

**A pilot study of the population dynamics of *Orcaella  
brevirostris* (Owen in Gray, 1866)  
in Chilika lagoon, Orissa, India**

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## Introduction

The Irrawaddy dolphin, *Orcaella brevirostris*, is a species inhabiting coastal, estuarine, fresh and brackish waters and is often found in isolated or semi-isolated subpopulations. It is patchily distributed along waters of South East and South Asia, extending from the Philippines right up to the northeast of India. Because of its tendency to restrict itself to narrow ecological niches, of the 7 existing subpopulations worldwide, those of the Mahakam river of Indonesia, Malampaya Sound in the Philippines, the Mekong river of Cambodia, Songkhla Lake in Thailand and the Ayeyarwady River in Myanmar have been declared as “Critically endangered”.

Chilika lagoon, located at 19° 28'N – 19° 54'N and 85° 05'E – 85° 38' E, is home to a subpopulation of Irrawaddy dolphins. The population abundance of these dolphins has been studied in the past with varying results. While unsystematic surveys have given a range of population size estimates from 20 to 50 animals, more recent direct counts conducted by the Chilika Development Authority (CDA) have estimated population size to be around 138 animals. Research based on photo-identification of the dorsal fin, estimates the population size to be between 92-117 individuals between 2004 and 2006, using both Open and Closed models.

The study herein, initiated in January 2008, uses boat based surveys and dorsal fin photo-identification to study the population dynamics, life history and foraging strategies of the Irrawaddy dolphin, *Orcaella brevirostris* at Chilika lagoon. In addition, a survey is currently being conducted to assess the attitudes of fishermen towards the conservation of the Irrawaddy dolphin around the study area.

## Study site

Boat based surveys for photo-identification of dorsal fins were conducted from January 2008 till date. Due to logistic reasons, effort for the same was concentrated only in the following areas (a) Satapada to Sea mouth channel (b) Mahisa to Rajhans channel and (c) Magarmukh channel. This area, collectively termed as the “Outer channel” is known to have the highest density of animals in the whole of Chilika lagoon, and many individuals from other parts of the lagoon are known to regularly frequent this area.



Fig. 1: Map of Chilika lagoon. Effort for the present study is concentrated in the dark green area shown (map taken from Sutaria, 2008).

## Methods & preliminary Output

### *Population dynamics*

Dorsal fin photographs of dolphins were taken during boat surveys, along with their GPS location, total time of the encounter, water depth, salinity, water temperature etc.

Re-sightings and new sightings of identified dorsal fins will be catalogued and this data will be used to calculate the population estimate, using Open, Closed and Robust models. Comparisons with previous years' estimates will be made in order to analyse trends in population estimates.



*Fig2: The above individual is an adult and was seen on several occasions, mostly in a group from Mahisa to the sea mouth.*



*Fig. 3: The above individual is an adult, and is mostly observed in a group and was seen all over the study area*

### *Life history*

During boat based surveys, a watch was kept for animal carcasses. People of neighbouring villages were also requested to pass on information in case any Irrawaddy dolphin carcass was encountered. Carcasses encountered were measured for their total length, GPS location was recorded where possible, sex was recorded and reason for death was noted down. New mothers with calves noticed this year will be identified at a later date from photographs.

A total of two carcasses were encountered during the study period starting from January 2008. For details, refer to contents of Table 1. as shown below.

<i>Date</i>	<i>GPS location</i>	<i>Sex</i>	<i>Length</i>	<i>Reason for death</i>	<i>Comments</i>
28 <sup>th</sup> March, 2008	N 19° 40.077 E 85° 28.556	Male	2.0m	Fishing line caught around tail fluke	Carcass was at least 1 week old, see Figs. 5 & 6
2 <sup>nd</sup> April, 2008	unknown	Female	2.21m	Old age and propeller gash on head	Carcass was fresh and was floating in water, no teeth found in mouth. See Fig. 7

*Table 1.: Specific details of carcasses encountered during the study period from January 2008 till date.*

### *Foraging strategies*

An ethology of the foraging strategies of the dolphin in the Outer channel was made. During boat based surveys, areas both with and without nets were surveyed equally. Irrawaddy dolphin behavioural data was collected by means of scan sampling and focal animal sampling.

Around 8 different foraging tactics were observed in the Outer channel region. Preliminary observations indicate that females with calves/juveniles feed more near nets than in open waters. The statistical significance of this observation still has to be investigated.

### *Local attitudes towards the Irrawaddy dolphin*

A questionnaire to assess the attitudes of local people towards the Irrawaddy dolphin and its conservation is currently being conducted. Villages surveyed are located around the areas of boat based transects, for logistic reasons and because the abundance of dolphins around these areas is known.

Preliminary observations indicate that most fishermen are sympathetic towards the Irrawaddy dolphin and its conservation and there appears to be no conflict or negative attitude towards the dolphin. Many fishermen believe that the dolphin is sacred and assists them in catching fish. However, in areas where dolphins are less abundant, fishermen are generally unsympathetic towards these animals.

## *Educational Outreach*

As part of the conservation effort of this project, an educational session on the Irrawaddy dolphin and its conservation was conducted at the Satapada primary school along with a quiz and drawing competition for children of classes 4 and 5.

The classroom session with children of Satapada primary school was successful, with children very enthusiastic to learn about the ecology of the Irrawaddy dolphin and its conservation (refer to Fig. 4). Most children faired very well in the quiz on dolphins and were enthusiastic about the drawing competition.



*Fig 4: Educational outreach at Satapada village, Chilika*

## **Conclusion**

Apart from surveys conducted to obtain dorsal fin photo-identification data, for the estimation of population size (2008), behavioural observations made and the surveys on attitudes of the fishermen towards the dolphin promise to give new insights into the biology and conservation of the Irrawaddy dolphin at Chilika lagoon. The potential of educating children in the area about conservation has also been explored and was found to be successful. The possibility of continuing both scientific work on the biology and ecology of the Irrawaddy dolphin, as well as a continuation of the conservation efforts are currently being considered.

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