



# CETACEAN DIVERSITY AND ABUNDANCE OFF KARWAR, SOUTHWEST COAST OF INDIA

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## Introduction

- The Indian Seas are one major habitat for many marine mammal species and support 25 cetacean species and one sirenian species.
- Offshore and coastal distribution of many cetaceans in Indian waters is well documented (Afsal *et al.*, 2008). Southwest coast of India in Arabian Sea has been identified as potent area for rich cetacean diversity due to high productivity.
- However, information on cetacean diversity, abundance and their distribution in nearshore waters is sparse.
- The present study was aimed to study diversity, distribution and abundance of cetacean species in coastal waters of Karwar in southwest coast of India.
- Several boat based visual surveys were conducted off Karwar to enumerate the marine mammals off Karwar. The objectives of the survey were as follows:
  - Examine the diversity of marine mammal and abundance of each species off Karwar using visual surveys and photo identification method.
  - To understand interaction of cetaceans with local fishery and their behaviours.

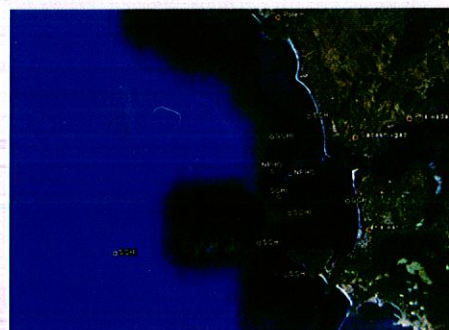
## Methodology

- Boat based opportunistic visual surveys were conducted in the coastal waters off Karwar continuously for seven days from 8<sup>th</sup> to 14<sup>th</sup> of March 2011.
- Photo identification method was adopted to assess abundance of each species.
- Surveys were conducted in the morning between 6hrs to evening 1hrs. Daily observation effort ranged from 5 hrs to 7hrs with average of 6 hrs. Surveys were abandoned during evening because of inclement sea condition. A trawl boat (OAL: 32m) fitted with 52hp engine was used for surveys.
- Two observers were positioned to scan the survey area and were aided by boat crew of 4 members.
- Data on Sea surface temperature (SST) and surface salinity were collected by handheld thermometer and refractometer, respectively.
- Handheld Garmin GPS was used to position the animal sighted area.
- Nikkon D80, digital SLR camera fitted with 55-70mm Nikkor lens was used for photo sampling, species identification and abundance estimation.

## Important Highlights

- Daily observation effort ranged from 5 hrs to 7hrs with average of 6 hrs. The total survey effort for seven days was 42 hrs.
- The area covered every day ranged from 35 km<sup>2</sup> to 45 km<sup>2</sup> with an average of 40 km<sup>2</sup>. Survey was carried out upto 6 km from the shore.
- Depth of survey area ranged from 2m to 12m. SST ranged from 26°C to 29°C and salinity from 30ppt to 32 ppt.

- Two species namely, *Sousa chinensis* (humpbacked dolphin) and *Neophocaena phocaenoides* (finless porpoise) were sighted during the survey.
- A total of 11 sightings consisting of 84 individuals were observed during survey period (Table 1).
- Humpbacked dolphin was dominant in terms of occurrence and abundance and was sighted on nine occasions, whereas finless porpoise was sighted on two occasions.
- Most of the sightings were in the northern part near Kurumgad and Devgad Islands which are 4 km off Karwar.
- Sightings were observed in the southern part also, near Anjadiv and Devgad Island. Humpbacked dolphins were sighted throughout the survey area as scattered groups in depth range from 3 to 8m. Based on photo identification method it was found a total of 32 individuals of 9 small groups occurred and each group consisted of 3 to 6 adults and sub adults.
- The dolphins congregate in northern part near Kurumgad Island for feeding whenever there is fishing activities. Feeding and socializing were the main behaviours of the humpbacked dolphin observed in the present survey.



Sighting of *Sousa chinensis* (SCH) and *Neophocaena phocaenoides* (NPHO) in Karwar water

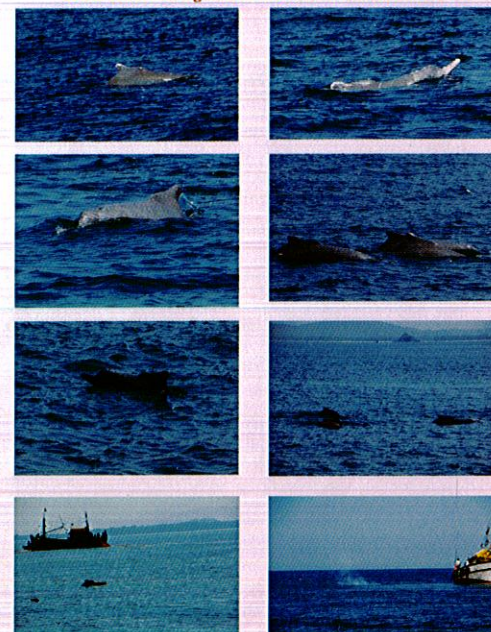
Table 1 Sighting of cetacean species off Karwar in March 2011

Species	GPS Position	Area of sighted	Depth (m)	SST (°C)	Salinity (ppt)	No. of animals
<i>Sousa chinensis</i>	14°52.40.07'N 74°05'32.26'E	Near Kurumgad Island	8	28	31	30
<i>Neophocaena phocaenoides</i>	14°50'34.86'N 74°04'14.05'E	Off Devgad beach	3	27	30	5
<i>Sousa chinensis</i>	14°51.50.16'N 74°06'17.08'E	Off Devgad beach	7	28	31	4
<i>Sousa chinensis</i>	14°52.83.03'N 74°06.14.29'E	Near Kurumgad Island	7	29	31	20
<i>Neophocaena phocaenoides</i>	14°50'34.86'N 74°05'14.05'E	Off Lighthouse Island	12	28	32	1
<i>Sousa chinensis</i>	14°49.43.01'N 74°05'53.98'E	Anjadiv Island	8	28	31	2
<i>Sousa chinensis</i>	14°49.37.57'N 74°05'32.02'E	Anjadiv Island	8	28	31	5
<i>Sousa chinensis</i>	14°49'15.38'N 74°05'40.90'E	Off RT Beach	5	26	30	4
<i>Sousa chinensis</i>	14°48'28.16'N 74°04'49.72'E	Between Anjadiv and Lighthouse Islands	6	27	30	4
<i>Sousa chinensis</i>	14°48'12.18'N 74°07'16.95'E	Off RT Beach	6	26	30	6
<i>Sousa chinensis</i>	14°48'30.08'N 74°07'54.30'E	Baikal Harbour	3	26	30	3

- A group of finless porpoise consisting of 5 individuals was sighted near Devgad Island at 3m water depth on one occasion. Single animal was sighted off Devgad (Lighthouse) Island at 10m depth.

- During the survey, interaction between humpbacked dolphin and local trawl and purse seine fisheries was observed regularly.
- During purse seine operation dolphins consisting of 30 animals congregate in fishing area, surround purse seine net and cause disturbance to their fishing by taking away fishes like sardine and mackerel from the net.
- In order to prevent this, some fishermen use crackers to drive away the dolphins from their fishing area.
- Some other fishermen are cautious to avoid physical injury to the dolphin groups by patrolling the fishing area on small boat which is used for deploying net.
- Trawl fishing is also more susceptible to the disturbance but no preventive method is undertaken by fishermen.

## *Sousa chinensis* sighted in the coastal waters of Karwar



Humpbacked dolphin interacting with purse seine fishery

Fishermen use crackers

## Reference

- Afsal, V.V., K.S.S.M. Yousuf, B. Anoop, A.K. Anoop, P. Kannan, M. Rajagopalan AND E. Vivekanandan. 2008. A note on cetacean distribution in the Indian EEZ and contiguous seas during 2003-07. *J. Cetacean Res. Manage.* 10(3):209-215.