



Area Size

14 441 km²

Qualifying Species and Criteria

Dugong – *Dugong dugon*

Criterion A; C (1, 2)

Indo-Pacific bottlenose dolphin –

Tursiops aduncus

Criterion C (1, 2)

Marine Mammal Diversity

Criterion D (2)

Stenella longirostris, *Stenella attenuata*,
Stenella coeruleoalba, *Lagenodelphis hosei*,
Grampus griseus, *Orcinus orca*, *Pseudorca
 crassidens*, *Peponocephala electra*, *Globicephala
 macrorhynchus*, *Indopacetus pacificus*, *Ziphius
 cavirostris*, *Kogia sima*, *Physeter macrocephalus*,
Balaenoptera omurai, *Dugong dugon*,
Tursiops aduncus

Summary

The Andaman and Nicobar Islands are a group of volcanic island systems in the North-eastern Indian Ocean with complex bathymetry, characterized by fringing coral reefs, seagrass beds and mangroves. The IMMA of the Southern Andaman Islands has 16 species of marine mammals consisting of 15 cetacean species and the sirenian dugong. Seagrass bed dugong

Southern Andaman Islands IMMA

Summary, continued.

feeding trail surveys show that four seagrass meadows are being utilised by the remnant population of dugongs. Of the fifteen species of cetacean recorded during systematic vessel based surveys, ferry-based sighting surveys and from opportunistic sightings by network members only *Tursiops aduncus* and *Dugong dugon* are nearshore residents. They have been reported with calves, and with individual re-sightings in the IMMA. *Stenella longirostris*, *Stenella attenuata*, *Grampus griseus*, and *Globicephala macrorhynchus* are other commonly observed species in the area, while *Lagenodelphis hosei*, *Balaenoptera omurai* and *Pseudorca crassidens* have been reported here for occasionally.

Description

The Andaman and Nicobar archipelago of India is part of the Indo-Myanmar and Sundaland biodiversity hotspot in the Bay of Bengal. The islands have highly diverse terrestrial and marine ecosystems, comprising evergreen and littoral mangrove forests, extensive seagrass meadows, fringing coral reefs and active volcanic islands. With more than 350 islands of which 13 are inhabited, a coastline of 1962 km and an area of 8,249 km² (Director-Census Operations, 2011) the archipelago is a significant region for conservation action. This region is significantly influenced by the southwestern and northeastern monsoons (May–December). The Andaman-Nicobar basin is characterized by a complex system of rift valleys and associated volcanic seamounts, because of which the sea-floor west of the islands is characterized by an insular shelf, steep drop-offs and

deep-sea ridges reaching depths of 4400m, giving rise to a bathymetrically complex area and favourable habitat for several cetacean species.

The islands have historically been occupied by indigenous peoples (Jarawa, Great Andamanese, Sentinelese) (Director-Census Operations, 2011). These native groups constitute only about 9 % of the present population, which is dominated by recent (c. 80–100 years) immigrant settlers from mainland India, Bangladesh, Sri Lanka and Myanmar. Agriculture, livestock rearing, fisheries and plantation forestry are the main occupations in the islands, and the indigenous people still significantly depend on minor forest produce and hunting, including ritual hunting of dugongs (D'Souza, 2016).

Interview surveys, seagrass distribution and diversity studies, dugong feeding trail surveys and vessel-based sighting surveys for *Dugong dugon*, have been carried out in the Andaman Nicobar Islands since 2004 (D'souza et al., 2012, 2015; Anonymous, 2012). Twelve species of seagrass have been recorded from this region, with *Thalassia hemprichii* and *Cymodocea rotundata* being the predominant species. A systematic database maintained since 2007 has recorded 19 dugongs including 3 mother-calf pairs) (D'Souza, Pers.Comm).

Prior to 2016, data on cetaceans from the region was limited to opportunistic sightings, carcasses washed ashore or rare by-catch accounts. In 2016, a participatory cetacean monitoring network was established via interviews, and local stakeholders such as fishers, divers, recreational fishers and ferry crew were requested to record their sightings by taking a photo/video whenever possible on their phone cameras (Mankeshwar and Sutaria, 2018). Along with the image, the time of day, date, details about the area (coordinates marked on the GPS device or general location) and water depth were

requested. Confirmation of species either from the monitoring data or interview surveys was done only on the basis of good quality images obtained from the respondents. Mankeshwar and Sutaria (2018), conducted inter-island ferry-based sighting surveys between January and March 2018, and in October 2018, over three fixed routes. The surveys consisted of 1,782 km and 91 hours of survey effort. Dedicated vessel based surveys to understand space use patterns in waters of Southern Andaman islands IMMA have also been carried out with 739 km and 45.35 hours of survey effort. Fifteen species of cetaceans have been documented from this IMMA. The photo-documentation of *Balaenoptera omurai* provides the most northern record in its geographic range (Mankeshwar and Sutaria, 2018, www.marinemammals.in).

Since most sightings have been within 7 km off any island in the area, it is concluded that the bathymetric complexity of the Southern Andaman islands IMMA is peculiar and one of the underlying factors that are helping harbour these deep sea species in waters comparatively closer to shore.

Tursiops aduncus hereafter Indo-Pacific bottlenose dolphins (also reported for the Andaman's by Ducci et al., 2012) and dugongs are the only near-shore species observed in the area. Indo-Pacific bottlenose dolphins have been observed with calves; individuals have been re-sighted, and are known to interact with fishing gear. Although the extent of their by-catch is unknown since none are brought to landing centres, fishers have reported net depredation by the animals in nearshore waters.

From the information collected so far, Dugongs and Indo-Pacific bottlenose dolphins are the most vulnerable species in the region. Increasing number of fishing vessels, loss of seagrass habitat to fishing pressure, developing tourism sectors, increasing ferry

traffic and waters sport vessels, along with intense naval presence, are all matters that need to be considered and managed.

Criterion A: Species or Population Vulnerability

The area is known habitat for a very small and vulnerable locally occurring population of dugongs (D'Souza et al., 2013, 2015). Stranded dugong calves and adults have also been recorded occasionally. Based on interview surveys with local fishermen, seagrass beds in this IMMA have been identified as 'Critical Dugong Habitat of the Andamans' (Sivakumar and Nair, 2013; D'Souza et al., 2013). Furthermore, dugong occupancy across this archipelago is estimated to have declined by 60% over the last 20 years and the present distribution is largely restricted to sheltered bays and channels supporting seagrass meadows dominated by *Halophila* and *Halodule* sp. (D'Souza et al., 2013).

Criterion C: Key Life Cycle Activities Sub-Criterion C1: Reproductive Areas

A total of 906 interviews were carried out in the Andaman and Nicobar islands (Sivakumar and Nair, 2013), of which 44% of respondents had sighted dugongs, with a total of 247 encounters reported. Of these 24% were of mother-calf pairs (Sivakumar and Nair, 2013) showing that the IMMA is an important reproductive area. Solitary individuals made up 60% of the observations. Dugong calves have been stranded in this region (www.marinemammals.in).

Indo-Pacific bottlenose dolphins were observed with calves and sub-adults in seven of the thirteen sightings between January and May 2018. The limited sampling effort restricts us from making remarks about reproductive seasons observed in the region but data collected suggests that the near-shore waters host resident populations of the species.



Figure 1: Dugong observed from survey done for Dugong Recovery Program.
Photo: Swapnali Gole and CAMPA-Dugong Project, Wildlife Institute of India, MoEFCC, Government of India.

Sub-Criterion C2: Feeding Areas

Indo-Pacific bottlenose dolphins have been observed foraging and feeding in near-shore waters. The dolphins were seen feeding on Indian mackerel (*Rastrelliger kanagurta*) around reef habitats, and are also known to interact with shore seine nets that are used to catch bait fish species such as *Sardinella sirm*, *Sardinella longiceps* and *Engraulis* spp. suggesting that these near shore waters are important foraging grounds for the species. Dugongs are known to use the seagrass meadows in this IMMA and grazing trails were recorded in 11 seagrass meadows in this area (D'Souza et al., 2013, 2015). All feeding trails were recorded in meadows comprised of short-lived or early successional seagrasses like *Halophila* spp. and *Halodule* spp.

Criterion D: Special Attributes Sub-criterion D2: Diversity

Sixteen species of marine mammals have been documented from the waters of South Andaman

making use of a diverse number of habitat types, from shallow coastal waters, offshore seas and complex undersea features, making this region critical (Mankeshwar and Sutaria, 2018; www.marinemammals.in). These include Indo-Pacific bottlenose dolphins (*Tursiops aduncus*), dugong (*Dugong dugon*), killer whales (*Orcinus orca*), false killer whales (*Pseudorca crassidens*), Omura's whale (*Balaenoptera omurai*), Fraser's dolphins (*Lagenodelphis hosei*), striped dolphins (*Stenella longirostris*), and pantropical spotted dolphin (*Stenella attenuata*), striped dolphin (*Stenella coeruleoalba*), Risso's dolphin (*Grampus griseus*), melon headed whale (*Peponocephala electra*), short-finned pilot whale (*Globicephala macrorhynchus*), Longman's beaked whale (*Indopacetus pacificus*), Cuvier's beaked whale (*Ziphius cavirostris*), dwarf sperm whale (*Kogia sima*), and sperm whale (*Physeter macrocephalus*). The record of the Omura's whale, which has been documented twice to date from within the IMMA, marks the northern record of the species in the Indian Ocean.



Figure 2: An Omura's whale sighted in the southern Andaman waters by a sport-fisher and member of the cetacean monitoring network, Hakim Shaikh.

Supporting Information

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MARINE MAMMAL PROTECTED AREAS TASK FORCE

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