

# CETACEAN DIVERSITY OFF LA REUNION ISLAND (FRANCE), interactions with human activity

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## INTRODUCTION

Little is known about cetacean populations off La Réunion. Cetaceans have never been investigated in the area and, up until recently, the only data available came from opportunistic sightings (from land and at sea) and standings (recorded consistently only since 1998). Since 2001, GLOBICE-REUNION has been conducting dedicated cetacean surveys. The main objective of these surveys is to determine the cetacean diversity and to collect photo-identification and behaviour data on the species encountered. This data is a pre-request to further conservation of cetacean population in La Réunion. We present here the data collected over the last 6 years off La Réunion, in the aim of providing useful basis for assessing the impact of cetacean interactions with human activities.

## MATERIALS AND METHODS

Fieldwork consisted of one-day surveys, conducted year round, on 5-meter inflatable boats. Surveys were conducted in coastal waters, up to 6 nm offshore, in southern and western waters of La Réunion. All encounters with cetaceans were recorded, together with group size and behaviour data. For the most common species, photo-identification data were collected using digital cameras. For the analysis, the study area was divided into 2 zones (Figure 1). For each zone, the sighting frequency of each species was computed, together with the mean bottom depth and group size.

## RESULTS AND DISCUSSION

### Cetacean diversity

A total of 210 sightings was achieved, with **8 species observed**. Significant differences in species diversity were observed between the 2 zones (Figure 2).



The most frequent species encountered year round was the **Indo-Pacific bottlenose dolphin** (*Tursiops aduncus*), which represent 42.6% of the sightings in the western part of the island and 18.2% in the southern zone. This species uses a coastal habitat, with sightings occurring in waters less than 50m deep (Figure 1). Group sizes were relatively small, with a mean of 9.5 individuals per school. Preliminary results suggest a resident population in La Réunion, with 54 individuals photo-identified.



The **bottlenose dolphin**, *T. truncatus*, was also present in the study area, both in the western and southern zone (6.7% and 9% of the sightings respectively). Compared to *T. aduncus*, this species uses deeper waters, between 350 and 900m depth, and was found in larger groups of 55 individuals on average.



The **spinner dolphin** (*Stenella longirostris*) was mostly seen in the western part of the island. This species was observed in both very shallow waters (<50m) and deeper waters (down to 700m), in groups of 5 to 200 animals (mean of 44).

The southern part of the island hosts a greater species diversity. The **Pantropical spotted dolphin** (*Stenella attenuata*), the **Fraser's dolphin** (*Lagenodelphis hosei*) and the **Melon-headed whale** (*Peponocephala electra*) were seen relatively frequently in the area (13.6%, 9.1% and 13.6% of the sightings respectively). The **short-finned pilot whale** (*Globicephala macrorhynchus*) was sighted once, 6 NM offshore. These 4 species were found in waters from 350 to 1400m deep, on steep slope and were always observed in large groups (mean group size of 70, 150, 406 and 50 respectively).



During winter, the **humpback whale** (*Megaptera novaeangliae*) appears to be frequenting both the western and southern part of the island, and are generally observed very close to shore, in waters of less than 100m deep. A total of 74 sightings of humpback whales was performed including 30% of solitary individuals, 46% of pairs of mother with calf and 16 % of pairs with escorte. Sightings occurred from early June to late October. A total of 50 whales were photo-identified. The presence of newborn calves and singing males strongly suggests that La Réunion represents a breeding and mating ground for humpback whales in the Indian Ocean. Coming very close to the coast of La Réunion to shelter from predators, humpback whales are very vulnerable to whale-watching activities. For the species conservation, measures urged to be implemented toward a sustainable management of this activity.

### Evidence of interactions with human activities

During surveys, evidences of interactions between cetacean and human activities were observed. These includes observations of :

- Bottlenose dolphins (*T. aduncus*) with the dorsal fin missing or half cut. This could be consistent with line or fishing gear injuries, as documented from *T. truncatus* (Wells *et al.*, 1998) and spinner dolphin (Green *et al.* 1991).
- Bottlenose dolphin showing marked propeller injuries
- A spinner dolphin entangled accidentally on a fishing line (December 2004)
- Bottlenose dolphin (*T. aduncus*) with a piece of fishing net wrapped around its head (February 2006)

Furthermore, fishermen of Saint-Paul bay report the systematic presence of bottlenose dolphin (*T. aduncus*) around beach-seine nets. Bycatch of bottlenose dolphins (*T. truncatus*) in coastal seine fisheries are known to occur in different parts of the world (ex: East coast of the United-States). In La Réunion, fishermen report no bycatch of cetacean and do not complain of either gear damage or reduced catch.

Interactions also occur with the pelagic longline fisheries in offshore waters of La Réunion, with false killer whale (*Pseudorca crassidens*) and the short-finned pilot whales (*Globicephala macrorhynchus*) being involved. These interactions appear to be more detrimental to fishermen, who reported no by-catch of marine mammals while undergoing great loss (about 4% of the catch) from cetacean depredation (Poisson & Taquet, 2001).

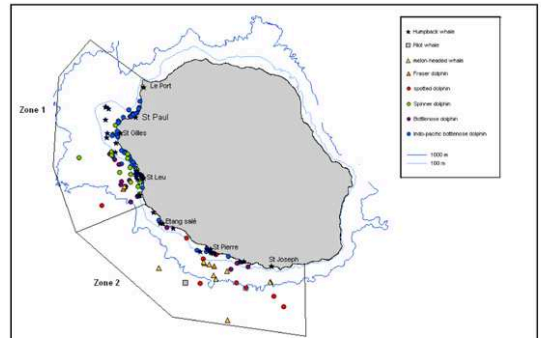


Figure 1. Distribution of cetacean sightings performed during 2001-06 GLOBICE surveys off La Réunion.

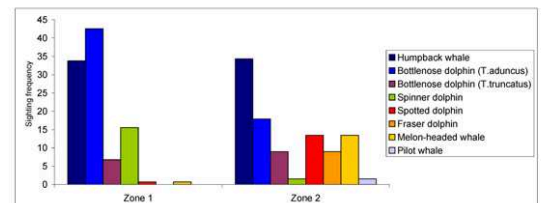


Figure 2. Sighting frequencies (in %) of cetacean species sighted in the western (zone1) and southern (zone 2) part of La Réunion.

## CONCLUSION

This study demonstrates a relatively high cetacean diversity around La Réunion, including coastal and offshore species.

The **western part of the island**, relatively sheltered and characterized by a **gentle slope**, hosts mainly coastal species such as the bottlenose dolphin, the spinner dolphin and the humpback whales. The **coastal habitat** of these species make them particularly to interact with inshore human activities, including local fisheries and boat traffic.

The **southern part of the island**, which include **deeper waters and steeper slope**, provides a suitable habitat for **offshore species**. This region provides therefore the opportunity to observe poorly known cetacean population relatively close to shore. Among these species, some have been shown to interact with offshore fisheries.

Further studies are needed to increasing our knowledge on the abundance, critical habitat, and foraging behaviour of these species, in order to assess the real impact of these interactions on the cetacean population of La Réunion.

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