under the Malaysian Fisheries Act 1985 and Fisheries (Control of Endangered Species) Regulation (Amended) 2008. Furthermore, the Mersing Archipelago is the only place in Peninsular Malaysia where dugong occurrence is frequent and reliable. The population is small and there have been at least 19 dugong deaths recorded between 2015 and 2022, most of which were of calves/juvenile individuals (MareCet, unpublished data). A bycatch risk assessment on dugongs at Sibu and Tinggi Islands revealed that the species was most likely to be impacted by the use of gillnets in the surrounding waters (Hines et al., 2020).

**Criterion B: Distribution and Abundance**

**Sub-criterion B2: Aggregations**

Systematic aerial surveys were conducted three times a year from 2014 to 2016 covering total search effort of 23,790 km over 145 hours (Ponnampalam, 2017). A total of 642 dugong sightings were made over the course of the surveys with group size...
ranging from solitary animals to large herds of more than 40 animals (maximum count of 43 in a single sighting) (Ponnampalam, 2017). Although dugongs have a wide global range, populations are often small and fragmented throughout its range. While this population does not represent a large proportion of the entire global population of the species, it is the only population around Peninsular Malaysia where regular occurrences of the species have been observed. These herds are usually inclusive of mother-calf pairs. These aggregations were observed mainly in the mornings, concentrated mainly in a small area south of Sibu Island (Ponnampalam, 2017) (Figure 3).

Criterion C: Key Life Cycle Activities

Sub-Criterion C1: Reproductive Areas

The area around Sibu island, especially to the southwest, is considered to be an important nursing ground where most dugong mother-calf pairs were observed (24% of all dugong groups sighted during aerial surveys were of mother-calf pairs/contained mother-calf pairs) (Ponnampalam et al., 2014, 2015; Ponnampalam, 2017) (Figure 1).

Sub-Criterion C2: Feeding Areas

The seagrass meadows in the area, especially those around Sibu Island are known dugong feeding grounds due to documented presence of many feeding trails during surveys throughout the year (Ponnampalam, 2017, Heng et al., 2022) (Figure 2).

Criterion D: Special Attributes

Sub-criterion D1: Distinctiveness

The seagrass meadows in the area especially those of Tinggi Island and the area south of Mentigi and Nanga Kecil and Nanga Besar Islands are identified
as dugong ‘vocal hotspots’ where dugong vocalizations were often detected (Ichikawa et al., 2015; Ponnampalam, 2017) (Figure 4). The ‘vocal hotspot’ is believed to be an area for daily communication and social cohesion for the dugongs using the area.

### Supporting Information


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