

## *Partial report*

### **Introduction**

The *franciscana* is endemic to coastal waters of central western South Atlantic, presenting close association with estuaries. The species is, perhaps, the most impacted cetacean in this region. Its restricted distribution makes it vulnerable to anthropogenic activities. In the past, data on incidental mortality of *franciscana* along the southern Brazilian coast were obtained from stranded carcasses. Since January 1994 we monitored the unloading of about 15% of total coastal gillnet fleet that is composed by 140-150 vessels. Our objectives were mainly to evaluate quali-quantitatively the mortality of the species in coastal gillnet fisheries and verify if by-catches of *franciscanas* are causing some impact to the studied population. At least 223 dolphins were indirectly taken in the southern region (Rio Grande area) of the study area since the beginning of the project. The captures occurred in nets set for sciaenid and pomatomid fish and the sizes of nets varied from 800 to 11000 m in length, from 3.0 to 14.0 m in depth, and from 9.0 to 16.0 cm stretch mesh, depending on the target species (see Secchi *et al.*, 1997 for additional details on the fishing characteristics). About sixty percent of these incidentally caught dolphins were juveniles. The mean depth of captures was higher for males (25.2 m) than for females (22.0 m), but the differences were non-significant. Mean depths of capture were also higher for adult dolphins (25.9 m) than for juveniles (22.8 m), but differences were also non-significant. Mean depth of captures (24.7 m) were higher during austral winter months (cold water temperatures) than during austral summer months (22.9 m), but differences were again non-significant. Extrapolating our incidental capture estimates based on gear type and fishing effort, we estimated that between 600 and 700 *franciscanas* may have been taken only in 1994 (see combined results from Secchi *et al.*, 1997, Kinas and Secchi, 1998, Ott, 1998 and Secchi, 1999).

Data on total lengths frequency distribution; capture depths frequency distribution; monthly frequency distribution; proportion between sex and reproductive status are being collected. Furthermore, estimates on the number of annually caught animals are being calculated through different methods. Preliminary information on stock identity is herein reported.

### **Ongoing studies:**

#### *Reproduction:*

The analysis of the reproductive status of captured animals is being assessed. Gonads are being weighed, measured and examined macroscopically, then preserved in buffered formalin for further histological analysis. We have already collected the gonads of about 223 dolphins, some of which have already been analysed (see Danilewicz *et al.*, 2000).

### *Age determination*

Teeth are being taken from the lower jaw of incidentally caught animals in order to have their age determined through thin sections obtained on a freezing microtome and further staining.

### *Blubber analysis:*

Samples of blubber and attached skin are also being taken for analysis of blubber composition, presence of contaminants and ultimately relationship with diet through stable isotope ratios. Although the franciscana's habitat is restricted to coastal waters, where pollutants are expected to be concentrated, some preliminary results have indicated a low level of contamination by PCBs and DDTs, however, most samples came from young dolphins.

### *Feeding habits:*

We collected stomachs of near 80 incidentally captured dolphins. The contents of about 30 stomachs were removed for analysis of their diet. We found pieces of net (nylon) in two of these stomach contents and we believe that at least some of the dolphins got entangled because caught fish attracted them. We intend to verify the relationship between the incidental captures of franciscanas and the target species based on stomach content analysis. *Franciscana* feeds upon much smaller fish than commercially targetted ones. Additionally, we intend to compare the data obtained from stomach contents with isotope ratios and blubber composition to better assess individual diet.

### *CPUE:*

Different units of effort are being currently tested in order to determine the best indicator of the magnitude of the captures. We are also testing the possibility of using the CPUE as an indicator of relative abundance of *franciscanas* in southern Brazil.

### *Genetic studies*

Muscle samples for genetic based studies were taken from Rio Grande do Sul state (n=80) as well as additional samples were obtained with researchers from Argentina (n = 30), Uruguay (n=3), Santa Catarina (n = 4), Paraná (n= 10), São Paulo (n=13), Rio de Janeiro (n = 30) and Espirito Santo (n=1) covering the whole range of distribution. Preliminary results, using 10 samples from Rio de Janeiro and 10 from Rio Grande do Sul, have already been published (see Secchi et al., 1998). The authors analysed about 418 base pairs in the D-loop region and 67 base pairs in the Pro-tRNA of the mtDNA. It was found five haplotypes in the North and 6 haplotypes in the South. Of most importance, we found no sharing of haplotypes between the groups. Further, a maximum likelihood analysis separates the haplotypes into two groups: a northern group of haplotypes and another containing the southern haplotypes. This study is ongoing and we plan to continue collecting tissue samples to provide our study with a larger sample size for subsampled areas. Additionally, we intend to start studies on kinship and social structure, which is

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still lacking for the species. Specific primers have been designed for *Franciscana* which will allow amplification of the most variable portion of the mtDNA control region (D-loop) and faster analysis of additional samples.

As a result of our studies, two Bachelor and two Master theses have been produced, several abstracts were submitted and presented at international meetings and papers have been published. A list of these contributions follows.

### **Related papers:**

BASSOI, M. 1997. Avaliação da dieta alimentar de toninha, *Pontoporia blainvillei* (Gervais & D'Orbigny, 1844), capturadas acidentalmente na pesca costeira de emalhe no sul do Rio Grande do Sul. BSc Dissertation. Fundação Universidade do Rio Grande. Rio Grande - RS. 68pp.

CLAVER, J. A., E. R. SECCHI, I.L. MURIAS, A. ZERBINI and M. A. IÑIGUEZ. 1997. Observaciones histológicas en ovarios de franciscana (*Pontoporia blainvillei*). ('Histological observations of the ovaries of franciscana dolphin (*Pontoporia blainvillei*)'. *Third Workshop on the Research and Conservation of Franciscana Dolphins*. Buenos Aires - Argentina. 26-28 November, 1997.

DANILEWICZ, D.S. 2000. Biologia reprodutiva e padrões de uso de habitat da toninha, *Pontoporia blainvillei* (Mammalia, Cetacea) no litoral do Rio grande do Sul, sul do Brasil. MSc Dissertation. PUC-RS. Porto Alegre.

DANILEWICZ, D.S., E.R. SECCHI, P.H. OTT and J. CLAVER. 1998. Preliminary assessment of age at sexual maturity and reproductive rates of *Pontoporia blainvillei* from Rio Grande do Sul, Southern Brazil. *VIII Reun. Trab. Esp. Mamíf. Aquát. América Sul*. 25-29 de outubro. Olinda - Brasil. 63p. (Abstracts).

DANILEWICZ, D.S., E.R. SECCHI, P.H. OTT, and I.B. MORENO (2000). Analyses of the age at sexual maturity and reproductive rates of franciscanas (*Pontoporia blainvillei*) from Rio Grande do Sul, southern Brazil. *Comunicações do Museu de Ciências e Tecnologia da PUCRS, série zoologia*. 13: 89-98.

FIDÉLIX, L., M. BASSOI and E.R. SECCHI. 1998. Aspectos sócio-econômicos e culturais da utilização da toninha, *Pontoporia blainvillei*, pela comunidade pesqueira de Rio Grande, Rio Grande do Sul, Brasil. *VIII Reun. Trab. Esp. Mam. Aquát. Amér. Sul*. 25 a 29 outubro de 1998. Olinda, Brasil. 81p. (Abstracts).

JUNIN, M., H. P. CASTELLO, E. R. SECCHI and I.B. MORENO. 1994. Analisis cuali y cuantitativo de organoclorados y metales pesados en mamíferos marinos del Atlántico Sudoccidental. Technical Report EF/2/DT/16. *II Encontro sobre Coordenação de Pesquisa e Manejo da Franciscana*. Florianópolis, SC.

KINAS, P.G. and E.R. SECCHI. 1999. Modelling truncated data to estimate incidental kills of franciscana, *Pontoporia blainvillei*, by gillnets. ICES/SCOR Symposium on Ecosystem Effects of Fishing. 16 - 19 de março de 1999. Montpellier, França. (Abstracts).

KINAS, P.G. and E.R. SECCHI. (1998). Modelling truncated data to estimate incidental kills of franciscana, *Pontoporia blainvillei*, by gillnets. *Rep. Int. Whal. Commn.* 48:533-536.

MORENO, I.B., P.H. OTT, and D.S. DANILEWICZ. 1994. Análise preliminar do impacto da pesca artesanal costeira sobre *Pontoporia blainvillei* no litoral norte do Rio Grande do Sul, sul do

- Brasil. *Proceedings of the 2º Encontro sobre Coordenação de Pesquisa e Manejo da Franciscana*. 22-23 de outubro de 1994. Florianópolis – Brasil. EF/2/DT8. pp 31-41.
- OTT, P.H. 1998. Análise das capturas acidentais de *Pontoporia blainvillei* (Gervais e D’Orbigny, 1844) (Cetacea, Pontoporiidae) nas comunidades pesqueiras do litoral norte do Rio Grande do Sul, Sul do Brasil. MSc Dissertation. PUC-RS. Porto Alegre. 103 pp.
- OTT, P. H., E. R. SECCHI, E. A. CRESPO AND S. L. DANS. Estrutura etária da população de *Pontoporia blainvillei* acidentalmente capturada pela atividade pesqueira na costa do Rio Grande do Sul - Brasil. (‘Age structure of franciscana population incidentally caught in the coastal gillnet fishery in the Rio Grande do Sul State - Brazil’). *Third Workshop on the Research and Conservation of Franciscana Dolphins*. Buenos Aires - Argentina. 26-28 November, 1997.
- SECCHI, E.R., . 1999. Taxa intrínseca de crescimento de uma população de toninhas, *Pontoporia blainvillei* (Gervais & D’Orbigny, 1846) (Cetacea, Pontoporiidae) sujeita a capturas acidentais na pesca costeira de emalhe no sul do Brasil. MSc Dissertation. Fundação Universidade do Rio Grande. Rio Grande - RS.
- SECCHI, E.R., BASSOI, M., DALLA ROSA, L., ROCHA-CAMPOS, C.C. and MÖLLER, L. 1995. Incidental captures of franciscanas, *Pontoporia blainvillei* (Cetacea, Pontoporiidae), in coastal gillnet fisheries along southern Rio Grande do Sul State - Brazil: evaluation of the problem. - *Technical report to the Whale and Dolphin Conservation Society*, Bath - UK. 21pp. (unpublished data).
- SECCHI, E.R. and P.H. OTT. 1997. The depth factor determining the distribution and abundance of franciscana, *Pontoporia blainvillei*, as demonstrated by a CPUE index approach. Technical report. *III Taller para la Coordinación de la Investigación y la Conservación de la Franciscana en el Atlántico Sudoccidental*. Buenos Aires. DT18.
- SECCHI, E. R., P. H. OTT, E. A. CRESPO, P. G. KINAS, S. N. PEDRAZA and P. BORDINO. *In press*. Abundance estimation of a franciscana dolphin, *Pontoporia blainvillei*, stock from aerial surveys. *Rep. int. Whal. Commn.*
- SECCHI, E.R., A.N. ZERBINI, M. BASSOI, L. DALLA ROSA, L.M. MOLLER and C.C. ROCCHA-CAMPOS. 1997a. Mortality of franciscanas, *Pontoporia blainvillei*, in coastal gillnetting in southern Brazil: 1994-1995. *Rep. Int. Whal. Commn.* 47:653-658.
- SECCHI, E.R., L. DALLA ROSA, M. BASSOI and L. BARCELLOS. 1997b. Uma alternativa para minimizar o impacto das capturas acidentais de toninhas, *Pontoporia blainvillei*, na pesca costeira de emalhe no sul do Brasil. *Proceedings of VII Latin-American Conference on the Sciences of the Sea - COLACMAR* - Santos, Brazil.
- SECCHI, E.R., J.Y. WANG, B. MURRAY, C.C. ROCCHA-CAMPOS, and B.N. WHITE. 1998. Populational differences between franciscanas, *Pontoporia blainvillei*, from two geographical locations as indicated by sequences of mtDNA control region. *Can. J. Zool.* 76:1-6
- SECCHI, E.R. and KINAS, P.G. 1999. Potential rates of increase of a franciscana stock under current levels of incidental mortality in coastal gillnet fisheries. 13th Biennial Conference on the Biology of Marine Mammals. 28 Nov - 03 Dec 1999, Wailea, Maui, Hawaii p. 169. (Abstracts).
- WALTER, T., P.G. KINAS and E.R. SECCHI. 1998. Comparação entre o crescimento de toninha *Pontoporia blainvillei* ocorrente no extremo sul do Brasil e no Uruguai. *VII Reun. Trab. Esp. Mamíf. Aquát. América Sul*. 25-29 outubro. Olinda-Brasil. 225p. (Abstracts).

## **ANÁLISE ESTATÍSTICA DE CADERNOS DE BORDO E A MORTALIDADE DE FRANCISCANA, *Pontoporia blainvillei*, EM REDES DE EMALHE DA FROTA COSTEIRA DE RIO GRANDE (RS)\***

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Com o objetivo de quantificar o impacto das capturas acidentais de franciscana, *Pontoporia blainvillei*, que ocorrem na pesca de emalhe costeira da frota que opera a partir do porto de Rio Grande, foram analisados cadernos de bordo obtidos com 5 mestres de embarcações desta frota. A participação foi voluntária. Para cada viagem eram fornecidas informações sobre número de dias no mar, local e profundidade do lançamento da rede, espécie-alvo da pescaria, tamanho da rede e número de toninhas capturadas. Os resultados descritos abaixo referem-se a um total de 235 viagens, distribuídas entre maio de 1998 e março de 2000. A maioria destes registros (73%) referem-se ao período agosto-dezembro. A espécie-alvo da pescaria foi a corvina em 70% dos registros e a pescada nos demais. Existe dependência entre espécie-alvo e local de pescarias ( $\chi^2=31,2$ ; gl=4;  $p<0,001$ ): pesca da corvina ocorre predominantemente (52%) na região entre Albardão e Sarita enquanto as pescarias para pescada se distribuem mais homogeneamente entre Albardão e Mostardas. As profundidades para pesca da corvina também são significativamente menores que aquelas registradas quando o alvo é a pescada (U de Mann-Whitney;  $p<0,001$ ). Do total de 198 viagens em que houve registros quanto a captura ou não de franciscanas, 161 viagens não tiveram capturas alguma enquanto a captura incidental de 69 franciscanas ocorreu em 37 viagens sugerindo uma distribuição agregada destes animais. Particularmente, houve uma viagem que capturou 11 animais. Ao realizar-se a análise das capturas separadamente para o total de viagens dedicadas a pesca de corvina (140) e de pescada (56) para as quais havia informação referente a captura ou não de franciscanas, verificou-se que as primeiras representam risco maior para franciscanas pois, embora representem 71% das viagens, elas são responsáveis por 92% das capturas. Comparando-se a probabilidade de capturar ao menos uma franciscana por viagem dedicada à corvina (0,21) com a probabilidade equivalente por viagem dedicada à pescada (0,09), verifica-se que esta é uma diferença significativa ( $p=0,024$ ). Uma possível explicação está associada à profundidade do local da pesca pois verifica-se que para viagens sem captura a profundidade é significativamente maior que para viagens em que houve alguma captura incidental de franciscanas (Kruskal-Wallis  $H=21,32$ ,  $p<0,001$ ). Isso sugere que uma mudança na dinâmica de pesca pode reduzir as capturas acidentais de franciscana.

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Mônica Muelbert (acting coordinator)

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