

SIGHTINGS AND BYCATCH OF SMALL PELAGIC CETACEANS, NEW
INFORMATION REGISTERED BY VOLUNTEER FISHERMEN
OFF SÃO PAULO, BRAZIL

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In Brazil, marine mammals and turtles are legally protected and are of no commercial value to the fisheries of São Paulo State. Mortality in fishing nets is probably the most serious threat to the conservation of marine vertebrates throughout the world, where a large number of species is accidentally captured during fishing activities (SICILIANO, 1994; BERTOZZI; ZERBINI, 2002; MAJLUF et al., 2002; LÓPES et al., 2003; TUDELA et al., 2005; CARRETA et al., 2005). The evaluation and monitoring of the impact of this mortality is considered a priority action by The Brazilian Aquatic Mammals Action Plan (IBAMA, 2001). Since 1998, the Projeto BioPesca systematically monitors coastal artisanal fishery communities of the São Paulo State coast (BERTOZZI; ZERBINI, 2002). In Ubatuba (22°53'S, 45°08'W), through collaboration with the Projeto TAMAR (Brazilian National Sea Turtles Conservation Program), researchers were also able to access the pelagic fleet landing at Saco da Ribeira port.

Pelagic fleets operating surface driftnets are an acknowledged cause of considerable marine mammal mortality and are of particular concern because they are relatively less known and more difficult to monitor than other more coastal-operating fleets (ZERBINI; KOTAS, 1998). The Ubatuba driftnet fleet consists of boats of an average length of 12 meters, operating from October to March, mainly dedicated to shark fishing but also incidentally catching other elasmobranches, teleosts, turtles and cetaceans (ZERBINI; KOTAS, 1998; KOTAS et al., 2005). It is also important to mention that the fleet alternates seasonally between bottom (to catch *Micropogonias furnieri*) and surface nets depending on the target species. Consequently, there is a high variation in the number of boats operating over the year (with each kind of net) (KOTAS et al., 2005).

Data collected in 1997 showed that fishing trips ranged from 8-15 days, usually at 50-100 miles from the coast, and operated normally at depths of between 30 and 417 m (ZERBINI; KOTAS, 1998;

KOTAS et al 2005). Data collected about 10 years later, between 2005 and 2006, showed that the duration of the fishing trips had increased, the fishing area covered had expanded and the depths fished had increased to 2000 m, suggesting that fishermen needed to go further to find fish (SALES et al., 2003; KOTAS et al., 2005).

Disposable cameras were given to fishermen to voluntarily register sightings and/or captures of dolphins during two fishing trips. The first trip was in November 2005; fishing activity lasting for 18 days. The second trip took place in February 2006, there being 16 days of fishing. The sets began in the afternoon and the nets were hauled out the next morning, after an average total of 12 hours' immersion. The sets during the first trip (November 2005) were made at depths ranging from 30-500 meters, while the sets of the second trip (February 2006) occurred within a range of from 200-1000 meters, with only one set being made in waters deeper than 1000 meters (Fig. 1).

Four species of small cetaceans were sighted: *Stenella frontalis*, *Stenella longirostris*, *Tursiops truncatus* and one non-identified small cetacean. Four species were captured accidentally: *S. frontalis*, *S. longirostris*, *Peponocephala electra* and *Feresa attenuata* (Table 1).

One crew fisherman interviewed after the first trip reported that *S. longirostris* were captured (see Fig. 2) and released alive at a depth of 400m on the same day as sighted. The fisherman mentioned that "black animals" are frequently captured and released alive in the same area too. Three of those "black animals" were captured in the same set during the first trip close to the Merluza gas Platform, at about 600 m depth (Fig. 3). According to that crew member, only one animal actually died (*F. attenuata*, data not showed) and the other two (*P. electra*, Fig. 3) were released alive. *S. frontalis* were also sighted close to the boat and one specimen was accidentally captured. One unidentified cetacean was sighted swimming close to the boat during this trip.

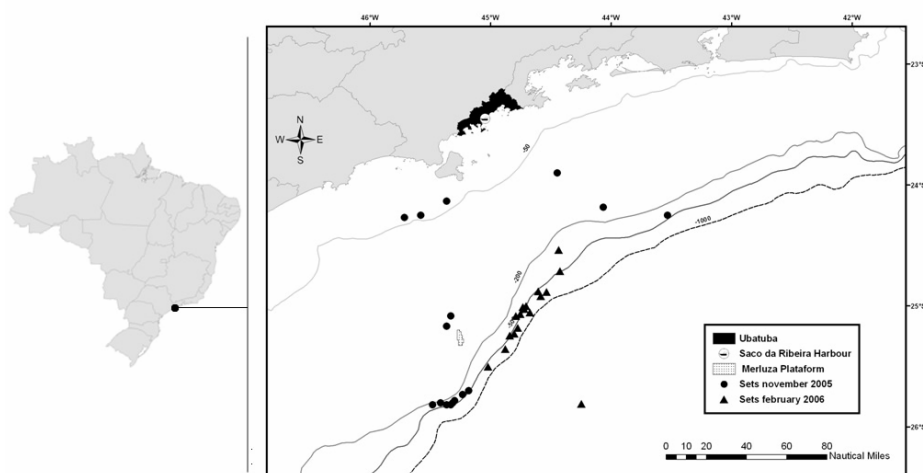


Fig. 1. Map showing the location and depths of sets performed during two fishing operations of boat from Saco da Ribeira, Ubatuba, São Paulo State, November 2005 and February 2006.

Table 1. Sightings and incidental captures of small cetaceans registered by fisherman of the Saco da Ribeira fleet during two fishing trips carried out in São Paulo waters in November 2005 and February 2006.

Species	1 st trip: Nov 2005		2 nd trip: Feb 2006	
	Sighting	Bycatch	Sighting	Bycatch
<i>Stenella frontalis</i>	x	1	x	
<i>Stenella longirostris</i>	x	1		1
<i>Peponocephala electra</i>		2		1
<i>Feresa attenuata</i>		1		
<i>Tursiops truncatus</i>	x			
Non-identified cetacean	x ?		x ?	



Figure 2: *Stenella longirostris* accidentally captured during the first trip in November 2005.



Fig. 3. The “black dolphins” accidentally captured in the same set during the first trip in November 2005. The net holds two specimens of *P. electra* and one *F. attenuata* is already in the boat.

On the second trip, *P. electra*, once again, (data not shown) and *S. longirostris* (data not shown) were captured. In addition, one more group of *S. frontalis* were sighted swimming close to the boat (data not shown).

Scientific knowledge of the distribution, abundance and biology of many cetaceans occurring on the Brazilian coast is still incomplete, most of the species still being considered “data deficient” by The Brazilian Aquatic Mammals Action Plan (IBAMA, 2001; ZERBINI et al., 2004).

T. truncatus is a delphinid cosmopolitan species of worldwide distribution but showing morphotypic variation among regions. Distinctions between coastal and pelagic populations have been documented throughout the species range (LEATHERWOOD; REEVES, 1990; NATOLI et al., 2004). We cannot be sure whether the specimens sighted on the first trip (data not shown) belonged to a coastal or a pelagic population because we do not have their exact sight location or any other morphological information.

Stenella frontalis and *S. attenuata* had been previously reported as having been accidentally captured by driftnets. In one case, *S. frontalis* was captured by the same Ubatuba fleet, also fishing for sharks (ZERBINI; KOTAS, 1998; IBAMA, 2001).

Although we only have evidence of the capture of a few specimens, we agree that given their wide distribution and high relative abundance, *S. frontalis* are possibly taken in great numbers throughout their range in southern Brazil and *S. longirostris* may be more susceptible to captures when fisheries operate in deeper waters (ZERBINI; KOTAS, 1998). According to our data the Ubatuba driftnet fleet are in fact operating at greater depths nowadays and capturing both species. The Brazilian Aquatic Mammals Action Plan (IBAMA, 2001), further, place *S. longirostris* among the species under high anthropogenic pressure, the main concern being related to bycatches in driftnets.

The “black dolphin” species are quite difficult to tell apart, especially in this case, where pictures were taken by fishermen and not all the necessary morphological characters were available to ascertain species identity. For example, the pygmy killer whale, *F. attenuata*, is one of the least well-known of the small cetaceans and confirmed sightings of the species on the Brazilian coast are rare. One possible explanation relates to the lower abundance of the species or to its morphological similarity with the melon-headed whale, *P. electra*. In Brazil, only two confirmed records of the stranding of *F. attenuata* have been published: one specimen was recovered on

the coast of São Paulo and a skull was found on the coast of Maranhão (ROSSI-SANTOS et al., 2006; SICILIANO et al., 2007). Both species are considered “data deficient” by the The Brazilian Aquatic Mammals Action Plan (IBAMA, 2001). Prey taken by a stranded animal suggests that feeding occurred over the outer continental shelf and slope but also that the animal had foraged close to the coast before stranding occurred (ZERBINI; SANTOS, 1997). *F. attenuata* could use the edge of the continental shelf occasionally for resting or feeding, just as several other pelagic species frequently do, e.g. *Stenella attenuata* off south-eastern Brazil (MORENO et al., 2005; SICILIANO et al., 2007).

This is the first record, as far as we know, of *F. attenuata* and *P. electra* as bycatch on the Brazilian coast. This represents not only new data on the occurrence but also on the identification of a potential threat to these little known species given that bycatch, according to fishermen, may take place repeatedly in that area. Further, the fact that the fleet is now operating at greater depths suggests that the more pelagic dolphin species such as these are more vulnerable to being caught as bycatch than ever before.

Zerbini and Kotas (1998) reported ten cetacean species interacting with driftnet fisheries off southern Brazil and mention that most cetaceans are found dead but that others are sometimes released alive. The authors pointed out that the capture of more than one individual on the same trip is common and, sometimes, occurs in the same set, which is corroborated by the report of the fishermen interviewed in this study.

Fishing vessels using driftnets are known to operate from at least nine ports along the southern Brazilian coast, however the total number of boats operating is unknown (ZERBINI; KOTAS, 1998). From previous reports and our results it is clear that bycatch may occur at high levels during these fishing activities and, as stated by Zerbini and Kotas (1998), is not negligible.

Siciliano (1994) comments that reported mortality appears to be greatest where a combination of factors occurs: regular fishing effort; relatively high cetacean abundance; and, of course, the presence of an observer. Our results show that it is possible to work in partnership with fishermen and even a small disposable camera can provide, at low cost, useful information about marine mammal interactions with fisheries.

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