

## CETACEANS AND FISHERY INTERACTIONS ALONG THE ESPÍRITO SANTO STATE, SOUTHEASTERN BRAZIL DURING 1994-2001

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The incidental capture of cetaceans in passive fishing gears such as gillnets represents the major threat to their conservation (Perrin *et al.*, 1994). Along the Brazilian coast the franciscana, *Pontoporia blainvillei*, and marine tucuxi, *Sotalia fluviatilis*, are the most vulnerable species. Confined to coastal waters, they are often incidentally caught in fisheries (e.g. Siciliano, 1994; Secchi *et al.*, 1997; Di Benedetto *et al.*, 1998; IBAMA, 2001; Ott *et al.* 2002). Information on the occurrence of cetaceans along the Espírito Santo coast, southeastern Brazil, is limited to a few reports of species incidentally caught during fishing activities (e.g. Di Benedetto *et al.*, 1990; Siciliano, 1994), stranded on beaches (e.g. Barros, 1991; Borobia *et al.*, 1991; Gasparini and Sazima, 1996; Barros *et al.*, 1997a,b; Barbosa *et al.*, 2000) or occasionally sighted (e.g. Lodi *et al.*, 1996). The objective of this report is to provide new data on the incidental capture of cetaceans along the Espírito Santo coast from 1994 to 2001 and to compile previous information for this region. Recent data on the incidental captures were obtained opportunistically by collecting stranded carcasses along the coast with indicative marks of interactions with fisheries (e.g. wounds, scars and fishing gear fragments on the animals' body) (Perrin *et al.*, 1994). One stranding report published by the local media was also included. Species identification, sex and standard length of the animals, as well as locality and date of stranding were recorded. The skeletons of all small cetaceans were deposited at the ORCA collection (Table 1).

Between 1994 and 2001 twelve stranded cetaceans with wounds that indicate interaction with fishery were collected along the Espírito Santo coast. The highest number of specimens was observed for *S. fluviatilis* (n=8), followed by the rough-toothed dolphin (*Steno bredanensis*) (n=3) and the humpback whale (*Megaptera novaeangliae*) (n=1) (Table 1). When reviewing the information on cetacean and fishery interactions in Brazil, Siciliano (1994) reported the stranding and incidental catch of 44 specimens along the Espírito Santo coast between 1983 and 1994. During that period, *S. fluviatilis* was also the species most commonly found (n=28), followed by *P. blainvillei* (n=13), *M. novaeangliae* (n=1), *Tursiops truncatus* (n=1) and *Physeter macrocephalus* (n=1).

The coastal habitat of *S. fluviatilis* is likely the main factor that makes the species more vulnerable to incidental captures in the area. The lower number of animals reported in this study in relation to the previous period (1983 to 1994) compiled by Siciliano

(1994) is probably due to a lower monitoring effort of the fishing villages and beaches rather than a marked decline in the by-catch or any change in the abundance of the species. Although Barros (1991) reported the incidental catch of a female tucuxi in the region, all individuals of known gender in the present study were males. Though sample sizes are small, this could suggest a higher vulnerability of male tucuxis to fishing activities. Assuming that Espírito Santo tucuxis exhibit similar growth patterns as those from adjacent northern Rio de Janeiro waters, where animals reach maturity at 180cm in length (Di Benedetto *et al.*, 2001), at least five specimens in this study can be considered adults (see Table 1).

Although this study presents the first indications of incidental take of rough-toothed dolphins along the Espírito Santo coast, several other captures of this species have been reported elsewhere along the Brazilian coast (e.g. Siciliano 1994, Lodi and Hetzel, 1998, Di Benedetto *et al.*, 2001). The lower ratio of *S. bredanensis* versus *S. fluviatilis* observed in this study might be partly due to the relatively low abundance of rough-tooth-dolphins in coastal areas off Espírito Santo, and therefore may be less vulnerable to coastal fishing activities. Dedicated surveys are needed to address this question.

The incidental capture of a humpback whale in fishing gears along the Espírito Santo coast has been previously reported by Barros (1991). Other cases of fishery interactions involving this species, especially juveniles, have also been observed in southeastern and southern Brazil (e.g. Siciliano, 1987, Pizzorno *et al.*, 1998, Danilewicz *et al.*, 2002) and may represent an increasing threat to the recovery of the species.

Although interactions of *P. blainvillei* with fisheries have been reported previously for this area (Di Benedetto *et al.*, 1990; Siciliano, 1994), none was recorded during this study. Despite some logistical constraints, the lack of any record of the species in the region in the last few years was unexpected. Considering that the Espírito Santo coast represents the northernmost limit for franciscanas and possibly contain an isolated population (Ramos *et al.*, 2002; Secchi *et al.*, 2002, Siciliano *et al.*, 2002), a better understanding of the current distribution and abundance of the species in the region is particularly important.

The present number of cetaceans incidentally caught and recorded along the Espírito Santo coast probably represents an underestimation of the problem in the

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**Table 1.** Records of cetaceans stranded along the Espírito Santo coast presenting wounds that may suggest interactions with fisheries

SPECIES (COLLECTION NUMBER)	Nº	SEX	TOTAL LENGTH (cm)	LOCAL	GEOGRAPHIC COORDINATES	DATE
<i>Megaptera novaeangliae</i> <sup>1,2</sup>	1	♀	490	Ponta da Fruta – Vila Velha	20°31'S; 40°22'W	28 October 1987
<i>Megaptera novaeangliae</i> (MN008)	1	-	700	Pontal do Ipiranga – Linhares	19°04'S; 39°44'W	3 November 2000
<i>Physeter macrocephalus</i> <sup>2</sup>	1	-	-	Meaípe – Guarapari	20°39'S; 40°27'W	6 August 1981
<i>Pontoporia blainvillei</i> <sup>3</sup>	1	-	-	Regência – Linhares	19°38'S; 39°49'W	1987
<i>Pontoporia blainvillei</i> <sup>4</sup>	2	-	-	Regência – Linhares	19°38'S; 39°49'W	1987
<i>Pontoporia blainvillei</i> <sup>5</sup>	5	-	-	Regência – Linhares	19°38'S; 39°49'W	February 1989
<i>Pontoporia blainvillei</i> <sup>4</sup>	2	-	-	Regência – Linhares	19°38'S; 39°49'W	September 1989
<i>Pontoporia blainvillei</i> <sup>4</sup>	1	♀	-	Itaúnas	18°25'S; 30°42'W	12 February 1991
<i>Pontoporia blainvillei</i> <sup>4</sup>	1	♀	-	Guriri – São Mateus	18°42'S; 39°51'W	28 February 1991
<i>Pontoporia blainvillei</i> <sup>4</sup>	1	-	-	Guriri – São Mateus	18°42'S; 39°51'W	17 January 1992
<i>Steno bredanensis</i> (SB002)	1	-	245	Praia de Itaparica – Vila Velha	20°21'S; 40°16'W	5 June 1996
<i>Steno bredanensis</i> (SB004)	1	♀	270	Praia de Setiba – Guarapari	20°38'S; 40°26'W	22 May 1999
<i>Steno bredanensis</i> (SB007)	1	♀	265	Porto de Tubarão – Vitória	20°18'S; 40°14'W	19 April 2000
<i>Sotalia fluviatilis</i> <sup>2</sup>	1	♀	206	Praia de Itapuã – Vila Velha	20°22'S; 40°17'W	05 June 1983
<i>Sotalia fluviatilis</i> <sup>3</sup>	2	-	-	Regência – Linhares	19°38'S; 39°49'W	1987
<i>Sotalia fluviatilis</i> <sup>5</sup>	6	-	-	Regência – Linhares	19°38'S; 39°49'W	January-March/1989
<i>Sotalia fluviatilis</i> <sup>5</sup>	3	-	-	Conceição da Barra	18°38'S; 39°51'W	March 1989
<i>Sotalia fluviatilis</i> <sup>4</sup>	4	-	-	Regência – Linhares	19°38'S; 39°49'W	1987-1990
<i>Sotalia fluviatilis</i> <sup>4</sup>	12	-	86-190	Guriri – São Mateus	18°42'S; 39°51'W	December 1988-August 1993
<i>Sotalia fluviatilis</i> (SF003)	1	♂	200	Praia do Sol – Guarapari	20°38'S; 40°26'W	18 May 1994
<i>Sotalia fluviatilis</i> (SF004)	1	♂	209	Ponta da Fruta – Vila Velha	20°31'S; 40°22'W	25 July 1995
<i>Sotalia fluviatilis</i> (SF006)	1	♂	222	Barra do Jucú – Vila Velha	20°25'S; 40°19'W	21 March 1996
<i>Sotalia fluviatilis</i> (SF009)	1	-	188	Praia Grande – Fundão	20°02'S; 40°11'W	30 January 1997
<i>Sotalia fluviatilis</i> (SF011)	1	♂	175	Praia de Itapuã – Vila Velha	20°22'S; 40°17'W	6 August 1997
<i>Sotalia fluviatilis</i> (SF012)	1	♂	173	Praia da Costa – Vila Velha	20°20'S; 40°16'W	24 November 1997
<i>Sotalia fluviatilis</i> (SF013)	1	♂	170	Ponta da Fruta – Vila Velha	20°31'S; 40°22'W	25 July 2000
<i>Sotalia fluviatilis</i> (SF014)	1	-	-	Praia de Itapuã – Vila Velha	20°22'S; 40°17'W	28 February 2001
<i>Tursiops truncatus</i> <sup>2</sup>	1	-	-	Guarapari	20°39'S; 40°27'W	23 April 1984

(1) Siciliano and Lodi, 1989, (2) Barros, 1991, (3) Geise and Borobia, 1987, (4) Siciliano, 1994, (5) Ramos *et al.*, 1994.

region and likely reflects the low monitoring effort on the fishing ports and beaches. Systematic beach surveys and monitoring of fishing fleet are clearly needed to properly evaluate the effects of fisheries on the coastal cetacean species inhabiting this area.

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