

# Whales and dugong sighting in Andaman Sea, off Andaman and Nicobar islands

## Abstract

The sighting of whales and the dugong was one of the important methods of the survey on its distribution. A study was initiated to understand this survey results in and around the Andaman and Nicobar waters. The source for the study was considered from the existing database from the published literature, unpublished reports from the different Government Agencies related to this study and personal interview with the fisher folk. Based on this survey it was found that there were total eight species of whale and one species of dugong had been recorded from this survey in Andaman waters. Among the sighted species, the sperm whale is the most abundant species were observed. While there is only one species record, from Family Balaenopteridae of Bryde's whale and from Family Ziphiidae of Blainville's beaked whale. Killer whale has been the most frequently recorded species during this survey. There was only one mass stranding occurred in Andaman and Nicobar Islands of 40 individuals of Short-finned pilot whale. Based on this it is recommended that various stakeholders, both within and outside the academic and government research communities, engage in more active collaboration and information sharing to better synergize research, conservation, and management efforts throughout the Andaman and Nicobar Islands.

**Keywords:** fisher folk, synergize research, marginal sea, species record, fishermen, polar bears, pinnipeds, dolphins and porpoises, manatees and dugong, pilot whale

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## Introduction

Andaman and Nicobar Islands are one of the biodiversity hotspots of the world, located between Lat. 06°45' to 13°41'N and Long. 92°12' to 93°57'E in Bay of Bengal. This archipelago comprised of 572 islands with a coastline of about 1,962km and total area of 8,249 km<sup>2</sup>. The Andaman Sea is a marginal sea of the eastern Indian Ocean, separated from the Bay of Bengal (to its west) by the Andaman and Nicobar Islands and touching Myanmar, Thailand and the Malay Peninsula. Its southernmost end is defined by Breueh Island, an island just north of Sumatra. The maximum length of the Andaman Sea is 1,200 km and maximum width is 645 km. The surface area of the sea is 600,000 km<sup>2</sup>. The average depth of the sea is 1,096 m while the maximum depth is 4,198 m. The Andaman Sea extends over 92° E to 100° E and 4° N to 20° N, Occupies a very significant position in the Indian Ocean, yet remained unexplored for a long period of time. Marine mammals are important components and occupy elevated trophic level in the oceanic environment. They are generally classified under three major Orders, namely Cetacea (whales, dolphins and porpoises), Sirenia (manatees and dugong), and Carnivora (sea otters, polar bears, and pinnipeds). Till date, there are 129 marine mammals Species of these three Groups and are known to occur in the world ocean.<sup>1</sup> Many cetaceans have fully adapted to live in almost all marine ecosystems and have evolved to exploit a wide variety of prey species. Being apex predators, cetaceans have the potential to be important barometers of marine diversity and give them significant role as indicators of marine ecosystem conservation state. Cetaceans are thought to have a major influence on marine food webs as well as the structure and function of some aquatic communities because of their large body size, high metabolic rates, and large numbers.<sup>2,3</sup> Therefore, an understanding the role of cetaceans in the marine ecosystem is imperative because it provides a context to evaluate the potential impact of their predation on prey population, prey community structure and variation in prey population.<sup>2</sup>

Cetaceans are highly mobile animals with complex habitat requirements and are distributed unevenly across oceans, ranging from temperate, tropical, subtropical, and polar water of the deep ocean. These apart, estuaries and the tributaries of some of the world's largest rivers act potential habitat for few cetaceans (river dolphin) and sirenians group (dugong). Some habitats, such as tropical, subtropical and temperate, maintain extremely diverse cetacean species assemblages, whereas Polar Regions support a restricted range of species (Gaston, 2003). Among the different marine habitats, tropical water occupies vast part of the world ocean and covers nearly 50% of the world's oceans, which supports a wide range of distribution of tropical cetacean species.<sup>4,5</sup> Dugongs were common in the Andaman and Nicobar Islands until the 1950s, but currently there are only sporadic sightings.<sup>6</sup> A first study on the distribution of seagrass meadows was carried out in 1995. This study estimated, the presence of 40 dugongs based on interviews with fishermen and regular divers<sup>6-8</sup> sighted three dugongs in the wild at Neil, Havelock and Kodiaghat Islands in the southern Andaman Islands and three dugongs were sighted near Neil Island by.<sup>9</sup> The year 2008, it was collated all available information on dugong occurrences from records available since 1956 and found that there were 58 records of mortality in the past 50 years and in the past 20 years there were 10 records of mortality indicating a possibility of a further decline in numbers since the 1999 report.

Based on the above review it was decided to bring out the status of sighting on whales and dugong in the Andaman Sea. This study was carried out in Andaman Sea extended from off Andaman and Nicobar Islands (Figure1). Whales and Dugong distribution status are important for the conservation and protection purposes. However, in general, this study was limited due to no catch of these species by the fisherfolk. So, their biodiversity may be understood only through the existing records as well as seafarer's information. This aspect, the existing records and information was collected from different review

of literature and agencies like, State Fishery Departments, Zoological Survey of India, Fishery Survey of India, NGO's and Department of Environment and Forest. The cetaceans of the southern and northern parts of the Indian Ocean have also been well studied relative to those of the other cetaceans, resulting in a basic understanding of distribution and abundance.<sup>10–17</sup> Contrast to these parts of the Indian Ocean, studies on cetacean in the northeastern part of the Indian Ocean, in particular, in the Indian peninsula is very little due to complete lack of systematic program in the last century. There is no uniformity among different authors as to the exact number of cetacean species occurrence in Indian water. Recent advancement in fishing has extended fishing activity to oceanic waters and thereby has added new species to cetacean community in the Indian Sea. Information from incidental catch (by-catch) in fisheries and sightings indicate that Indo-Pacific bottlenose (*Tursiops aduncus*), humpback (*Sousa chinensis*) and spinner dolphins (*Stenella longirostris*) are the most common species in India.<sup>18–20</sup> A few species such as Cuvier beaked whale (*Ziphius cavirostris*), Melon headed whale and Killer whale (*Orcinus orca*) have been recorded very rarely in the last 200 years and raises uncertainty as to the distribution of these species in Indian waters.<sup>19</sup>



**Figure 1** Study Area – Andaman Sea (Ref: Google Maps).

Cetacean entanglement in fishing gear represents one of the most immediate threats to their diversity in India.<sup>21</sup> Bycatch of several species of marine mammals are reported regularly in the Indian fisheries during all the season. Cetaceans entanglement has been observed in a wide range of fishing gear including pelagic driftnets,<sup>22</sup> bottom-set gillnets,<sup>23</sup> trawl nets<sup>24</sup> and purse seines.<sup>20</sup> Such an entanglement causes physical damages to fishing gear and also causes injuries to cetaceans or death through drowning. Among many gears used in Indian fisheries, gillnet is the main cause for massive cetacean entanglement. The Indian gillnet fishery is one of the largest driftnet fisheries in the world with around 14,800 operational fleets across the Indian Seas. Sea cow (*Dugong dugon*) is the only extant species in the Family Dugongidae and true herbivorous marine mammal. Currently dugongs are classified as vulnerable to extinction under the 1996 World Conservation Union (IUCN) Red List of Threatened Species. This classification describes taxon that faces a high-risk of extinction in the wild in the medium-term future. In the case of the dugong, it is deemed population reduction in the form of the following: an observed, estimated, inferred or suspected reduction of at least 20% over the last 10 years or three generations, whichever is the longer.<sup>25</sup>

India, dugongs have been reported from the Gulf of Kutch in the north-west, Gulf of Mannar and Palk Bay in the southeast and the Andaman and Nicobar Islands.<sup>26–38</sup> There are no records from further north along the east coast of India or from the Sunderbans,<sup>39</sup> although there are records from the Chittagong coast of Bangladesh and

Burmese waters.<sup>40</sup> They were previously reported (as seals) along the west coast of India,<sup>29</sup> from salt water inlets of the south Malabar and Konkan coasts as far north as Canara (which corresponds to southern Maharashtra, Goa, Karnataka and Kerala today). The occurrence of dugongs along the Malabar Coast was also mentioned in the Imperial Gazetteer.<sup>33</sup> Dugongs have also been reported from the Maldives and Laccadive Islands<sup>41</sup> but are now believed to be extinct.<sup>9</sup> Indian seas, the main threats to dugong populations are habitat loss and degradation, fishing pressure, indigenous hunting and use and naturally occurring diseases. Global warming is an indirect threat to the dugong. The United Nation's Intergovernmental Panel on Climate Change (IPCC) has speculated that climate change due to increasing amounts of anthropogenic "greenhouse" gases may result in increased tropical sea surface temperatures (SSTs) and increased tropical rainfall associated with a slightly stronger inter-tropical convergence zone (ITCZ).<sup>42–44</sup>

## Materials and methods

The oral interaction surveys were carried out from December 2017 to March 2018 with fisher-folks of Port Blair and Campbell Bay of Andaman and Nicobar Islands. The data were collected from 1902 to 2018. Out of 13 sighting, five belongs to 1902 to 2002 and remaining 08 data from 2009 to 2018. The purpose of such interview was to create a database of the whales and to collect information on local cetacean species. Additionally, the behavioural remarks also were considered with fishermen while they are at the sea fishing in different areas. The data suggested that the Bryde's Whale, Sperm Whale, Killer Whale, False Killer Whale, Short – Finned –Pilot whale and *Dugong dugon* were the most sighted along with stranded species. Apart from that, secondary data on the reports of whales and dugong in these islands were collected through published literature and unpublished reports from different scientific organizations. Consultations and interactions were made by scientific departments as well as fisher-folk communities and local inhabitants to confirm the collected literature information along with the information on sightings and the stranding of whales and dugong in the past. Additionally, there are some personal reports also have been included while sailing from Port Blair to Campbell Bay. Along with that, sailor of the passenger ships also have been interviewed for the sightings of whales along with sea route from Port Blair to other destinations such as Hut Bay, Car Nicobar, Kamorta and Campbell Bay.

These collected data were tabulated as well as visual graphic were made to understand the distribution as well as its distributional status. Based on these interpretations, the final report was developed.

## Results and discussion

The Andaman Sea, off Andaman and Nicobar Coasts, represented eight species of whales and one species of dugong as per the survey conducted during the period December 2017 to March 2018 among the fisher folk and sailors (Table 1). The secondary data on this aspect suggested that these records were meager and not up to the serious level to upkeep this record due to lack of interest or knowledge (Table 2) and (Figure 2) & (Figure 3). The fisher folk data was suggested that the sighting was a regular phenomenon in the coastal waters as well as in the insular shelf regions (Figure 4) & (Table 3). Further, it was also observed that the whales were swimming away from the boat generated noise. The whale stranding was another major observation was identified in this sector during this study. Till date, the stranding incidence of five species of whale and one species of dugon were

recorded (Table 2). Out of these six incidences, only one major stranding was occurred of Short Finned Pilot Whales. The causes for this stranding incidence may be due to the undersea earthquake, geomagnetic error, strong tidal currents, sonic waves, following the fast moving prey such as dolphin, school of fishes, etc., rough weather, weakness of whale due to ageing or infection, etc.,. There were some observations also suggested that entanglement in a ghost

net for this creature, which leads to death or injured (Figure 5). The dugong was also observed in almost all over the length and breadth of the Andaman and Nicobar coastal regions. The report suggested that its observation was from North Landfall islands to South Indira Point Figure 6 & Figure 7. This distribution suggested that the Ritchie’s Archipelago and Great Nicobar regions may be the most probable sighting were done (Table 4) & (Figure 8).<sup>45-48</sup>

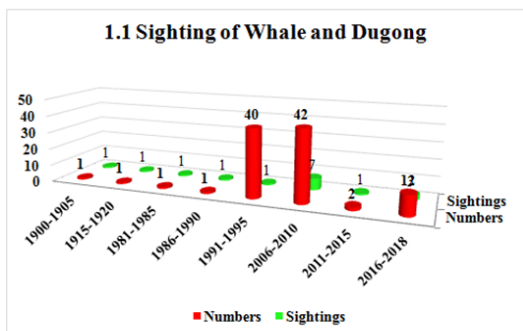


Figure 2 Sighting of whale and Dugong.

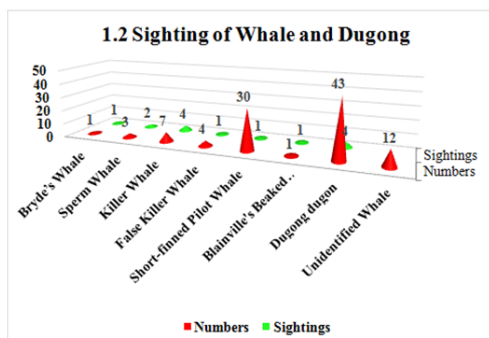


Figure 3 Sighting of whale and Dugon

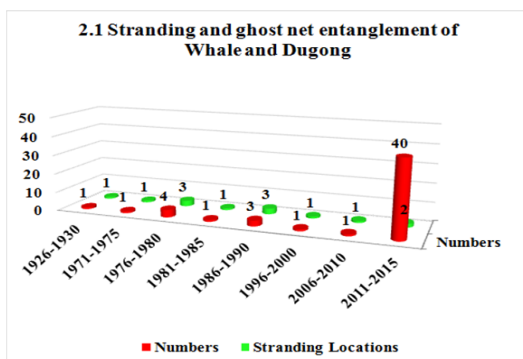


Figure 4 Stranding and ghost net entanglement of whale and Dugong.

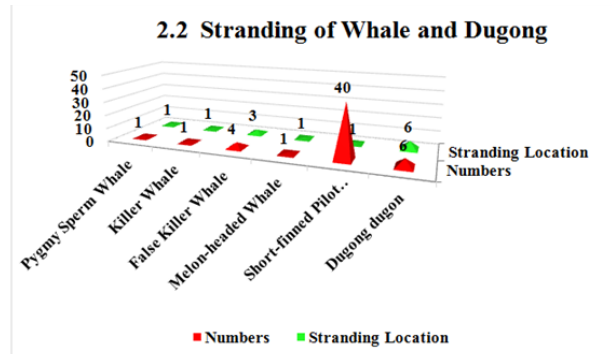


Figure 5 Standing of whale and Dugong.

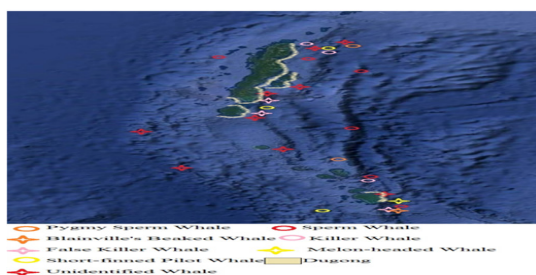


Figure 6 North Landfall islands to South Indira Point.

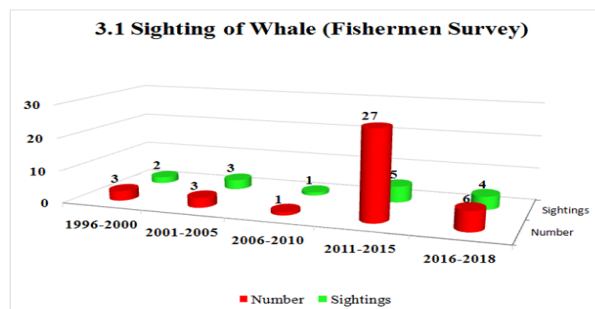


Figure 7 sighting of whale (Fishermen Survey).

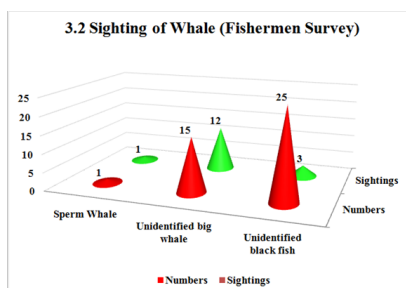


Figure 8 Distribution of Sighting.

## Sighting of Whales and Dugongs

Sr.No.	Species	Number	Date	Location
1	Bryde's Whale	1	15 May 1988	Sighted in Andaman sea
2	Sperm Whale	1	March & April 1920	Sightings off the Andaman and Nicobar Islands
3	Sperm Whale	2	30 November 2012	Ten degree Channel
4	Killer Whale	1	12 April, 1983	One sighted north of Andamans
5	Killer Whale	1	February 1902	Sighted Pulomilo Island near Little Nicobar
6	Killer Whale	1	April 2009	Little Andaman
7	Killer Whale	4	23 September 2010	Great Nicobar
8	False Killer Whale	4	June 2010	Andaman Sea
9	Short-finned Pilot Whale	30	May 2010	Andaman sea
10	Blainville's Beaked Whale	1	?	Recorded from the Nicobar Islands
11	Unidentified Whale	1	27 December 2017	Ross Island
12	Unidentified Whale	1	28 December 2017	Car Nicobar
13	Unidentified Whale	10	28 December 2017	Great Nicobar Island
14	<i>Dugong dugon</i>	40	1990 - 1995	Sightings in the Andaman islands: 6 Dugongs near Landfall Island, 6 near Ritchie's Archipelago and 5 near Little Andaman and Dugong Creek; in the Nicobars, 5 Dugongs near Katchall, 10 near Camorta Island, 4 specimens around Little Nicobar and 4 around Great Nicobar Island
15	<i>Dugong dugon</i>	1	Feb 2007 – Mar 2008	2 m, Havlock Island, Andaman
16	<i>Dugong dugon</i>	1	Feb 2007 – Mar 2008	2.5 m, Neil Island, Andaman
17	<i>Dugong dugon</i>	1	Feb 2007 – Mar 2008	3 m, Kodiaghat, Andaman
	Total	101		

Table 2 Stranding and Ghost Net Entanglement of Whales and Dugongs

Sr. No.	Species	Number	Date	Location
1	Pygmy Sperm Whale	1	8 July 1988	A 1.95 m long specimen from Port Blair, Andamans with an 80cm foetus
2	Killer Whale	1	?	Skull from the Nicobar Islands in the Bombay Natural History Society
3	False Killer Whale	2	27 July 1976	Entangled in gillnets off Madhuban, Port Blair; one escaped
4	False Killer Whale	1	9 June 1977	Caught in gillnet off Port Blair
5	False Killer Whale	1	7 March 1983	Shastri Nagar, Great Nicobar
6	Melon-headed Whale	1	Before 1971	Car Nicobar
7	Short-finned Pilot Whale	40	21 October 2012	Elizabeth Bay, North Andaman
8	<i>Dugong dugon</i>	1	8 March 1929	Female carrying a young, harpooned in the Andamans
9	<i>Dugong dugon</i>	1	8 July 1977	One caught in gillnets off Port Blair
10	<i>Dugong dugon</i>	1	March 1989	Hut Bay, Little Andaman
11	<i>Dugong dugon</i>	1	July 1989	One dead Dugong found near Pilo Kunji of the Great Nicobars
12	<i>Dugong dugon</i>	1	19 February 1997	2.63 m long female Dugong caught and brought dead to shore at Hut Bay, Little Andamans
13	<i>Dugong dugon</i>	1	25 December 2008	Stranded, Neil Island, Andaman
	Total	53		



**Table 3** Sightings of Whales – Fisherfolk Survey

Sr. No.	Whale	Numbers	Date	Location	Behavioural notes
1	Sperm Whale	1	2016	Inglish Island	Lob-tailing, Diving
2	Big Whale	1	2002	Chowra	
3	Big Whale	1	2010	Mayabandar	Specimen approached the boat, Feeding
4	Big Whale	2	1998	Mayabandar	Feeding
5	Big Whale	3	2017	South Sentinal Island	Specimens approached the boat
6	Big Whale	1	2016	Interview Island	
7	Big Whale	1	?	Hut Bay	Disturbed by the approaching boat
8	Big Whale	1	2001	North Sentinal Island	Breaching, Disturbed by the approaching boat
9	Big Whale	1	2017	Mayabandar	
10	Big Whale	1	2015	Ross Island	
11	Big Whale	1	2003	Interview Island	Entangled in fishing net
12	Big Whale	1	2015	North Sentinal Island	Specimen approached the boat
13	Big Whale	1	2014	South Sentinal Island	
14	Black Fish	20	2013	Indira Point	Feeding
15	Balck Fish	1	2000	Mayabandar	Feeding
16	Black Fish	4	2014	Hut Bay	
	Total	41			

**Table 4** Stranding of Whales – Fisherfolk Survey

Sr. No.	Species	Numbers	Date	Location
1	Black Fish	1	2013	Panchvati beach, Rangat
2	Big whale	1	Approx. 2003	Havelock
3	Big whale	1	2004	27 Km beach, Great Nicobar
	Total	3		

## Summary and conclusion

There are total eight species of whale and one species of dugong had been recorded from this survey in Andaman waters. The distribution of these species lies all over EEZ and coastal waters of Andaman and Nicobar Islands. Among the large whales, the sperm whale is the most abundant species. While there is only one species record, from Family Balaenopteridae of Bryde's whale and from Family Ziphiidae of Blainville's beaked whale, which suggests the low abundance of these to Families. Among the toothed whales Family Delphinidae is most diverse one with four species have been reported from the study area. Killer whale has been the most frequently recorded species during this survey, while the number of individuals was recorded of short-finned pilot whale. The stranding data show that the false killer whale was most frequently getting caught in ghost nets. There was only one mass stranding occurred in Andaman and Nicobar Islands of 40 individuals of Short-finned pilot whale. The death of whale and dugong are less by stranding compare to the ghost net entanglement. There have been also reports of stranding which do not have any authentic handling and supervision of carcasses, which could be a great opportunity to collect the morphological and anatomical data and distribution data. This Survey had provided a useful means for collection of whales sighting and stranding data as secondary data and most importantly

fisher-folks interview survey data. The data generated on species occurrence and distribution will be useful for assisting with the estimation of the abundance of whale in the Andaman waters in the future. For this, the oceanic survey research needs to be supplemented with coastal surveys with smaller boats and most frequent survey. It is recommended that various stakeholders, both within and outside the academic and government research communities, engage in more active collaboration and information sharing to better synergize research, conservation, and management efforts throughout the Andaman and Nicobar Islands. There should have better coordinate the handling of stranding events and facilitate valuable data collection through examination and sampling of stranded carcasses. Only through such collaboration can adequate research, conservation, and management take place.

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## Conflict of interest

The author declares there is no conflict of interest.

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