SM - A franciscana aerial survey in Uruguay - overcoming a challenge

IWC

INTERNATIONAL WHALING COMMISSION

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PROJECT PROPOSAL REQUEST

1 . PROPOSAL TITLE

A FRANCISCANA AERIAL SURVEY IN URUGUAY: OVERCOMING A CHALLENGE

2 . BRIEF OVERVIEW OF THE PROPOSAL AND ITS EXPECTED OUTCOME

Give a very brief overview (max 150 words) on your proposal and its expected outcomes. Use bullet point to list outcomes. Be succinct and clear as this may be used to summarise your project for the report.

Incidental mortality in the gillnet fisheries is the major threat to the franciscana dolphin (*Pontoporia blainvillei*). One of the greatest challenges to improve management of the species relates to the difficulty in estimating abundance in the Franciscana Management Area III (FMA III) where bycatch estimates are the highest across the species range. The issue relates to the fact that FMA III is shared between Uruguay and Brazil. Differences in government administration, difficulty in obtaining sufficient funds for a costly survey and in coordinating logistics across the two countries have made such a study a challenge. However, the establishment of a Franciscana CMP by the IWC coupled with the current availability of multiple sources of funding provide a unique and unprecedented opportunity to develop an aerial survey to compute an abundance estimate for franciscanas in FMA III (both Brazil and Uruguay). This estimate would be important for the ongoing review of the franciscana status by the IWC Scientific Committee and will be used in future assessments of the species.

3 . RELEVANT IWC SCIENTIFIC COMMITTEE GROUPS OR SUB-GROUPS

This proposal is relevant to the SM, CMP, ASI and potentially IA.

4 . TYPE OF PROJECT (PLEASE TICK)

Research project	X
Modelling	
Workshop/meeting	
Database creation/maintenance	
Compilation work/editing *(e.g. on whalewatching regulations, SOCER, etc.)*	
Other *(please specify below)*	

(A) BACKGROUND, RATIONALE, AND RELEVANCE TO THE PRIORITIES IDENTIFIED BY THE IWC SCIENTIFIC COMMITTEE:

Provide a clear explanation of the background and rationale for the proposal and its relevance to Scientific Committee identified priorities. Clearly identify the most relevant and recent Scientific Committee recommendations.

The Franciscana (*Pontoporia blainvillei*) is a small cetacean endemic to the western South Atlantic Ocean, ranging from Itaúnas (18º25´S - 30º42´W), Espírito Santo State, Brazil (Siciliano 1994) to Golfo Nuevo (42º35'S - 64º48´W), Chubut Province, Argentina (Crespo et al. 1998). Franciscanas are primarily coastal, inhabiting waters from the surf zone up to the 30 or 50 m isobaths (Secchi et al. 1997, Crespo et al. 2010, Danilewicz et al. 2010, Amaral et al. 2018, Sucunza et al. 2020) with occasional occurrences in bays and estuaries (Cremer and Simoes-Lopes 2008, Santos et al. 2009).

Incidental mortality in fisheries is regarded as the major threat for the franciscana throughout its range (Secchi 2010). Because of high bycatch levels and increasing habitat degradation, the species is considered one of the most threatened small cetacean in South America (Secchi 2010) and is listed as Vulnerable by the International Union for Conservation of Nature (IUCN) (Zerbini et al. 2017).

In the early 2000s, the range of the franciscana was divided into four 'Franciscana Management Areas (or FMAs) (Secchi et al. 2003), two in Brazil (FMA I and II), one shared between Brazil and Uruguay (FMA III) and a fourth in Argentina (FMA IV) (Fig. 1). These areas were determined based on the phylogeographic approach developed by Dizon et al. (1992) and took into consideration information on population dynamics, morphology, molecular genetics, contaminants, and parasite loads (Secchi et al. 2003).
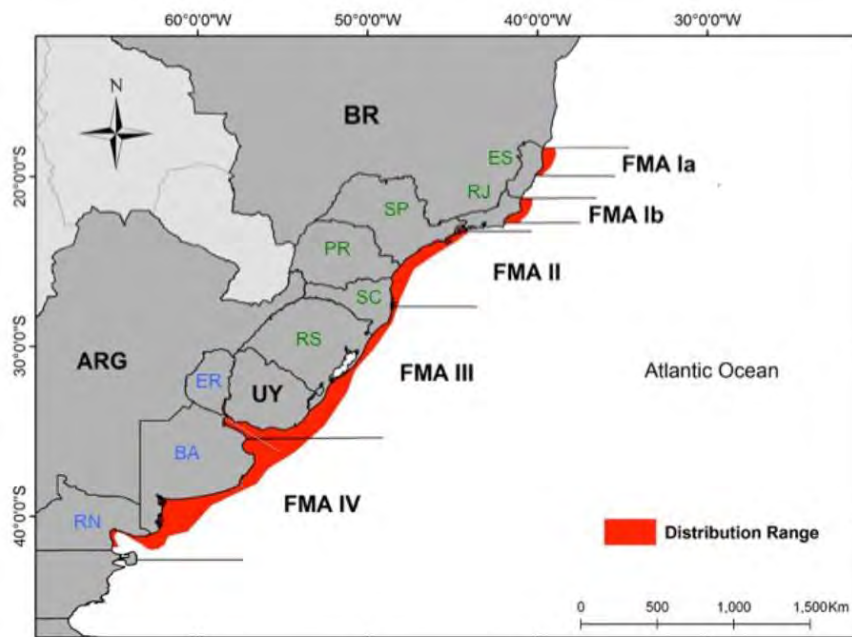

Figure 1. Franciscana distribution and the new boundaries of the Franciscana Management Areas along the coast of Brazil (BR), Uruguay (UY) and Argentina (ARG) (Anonymous 2015). Acronyms for states in Brazil and provinces in Argentina are indicated in green and blue, respectively (ES = Espírito Santo, RJ = Rio de Janeiro, SP = São Paulo, PR = Paraná, SC = Santa Catarina, RS = Rio Grande do Sul, ER = Entre Ríos, BA = Buenos Aires and RN = Río Negro).

Bycatch estimates in FMA III have been the highest among all FMAs. Franciscana were killed in relatively large numbers historically in Uruguay (nearly 4,000 animals between 1974 and 1993, Praderi 1997) and more recently in both Uruguay and Brazil (annual mortality reaching about 1,000-2,000 individuals, Ott et al. 2002, Secchi et al. 2004, Szephegyi 2012, Prado et al. 2013, Franco-Trecu et al. 2019). Estimating abundance in this region therefore is important to assess the potential impact of this high fishing-related mortality to the stock. For this reason, the IWC Scientific Committee, the Franciscana Conservation Management Plan, and the IUCN have regarded surveys in this area as a priority (Reeves et al., 2003; IWC, 2005; 2016; Anonymous, 2015).

To date, abundance estimates have only been carried out along the Brazilian portion of the range of the stock (Secchi et al. 2001, Danilewicz et al. 2010, SC/68B/ASI/06). Surveys in Uruguay have never been carried out. For this reason, reliable estimates of the whole stock size have never been computed.

For the first time, scientists working in Brazil and Uruguay have the opportunity to collaborate and develop surveys to estimate abundance of franciscanas in FMA III. Funding has been secured for a survey to be conducted in the Brazilan portion of the stock range by Danilewicz and colleagues and partial funding is available to Franco-Trecu and collaborators to survey Uruguay. This collaboration will lead to the use of the same aircraft, same observers, same sampling methods so the survey is standardized across countries. Furthermore, having an IWC CMP in place will greatly facilitate the survey and permits to move a single aircraft across two different countries.

(B) SPECIFIC OBJECTIVES OR TOR AND DELIVERABLES/OUTCOMES:

Provide the specific objectives and the expected deliverables. In the case of workshops and meetings, include the Terms of Reference (ToR) and expected outcomes.

The goal of this project is to develop a full aerial survey in FMA III and compute a stock-wide abundance estimate. Funds are being sought to complement existing resources to complete a full survey in the Uruguayan portion of the study area. As stated above, this will be the first time the distribution and abundance of franciscanas will be assessed in Uruguayan waters, where historical and current bycatch have been relatively high (Praderi 1997, Szephegyi 2012, Franco-Trecu et al. 2009, 2019).

(C) METHODOLOGICAL APPROACH/WORK PLAN/ADMINISTRATIVE DETAILS

Specify the methods to be applied (novel methods require more explanation than standard ones) and the broad workplan – the detailed timetable appears under Item 5 below.

In the case of workshops and meetings, include the broad work plan including any pre-requisites for the workshop/meeting to take place (apart from funding, e.g. completed analyses, papers etc.) and administrative details (e.g. location, dates, number of participants).

The study area will encompass the whole range of FMA III range. The Brazilian portion of this region includes the coast of Santa Catarina (SC) and Rio Grande do Sul (RS) States. The Uruguayan portion includes waters off the Río de la Plata and the Atlantic Ocean coast.

Aerial surveys are considered the most effective method to estimate the abundance of Franciscana dolphins (Crespo et al. 2002). This method has been applied over almost the entire range of the species (SC/68B/ASI/08). Surveys will be carried out following design-based line transect methods (Buckland et al. 2001) in January-March 2021.

An example of the survey design in Uruguayan waters is provided in Fig. 2. Surveys will be conducted over the Rio de la Plata and the Atlantic Ocean. Transect lines will be placed perpendicularly from the coastline up to the 50 m isobath in the Atlantic Ocean portion of the study area and up to the border between Uruguay and Argentina in the Río de La Plata side. A total of approximately 4,500 km of survey effort will be allocated in the study area. Effort

allocation will be performed to achieve uniform coverage probability across the whole survey region. A total of 10 flying days are estimated to complete the survey in Uruguayan waters but approximately 35 days are being allocated to the survey period to deal with weather restrictions.

Figure 2. Survey design to estimate abundance of Franciscana dolphins in the Uruguayan section of FMA III. Survey area includes coastal waters of the Rio de la Plata, and the adjacent Atlantic Ocean coast up to the 50 m depth contour.

A high-wing, twin-engine Aerocommander 500B aircraft equipped with bubble (front) and flat (rear) windows will be used. Flights will be conducted from an altitude of ~150 m and at a speed of ~180 km/hr, under good weather and visibility conditions (e.g. Beaufort sea state ≤ 3). Data collection will follow the methods described in SC/68B/ASI/06, ASI/07 and Sucunza et al. (2020). Four observers, two on each side of the plane, will work independently of each other (i.e. with no audio or visual communication) and will record environmental (e.g. Beaufort sea state) and biological (e.g. Franciscana sightings) data on audio digital recorders synchronized to a GPS. An inclinometer will be used to determine the declination angle of franciscana groups seen by the observers.

Detection probability will be estimated using Conventional (CDS), Multiple Covariate Distance Sampling (MCDS) or mark-recapture distance sampling (MRDS) methods (Buckland et al. 2001, Marques & Buckland 2003, Laake and Borchers 2004). Model averaging will be performed to incorporate unconditional model selection variance in the estimates and confidence intervals (Burnham & Anderson 2002). Analyses will be performed using a set of customized functions (mrds v.2.2.2, Laake et al. 2020) in R (R Development Core Team 2018).

Correction factors for visibility bias will be applied to correct for availability, perception and group size bias. These factor will be computed using data from the survey (e.g., perception factor can be computed using MRDS methods using the front and rear observers as independent platforms; Suzuna et al., 2020) or from the literature (SC/68B/ASI/04, Zerbini et al. 2011, Sucunza et al. 2018).

These surveys will also provide an opportunity for capacity building in Uruguay. Scientists experienced in franciscana aerial surveys will be providing training on field methods, data collection and data analysis to local scientists. Training of local scientists will provide an opportunity for additional surveys to be carried out in Uruguayan waters in the future.

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Please, note that successful proponents will be requested to produce ad hoc material that will be used by the IWC Secretariat for dissemination and outreach.

Story map of the research project and results. Press release and social media communication. Provide text and images for use in the IWC website and in the newsletter of the IWC CMP.

6 . TIMETABLE FOR ACTIVITIES AND OUTPUTS

Specify the timetable for project activities and expected out puts separately. For projects with multiple distinct elements please indicate interim goals and timeframes. Add as many rows as you need to the tables below. If publications are an expected output please note whether you will submit the manuscript to the IWC's Journal of Cetacean Research and Management.

Activity to be undertaken	Key person(s)	Start(mm/yy)	Finish (mm/yy)
Survey preparation	Danileiwicz, Sucunza, Passadore, Dimitriadis, Franco-Trecu, Zerbini	09/2020	12/2020
Survey execution	Danileiwicz, Sucunza, Ferreira, Dimitriadis, Passadore, Franco-Trecu	01/2021	03/2021
Data analysis	Danileiwicz, Sucunza, Passadore, Franco-Trecu, Dimitriadis, Andriolo, Zerbini	03/2021	04/2021
Report preparation	Danileiwicz, Sucunza, Passadore, Dimitriadis, Franco-Trecu, Zerbini	04/2021	04/2021
Publication	Danileiwicz, Sucunza, Passadore, Franco-Trecu, Dimitriadis, Zerbini	04/2021	12/2021
Media and press release, outreach	Dimitriadis, Andriolo	01/2020	05/2020

Expected outputs	Completion date (mm/yy)
An abundance estimate for the entire FMA III	04/2021
Publication	12/2021

7 . RESEARCHERS' (OR STEERING GROUP) NAME(S) AND AFFILIATION

Please, also specify if the project team has any direct connection (e.g. same research group or institute, collaborator on common project) with people involved or likely to be involved in taking the funding decision (e.g. IWC SC heads of delegations, SC convenors, etc.). Add as many rows as you need to the table below.

Name	Affiliation	Connection with decision
Valentina Franco-Trecu (co-PI)	Facultad de Ciencias, Universidad de la República	none
Daniel Danilewicz (co-PI)	GEMARS & Instituto Aqualie	none
Federico Sucunza	GEMARS & Instituto Aqualie	none
Paulo Henrique Ott	GEMARS	none
Cecilia Passadore	Independent researcher	none
Caterina Dimitriades	Independent researcher	none
Emanuel Ferreira	Associação R3 Animal	none
Artur Andriolo	UFJF & Instituto Aqualie	none
Alexandre Zerbini	University of Washington/MML-AFSC-NOAA	SC-vice chair, ASI convener

8 . TOTAL BUDGET

Breakdown into: (1) salaries/wages (include name/position of each individual and breakdown of time and duties i; (2) travel/subsistence expenses (breakdown by person and justification) unless for IPs for workshops where a total estimate based on an average for the total number of IPs is acceptable; (3) services (e.g. aircraft/vessel time, consultancy fees, ARGOS fees, etc.; (4) reusable capital equipment (e.g. reusable equipment such as a hydrophone, cameras, etc. Note that this equipment will have to be registered at the IWC Secretariat and will remain property of the IWC at the end of the project), (5) expendable capital equipment (e.g. consumables, tags, stationery), (6) shipping costs, (7) insurance costs, (8) in kind co-funding (specify whether other funding is available for personnel/name, equipment, venues, etc.). Note that "Overheads" are not admissible. Add as many rows as you need to the table below.

Type	Detailed description	Cost in GB pounds
(1) Salaries (by person)		
(2) Travel/subsistence (by person or est. total for IPs)	Return flights for Brazilian researchers to Uruguay (4 people @ GBP 250 per flight)	1,000
	Accomodation in Uruguay (4 foreign researchers @ GBP 45 per day) x 35 days	6,300
	Accomodation in Brazil (4 researchers @ GBP 45 per day) x 35 days	6,300
	Local transportation and per Diem in Uruguay (6 researchers @ GBP 32 per day) x 35 days	6,720
	Local transportation and per Diem in Brazil (6 researchers @ GBP 32 per day) x 35 days	6,720
(3) Services (by item)	Aircraft services in Uruguay (43 hours of flight @ GBP 1,000 per hour)	43,000
	Aircraft services in Brazil (59 hours of flight @ GBP 1,000 per hour)	59,000
(4) Reusable equipment		
(5) Consumables		
(6) Shipping (by Item)		
(7) Insurance (by item)		
(8) Co-funding	YAQU PACHA e.V. (US$ 25,000) survey in Uruguay	-20,750
(8) Co-funding	Instituto Aqualie (US$ 15,000) survey in Uruguay	-12,450
(8) Co-funding	GEMARS survey in Brazil	-72,020
(9) Other		
Total budget		129,040
Total requested to IWC		23,820

NOTE: USD 1 @ 0.83 GBP was used.

9 . DATA ARCHIVING/SHARING

Please state your plans for data archiving and sharing. Note that data collected primarily under IWC grants are considered publicly available after an agreed period of time for publication of papers, usually about two years. The work of the IWC depends on the voluntary contribution of data to the various databases and catalogues IWC supports. Please consult the Secretariat (secretariat@iwc.int).

Data can be shared with the SC for assessment purposes and will be made publicly available after a period of 2 years.

10 . PERMITS (PLEASE TICK)

Do you have the necessary permits to carry out the field work and have animal welfare considerations been appropriately considered?	Permits in Brazil have already been awarded and permit application for this survey in Uruguay is in progress.
Do you have the appropriate permits (e.g. CITES) for the import/export of any samples?	Not applicable

If 'Yes' please provide further details and enclose copies where appropriate: