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BIOECOLOGY OF FRANCISCANA (*Pontoporia blainvillei*) IN NORTHERN PATAGONIA, ARGENTINA

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ABSTRACT

Franciscana or La Plata dolphin, *Pontoporia blainvillei*, is distributed in coastal waters and estuaries of the east coast of South America, between Itaúnas (Espirito Santo, Brazil, 18º25'S) and Golfo Nuevo (northern Patagonia, Argentina, 42º35'S). The objective of this study is to evaluate the bioecology of franciscana in the Rio Negro mouth (41º 3.6' S, 63º 50.4' W), Patagonia, Argentina. Franciscana were observed year round on 431 occasions from January 2002 to January 2004 off Rio Negro mouth totalling 117 groups. Land-based and boat-based observations were conducted. Group dispersion, group size, group composition, behaviour and presence of predators were recorded. Group size ranged from one to five ($\overline{X}$ = 1.692, SD = 0.7391, *n* = 117). The group dispersion most frequently observed was 0 DL (*n* = 28), ($\overline{X}$ = 1.4, SD = 0.7473, *n* = 51). The presence of calves was recorded in January 2002 and 2004 (*n* = 2) and juveniles were observed in September 2003 (*n* = 1). Behavioural data on movement, feeding, resting and milling were quantified and the most frequent behaviour was travelling (*n* = 40, 34.19%). Four killer whales were observed in the study area for a day, Two days prior to the appearance of the killer whales, franciscana were recorded in the area, however for two days following, they were not observed. This observation may suggest killer whales as a potential predator of this species in the Rio Negro mouth. Biological data collected on this population of Franciscana indicates habitat in the mouth of the Rio Negro is of prime importance. Rio Negro artisanal fishermen have only recently begun using gillnets, however gillnets have proved to be a hazard for other populations of franciscana as incidental catches are known from throughout its distribution Therefore long-term potential impact of gillnets on franciscana in this area may be high and monitoring is strongly recommended. This is the first long-term study of the species in the Rio Negro mouth.

KEYWORDS: FRANCISCANA, *PONTOPORIA BLAINVILLEI,* BIOECOLOGY, BEHAVIOUR, PREDATOR, PATAGONIA, ARGENTINA.

INTRODUCTION

The franciscana, (*Pontoporia blainvillei)*, is endemic to the coastal waters of the southwestern Atlantic, from Itaunas (18º25'S), Espirito Santo, Brazil (Moreira and Siciliano, 1991) to Golfo Nuevo (42º35'S), Chubut, Argentina (Crespo *et al.* 1998). The species has been extensively captured in coastal gillnets throughout its range and information on the biology of this species comes from entangled dead individuals (Perez-Macri and Crespo, 1989; Praderi *et al*., 1989; Corcuera, 1994; Pinedo, 1994; Secchi *et al.,* 1997; Di Beneditto *et al.,* 1998; Bertozzi and Zerbini, 2002 and Rosas *et al.,* 2002).

The asymptotic lengths of individuals of the southern form of *P. blainvillei* (distributed south of 32ºS) ranged between 129.8 – 136.4cm for males and between 146.4cm – 161.9cm for females (Kasuya and Brownell, 1979; Barreto et al., 2000). Studies on biology and ecology of wild franciscana are very few (Bordino *et al.,* 1999; Bordino, 2002). The main objectives of the present research were to study the bioecology of the franciscana in the mouth of Río Negro (41º 3.6´ S, 63º 50.4´ W), Patagonia, Argentina.

METHODS

Research was carried out in the mouth of the Rio Negro. The tidal cycle peaks about every 12h, with an average height of 3m. From January 2002 to January 2004 observations on the behaviour of franciscana inhabiting the mouth of the Río Negro was studied. Sightings from the coast and onboard a vessel were carried out with sea conditions ≤ 2, from 10:00 to 19:00 h, during all tides. The Río Negro lighthouse was used as an observation platform, with a 50m elevation and observations were made using binoculars 10x50. Surveys on vessels, during January-February 2002, were also carried out using a 5m inflatable boat. The sampling methodology used was scanning and focal group (Altmann, 1974; Mann, 1999).
To ensure the data recorded for each group were as

accurate as possible, the area was divided into three zones; each one extended approximately 100 m offshore following De Haro and Iñiguez, (1997). Dolphins further than 300m were not considered. Group dispersion, group size, group composition, behaviour and presence of predators were recorded. The group dispersion was the distance between individuals of a group. The measuring unit was the "dolphin-length" (1DL = 1.5m) observed with binoculars from the platform. The term "group" was defined as individuals at a smaller distance than 10DL, exhibiting the same general behaviour. The group dispersions from platform and from vessel were measured in DL.
The criteria for classification were as follows: adults are over 1.5m. in length, calves were those no more then half that size, and the remainder were juveniles. The groups were classified as: adult groups, groups with adults and calves, and groups with adults and juveniles.
Statistical analysis was performed using SPSS v.7.5 (SPSS Inc.) and Zar (1996)

RESULTS

The population was studied during all seasons over the course of two years (2002-04). Land-based surveys were conducted during 53 days (106 h) and on-water surveys were conducted on an additional 11 days (20 h). Franciscana were observed 431 times and 117 groups were recorded. Individuals were found in small groups numbering between 1 and 5 ($\overline{X}$ = 1.692, SD = 0 7391, n = 117), with the most frequent group size being 2 (n = 54) and 1 (n = 51) (Fig. 1).

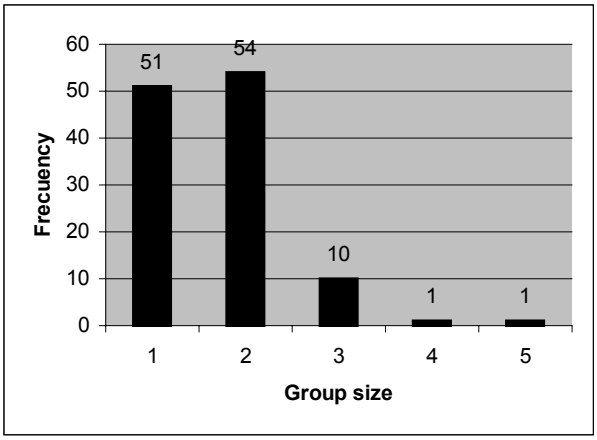

Fig. 1. Group size of franciscana from the Río Negro mouth, Patagonia, Argentina.

The maximum numbers of groups recorded simultaneously in the same area were 4 made up of 7 individuals. Calves were recorded in January 2002 and 2004 (n = 2) with only one calf present each time. Juveniles were observed in September 2003 (n=1), with one individual present.
The group dispersion most frequently observed was ≤1DL (n = 28), ($\overline{X}$ = 1.4, SD = 0.7473, n = 51) (Fig. 2) .

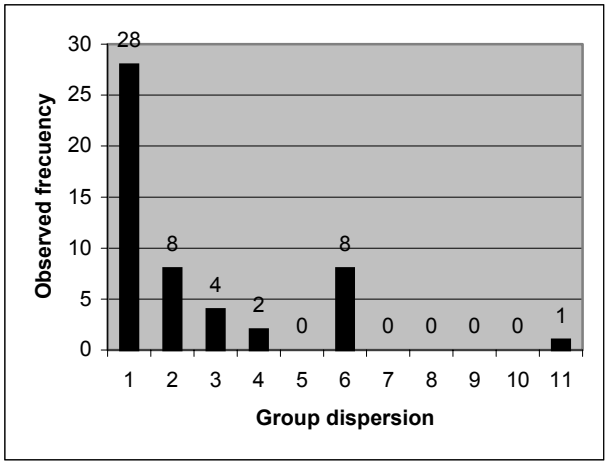

Fig. 2. Group dispersion of franciscana from mouth of the Río Negro, Patagonia, Argentina.

Franciscana were always observed in turbid waters (visibility <2m.) where the depth ranged between 1-10m. Behavioural data on travelling, feeding, resting and milling were quantified (Fig 3.) with travelling the most frequent (34.2 % of observations). All travelling behaviours were recorded as 'slow travel' as only low surface rolls were observed, and no high-speed porpoisings or breachings were recorded. The second most frequently observed behaviour was feeding (24.8 %). As franciscana are difficult to observe in the wild (*e.g.,* similar colour to the surrounding waters, small size and unobtrusive surfacings) 32.5 % of observations could not be classified into a behaviour category.

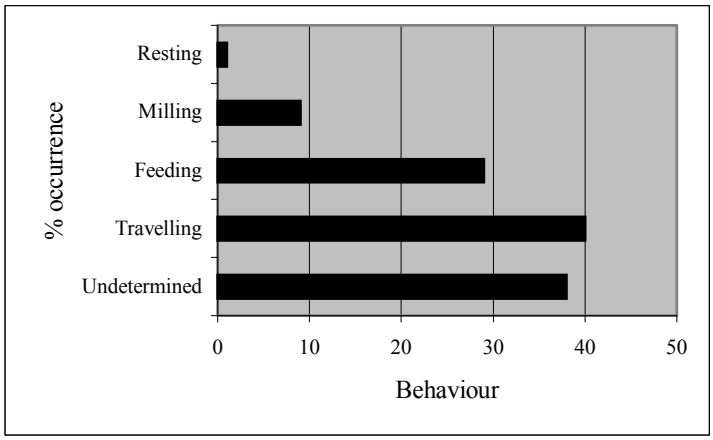

Fig 3. Percent of behavioural observations of franciscana on the Rio Negro.

Four killer whales (*Orcinus orca*) (3 females or subadults and an adult male, as defined by Bigg 1982) were observed for an hour in December 2003 in the study area (Pagnossin, *pers. comm*.). Two days prior to the appearance of the killer whales franciscana were recorded in the area, however for two days following, they were not observed.

DISCUSSION

Crespo's *et al.* (1998) proposed that franciscana would be present in the Rio Negro mouth. Our findings support this and have also shown that franciscana were present year-round. Additionally we found that their numbers did not decrease in winter, as has been reported in Bahia Anegada (Bordino *et al.*, 1999). This may be explained by the abundance of two fish which Danilewicz *et al*. (2002) included in franciscana diet; the juvenile whitemouth croaker (*Micropogonias furnieri*) and the stripped weakfish (*Cynoscion guatupuca*). Both species of fish are found in the river mouth and local fishermen catch them year-round (Fishermen, *pers. comm*.). The distribution and the accessibility of food may have been a determining factor for the establishment of franciscana in the area, whilst their year-round presence suggests the ongoing importance of the Rio Negro mouth habitat.

Our findings of group size of franciscana conform to those generally described (*i.e.,* between 2 to 5 individuals, Pinedo *et al.,* 1989, Bordino *et al*., 1999; Secchi *et al*., 2001). However, in Argentina and Brazil larger groups have been also been recorded **(**Crespo *et al*., 1998; Bordino *et al.,*1998; Di Beneditto *et al*., 2001). The smaller group sizes we found may be indicative of a lower quality of habitat, depth of water or some other factor as yet undescribed and beyond the scope of this study.

Even though the sample size of calving seasonality in this study was small, it coincides with the marked seasonal reproduction of the southern population with peaks in austral spring and summer (Kasuya and Brownell, 1979; Pinedo *et al.,* 1989; Danilewicz *et al.*, 2000). However these preliminary results are contrary to the observations made in northern Rio de Janeiro, where franciscanas appear to reproduce year round with no evident seasonal peak (Ramos *et al.*, 2000). Further studies in the Rio Negro are needed to confirm our observations.

During this study we observed travelling, feeding, resting and milling, with all travel movements recorded as 'slow' and without aerial displays, similar to those reported for other rivers dolphins such as the Amazon river dolphin*, Inia geoffrensis* (da Silva, 2002). However, in our study the proportions of behaviours were different to those observed by Bordino *et al.* (1999) for shallow waters, who found milling was the most frequently observed behaviour (> 40%). In their study, feeding was the second most frequently observed behaviour (>30%), which was similar in percentage to our study, but not in ranking.

Ott and Danilewicz (1996) reported remains of three franciscana in the stomach of a killer whale stranded in southern Brazil, confirming franciscana as a prey item. The avoidance responses by franciscana to the presence of killer whales in Rio Negro mouth may suggest killer whales as a predator in this area. Killer whales were described as frequent visitors to northern Golfo San Matias, including Rio Negro mouth during June and August (Iñíguez, 2001). Avoidance behaviour toward killer whales has been observed in other small cetacean species such as *Lagenorhynchus obscurus* (Würsig and Würsig, 1980, Constantine *et al*., 1998, Visser, 1999), *Sousa chinensis* (Saayman and Tayler, 1979), *Phocoenoides dalli* (Jefferson 1987), *Tursiops truncatus* (Constantine 1995 *in* Constantine *et al*., 1998, Visser, 1999) and *Delphinus delphis* (Visser, 1999).

The mouth of the Rio Negro apparently provides the environmental requirements for this species, the characteristics which are described by Pinedo *et al*. (1989), Bordino *et al*. (1999), Di Beneditto and Ramos (2000) and Siciliano *et al.* (2000). These include turbid waters, depths ranging between 5-35m, favourable conditions for feeding and protection against natural predators.

Incidental catches of franciscana are known throughout its distribution (Perez-Macri and Crespo, 1989; Praderi *et al*., 1989; Corcuera, 1994; Pinedo, 1994; Secchi *et al*., 1997; Di Beneditto *et al.,* 1998; Bertozzi and Zerbini, 2002 and Rosas *et al*., 2002). The Rio Negro mouth has recently been used by fisheries with gillnets. It is important to begin studying the impact that could be caused by this incipient development in the region.

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