

## Darwin Plus: Overseas Territories Environment and Climate Fund

### Final Report

**Important note** To be completed with reference to the Reporting Guidance Notes for Project Leaders:  
it is expected that this report will be a maximum of 20 pages in length, excluding annexes

#### Darwin Project Information

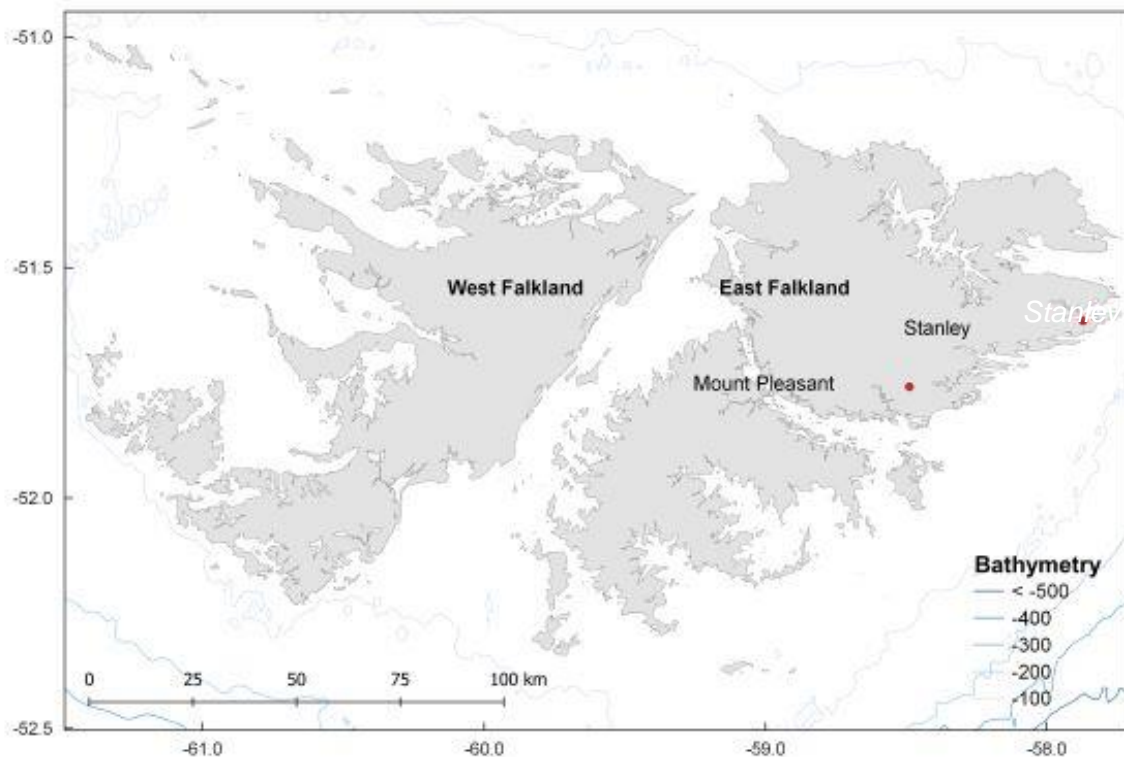
Project reference	DPLUS042
Project title	Dolphins of the kelp: Data priorities for Falkland's inshore cetaceans
Territory(ies)	Falkland Islands
Contract holder Institution	South Atlantic Environmental Research Institute (SAERI)
Partner institutions	Austral Biodiversity, Falklands Conservation, Oregon State University, University of St Andrews, Shallow Marine Surveys Group
Grant value	£269,914.00
Start/end date of project	1st April 2016 / 30th September 2018
Project leader name	Paul Brickle
Project website/Twitter/blog etc.	Website: <a href="http://www.south-atlantic-research.org/research/current-research/166-dolphins-of-the-kelp-data-priorities-for-falkland-s-inshore-cetaceans">www.south-atlantic-research.org/research/current-research/166-dolphins-of-the-kelp-data-priorities-for-falkland-s-inshore-cetaceans</a> Blog: <a href="http://www.south-atlantic-research.org/blog">www.south-atlantic-research.org/blog</a> Twitter: @SAERI_FI Facebook: <a href="https://m.facebook.com/profile.php?id=1854594054830087">m.facebook.com/profile.php?id=1854594054830087</a>
Report author(s) and date	Marina Costa (Project Manager - PM), Marcello Cazzola (Project Assistant), 30th September 2018

## 1 Project Overview

The Falkland Islands (**Figure 1**) is an archipelago located in the south-west region of the South Atlantic Ocean, approximately 600 km east of the mainland of Patagonia, between latitudes 51°S and 53°S, and longitudes 57°W and 62°W. The Falkland Islands are an Overseas Territory of the United Kingdom (UKOT) and are economically self-sufficient (FIG State of Environment 2008). The main sources of income are commercial fishing regulated through the sale of licences, agriculture and cruise ship tourism. The archipelago includes two main islands (East Falkland and West Falkland) and 778 smaller satellite islands and islets, for a total land area of about 12,000 km<sup>2</sup> and a total coastline of 7,400 km (**Figure 2**).



**Figure 1** - Satellite pictures showing the position the Falkland Islands in respect to the Patagonian region in the southern part of South America and within the South Atlantic Ocean.



**Figure 2** - Detail of the Falkland Islands showing the main islands, West and East Falkland, the capital Stanley and the military base of Mount Pleasant. The map does not include Beauchene Island located 54km southeast of East Falkland.

The current population is approximately 3,400 people (Census 2016) mainly living in the capital, Stanley (2,500 inhabitants) located in East Falkland. About 400 people live in the 70 small settlements across the islands and a further 380 civilians live in the British Military base of Mount Pleasant (military are not taken into account) (**Figure 2**). The coastline of the archipelago is complex, containing many small inlets, bays and river estuaries. The majority of the Falkland

Islands coast is rocky although several sandy beaches and muddy embayments are present. Kelp (mainly giant kelp, *Macrocystis pyrifera*, and tree kelp, *Lessonia* spp.) forms extensive forests in the shallow waters extending for a few kilometres from the coast in several areas.

The Falkland Islands also include a marine Exclusive Economic Zone (EEZ) of approximately 460,000 km<sup>2</sup> embracing shallower shelf waters, steep slope and deeper oceanic waters. This diversity of coastal and oceanic habitats and the complex system of currents flowing around the islands generate an area of high marine productivity (Arkhipkin et al. 2013) able to support a large biodiversity including a diverse community of cetaceans (Otley et al. 2008).

Twenty-five species of cetaceans have been identified as occurring within the Falkland Islands' waters (Otley et al. 2008) of which seven appear to have regular presence in the nearshore waters, year-round (Commerson's dolphin *Cephalorhynchus commersonii* and Peale's dolphin *Lagenorhynchus australis*), or seasonally (killer whale *Orcinus orca*, sei whale *Balaenoptera borealis*, fin whale *B. physalus*, minke whale *B. acutorostrata/B. bonarensis* and southern right whale *Eubalaena australis*). The Dusky dolphin (*Lagenorhynchus obscurus*) is regularly found in shelf waters off Patagonia (Garaffo et al. 2011) and its presence in inshore waters of the Falkland Islands might have been unrecorded. The remaining eighteen species are mainly found offshore (and/or some specimens were founded stranded), and they were not focus of this study.

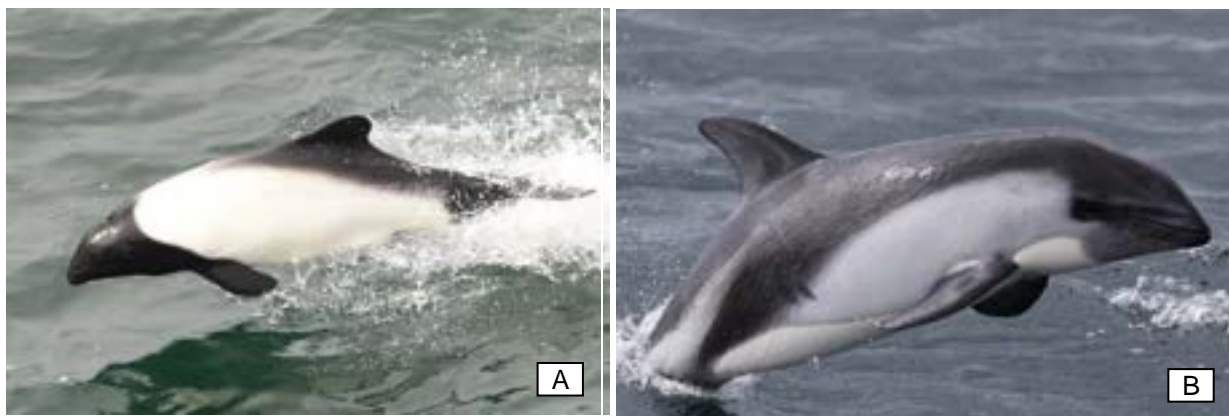
The Falkland Islands inshore waters are in rather pristine conditions if compared with other areas worldwide. Coastal development is still at its early stage and commercial fisheries do not operate in nearshore waters. However, marine traffic is expected to growing in the near future following emerging plans for the development of offshore oil extraction, inshore oil transshipment, large-scale aquaculture facilities, and the construction of a new port. These activities have the potential to impact on the local marine environment. Cetaceans, due to their biological and ecological characteristics (i.e. long-lived animals, low reproductive rates, and often site fidelity) are particularly vulnerable to the many human pressures exerted on the marine environment. However, lack of information about these charismatic species often hampers the identification of their important areas, the development of effective strategies to protect them and their environment and to inform industry development decision.

Cetacean conservation is very high on the agenda of a number of international Multilateral Environmental Agreements (MEA's) adopted by the Falkland Islands, including the United Nations Convention on the Law of the Sea (UNCLOS), the Convention on Biological Diversity (CBD), the Convention on the Conservation of Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The International Union for Conservation of Nature (IUCN) lists three of the twenty-five species present in the Falkland waters as endangered, one as vulnerable and the majority as data deficient (IUCN 2018) which means that their status could not be assessed because of lack of information with regard to population size, trends, and threats. For the seven species listed as least concern, the IUCN assessors flagged that there was not enough information available regionally for a rigorous evaluation against the Red List criteria.

Whilst offshore surveys have been conducted by the Joint Nature Conservation Committee and Falklands Conservation (JNCC and FC), inshore studies in the Falkland Islands have been limited to voluntary cetacean reporting, cataloguing of historical strandings and a few small-scale surveys. This lack of information on which to base conservation and management decisions restricts inclusion in on-going national spatial planning initiatives and inshore ecosystem-based fisheries assessments. For example, cetaceans were not considered specifically in a Species Action Plan for the Falkland Islands Ecoregions, Habitats, Species and Sites Strategy 2016 – 2020. This project will inform the Ecoregion plan for cetaceans.

The aim of the ‘Dolphins of the kelp: Data priorities for Falkland’s inshore cetaceans’ project (hereafter called DOKE) was to establish baseline data on the **abundance, distribution, natural history** and **genetic diversity** of the Falkland Islands inshore cetacean populations to provide a scientific basis for conservation and ecosystem-based marine management initiatives.

Target species of the project were Commerson’s and Peale’s dolphins (**Figure 3**) although observations of other cetacean species were also recorded (e.g. time, position, species identification, group size).



**Figure 3** – The two target species of the Dolphins of the kelp project: A. Commerson’s dolphin (*Cephalorhynchus commersonii*), and; A. Peale’s dolphin (*Lagenorhynchus australis*). Photos by SAERI.

The DOKE project was delivered through three complimentary work programmes:

1. Island-wide transect survey (Output 2)

Aerial line-transect surveys utilising distance sampling provided abundance estimates and mapped the island-wide distribution island-wide for all inshore cetacean species within 10km from shore. The work package was to use a vessel as survey platform based on a pilot survey carried out in 2014 (Darwin pilot EIDCF019). However, due to the strong attraction to boats shown by, the team in co-ordination with the steering committee, decided to use an airplane instead of a vessel for the island-wide surveys (see **section 5.1**). This change triggered several new actions, including new survey designs, modified protocols for data collection and extra equipment, and budget re-allocation.



2. Focal studies: repeat transect sampling (Output 3), Photo-identification (Output 5), Passive Acoustic Monitoring (Output 4)

Small boat-based focal area surveys, photo-identification and passive acoustic monitoring techniques were used to investigate seasonal site fidelity, local abundance, and movements of inshore cetaceans. Also in this case, there was a change in the



survey platform and in the survey design (see **section 5.1**).

### 3. Genetic diversity and local population structure (Output 6)

Tissues from the target species were sampled to determine genetic diversity, local population structure, and the relatedness to other South Atlantic populations.



## References

Arkhipkin A., Brickle P. and Laptikhovsky V. (2013). Links between marine fauna and oceanic fronts on the Patagonian Shelf and Slope Arquipélago. *Life and Marine Science*, 30: 19-37.

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Garaffo G. V., Dans S. L., Pedraza S. N., Degradi M., Schiavini A., González R., and Crespo E. A. (2011). Modeling habitat use for dusky dolphin and Commerson's dolphin in Patagonia. *Marine Ecology Progress Series*, 421, 217-227.

Otley H. (2012). The composition of the cetacean community in the Falkland (Malvinas) Islands, southwest South Atlantic Ocean. *Revista de biología marina y oceanografía*, 47(3), pp.537-551.

## 2 Project Stakeholders/Partners

The project had a core of stakeholder engagement component and activities, issues and solutions were periodically presented and discussed with partners and stakeholders through a locally-led iterative process.

The **project partners** were key stakeholders, and were all members of the Project Steering Committee:

- Falkland Islands Government (**FIG**)
- Falklands Conservation (**FC**)
- Shallow Marine Surveys Group (**SMSG**)
- **Austral Biodiversity Ltd**
- Oregon State University (**OSU**)
- **University of St Andrews**

**FIG** co-funded the project (£10,000 – see section **7.2**) and was involved in the processes related to the assessment and releasing of the research and CITES permits. Four research permits were acquired to carry out the field work, namely: collection of genetic material, surveys, drone usage and collection of genetic material from 'rare' or 'infrequent' species (R04/2016, R22/2016, R02/2018, R14/2018 – Available upon request at SAERI). The FIG veterinary officers, Dr Steve Pointing and Dr Zoe Flower, were responsible for approving the methods for the sampling of

genetic material. In January 2017, Steve Pointing travelled to one of the project sites to supervise the fieldwork and approve the method (**Figure 4 A**).

The Environmental Planning Department (**FIG EPD**) officers Mr. Nick Rendell and since December 2017, Ms. Denise Blake were involved in the drafting process of the cetacean Species Action Plan (SAP) produced by this project (see **Outcome**). The project staff were involved by the EPD officers in the implementation of the Falkland stranding network for cetaceans. The aim of the network was to improve information on strandings reported by the local community and coordinate responsive actions among the local organizations (e.g. SAERI, FC, the Fishery Department).

**FC.** Dr Andrew Stanworth, FC CO, was a member of the project Steering Committee and provided access to FC research equipment (i.e. two shallow C-PODs), and support during the drafting of the reports and the draft cetacean SAP. Ms. Liz Milston, FC community officer, provided support during educational events (see Output 1). The total in-kind support of FC was £2,120 over two years (see section **7.2**).

**SMSG** supported the project scientifically and logistically. Dr Paul Brewin was a member of the Steering Committee and contributed to each step of the project - reading and reviewing documents and providing advices. Mr. Steve Cartwright was the skipper of the rigid-hull inflatable boat (hereafter RHIB), *Baltic Warrior*, used for the focal surveys (**Figure 4 B**), and built the several extra tools needed during the research (i.e. poles for underwater video-cameras, drone pad to use on the boat, etc.). The in-kind support of Dr Paul Brewin was £2,120 over two years (see section **7.2**).

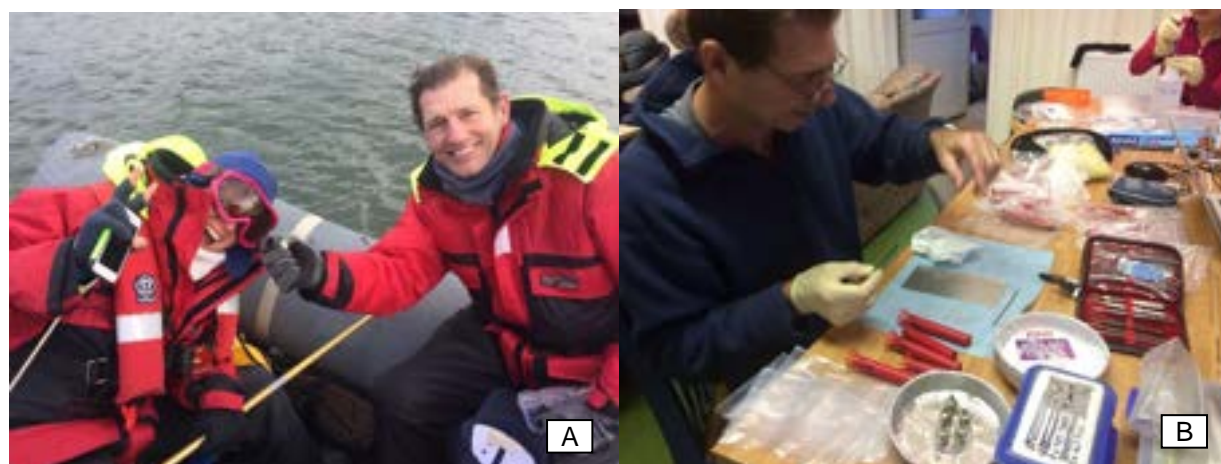


**Figure 4** – A. Scott Baker, OSU (left) and Steve Pointing, the FIG veterinary officer (right) on board of the boat during the genetic sampling in Port Howard. Dr Steve Pointing is checking the tissues sampled from a Commerson’s dolphin using a minimally intrusive dart deployed with a modified capture rifle (0.22 calibre supplied by PaxArms); B. Mr. Steve Cartwright piloting the research RHIB in the mainly uncharted nearshore waters of the Falkland Islands.

**Austral Biodiversity Ltd.** Mr. Grant Munro, was member of the Steering Committee and provided extensive support for C-POD survey design, essential suggestions for the logistic, and material to use (anchors, buoys, etc.). C-POD preliminary analyses presented in this document were carried out by Mr. Munro (<https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE-Cpod-GM-Report.pdf>). The in-kind support of Mr. Grant Munro was £3,500 over two years (see section **7.2**).

**OSU.** Prof Scott Baker was member of the Steering Committee and leader of the genetic work program. Prof Baker visited the islands in January 2017 to collect part of the dolphin tissues and

to train the DOKE staff in genetic sampling and sample handling (**Figure 5**). Prof Baker's contribution to DOKE also included support of field logistics for the survey in January 2017, reading and reviewing the documents and report produced (see **Output 6**), and carry out genetic analysis of the samples collected. The in-kind support of Prof Baker was £6,750. Prof Baker was awarded with a National Geographic Society/Waitt Grant (US\$10,000) in 2016 which allowed for two extra surveys to be conducted (see section **3.3** and section **7.2** for funding matter).



**Figure 5** – Prof Scott Baker and Dr Maria Garcia (Project officer) during A. the training of the project staff in January 2017 and, B. the processing of the tissue samples collected.

**University of St Andrews.** Dr Sonja Heinrich (Sea Mammal Research Unit, **University of St Andrews**) was member of the Steering Committee and provided scientific and logistic support, in particular during survey planning, data analyses, and writing of reports and scientific articles. Dr Heinrich supervised a MSc student who collaborated with analysis of data collected during Darwin pilot EIDCF019 project. Dr Heinrich will also supervise the student who will work on the acoustic material collected during this project. The in-kind support of Dr Heinrich was £12,000 over two years (see section **7.2**).

**SAERI.** Dr. Paul Brickle and Ms. Tara Pelembe (SAERI) were also members of the Steering Committee and provided scientific and logistic support during all steps of the project. Dr Laria Marengo, Project manager of the SAERI ISM-GIS Datacentre also provided her time and expertise to the project in particular for the metadata preparation and map production. SAERI in-kind support was £12,398 over two years (see section **7.2**).

The Project Steering Committee was involved in all decisions and changes that occurred in this project. The Steering Committee met twice before the project manager was in place and five times after to discuss progress, methodology, provide technical advice, drafting the field reports, the Darwin reports, the draft cetacean SAP, etc. Meeting notes were produced and sent for feedback providing opportunity to ensure the partners were involved in planning and decision making of the project even if not physically present at the Falkland Islands (see **Annex 6** for links to the Steering Committee meeting minutes).

A lesson learnt from other projects was the importance to select a supportive and experienced group of partners. In this project the committee members were extremely helpful in all the project steps, from the field work to the production of the final documents and outcomes. This project, as others before it, strongly recommends taking some time to identify the most suitable people to form the steering committee group for each project.

One limiting factor for cetacean research is finding an experienced captain with an understanding of the factors essential for the researchers and how their needs can be met given the environmental conditions in the study area. The success of the focal study was largely due to Mr.

Mr. Cartwright's extensive experience and his willingness and enthusiasm to carry out the work in the best and safest conditions possible.

Other **stakeholders** involved in the project were:

- **Premier Oil:** provided four deep waters C-PODs for passive acoustic monitoring (total value £14,000 – see section 7.2).
- **Royal Navy:** Commander Bill Dawson, Queens Harbour Master, and later Lieutenant Commander Chris Stevens, provided logistic support during the focal surveys including the use of the SAR helicopter in case of emergency. Force Sergeant Major Paul Watson, Falkland Islands Defence Force, provided a satellite phone for the RHIB-based focal surveys (total value £900 – see section 7.2). An article was published in the MOD magazine Sanctuary ([https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Studing\\_Dolphins\\_of\\_the\\_Kelp\\_Sanctuary\\_46\\_2017.pdf](https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Studing_Dolphins_of_the_Kelp_Sanctuary_46_2017.pdf)).

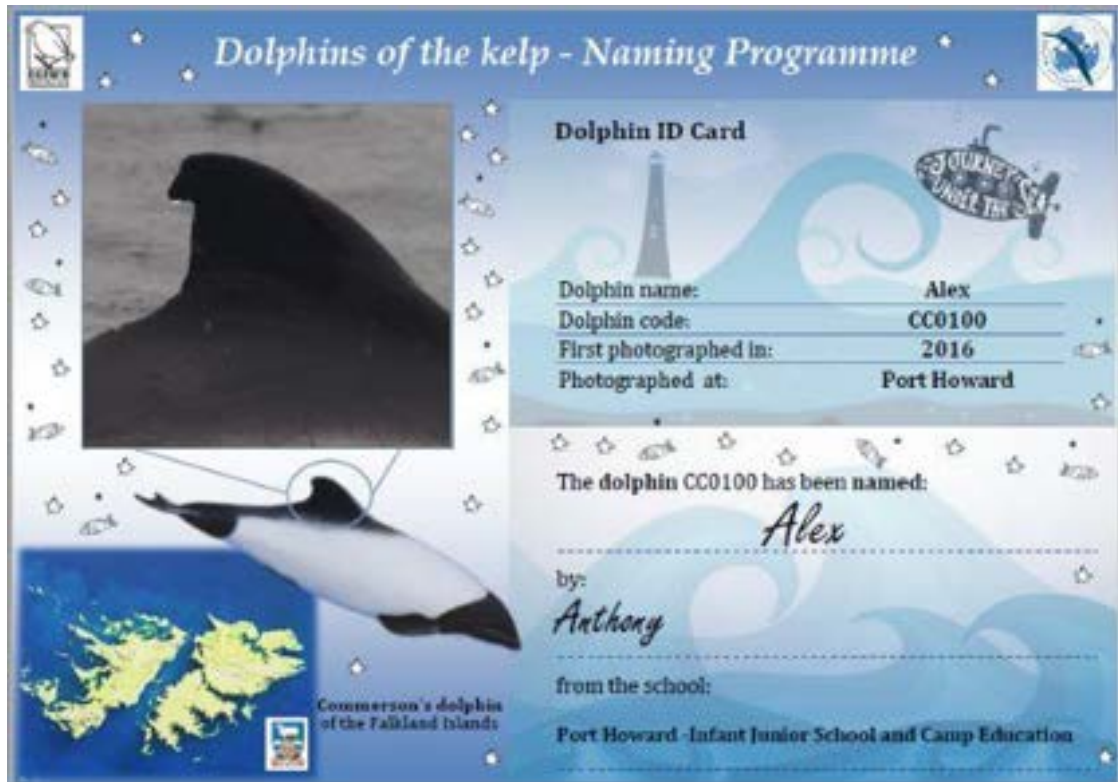
Commander Philip Harper invited the project staff (Dr Costa and Dr Garcia) on board of the HMS Enterprise for a 10-day trip to South Georgia where cetacean observations were carried out (see section 3.3) (total value £20,000 – see section 7.2). Cetacean data collected by the HMS Enterprise crew during two months of patrolling in the Falkland Islands waters were included in the SAERI IMS-GIS Datacentre.

- **British Antarctic Survey (BAS):** the project staff were involved with Dr Jen Jackson and her team from June 2017 when several individuals of southern right whales were observed in the near-shore waters of the Falklands. The involvement included: local logistic support to the BAS team before their trip to South Georgia in January 2018 to study southern right whales, photo-identification and sloughed skin data collection protocol exchange, and data exchange. The BAS team loaned to the project a net to sample dolphin faeces that was used during the focal surveys (total value £350 – see section 7.2). Photographs of individual southern right whales identified in the Falkland Island waters are being uploaded to the 'Happywhale' (<https://happywhale.com>) on-line catalogue. This will allow sharing those data with the wider scientific community and the general public worldwide.
- **Falkland Islands Government Air Service (FIGAS):** General Manager Mr. Morgan Goss provided information and advice for out the aerial survey. FIGAS pilots offered extra time to insert waypoints into the aircraft GPS as well as were responsible together with FIGAS engineers to prepare the airplane for the surveys (e.g. remove seats, set up the headphone system, etc.). The FIGAS tower control team, provided detailed weather conditions prior each survey by calling people living in the remote areas where the survey was planned.
- **Consolidated Fisheries Ltd and Martech Falkland Ltd:** donated material for the C-POD anchoring systems including ropes and buoys (total value £1,200 see section 7.2).
- **Landowners** Bill Pole-Evans, Shirley Pole-Evans, and Karen Jones at Bold Cove, Myles and Karen Lee, and Critta and Beccy Lee at Port Howard, Steven and Chris Poole at Lively Island, Ken and Bonnie (Bonita) Greenland at Darwin, Keith Alazia manager of Goose Green, Gilberto Castro and Suzie Clarke mangers at Fitzroy Farm, Bobby and Lindsay Short at Walker Creek, Andy Pollard General Manager of the Falklands Landholdings at Goose Green and Fitzroy, and Vernon Lee retired FIGAS General Manager and Engineer: provided logistic support and assistance during the field work, including accommodation, tools and space where to anchor the RHIB, and permits to enter in their land to carry out activities connected with the field work (i.e. launch the RHIB).

- **Students** from the Primary and Junior schools of Stanley and Port Howard were involved through several lectures at the schools (**Figure 6** and **Figure 10 D**), and contributed to the 'Dolphin naming programme' aiming to raise awareness and empathy towards dolphins by naming marked individuals identified from the photo-identification (**Figure 7**). The students also donated £70 from a 'Plastic Pollution Campaign' (see section 7.2) to support research and a conservation campaign (**Figure 8 A**).
- **The local community:** was engaged through the publication of articles in the local newspaper Penguin News, local radio and television interviews, post on the SAERI and Falkland Community board Facebook pages, several public presentations, training courses (e.g. Photo-identification Course), and other events (e.g. World Ocean Day - **Figure 8 B**). Several people contributed to the photo-identification work (see **Output 1**).



**Figure 6** - School Newsletter article about the dolphin lecture at the school of Port Howard (permit to use the children pictures have been asked to the guardians).



**Figure 7** – The certificate released to the children who participated to the ‘Dolphins Naming Programme’ where individuals identified by researcher and coded by the first two letter of genus and species and a progressive number, i.e. CC0100, were named.



**Figure 8** – A. The letter sent to SAERI by the students donating their savings (£70) to research and conservation projects. B. Children at the World Ocean Day

An important achievement of this project was the good relationship developed with the military that supported logistically the project offering materials and anchoring points and allowed the team to collect further data offshore. There were no particular challenges in the relationship with any of the stakeholders during field work because the majority of the work was done at sea in remote areas. On the contrary, often landowners of areas where work was carried out o

supported the project by becoming part of a network of people to alert in case of accidents. Furthermore, due to a general empathy towards dolphins, stakeholders and public speeches were always well received.

### 3 Project Achievements

#### 3.1 Outputs

The six outputs set out in the original application were completed within the two-years of the project.

##### **Output 1: Capacity building for cetacean research.**

In the Falkland Islands at the beginning of the project very few people knowledge on cetacean identification, research techniques, or awareness about the important role of cetaceans as umbrella species to help achieve broader conservation objectives.

A great deal of effort was put into capacity building, training and awareness-raising. Volunteers joined the research team at sea during field work and at the office for photo-identification work. Several other people participated in dedicated training courses, public presentations, and special events.

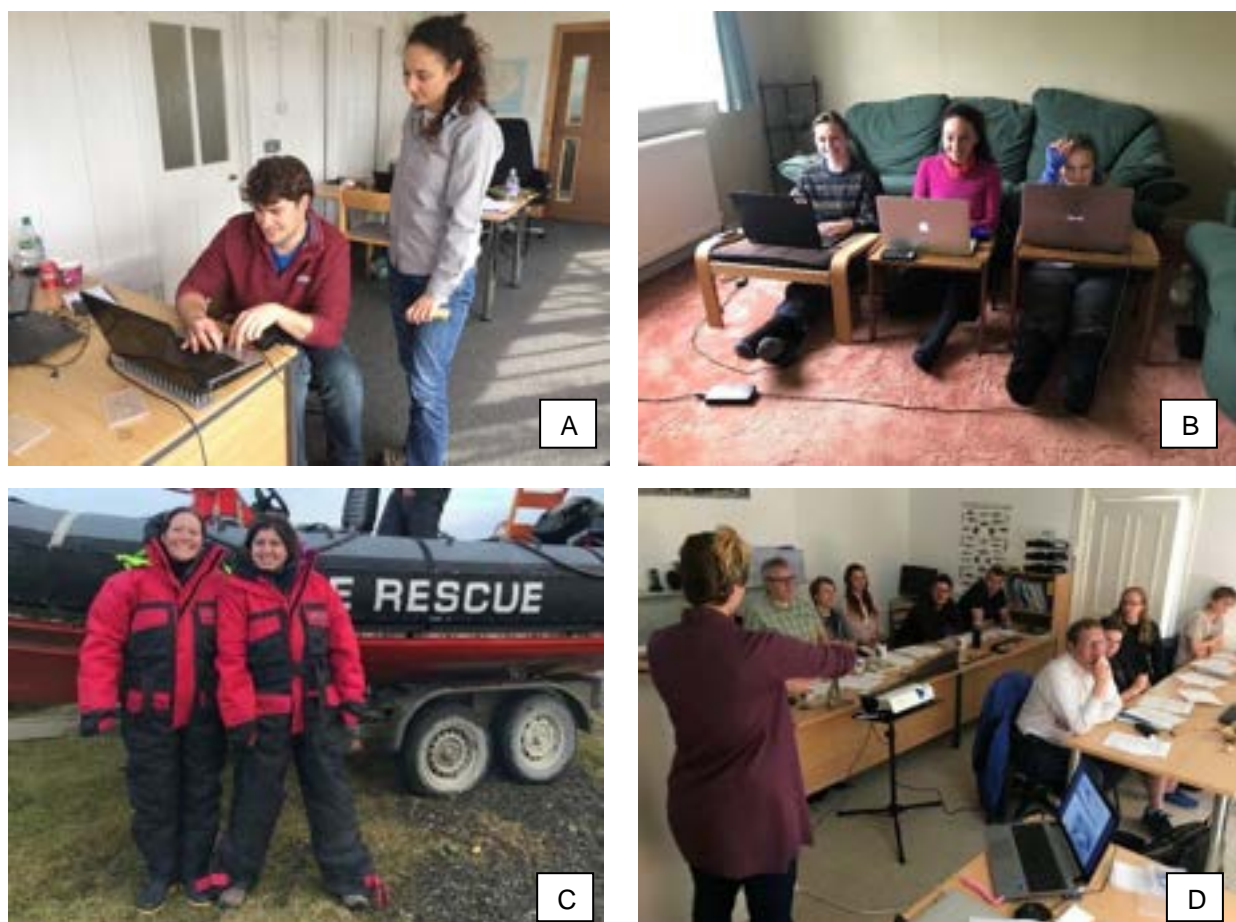
In total 51 people instead of the 10 suggested (**Indicator 1.3**) were directly engaged in the project.

Thirty people (**Figure 28**) joined the boat-based surveys and were trained in cetacean identification, survey methodology, photo-identification, group size estimation, distance estimation, safe boat operations, and health and safety procedures (**Indicator 1.3**) (**Figure 9 C**). Out of the 30, 12 live in the Falklands permanently and will be locally available to support future projects on cetaceans (e.g. the DPLUS082). Two were employed at the Falkland Islands Television and are now working on a documentary that will be presented at the 2<sup>nd</sup> World Marine Mammal Science Conference in 2019 at Barcelona, Spain (<https://www.marinemammalscience.org/conference/2019-2nd-world-marine-mammal-science-conference/>). Several students (three international PhD students, one local undergraduate student, two local college students, and one local high school student) used the skills and experience gained to improve their CVs and apply for colleges and universities.

Six people, including two international interns, joined the aerial surveys and were trained in cetacean identification, use of the survey program Logger and survey equipment (see **Output 2**), and health and safety procedures. The two interns also participated in dedicated higher education level courses, including line transect methods using the program Distance, mark recapture methods using the program Mark, and map generation using the program QGIS. One intern (Connor Bamford - see **Figure 9 A**) has later been accepted for a PhD with the British Antarctic Survey, the other intern (Lorna Hamilton) is applying for a PhD. In both cases the experience and analytical skills gained with the project enhanced in their CVs.

Twenty people participated in the 'Cetacean Photo-identification course' learning about conservation status of cetaceans, ethics in marine mammal science, photo-identification and non-invasive marking techniques, the new islands cetacean code of conduct, and photo-processing matching procedures, and use of DSLR cameras for photo-identification (**Figure 9 D**). Of these 12 people, together with a further 20 people that joined the field work at sea, worked on the photo-identification of the dolphins processing about 16,000 pictures (24 hours of work per person) (see Section **7.2**).

Two students from the Stanley high school selected SAERI as the organisation for a week of work experience, and were trained by the project staff in cetacean monitoring techniques for a total of 16 hours (**Figure 27 B**).



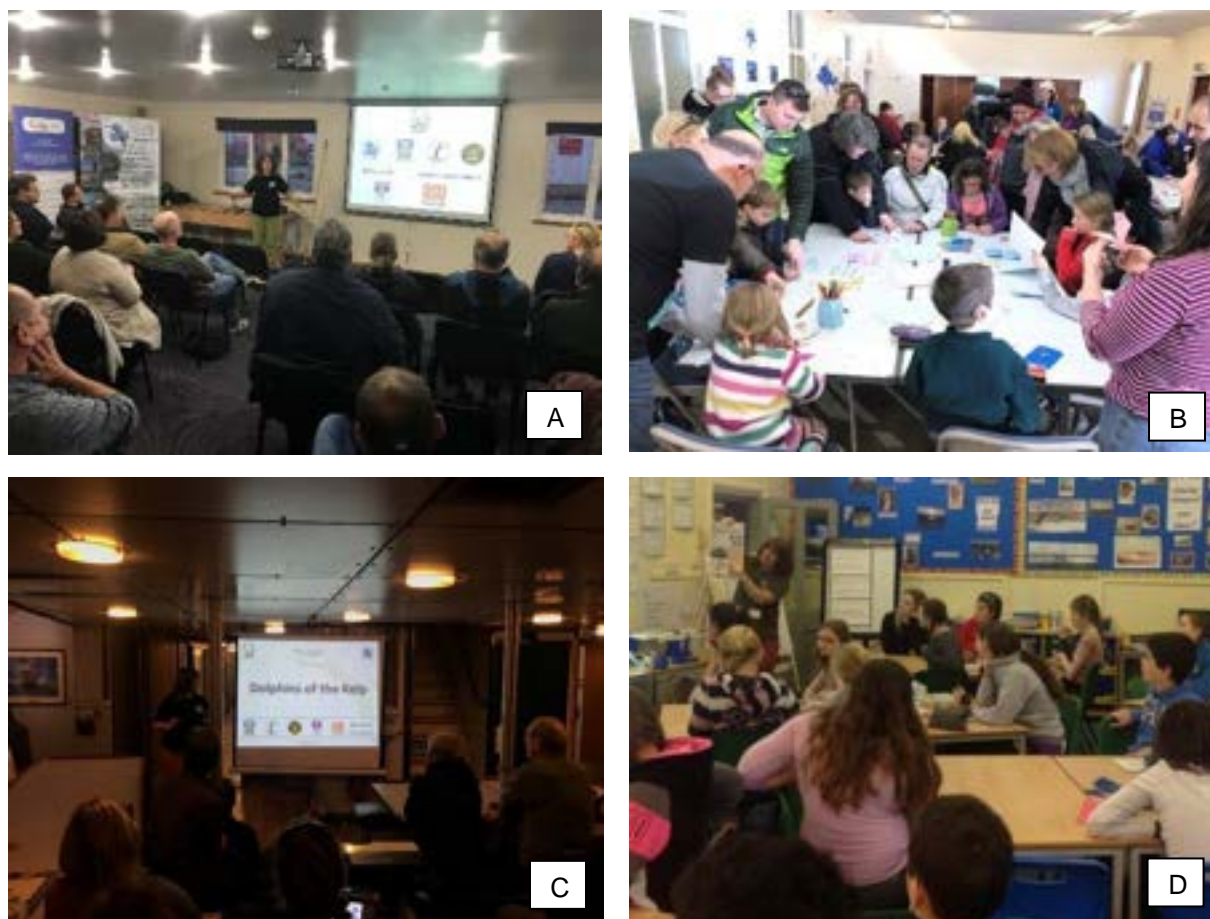
**Figure 9** - A. Intern Connor Bamford learning how to use the software Logger under the supervision of project officer Dr Garcia; B. Amy, Dr Garcia and Veronica working on the photo-id data during a break from field work in the 'office' at Port Howard; C. The volunteers Jenni and Pam ready to launch the RHIB for a survey; D. Participants in the Photo-identification course learning about cetacean identification.

Four local aircraft pilots from FIGAS (Paul and Drew Robertson, Andrew Alazia, and Troyd Bowles) and three skippers (Steve Cartwright, Michael Clarke, and Bill Pole-Evans) were trained in cetacean monitoring techniques, including cetacean code of conduct and best practice for approaching cetaceans. These skills are being used and/or will be used in future marine projects in the area (e.g. DPLUS082, DPLUS071 and DPLUS065).

Dissemination activities (**Indicators 1.6-1.8**) have been undertaken targeting people inside and outside Stanley. A total of 15 presentations were given to general public (e.g. Night at the Museum, Chamber of Commerce, Farmers' week), local associations (e.g. the Falklands Womens Association), visitors (e.g. the Tall Ship Tenacious, <http://jst.org.uk>), schools (e.g. Community high School, Stanley Primary School, and Port Howard Primary School), military (e.g. HMS Enterprise), and local authorities (e.g. Environmental Committee) (**Figure 10** – see **Annex 4** for the presentation link).

Outreach visits to locations outside Stanley were only possible where fieldwork was carried out (e.g. Port Howard and Darwin). Visits to other locations were not planned in the original application and budget was not available to cover these extra expenses. Therefore, special events (e.g. Cetacean awareness Day, exhibit at the Farmer's week - a rural sector event when the majority of farmers visit Stanley -, World Ocean Day, and Dolphin naming programme) were

organised during weekends in winter when farming activities are reduced and people travel to Stanley more often (see **indicator 1.8**). The Cetacean Awareness Day was organised in July 2017 and at least 80 children and their families attended the event (**Figure 10 B**). The research team coordinated the organization of a series of activities carried out on the 8<sup>th</sup> of June 2018 to celebrate the World Ocean Day with more than 200 participants (almost 10% of the Stanley population) (**Figure 8 B**).



**Figure 10** – A. Presentation at the Chamber of Commerce on the 20<sup>th</sup> of April 2017; B Children and their family at the Cetacean Awareness Day on the 29<sup>th</sup> of July 2017; C. Presentation made on board of the Tall Ship Tenacious during a visit in the Falkland Islands on the 4<sup>th</sup> of April 2018; D. Presentation at the Infant Junior School in Stanley on the 4<sup>th</sup> of July 2018.

### *Evidence*

The material published (cetacean identification resources distributed to locations in outside Stanley, local newspaper articles, presentations, protocols, reports, etc.) is available from the project page on the SAERI website and links to each document are provided in **Annex 4**. Facebook is a major means of communication among the islanders (especially in reaching the dispersed rural populations) and posts published were seen more than 5,000 times in total - [https://www.facebook.com/pg/S4ERI/videos/?ref=page\\_internal](https://www.facebook.com/pg/S4ERI/videos/?ref=page_internal). The DOKE research equipment is hosted at SAERI. Due to changes in the field work (see section 5.1) research equipment includes more tools than was originally planned for (e.g. a drone DJI Mavic Pro, two clinometers, a GoPro Hero 4, etc.). The equipment list has been circulated among partners and it is attached (see **Annex 6**). The established volunteer database is available at FC upon request ([community@conservation.org.fk](mailto:community@conservation.org.fk)).

Capacity building in the Falkland Islands is not often easy due to the small number of inhabitants and to a fast turnover of people (i.e. external contracts usually last two years). A major challenge

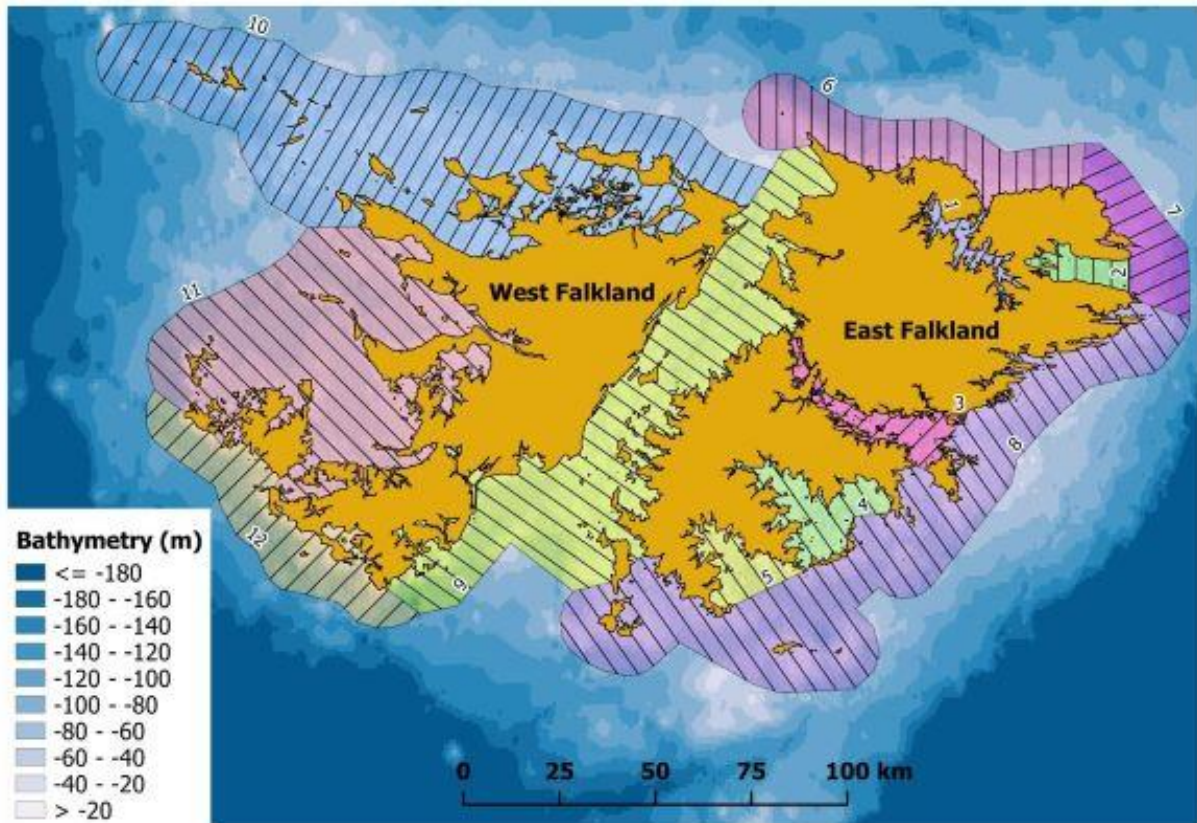
for this project was to involve people in the field and/or office work who did not have a Permanent Resident Position (PRP) in the Falkland Islands. To volunteer non-PRP people needed in fact a work permit costing £23 per person. This limited the number of non-PRP people involved in the project because in the initial plan there was no budget to cover the permit cost and not all people were willing to pay themselves to volunteer. This issue was addressed in the SAP.

## **Output 2: Island-wide Transect Survey. Island-wide population estimate and species distribution maps for Commerson's dolphin, Peale's dolphin and sei whale and model of abundance.**

The lack of data on cetacean abundance and distribution in the Falkland Islands waters have hampered the development of an efficient strategy for the conservation of these charismatic animals and limited their inclusion in management plans, including the Marine Spatial Planning project (DPLUS027). The island-wide transect surveys were planned to fill this gap in knowledge and provide new evidence to review the Species Action Plan (see **Outcome** and **Annex 6**) and be available for updates to other policies (e.g. the Biodiversity framework and the Falkland Islands Ecoregions, Habitats, Species and Sites Strategy) as required.

This project provided the first scientifically robust estimates of abundance and density of Commerson's and Peale's dolphins and baleen whales for the whole inshore Falklands waters (within 10 km from the coastline), as well as the first distribution maps for seven species (**Figure 13** and **Figure 14**). Changes of the survey platform used, the fieldwork schedule and the methods applied from the original work plan are discussed in session 5.1. However review of the most appropriate survey methods was always expected and was a valuable component of having experienced cetacean experts on site, facilitated by the funding and capacity building of the project.

From mid-February until mid-March 2017, meetings were held with the Morgan Goss General Manager of the Falkland Islands Government Airline Service (FIGAS) and the aircraft pilots to discuss the survey logistical details. Protocols were drafted and the extra equipment and programs needed were provided. Training was carried out to get the crew and the pilots familiar with instruments, the program used to record data and the protocols. The software Distance 6.2 (Thomas et al. 2010) was used to generate different survey designs and select the most suitable for the characteristics of the area and the target species. The study area was divided into 12 strata accounting for possible differences in physical characteristics with respect to the prevailing winds and currents and the general physiography of the sea bottom. A total of 217 transects spaced between 5 and 6 km apart and generally oriented perpendicular to the coast north-south were generated to obtain a coverage probability of 0.8 (**Figure 11**). The survey platform was the aircraft BRAVO-OSCAR Britten-Norman BN-2B Islander with high-wing, double engine and two bubble windows on the rear allowing observation below the plane itself (**Figure 12A**). The aircraft flew at an altitude of 150 m and a speed of 90 knots (~167 km/hour). The maximum permitted flight time was approximately six hours allowing for about 1,000 km to be flown per day. The aircraft was only able to be refuelled at Stanley airport, the start and end point for each day of surveying. Overall, the total length of the designed transects was 4317 km. Accordingly, the estimated time to survey the planned transects, considering transfer time (to and from the airport and from one transect to another) was 52 hours. The research crew consisted of a data recorder (**Figure 12B**) and two observers (**Figure 12C**). The data recorder was positioned near to the pilot; the observers were seated at the bubble windows to the rear of the plane. The researchers rotated positions in the plane according to the instructions of the data recorder, ideally every hour, and during off line effort.

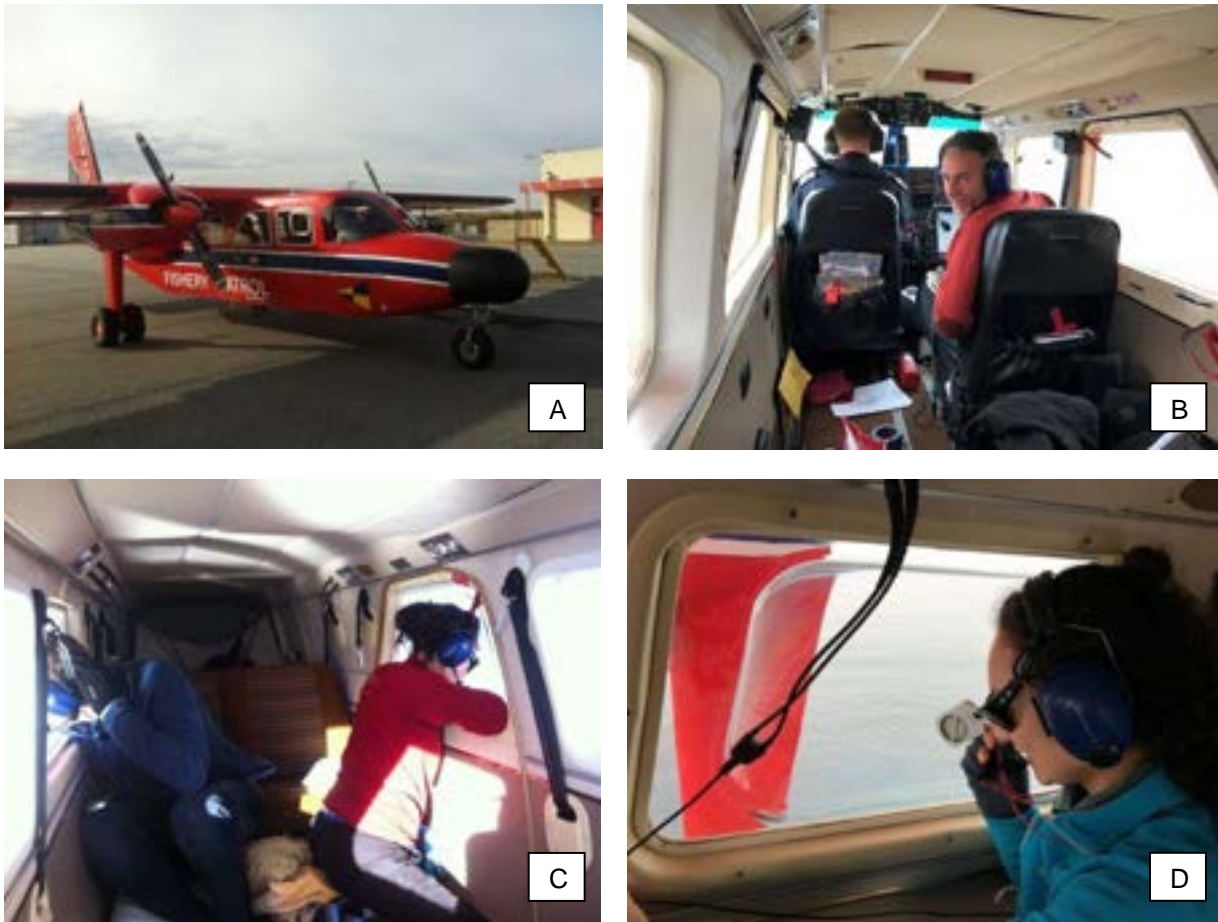


**Figure 11** – Map of the Falkland Islands showing the study area within 10km from the coastline (divided in 12 strata) and the transects (parallel black lines), survey design generated with the software Distance 6.2.

The aerial surveys were carried out successfully during nine days of very good weather from the 18<sup>th</sup> of March to the 8<sup>th</sup> of May 2017 (**Indicator 2.1**). The originally planned schedule (February-March) had to be postponed slightly due to the changes described in section 5.1, the availability of the aircraft (also used for fishery patrols), and bad sea conditions. The majority of survey effort was made in sea conditions of Beaufort 4 or less (83%). The total number of sightings was 454 comprising seven species (**Figure 13** and **Figure 14**): Commerson’s dolphin (238 sightings), Peale’s dolphin (60 sightings), sei whale (74 sightings), fin whale (12 sightings), dwarf minke whale (2 sightings), blue whale (2 sightings), and southern right whale (1 sighting). The remaining 65 sightings were recorded as unidentified baleen whales. Abundance of individuals was estimated using a Horvitz–Thompson-like estimator:

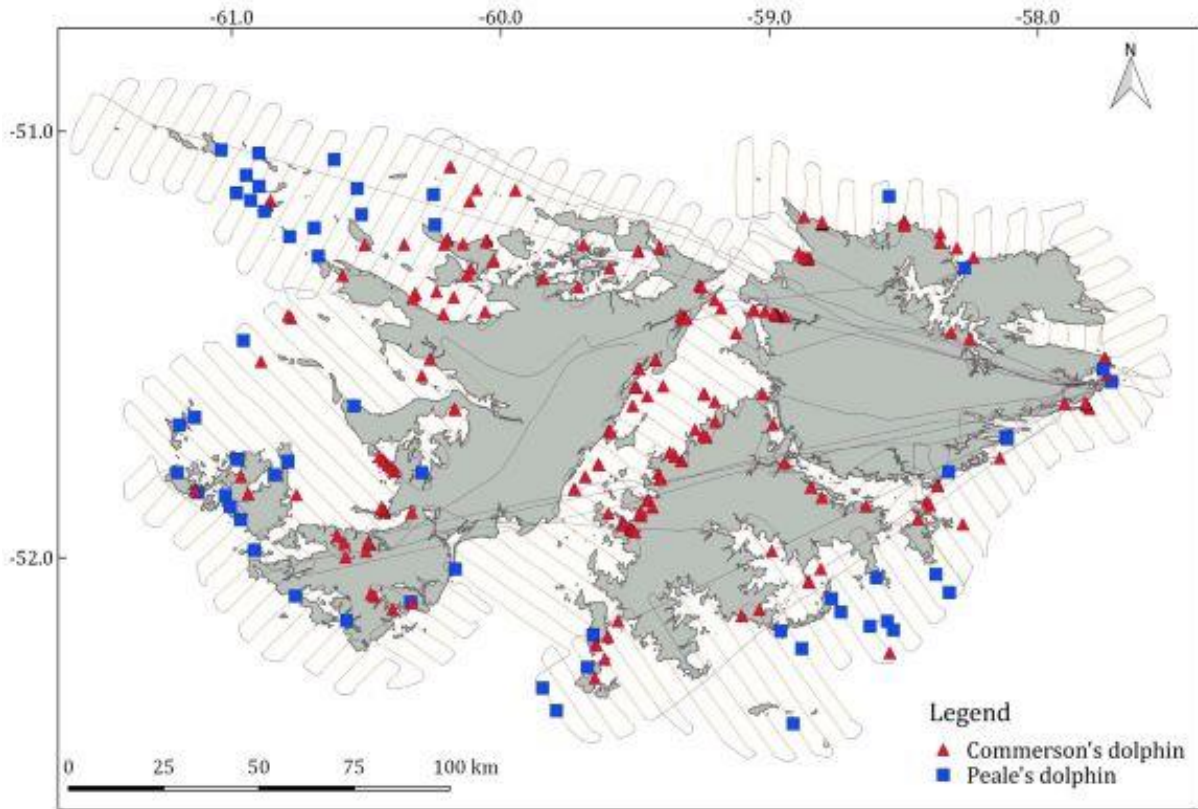
$$\hat{N} = \frac{n\hat{E}(cs)}{2wL\hat{P}_a\hat{g}(0)}A$$

where  $n$  was the number of groups encountered,  $\hat{E}(cs)$  the estimated group size,  $w$  was the maximum perpendicular distance from the trackline at which groups were recorded after truncation,  $L$  was the total transect length,  $A$  study area, and  $\hat{g}(0)$  the probability of seeing a group on the trackline. In this study  $\hat{g}(0)$  was equal to 1

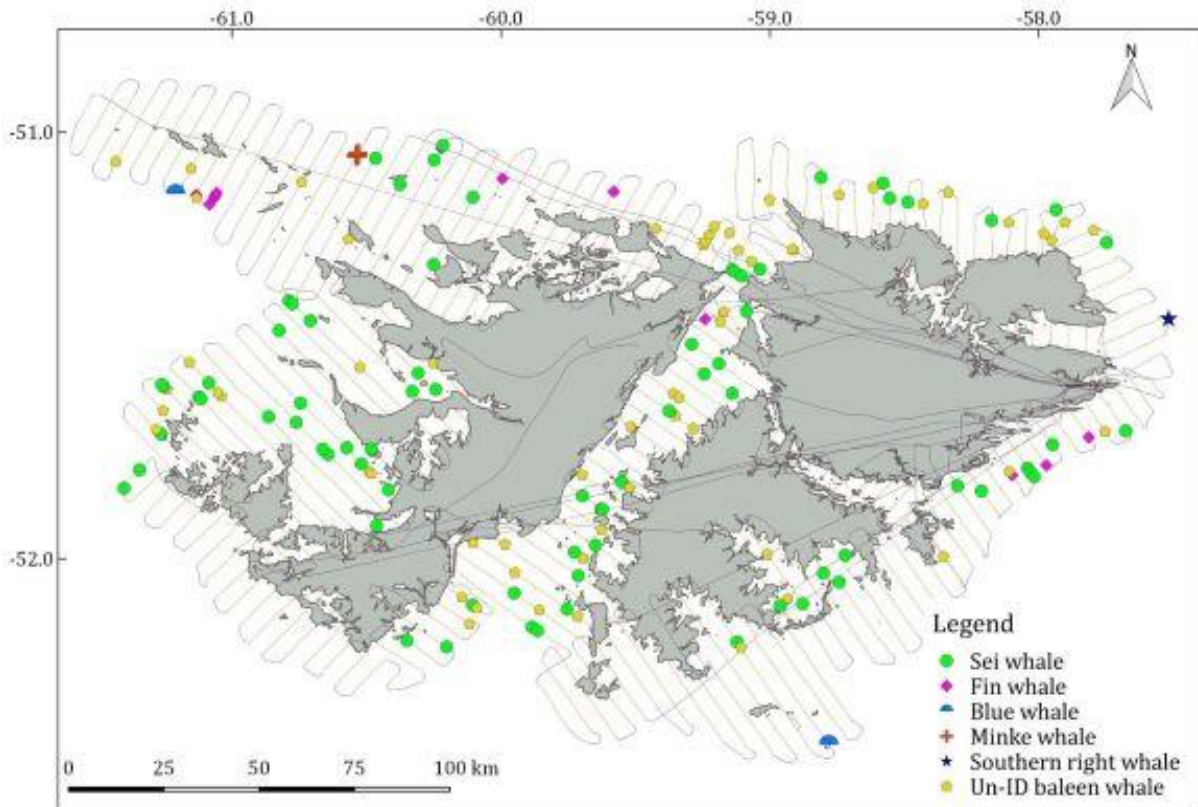


**Figure 12** – A. The aircraft used for the survey was a Britten-Norman BN-2B Islander from FIGAS equipped with two rear bubble windows for vision ahead and below the plane; The research crew was formed by, B. the recorder, located near the pilot and, C. two observers located in the rear of the plane and watching through the bubble windows; D. Maria using the clinometer to measure the perpendicular distance of one animal or the center of a group of dolphins in relation to the trackline.

The first ever systematically obtained estimates of abundances are the follows: 5,789 (coefficient of variation=0.18) for Commerson’s dolphins, 1,896 (coefficient of variation=0.33) for Peale’s dolphins, and 546 (coefficient of variation=0.18) for baleen whales of which 341 (coefficient of variation=0.21) sei whales, 64 (coefficient of variation=0.43) fin whales, 13 (coefficient of variation=0.99) dwarf minke whales and 148 (coefficient of variation=0.31) of unknown baleen whales (**Indicator 2.2**). The few sightings of blue and southern right whales occurred during transits/ off effort legs or too far from the trackline and were thus not included in the analyses.



**Figure 13** - Sighting of Commerson's (red triangles) and Peale's dolphins (blue squares) during the aerial surveys (including navigation between transects) carried out from March to May 2017.



**Figure 14** - Sightings of baleen whales during the aerial surveys (including navigation between transects) carried out from March to May 2017.

Some additional field work with the use of a drone from land was carried out on dolphins and will continue after the end of this project to estimate the fraction of time animals spend submerged under water. This diving time is required to address availability bias (i.e. the amount of time animals are available to be seen at the surface) and will be likely lead to correction of the overall abundance estimates and correct upward the population size estimates (see section **3.3** and **4**).

### *Evidence*

Protocol and field work report have been circulated and are available from the project website (see **Annex 4** for links). Preliminary results have been presented at:

- a Webinar hosted by the Chartered Institute of Ecology and Environmental Management (CIEEM) on the 7<sup>th</sup> of February 2018 through. Thirty-five people attended the webinar that was also broadcasted to the participants of the '2018 Diverse Island Environments' Conference in St Helena. The webinar is available at <https://www.youtube.com/watch?v=gDIWsFZfjUc&feature=youtu.be> and has been seen 80 times since its publication.
- the 32nd Conference of the European Cetacean Society (ECS) held in Italy between the 8<sup>th</sup> and the 11<sup>th</sup> of April 2018. Poster title: Abundance of Commerson's and Peale's dolphins in inshore waters of the Falklands Islands estimated by aerial survey.
- these results were presented at the 'XII Congreso de la Society Latin American of Specialists in Aquatic Mammals (SOLAMAC)' in Peru' from the 5 to the 8 of November 2018 (<http://solamac2018.com/>). A peer-reviewed publication is being reviewed by the authors and will be submitted soon (**Indicator 2.2**). Analyses of habitat modelling using Generalized Additive Models (GAMs) and spatial modelling derived estimates of abundance are being currently undertaken (**Indicator 2.3**).

Results have been used to review and draft a new Species Action Plan for cetaceans. Metadata and data have been submitted to the SAERI IMS-GIS Datacentre and to the JNCC (**Indicator 2.4**)

### References

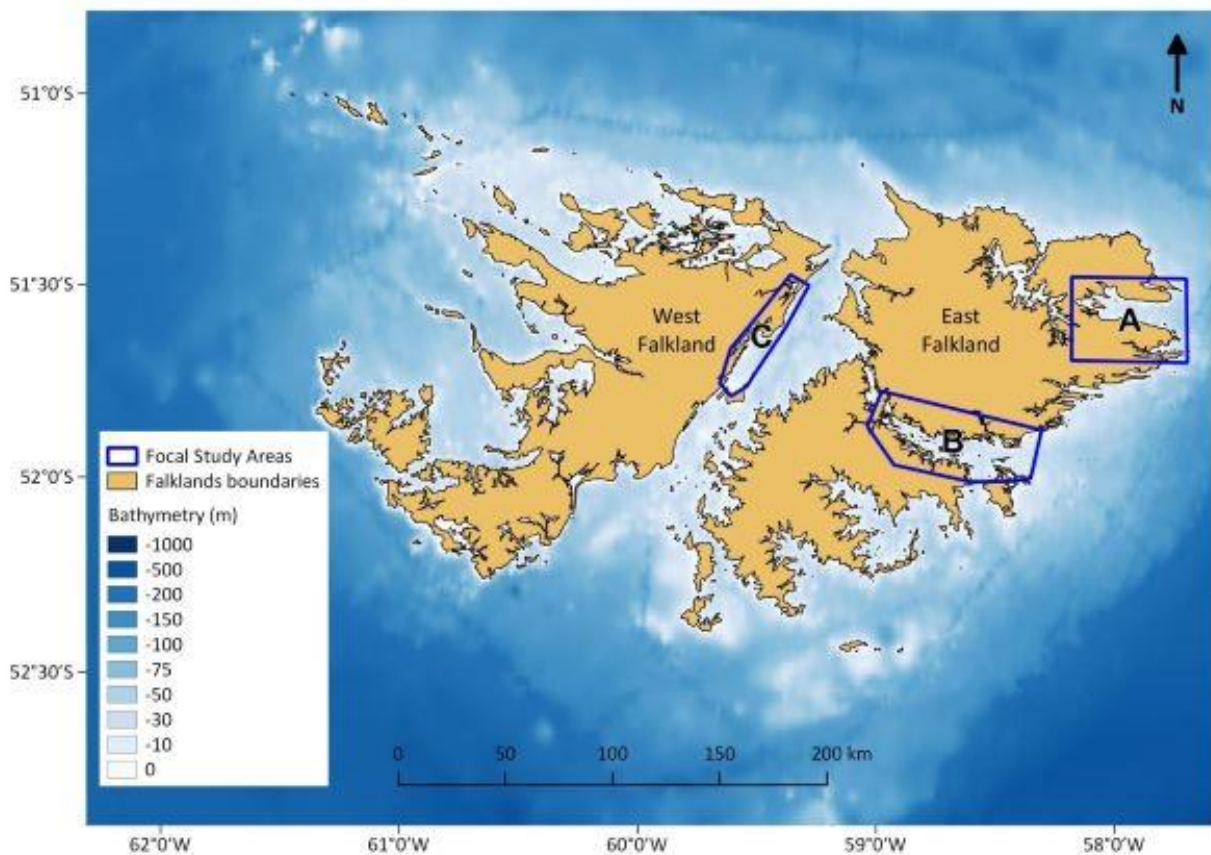
Thomas L., Buckland S.T., Rexstad E.A., Laake J. L., Strindberg S., Hedley S. L., Bishop J. R.B., Marques T. A., and Burnham K. P. (2010). Distance software: design and analysis of distance sampling surveys for estimating population size. *Journal of Applied Ecology* 47: 5-14. DOI: 10.1111/j.1365-2664.2009.01737.x

### **Output 3: Repeat transect focal study at 3 focal study sites. Data on finer-scale spatial drivers of distribution, seasonal occurrence and key habitats.**

The repeated transect focal survey was planned to study the degree of the dolphins' association with specific habitat types to investigate potential drivers of small-scale habitat selection and highlight critical habitats. Although dolphins' presence has been reported from many areas off the Falkland coastline, distribution, hot spots, and seasonal occurrence were unknown.

This project provided the first seasonal distribution and abundance for Commerson's and Peale's dolphins in the three sites of: A. Port Stanley, Port William, Berkeley Sound; B. Choiseul Sound and Bertha's beach; C. Port Howard and Many Branch (**Figure 15**). The sites were identified based on previous knowledge about the presence of at least one of the two target species, accessibility to the site, and survey feasibility during both seasons (see section **5.1**). Reproductive peak for Commerson's dolphins were identified in the period February-March

although few newborns were observed in July. For Peale's dolphins the peak was recorded in January (**Figure 16**).

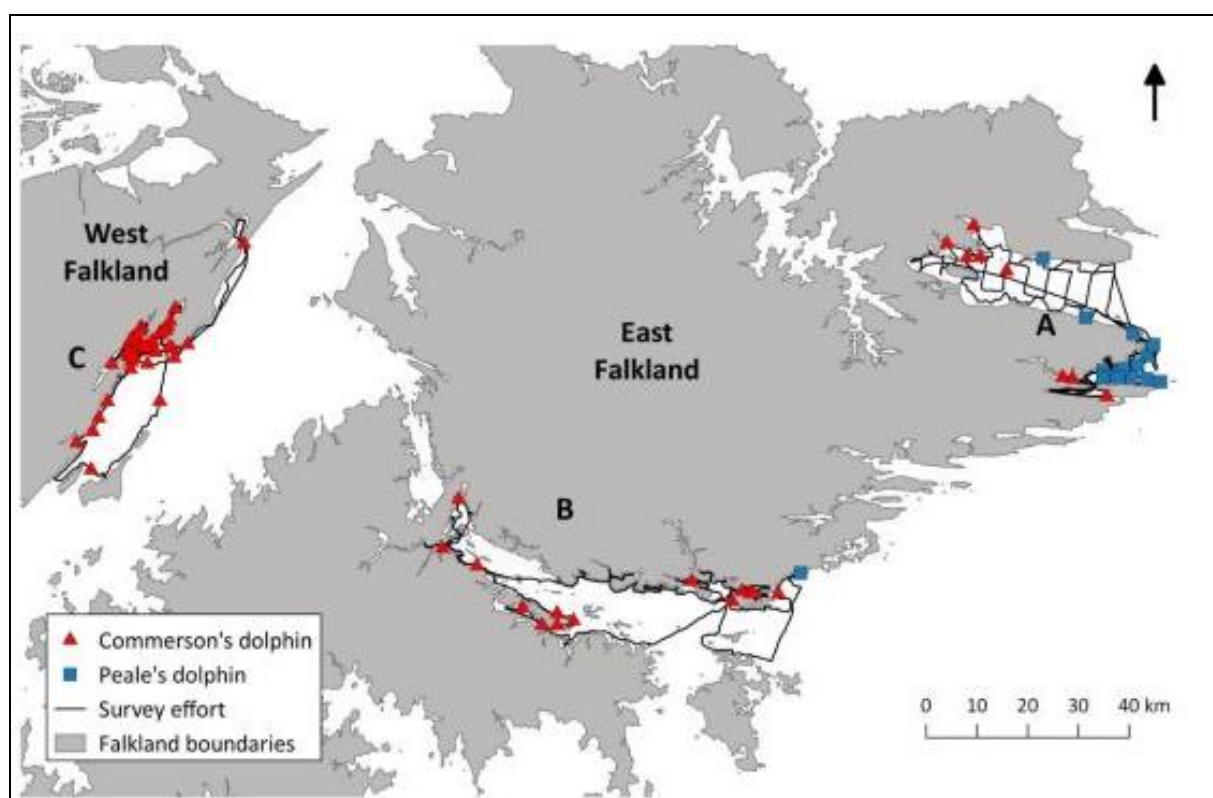


**Figure 15** - Map of the Falkland Islands showing the three selected areas for the focal survey (in blue): A. Port Stanley – Port Williams – Berkeley Sound; B. Choiseul Sound – Bertha's Beach; C. Port Howard – Many Branch Harbour. Map generated with QGIS 2.18.4. Falkland shape file obtained from SAERI. Bathymetry obtained from GEBCO2014.



**Figure 16** - Mother and a newborn of Peale's dolphins photographed in January 2017 in area A. The newborn is identifiable by the small size (less than half of the mother) and by the presence of whitish vertical foetal crests on the body side (white arrows).

In summary, 6 surveys were carried out on board of the rigid-hull inflatable boat (RHIB) *Baltic Warrior* (**Figure 29**) at the three sites in Nov-Dec 2016 (**Figure 17**), Jan 2017, Jun-Jul 2017, Nov-Dec 2017, Feb-Mar 2018 and Jun-Jul 2018 (**Indicator 3.1**). A total of 73 days, c. 416 hours and 5,417 km was spent at sea. Six species were encountered during 560 sightings (183 hours), including Commerson's dolphins (348 sightings), Peale's dolphins (162 sightings), southern right whales (23 sightings), sei whale (20 sightings), minke whales (3 sightings), and orcas (1 sighting). Preliminary results suggest that Commerson's dolphins are present all along the coastline with higher numbers in summer than winter. The area around Port Howard (Area C in **Figure 17**) appeared to be a hotspot for Commerson's with larger number (x2.5 higher) being encountered in summer than in winter. Peale's dolphins showed a restricted distribution, including Port William/Kidney Island (Area A in **Figure 17**) and occasionally in the outer part of Choiseul Sound (Area B in **Figure 17**). Port William appeared to be a hotspot for Peale's dolphins. Peale's dolphins were recorded in summer and winter with highest numbers in winter. In areas A and B the two species overlapped although Commerson's dolphins appeared to occupy the inner part of the bay and Peale's the outer part (**Indicator 3.2** and **3.3**).



**Figure 17** - Survey effort and dolphin detections (red triangle: Commerson's dolphin; blue square: Peale's dolphin) carried out from the 21<sup>st</sup> of November to the 22<sup>nd</sup> of December 2016, in the three focal areas. A. Port Stanley, Port Williams, Berkeley Sound; B. Choiseul Sound & Bertha's Beach; C. Port Howard and Many Branch Harbour.

Data (navigation and/or photo-identification) were also collected during extra eight days from land or boat (during diving or other trips), increasing the number of sightings to 24 units (3 of Commerson's dolphins, 15 of Peale's dolphins, 4 of southern right whales, 2 of sei whales, and 1 of minke whales).

Shore based observation as proposed in the original application, was investigated and considered inefficient due the high mobility of dolphins (dolphins could be followed only for few minutes then they were too far away for photo-identification), and the difficulty to access several coastal areas in the Falkland Islands (access to a large part of the coast of Port William is

inaccessible due to presence of minefields). Whale land observation however, appeared to be an efficient way to study large animals.

### *Evidence*

Protocols, field work reports and distribution maps have been circulated and are available at the project website (<https://www.south-atlantic-research.org/research/dolphins-of-the-kelp/> – see **Annex 4** for the links). Results have been used to review the Species Action Plan for cetaceans. Metadata and data have been submitted to the SAERI IMS-GIS data centre. Analyses for a peer-reviewed publication also including results from **Output 5** are on-going.

### **Output 4: Passive acoustic monitoring focal study at one of the focal study sites. Data on temporal drivers of distribution and seasonal sensitivity.**

C-PODs are fully automated, static, passive acoustic monitoring systems for the detection and logging of toothed whales clicks (**Figure 18 C**). In the Falkland, they were previously used to investigate if sympatric Commerson's and Peale's dolphins show similar adaptations in their echolocation and whether their clicks display signs of character displacement (Kyhn et al. 2010, Munro 2010).

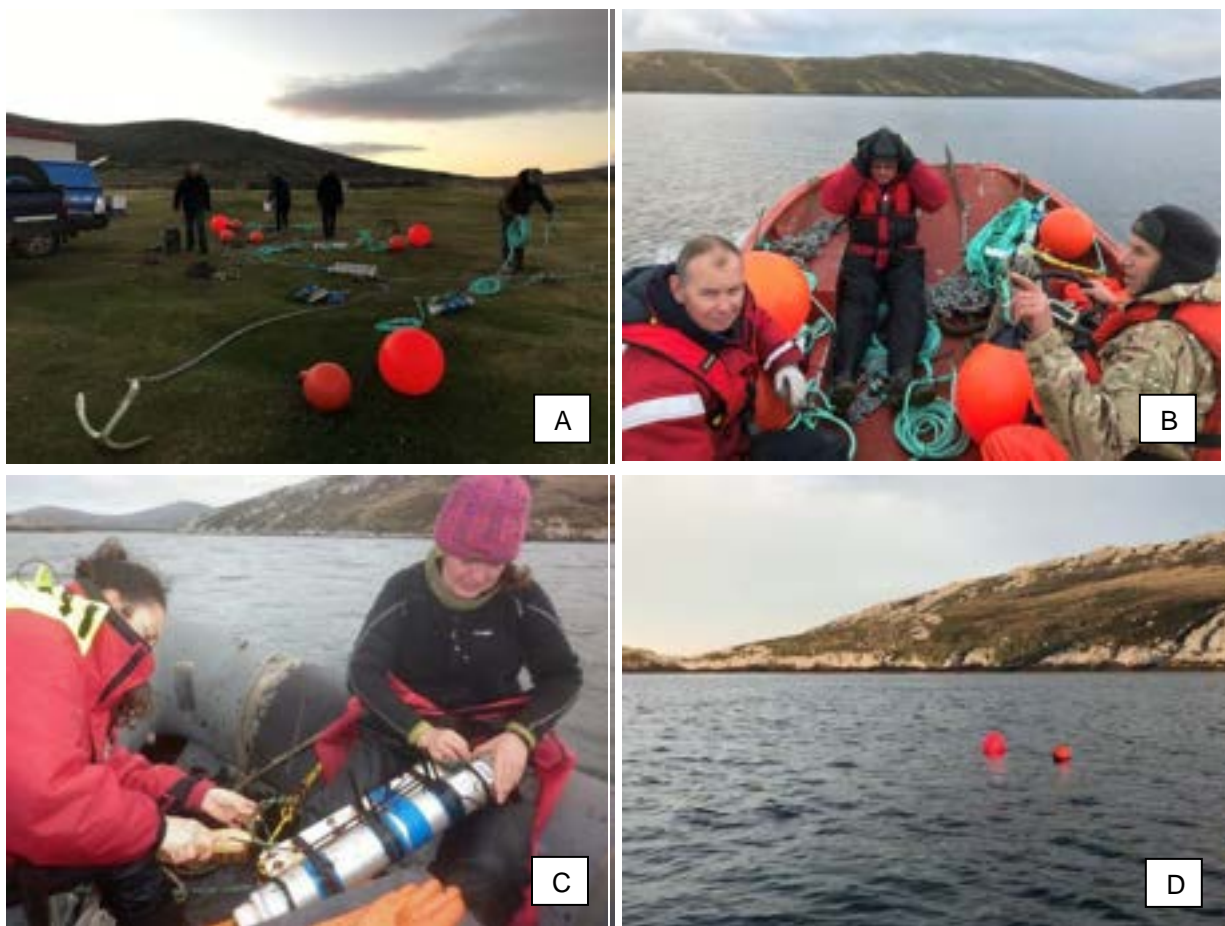
In this project, C-PODs were used to investigate Commerson's dolphin changes in behavioural state during day and night, and seasons and to understand why this animal 'use' sheltered areas, bay or harbour during the day. In particular, the project provided information about Commerson's dolphin occurrence in Many Branch Harbour, West Falkland (**Figure 18**) (**Indicator 4.1**).

This area was selected for several reasons. The first was that only Commerson's dolphin appeared to be regularly present in the harbour simplifying species assignment. C-POD in fact do not currently allow for species determination within each signal type, because of the considerable overlapping in the acoustic parameters of Commerson's and Peale's dolphins measured both species are similarly assigned as Narrow Band High Frequency species. The deployment in an area where both species are regularly present would have complicated data interpretation if species could not be reliably separated (this species separation is an area of possible future research but was out with the scope of the current project). A second reason was that the topography and geography of the harbour (with a large internal lagoon rich on kelp, a narrow and long canal connecting the lagoon to the open sea and the lack of other sheltered bays nearby) made the location a natural laboratory to study possible uses of these sheltered and coastal areas by dolphins. Finally, there was very limited vessel traffic or other human activities carried out in the area that could either have influenced dolphin distribution due to the strong animal attraction to vessels, or risked loss of equipment due to vessel collision and multiple logging of vessel sonar. The site selection was discussed and approved by the steering Committee in March 2017. Dr Line Anker Kyhn (lky@bios.au.dk) working at the Institute of Bioscience, Aarhus University, was also consulted having years of experience with C-PODs and similar species and having worked already at the Falkland Islands.

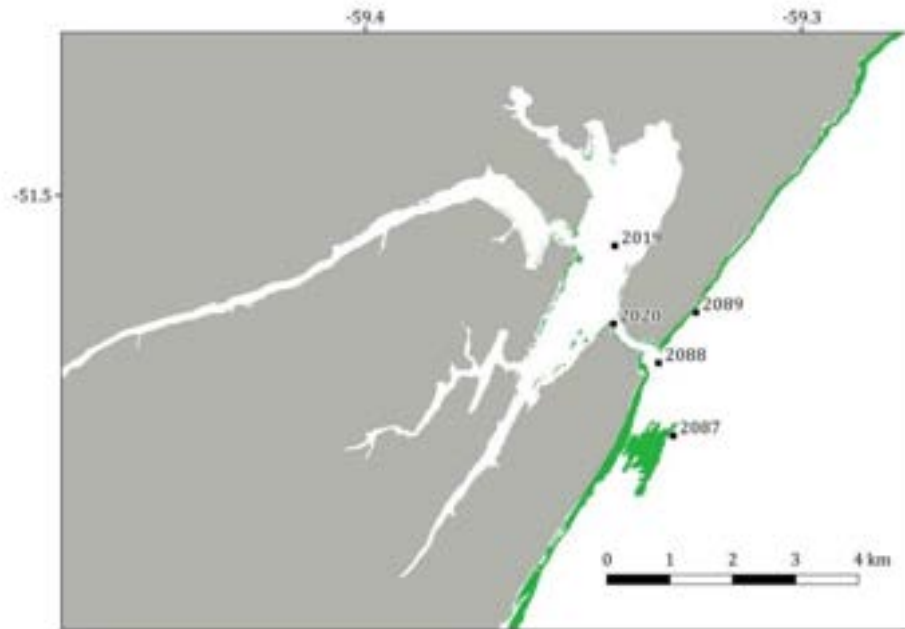
Of the five C-POD units deployed in April 2017, two (units 2087 and 20089) were lost (see section **5**) between the first deployment and the first recovery. The loss of some units was among the assumptions on the original application. Data are therefore available for the three surviving units but which still covered the three distinct habitats of inside, entrance and outside: 2088 - outside canal, 2020 - inside canal, 2019 - inside lagoon (**Figure 19**). These C-PODs recorded data for a total of 14 months from the 16<sup>th</sup> of April 2017 to the 17<sup>th</sup> of June 2018, exactly 423 days (considering only full 24 hours periods) or 10,152 hours. Commerson's dolphin is a Narrow Band High Frequency (NBHF) species and data were filtered accordingly. The detection positive

minute (DPM) meaning the count of any minute with at least one detected NBHF click, was used as the metric for the study of occurrence / attendance.

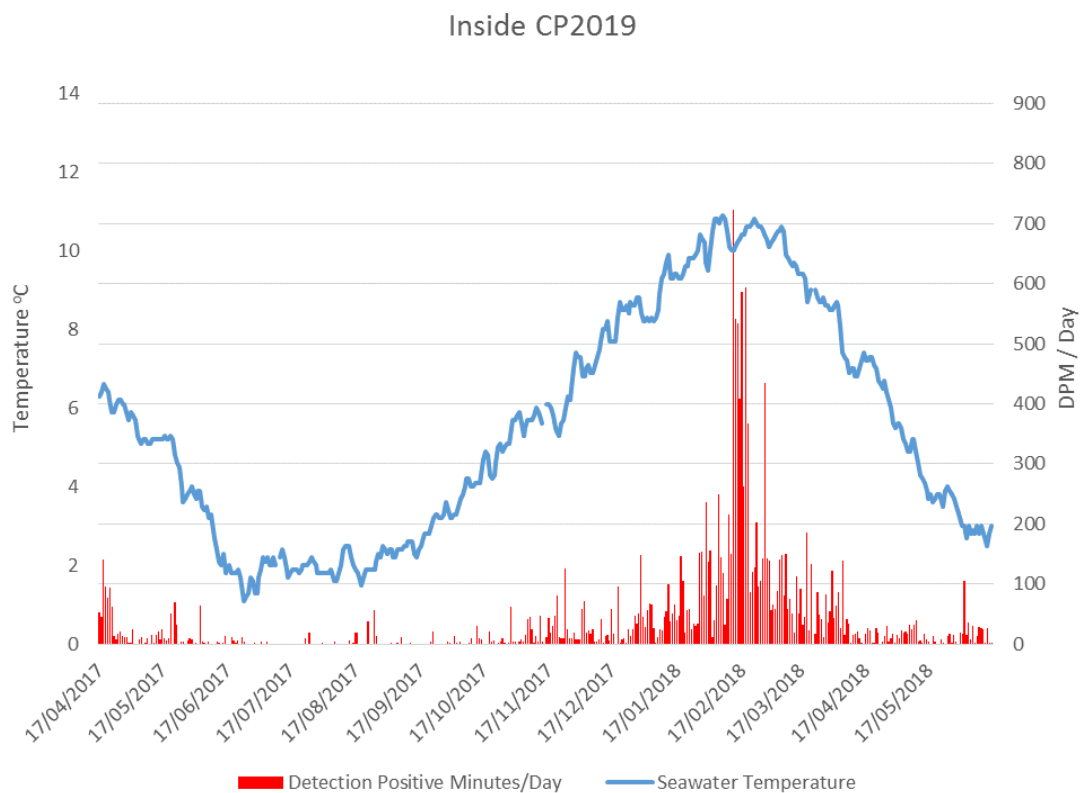
Preliminary results (**Indicator 4.2**) showed that Commerson's were present in all locations with a strong summer peak in summer in occurrence (late December-end of March). In particular, animals seemed to have used the internal lagoon during daylight hours in February-March a period that have been discovered to be the calving peak for the species in the Falkland Islands. The lowest peak was recorded in the winter for all locations and in particularly for the inside lagoon site. In the rest of the year dolphins appear to be present at very low density in the area (**Figure 20**) (**Indicator 4.2**). Diurnal patterns show that animals use the internal lagoon during predominantly daylight hours in February-March, a period that correspond to the reproductive peak for the species, but outwards to outside near-shore areas during the hours of darkness. In the rest of the year dolphins appear to be present at very low density in the area (**Figure 20**) (**Indicator 4.2**). C-pod data has allowed occurrence patterns to be determined over a continuous period at a finer temporal scale than is possible than periodic visual surveys and during the hours of darkness and poor weather. This is complimentary to visual survey data but also extends the understanding, for example showing that summer peaks in enclosed inshore areas relate only to daylight hours (captured and confirmed by the parallel visual surveys) but that there is a diurnal pattern with animals largely absent from these areas during darkness.



**Figure 18** - A. C-PODs anchoring system is set up before the deployment; B. On board of Bill Poole-Evan's (right) boat on the way to deploy the five C-PODs in Many Branch Harbour; C. Marina Costa and Maria Garcia while cleaning and changing batteries to a C-POD unit before the re-deployment; D. The buoys attached to the anchoring system of the C-POD off the entrance to Many Branch Harbour.



**Figure 19** - C-POD positions (black squares) at Many Branch Harbour, West Falkland. Green patches represent kelp forests. The units 2087 and 2089 have been lost during a storm between mid-April and mid-July 2017.



**Figure 20** - Graphs showing the ‘inside lagoon’ C-POD detection per minutes for the 14 months (the other graph are in the report available in Evidence).

*Evidence*

The C-POD reports and the field work reports have been circulated and area available at the project website (<https://www.south-atlantic-research.org/research/dolphins-of-the-kelp/> – see **Annex 4** for the links). Results have been used to review the draft Species Action Plan for cetacean Data Metadata and data have been submitted to the SAERI IMS-GIS Data centre.

## Reference

Kyhn L. A., Jensen F. H., Beedholm K., Tougaard J., Hansen M., and Madsen P. T. (2010). Echolocation in sympatric Peale's dolphins (*Lagenorhynchus australis*) and Commerson's dolphins (*Cephalorhynchus commersonii*) producing narrow-band high-frequency clicks. *Journal of Experimental Biology*, 213(11), 1940-1949.

Munro G.M. (2010). Can static acoustic monitoring with C-PODs be used to study sympatric dolphins? A case study with two species utilising narrow-band high- frequency echolocation clicks, Commerson's dolphin (*Cephalorhynchus commersonii*) and Peale's dolphin (*Lagenorhynchus australis*) in the Falkland Islands. University of Exeter 2010. 44 pp.

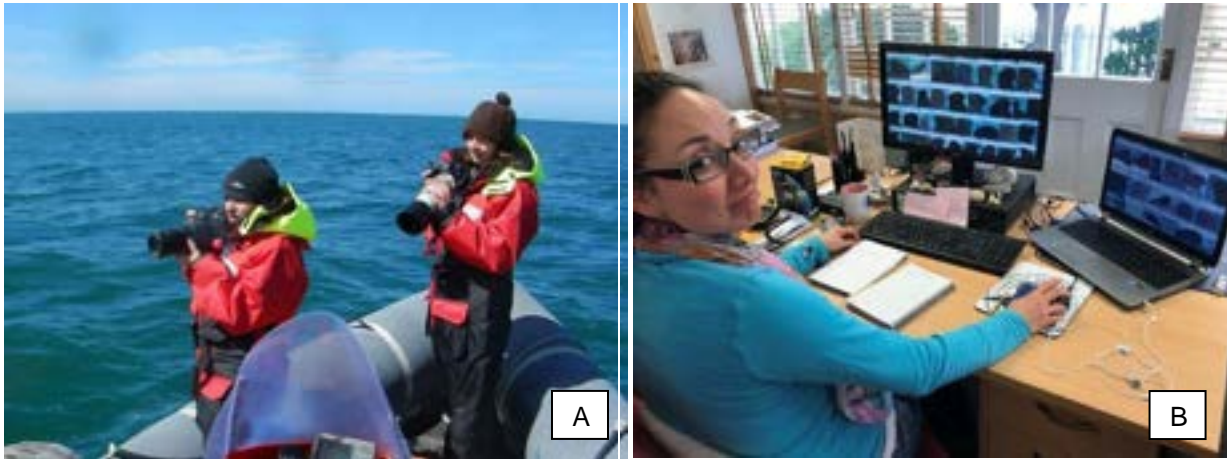
### **Output 5: Photo-identification focal study at 3 focal study sites for residency, dispersal, population structure & recruitment and population estimate. Residency, ranging patterns and spatial scale of movement with reference to susceptibility to localised impacts and appropriate scale of management units.**

Presence of Commerson's and Peale's dolphins at the Falkland Islands was well reported (Otley 2012) but information about the biology and ecology of the species were missing.

This project provided the first data about residency, movement, population structure, and abundance for Commerson's and Peale's dolphins at the Falkland Islands. Photo-identification data (**Figure 21**) were collected during the six surveys in the three areas for all cetacean species encountered (**Indicator 5.2**). A total of 65,326 pictures have been selected for photo-identification work of which 68% (44,238) are of Commerson's dolphins, 26% (17,145) of Peale's dolphins and the remaining are from killer, sei and southern right whales (**Table 1**). The matching processing was finished within the project and the analyses are on-going, therefore results presented here are very preliminary.

**Table 1** - Number of pictures useful for photo-identification taken per each species in each sampling period.

Period	Commerson's	Peale's	Killer w.	Sei w.	Southern R. w.	Minke w.	Total
Nov-Dec 16	10,497	860	0	0	0	0	10,497
Jan 17	3,687	924	145	0	0	0	3,687
Jun-Jul 17	2,514	3,895	0	0	1,361	0	2,514
Nov-Dec 17	9,911	2,542	0	146	0	42	9,911
Feb-Mar 18	13,023	2,358	0	227	0	15	13,023
Jun-Jul 18	4,606	6,566	0	0	2,007	0	4,606
<b>All</b>	<b>44,238</b>	<b>17,145</b>	<b>145</b>	<b>373</b>	<b>3,368</b>	<b>57</b>	<b>65,326</b>



**Figure 21** - A. Photo-identification carried out sea; B. Photo-identification and matching work at the office.

### *Commerson's dolphin*

A total of 720 marked individuals have been identified in the three areas. Of these, 385 (53%) bear enough marking information (highly marked individuals, hereafter called HM) to be used in the analyses (**Figure 23**). The majority of the HM were observed in area C (69%), followed by area A (16%), and area B (14%) (**Figure 17**). Preliminary results showed similar percentage of recaptures of the same HM in the three areas (values ranging from 16% to 20% - **Table 2**). Only 3 individuals have been recaptured between Area A and B. The individual CC0034 in particular, has been captured on the 25/11/2016 in Stanley Harbour William and 11 days later, on the 6<sup>th</sup> of December 2016, off Bertha's Beach. The minimum distance between the two recapturing points was 66 km. This result suggest that Commerson's dolphin range covers relative large areas and animals are quite mobile. There were no recaptures between area A/B and C (**Indicators 5.3** and **5.4**).

**Table 2** - Number and % of high marked individuals (HM) observed in each area in total, once, or more than once.

Area	Total		Sighted once		Sighted more than once	
	Number	%	Number	%	Number	%
A	63	16	51	81	12	19
B	55	14	46	84	9	16
C	267	69	213	80	54	20
<b>Total HMi</b>	<b>385</b>		<b>310</b>		<b>75</b>	

The percentage of unmarked individuals ranged from 50.4% to 51.1% among the areas.

### *Peale's dolphin*

A total of 98 marked individuals have been identified in areas A and B. Of these, 24 (24%) are considered highly marked (HM) and 47 (48%) slightly marked (SM), bearing sufficient information to be identified. The remaining 27 (28%) bear only few marks (PM) and will be excluded by the mark-recapture analyses. Only 3 sightings were made in area B and 2 individuals (one HM and one SM) were identified. There were no recaptures between the two areas. Fifty-two percent of the individuals were recaptured within area A (**Table 3**).

**Table 3** - Peale's dolphins individuals divided by marking category (HM=highly marked, SM=slightly marked, PM=poorly marked) observed in area A and B and recaptured.

Marking code	Number of individuals	Recaptured individuals	
		Number	%
HM	24	16	67
LM	47	26	55
PM	27	9	33
<b>Total</b>	<b>98</b>	<b>51</b>	<b>52</b>

When the project was planned the number of dolphins was unknown and the photo-identification survey design was based on information available in the literature from the same species inhabiting the Patagonian coast. The large number of dolphins encountered and therefore the huge amount of pictures collated was a positive surprise for this project. Due to this large number however, the photo-identification database needed to be re-planned. Dr iLaria Marengo (SAERI's Information Management and GIS Centre Project Manager) and Jorge Batista Echevarria (PB) (SAERI's interim IMS and GIS Centre Project manager) are setting up a new picture database able to manage large quantity of data able to manage the dolphins catalogues (**Figure 22**) (**Activity 5.1** and **5.2**). Very recently the free software FinFindR (<https://github.com/haimeh/finFindR/wiki>) to run the matching automatically has also become available. In the next months, the pictures will be processed with the software to verify if the algorithm works with the target species.



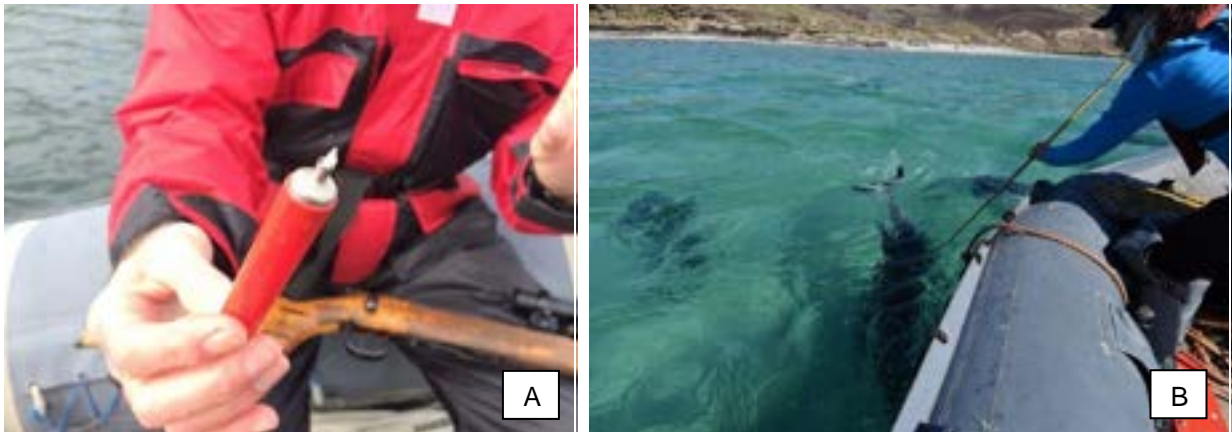
**Figure 22** - An example of the new image catalogue that iLaria is building to manage all images and video collected during research activities.

### Evidence

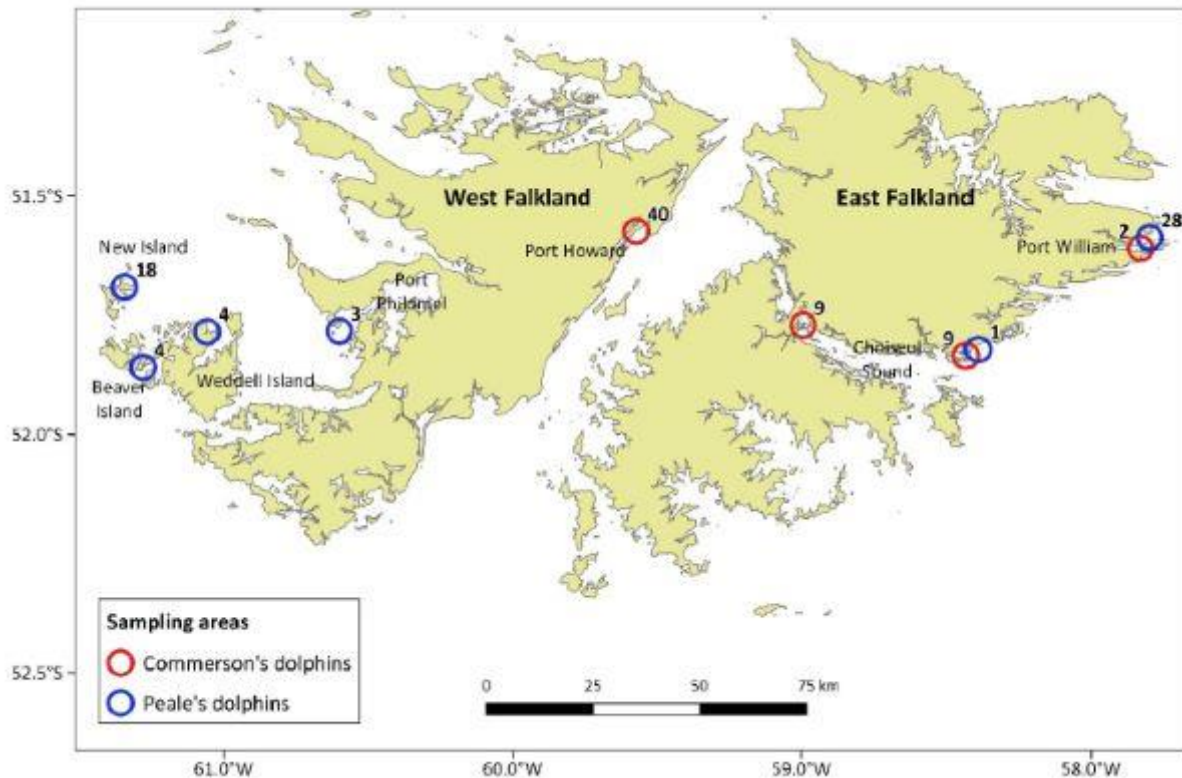
Protocols, field work reports, and photographic catalogues including fins of marked individuals for each species (**Figure 22**) have been circulated and area available at the project website (<https://www.south-atlantic-research.org/research/dolphins-of-the-kelp/> – see **Annex 6** for the link). Preliminary results have been presented during public presentation and used to set up the Dolphins Naming program (see **Output 1**). Results have been used to review the Species Action Plan for cetaceans. Metadata and data (including row pictures, matched pictures, and pictures in the catalogues) have been submitted to the SAERI IMS-GIS Data centre (**Indicator 5.1**). A peer-reviewed publication will be produced including results from **Output 3**.



Dolphins' reaction to the biopsy was considered low. For the Commerson's dolphins, 42% of the individuals sampled showed a 'no or low' reaction and 58% showed a mild reaction (tail flick or quick dive). For the Peale's dolphins, 92% of the individuals sampled showed a 'no or low' reaction and only 8% a mild reaction.



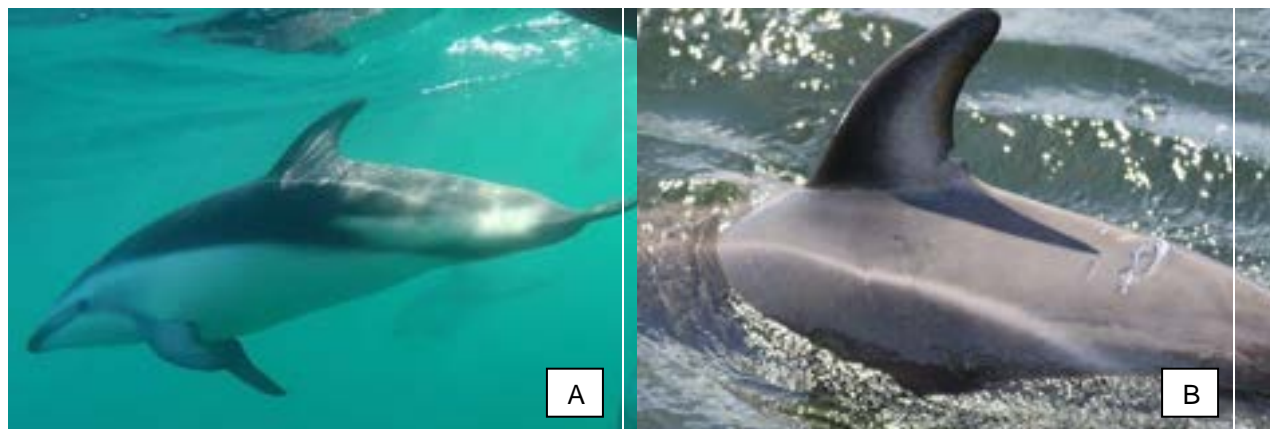
**Figure 24** - A. Scott Baker showing a Commerson's dolphin sample; B. Maria collecting a Peale's dolphin sample.



**Figure 25** - The location and number of genetic samples collected from Commerson's and Peale's dolphin during the 2017 austral summer season in the Falkland Islands.

A Dusky dolphin (**Figure 26**) was repeatedly observed within a group of Peale's in Port William both in 2017 and 2018. Dusky dolphins are known to be present in the Falkland waters but are rarely observed inshore. They are thought to be part of the subspecies *L. o. fitzroyi* inhabiting the South American waters but recent genetic evidence suggests that Peruvian and Patagonian animals should be considered separate subpopulations (Brownell and Cipriano 1999). A skin sample was collected with a biopsy pole by the team and has been sent to the project partner Dr Scott Baker, Oregon State University, for the analyses. The results will contribute to disentangle

the taxonomy of the Dusky populations living in the South Atlantic and South Pacific Ocean' waters off South America.



**Figure 26** – A. Dusky dolphin (*Lagenorhynchus obscurus*) observed within Peale's dolphin in the waters between the mainland and Kidney Island. B. Detail of the dorsal fin. Photos by SAERI.

#### *Evidence*

Field work reports and results (including an abstract to the SOLAMAC conference) have been circulated and are available at the project website (<https://www.south-atlantic-research.org/research/dolphins-of-the-kelp/> - see **Annex 4** for the links). A peer-reviewed publication is being reviewed by the authors and will be submitted to a relevant journal soon. Samples will remain stored at the Hatfield Marine Science Centre, Oregon State University, USA where facilities are more suitable than facilities at the Falklands (**Indicator 6.4**). Genetic metadata were archived at the SAERI IMS -GIS centre; the novel mtDNA haplotypes have been submitted to the international DNA repository GenBank to be available for future research (**Indicator 6.5**).

### 3.2 Outcome

The outcome set up in the original proposal was achieved. Intended indicators and sources of evidence are summarized in **Table 4**.

**Table 4** – Outcome table summarizing the indicators and the source of evidence

Outcome	Measurable Indicators	Source of evidence
Established baseline data on the abundance, distribution, natural history and genetic diversity of the Falklands inshore cetacean populations to provide a scientific basis for conservation and ecosystem-based marine management initiatives.	0.1 Biologically assessed Conservation Status and updated SAP available to ensure population-units have sufficient numbers, geographic distribution, genetic diversity and habitat to provide a stable population.	<p>A new Cetacean Species Action Plan has been developed with the project partners and the Falklands Environmental Officer and Policy Advisor Denise Blake and have been submitted to Denise Blake. It will be presented to the next available Environment Committee Meeting for discussion.</p> <p>The SAP is attached to this report.</p>
	0.2 Prioritised research plan published and available to mesh identified needs for future research and meshing of project data into planning initiatives, EIAs, etc.	The research plan is attached to this report.
	0.3 Project data are held within the South Atlantic Information Management and GIS Centre for inclusion within national planning i.e. Marine Spatial Planning/Ecosystem Assessment.	<p>Data and metadata for all the outputs have been entered in IMS-GIS Datacentre.</p> <p>Search for 'Dolphins of the kelp (DOKE)' for a list of data available in the on-line catalogue at: <a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/07/MetadatalistFK_2018_04_22.zip">https://www.south-atlantic-research.org/wp-content/uploads/2018/07/MetadatalistFK_2018_04_22.zip</a></p>

### 3.3 Long-term strategic outcome(s)

The project results are advancing the worldwide knowledge of cetacean biodiversity, contributing to the fulfilment of the Aichi target 19 of the Convention on Biological Diversity (CBD) as required by the FI Biodiversity Framework 2016-2030.

Aichi target 19 reads: *By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.*

*The key international indicators for this target include: 'the growth in species occurrence records through GBIF' and 'proportion of known species addressed through the IUCN redlist'.*

SAERI has had preliminary discussions with the UK's Joint Nature Conservation Committee (JNCC) around the feasibility of becoming a **GBIF** node. Should these discussions progress, the cetacean data will be fed to GBIF through this process. If these don't progress, it is the intention that the data will be fed directly to GBIF through the SAERI IMS-GIS data centre team. With respect to **IUCN redlisting** - currently, genetic characterization and the abundance estimates provided for the dolphin species by this project are not sufficient to evaluate the subpopulations status against the IUCN Red List Categories and Criteria of the risk of extinction. In fact, information about subpopulation trends are also needed. In the SAP submitted by this project the repetition of the aerial survey has been included as a priority for the next 5 years and will likely provide such information and allow for the Red List assessment of their conservation status.

In the Falkland Islands Policy: **FI Ecoregions, Habitats, Species and Site Strategy 2016-2020**, cetaceans are not listed as vulnerable species. However, the project demonstrated the presence in the Falkland waters of at least three unique dolphin subpopulations (see **Output 6**). The IUCN define subpopulations as 'geographically or otherwise distinct groups in the population between which there is little demographic or genetic exchange'. This new information should be taken into account to review the list of the vulnerable species in the strategy in the future as suggested in the SAP submitted to the Policy Department's Environmental Unit.

Information provided by this Darwin Plus project will be also used to identify the boundaries of some of the **Key Biodiversity Areas**, in particular for the Peale's dolphins that showed high level of residency and recapture rates in particular areas.

The long-term strategic outcomes of the 'Dolphins of the Kelp' project were the robust scientific data on biology, life history, stock identity, abundance, and distribution of several cetaceans inhabiting the coastal waters of the Falkland Islands. The lack of this information, in the past, hampered a local assessment of cetaceans conservation status and the establishment of local conservation programmes. In the most recent 'FI Biodiversity Framework 2016-2030', 'Uncertainty or lack of information' was identified as a cross cutting challenge that if not properly addressed would exacerbate the threats for the Falkland Islands' environment. The information provided by this project will support policy-makers to develop management measures for conservation and to integrate on-going national spatial planning and inshore ecosystem-based fisheries assessment.

There were many opportunities to inform and educate the public, stakeholders and decision makers about the project results and the importance of cetaceans, direct and indirect, in the maintenance of healthy oceans from which the Falklands' people and economy depend. These include steering committee meetings, public presentations, regular discussion with stakeholders, and the participation to the Environment Committee meeting in December 2017 and a meeting in Port Howard where the Falkland Members of the Legislative Assembly (MLAs) were present. The project has thus heightened awareness of cetaceans and results have been integrated into future strategies more fully than before, this ensures a higher profile into the future (see **Output 1**).

The project results were summarized in the updated version of SAP for cetaceans submitted to the Environmental Officer and Policy Advisor of the Falkland Islands Government. The document included a research plan for the future and recommendations about the cetacean role to develop citizen awareness and cultural values toward the importance to preserve healthy marine habitats.

Due to the unexpectedly but welcomed large quantity of novel data provided during the aerial, acoustic, photo-identification, and vessel surveys, the project has generated data surpassing the expectation and that can be considered of high value for money. Six databases have been produced including two navigation databases (aerial- and vessel-based), one photographic database with more than 67,000 pictures and 500 videos of dolphins and whales, one acoustic database with 426 full days of data, one mtDNA haplotype database, and one library based on the open-access program Mendeley including 900 scientific papers and grey literature documents focused on marine mammals. The library is available at the SAERI office.

This project represents good value for money, the details of which are outlined in section 7.2 and section 7.3 with an additional £136,438 (funding and in-kind contributions) generated during the life of the project.

Other aspects of value for money included in-kind time contributions from project partners, stakeholders, and students that were involved in reviewing documents, attending events, presentations and meetings, fieldwork and the photo-identification work (see section 7.3). These activities also assisted in raising the profile of the project, in developing awareness about the importance of preserving healthy marine environments, and in producing benefits in terms of local capacity building.

Finally, the project produced a lot of material including presentation, articles, protocols (see **Annex 4**) that will remain available in the Falklands and for other UKOTs that intend to carry out similar programmes.

## 4 Sustainability and Legacy

The project has a number of achievements that are likely to endure after the project at various levels.

**National Policy framework:** the Species Action Plan is key to the long term sustainability and legacy of the project. Once this has been through its formal consultation and sign of process, it will be part of the Falkland Islands national policy framework. This means that the SAP will then be taken forward by FIG in collaboration with partners, and a more focussed consideration will be given to cetaceans as part of national decision-making.

**Long term availability of new data:** the 'Dolphins of the kelp' has provided a legacy that will endure beyond the end of the project itself. The project is the first long-term cetacean monitoring ever carried out covering all<sup>1</sup> the nearshore waters of the Falkland Islands. The information gathered through the aerial and boat surveys, and the activities of photo-identification, acoustic monitoring and dolphin tissue sampling largely increased the current scientific knowledge about some of the poorest known cetacean's species worldwide (section 3.3). These data have been entered in the IMS-GIS Data centre and will be available post-project to government staff, stakeholders, and researchers.

**Increased public awareness:** several actions were also taken locally to ensure the impact of the project would endure in the future. These included an increase in public awareness through the dissemination of information (presentations in Stanley and Port Howard, newspaper articles, video and photo material posted on Facebook) and family events (where people of all ages were

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<sup>1</sup> All waters within 10km from the Falkland coastline have been surveyed with the exception of Beauchene Island. This remote island is located 54km south east of East Falkland, a distance exceeding the scope of this project.

involved in games/manual activities, i.e. Cetacean Awareness Day, World Ocean Day, Dolphin naming programme), and capacity building through training courses, work experience at the office and practice at sea side by side with the project team. Proof that these activities were successful was the request by many people to join the project as volunteers helping with the endless photo-identification/matching work (**Figure 27**).

**Specialist training:** during the field work activities, local boat skippers and airplane pilots were also trained in cetacean monitoring methods, including safely manoeuvring around animals at sea. The expertise gained will remain in the islands and will be useful for future projects.



**Figure 27** - A. Presentation done at the community center of the Port Howard settlement; B. Connor McLeod, high-school student, helping the team with the photo-identification work.

The protocol and training provided will allow volunteers to continue the collection of dolphin pictures independently after the project ends. Although this activity cannot replace dedicated research, it will help in maintaining the fin catalogues updated.

**New tools:** several tools are going to be developed by Dr iLaria Marengo in cooperation with the University of Dundee, following the project team request. These include a system to manage data, metadata and documents (based on CKAN), a website to report cetacean sightings, and an image catalogue to manage pictures and video.

**New Masters students:** the acoustic data are going to be further analysed by a Marine Mammal Science MSc student at the University of St Andrews and a thesis will be produced on September 2019. SAERI is finalizing the research agreement with the University). Possibly, the master thesis will investigate why Commerson's dolphins use enclosed bays such as Many Branch Harbour during daylight hours in summer. The project has looked at basic occurrence patterns however considerably more information is available within the acoustic data to look at further drivers of occurrence and to investigate not just occurrence but activity through click rates and other acoustic signal parameters.

**Focus for new research:** SAERI is working towards addressing some of the research gaps identified in the research plan as part of its future research initiatives

**Equipment for future projects:** The research equipment (see **Annex 6**) purchased under this Darwin project will remain at SAERI for potential future work on cetaceans or other projects.

The DOKE project manager has continued as a SAERI employee and is now working on the DPLUS 071 Fine scaling the design of Falkland Islands Marine Management Areas (MMAs)

which helps to further ensure that the increased cetacean knowledge generated by the DOKE project will be fed into the wider Falkland Islands MMA process.

## 5 Lessons learned

There are a number of areas of the project that have worked particularly well. The cooperation of the partners, volunteers and the stakeholders was a major key to the success of the project (**Figure 28**), in particular Steve Cartwright (SMSG) and Troyd Bowles (FIGAS).

This Darwin Plus project was a pioneering, large and articulate project and given its dependency on a number of external factors (i.e. site selection was made without a real knowledge of animals' distribution and occurrence, field work was weather dependent and difficult to schedule, etc.), had to be adjustable and adaptable. The quick and strong support received by the Darwin Initiative team, in particular in terms of budget-reallocation and log-frame re-scheduling, allowed the field activities to be carried out in time and in the best way possible contributing to the success of the project.

Nothing really did not work but some lessons have been learned. The initial survey plan was based on little local knowledge about dolphins' distribution and behaviour (e.g. the pilot survey carried out in 2014). With more knowledge, the selection of the sites for fieldwork as well as fieldwork timing might have been done differently. In particular, the aerial survey should have been carried out in the period of January-February instead than later (March-May) and programmed largely in advance to avoid overlapping with other activities, scheduled maintenance, and further equipment to be installed (for example external photo-cameras). Focal surveys also might be re-scheduled including the reproductive seasons (i.e. January for Peale's and February-March for Commerson's as discovered during this project).

Due to the limited resources in term of observation platforms available *in loco*, it is highly recommended that in the future, projects requiring similar infrastructures are planned well in advance to avoid overlapping.

One of the key lessons learnt was around lead in time for recruitment of the team in a remote and logistically challenging areas such as the Falklands (although this issue might be valid for all the other UKOTs). The timing of the recruitment was such that the Project Manager (PM) was recruited to arrive to the Falkland Islands six months into the project schedule. The time-schedule for the arrival of further team members was decided before the PM was in post and therefore project adjustments had to be made around permanence of staff already recruited. Therefore we recommend that in the future, projects on the Falkland Islands should build in a longer lead in time for PM recruitment (c. 6 months), with key project activities and any other recruitment scheduled well after that.

Another issue was the work permit requirement for volunteers without Falklands Permanent Resident Permit (PRP). This system hampered the participation to people willing to be part for a day to the project but unwilling to fill the work permit form and to pay the £23 required. The system was in place to give an advantage to local people over contractors but from our experience it only excluded the participation and therefore the training of more people. This problem was flagged to the EPD and will hopefully be discussed.



**Figure 28** - Some of the many volunteers that provided support to this project.

## 5.1 Monitoring and evaluation

The major changes in the project design were addressed through the Darwin Plus change request system. The key ones being:

- The project required an extension of six months due to the later announcement of funding approval that delayed the recruitment process. A change request was therefore submitted and approved in August 2016. About the staff, the project officer was employed for one year (from the 25<sup>th</sup> of November 2016 to the 24<sup>th</sup> of November 2017) and then short-term project assistants have successfully carried out the field and the office work (**Indicator 1.1**).
- Few changes have characterized this study concerning the platform used, the scheduled time at sea, and the method applied that had implications for logistics, the budget allocation, and staffing. Changes include:
  - Output 2: the platform for the island-wide transect survey was changed from a vessel to an airplane due to the strong animal's attraction to the vessel. The detection of animals prior to any movement in response to the observer is in fact considered an essential assumption to obtain unbiased abundance estimates.
  - Output 3: the 6.5 meters rigid-hulled inflatable boat (RHIB), *Baltic Warrior*, was used for the surveys instead of the smaller and singled engine RHIB proposed in the original application (**Figure 29**). This boat was considered more suitable and for the research and more closely aligned to the UK safety regulations at sea (although these regulations do not apply in the FI). Furthermore, two extra surveys were carried out in the three areas in January 2017 and February–March 2018 using funding through the National Geographic Waitt Grant and saving from the aerial survey.
  - Output 4: two C-POD units of the five deployed were lost. The loss of some equipment was anticipated in the assumptions therefore data collection was not

- compromised. The security of the other C-POD units has been carefully considered to minimize future losses, including different anchoring systems to adopt in the future.
- Output 5: the survey design was modified to better fulfil the photo-identification data collection requirements, including sampling the three locations (Figure 15) three times per year.



**Figure 29** - The RHIB *Baltic Warrior* of the Shallow Marine Survey Group (SMSG) used for the field work.

Changes have been discussed and agreed with the Steering Committee. Documents were available on-line to the committees on the 'Trello' sharing system. This process proved to be useful to assess progress regularly against targets and ensure final deliverables.

The monitoring and evaluation system embedded in the project was practical, as it mirrored the project management system. With a proactive steering committee, there was regular review, advice and regular updates to the Falkland Islands Environment Committee. During the project that has been both internal (via the project steering committee) and external evaluation of the work. The project steering committee has played the role of regularly reviewing the progress, management and outputs of the project (links to the steering committee minutes are available in the **Annex 6**). Individual outputs have been reviewed by wider groups of stakeholders as required – for example the Species Action Plan is a national document and therefore the consultation process for the SAP final sign off will be run by the Falkland Islands Government through its public consultation processes. Scientific papers fit into a different category and are being peer-reviewed through the required paper/journal processes.

These evaluations have been managed by the project manager through a document review and update process, which has been very useful in terms of refining and adapting the key outputs.

## 5.2 Actions taken in response to annual report reviews

Reviewers of the project Annual Report 2017 suggested a *larger stakeholder involvement and the development of a further output making explicit reference to the process and activities associated with ensuring the information produced is used by decision-makers*. We have responded to this issue raised as follows:

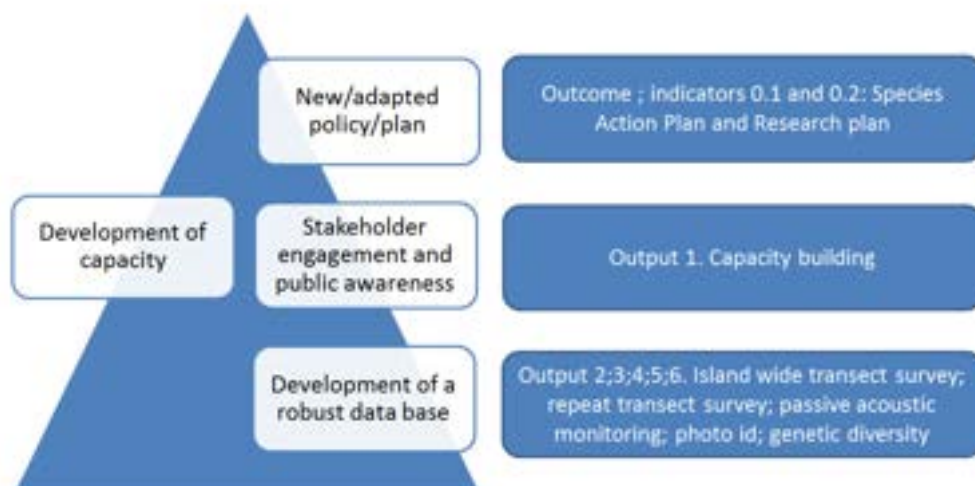
- (1) Increased effort has been put in to engage a wider stakeholder group – the details of these engagements are outlined in section 2 and section 3.1.
- (2) Use by decision-makers is key to the success of the project and some of the projects key outputs are directly linked to decision-making:
  - a. The draft Cetacean Species Action Plan will be taken on board by the Falkland Island Government Environment Adviser (who is a member of the Steering Committee) with a view to it becoming part of the Falkland Islands Government.
  - b. The cetacean research plan will also be taken on board by the Falkland Islands Government Environment Adviser and will be made available to others interested in undertaking cetacean research on the Falkland Islands.
  - c. Evidence gathered by this project will feed into the re-evaluation of Key Biodiversity Areas on the Falkland Islands – an initiative that is being led by Falklands Conservation (another member of the project Steering Committee).

The reviewers also recommended that:

*‘The project should make it more explicit as to how all the outputs will contribute to the outcome by maybe explaining the process which will be undertaken to renew the species action plans which are coming to an end in 2018 and the information provided by this project will be used. If the project’s team will be playing a role towards this under this project they could consider adding another output to track how it is all coming together’.*

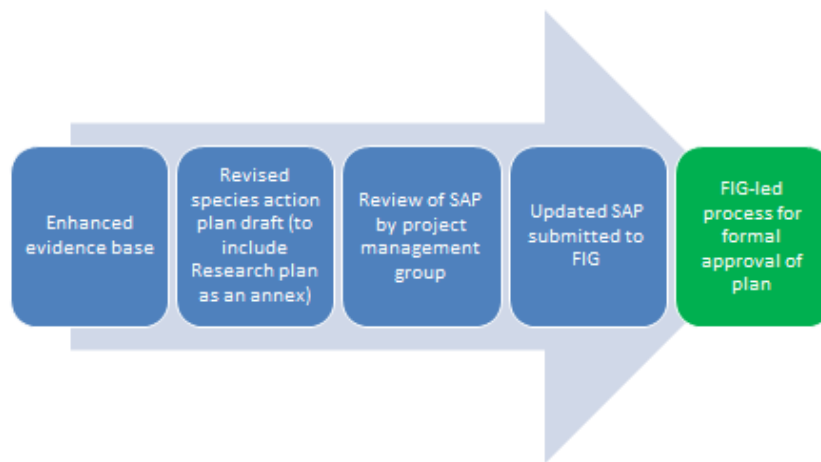
This recommendation was addressed through the provision of additional clarity on the connections and processes as follows:

- As much of the process is embedded in the existing activities, the 7<sup>th</sup> output was not added. Outputs 2-6 provide enhanced evidence base that was instrumental for updating the SAP that was drafted ten years ago based of limited data availability. **Figure 30** demonstrates how the project outputs feed into the outcomes in a Falklands context.



**Figure 30** – Links between project outputs and outcomes.

- In terms of the species action planning process, and the creation of a research plan, in consultation with partners, it has been agreed that the research plan will be separated from the SAP, and will be a stand-alone plan that will provide guidance for potential researchers. The SAP will go through the formal FIG approval process as outlined in **Figure 31** below.



**Figure 31** - SAP process in the Falkland Islands. This project delivered the blue steps and the Falkland Islands Government lead will take the SAP through the formal sign off process post project (i.e. the green step).

In the project Annual Report 2018 reviewer suggested to ‘... *revisit and assess the progress this project has made in supporting this UKOT to meet its commitments to multi-lateral agreements such as the CBD and the Aichi targets to be met by 2020*’.

- This recommendation has been addressed in an earlier section of this end of project report i.e. **3.3** Long-Term and strategic outcomes.

There was also a suggestion about *gauging awareness or what people knew before and after the project using a questionnaire was discussed with partners and stakeholders*.

- Unfortunately a questionnaire had not been issued at the start of the project and therefore there was no baseline against which to measure increase in awareness. In addition there have been other projects that have circulated detailed questionnaires to stakeholders (including the UK government funded CSSF Natural Capital Project) on the Falklands. With such a small population, ‘environmental survey fatigue’ is very real and can potentially result in an ‘inoculation’ against such initiatives. Therefore, organisationally and strategically, taking into account other island-wide processes, an end of project awareness questionnaire wasn’t issued. It was considered a good indicator, and recognised that for future projects, thought on how and when to issue this type of questionnaire should be built into the project monitoring and evaluation planning.

## 6 Darwin Identity

The project has received significant publicity. There have been regular posts on SAERI Facebook and twitter pages, and project videos have been uploaded onto youtube. For example, as outlined in section 3.1 Facebook is a major means of communication among the islanders (especially in

reaching the dispersed rural populations) and posts published were seen more than 5,000 times in total - [https://www.facebook.com/pg/S4ERI/videos/?ref=page\\_internal](https://www.facebook.com/pg/S4ERI/videos/?ref=page_internal).

All activities carried out to publicise the project as well as the material produced (see **Annex 3**) included the clause 28 of the Darwin terms and conditions<sup>2</sup> and the Darwin Initiative logo has been displayed with the funding entity clearly separated from the DOKE project.

During presentations a slide was usually dedicated to the Darwin Initiative (as well as the project partners) as shown in the examples below.



Presentation slide presented at CIEEM Webinar



Poster presented to ECS Conference at La Spezia

For the duration of the project, the Darwin Initiative support was recognised as a distinct project with a clear identity. There is good understanding of the Darwin Initiative in the Falkland Islands as a number of Darwin projects have been hosted here through a number of organisations. Therefore the general population is familiar with the Darwin Plus funding scheme, and with the Darwin logo.

## 7 Finance and administration

### 7.1 Project expenditure

Project spend (indicative) since last annual report	2018/19 Grant (£)	2018/19 Total actual Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs	25,485.11	25,485.11	0	
Consultancy costs	0.00	0.00	0	
Overhead Costs	8,586.84	8,641.83	+1	
Travel and subsistence	1,253.24	1,259.16	0	
Operating Costs	6,432.13	6,682.13	+4	
Capital items	0.00	0.00	0	
Others	4,235.33	3,854.76	-9	
<b>TOTAL</b>	<b>45,992.67</b>	<b>45,922.99</b>		

<sup>2</sup> The grantee is required to acknowledge **when publicising the work programme**, in reports etc., that it has been grant aided by the Darwin Initiative through UK Government funding and to use the Darwin Initiative logo wherever possible. In addition, project leaders are expected to advise the Department about any UK media/news stories before they are published. Where part of a larger programme, a Darwin project should be easily identifiable. Profile is important to the future of the Darwin Initiative.

<b>Staff employed (Name and position)</b>	<b>Cost (£)</b>
Marina Costa – Project Manager	£20,289.11
Marcello Cazzola	£5,196.00
<b>TOTAL</b>	<b>£25,485.11</b>

<b>Consultancy – description of breakdown of costs</b>	<b>Other items – cost (£)</b>
NA	£0.00
<b>TOTAL</b>	<b>£0.00</b>

<b>Capital items – description</b>	<b>Capital items – cost (£)</b>
NA	£0.00
<b>TOTAL</b>	<b>£0.00</b>

<b>Other items – description</b>	<b>Other items – cost (£)</b>
Support for statistical analyses	2,500.00
External Hardware to transfer large quantity of data to UK 2TB	95.99
External Hardware to transfer large quantity of data to UK 1TB	54.00
Material for GO-PRO	21.90
Material for GO-PRO	10.95
Material for GO-PRO	39.96
Material for GO-PRO	39.99
Awareness material printed	340.00
Cables ties	2.94
Pole to support the GO-Pro	2.25
Duct tape plus other small material for field work	10.80
Material for genetic (foil, lighters, etc.)	4.18
Batteries	10.47
CITES permit for Dusky sample	22.13
Genetic Analyses	699.20
<b>TOTAL</b>	<b>3,854.76</b>

## 7.2 Additional funds or in-kind contributions secured

<b>Source of funding for project lifetime</b>	<b>Total (£)</b>
FIG	10,000
Dr A. Stanworth (FC CO)	1,200
L. Milston (FC community officer)	920
Dr P. Brewin (SMSG)	2,120
G. Munro (Austral Biodiversity)	3,500
Prof Scott Baker (OSU)	6,750
Dr S. Heinrich (University of St Andrews)	12,000
Dr P. Brickle (SAERI director)	5,304
Dr I. Marengo (SAERI ISM-GIS Datacentre project manager)	7,094
Premier Oil – Loan of acoustic material	14,000
FC – Loan of acoustic material	12,930
OSU – loan of sampling material (rifle)	1,600
University of St Andrews – Loan of material (large binocular)	6,000
Royal Navy – Provided satellite phone for field work at sea (83 days)	900
Royal Navy – Provided trip to South Georgia to PM and PO	20,000

BAS – Loan of sampling material (net)	350
Consolidated Fisheries Ltd and Martech Falkland Ltd – Donation of anchoring material	1,200
Primary School students	70
Marcello Cazzola (in kind 7 months part time – about £800 per month)	5,600
Emmaleigh Middleton (in kind 2 months part time – about £800 per month)	1,600
Amy Guest (in kind 4 months part time – about £800 per month)	3,200
Jess Whalley-King (in kind 2 weeks full time - about £800)	800
Mick Jervois (in kind 1 month part time - about £800)	800
Other 30 volunteers (24 hours x 30 people x £15 per hour)	10,800
National Geographic Waitt Grant awarded to Scott Baker (US\$10,000)	7,700
<b>TOTAL</b>	<b>136,438</b>

### 7.3 Value for Money

The project can be considered good value for money. As evidenced in section 7.2, £136,438 of additional funding/in-kind contribution was sourced during the life of the project. Some specific examples of how the project delivered good value for money are presented here.

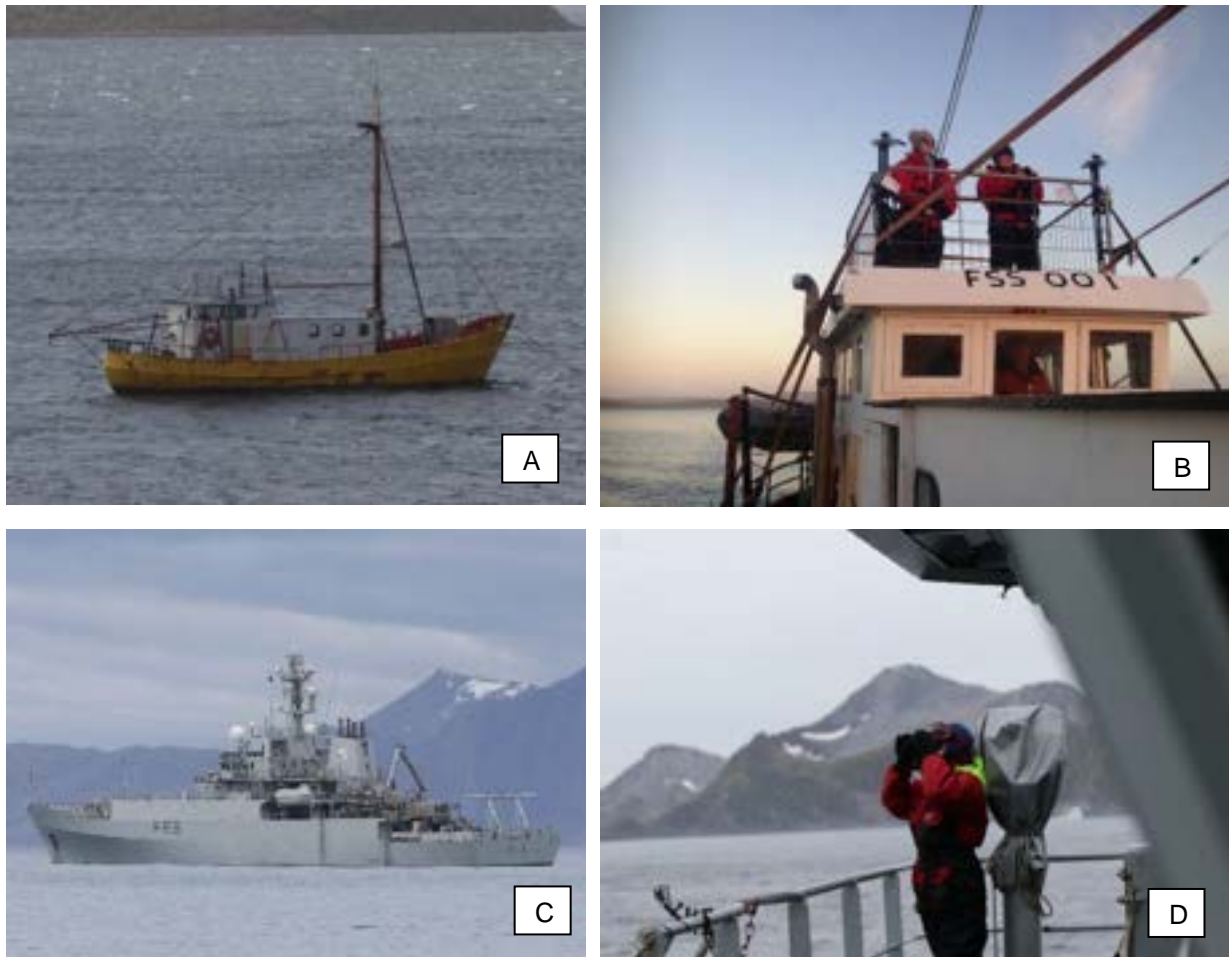
**Example 1:** The project delivered **three extra surveys (Figure 32)** for a total value of about £25,000 (see section 7.2 for details), including:

1. South Georgia trip on board of the HMS Enterprise of the Royal Navy (see Section 2 – Royal Navy).
2. The *Condor* survey (see section 5.1) in the wester waters of the archipelago. Estimated extra value: £2,500.
3. The genetic survey (see Section 3.1 - **Output 3 and 6**).

See **Annex 4** for the links to the documents produced from these surveys.

**Example 2:** Savings from the aerial survey also allowed an **extra focal survey** to be carried out in February-March 2018 (see **Output 3**). This survey was carried out in the period corresponding to the reproductive peak for Commerson’s dolphins and allowed important observations about the ecology of the species (see **Output 3 and 4**).

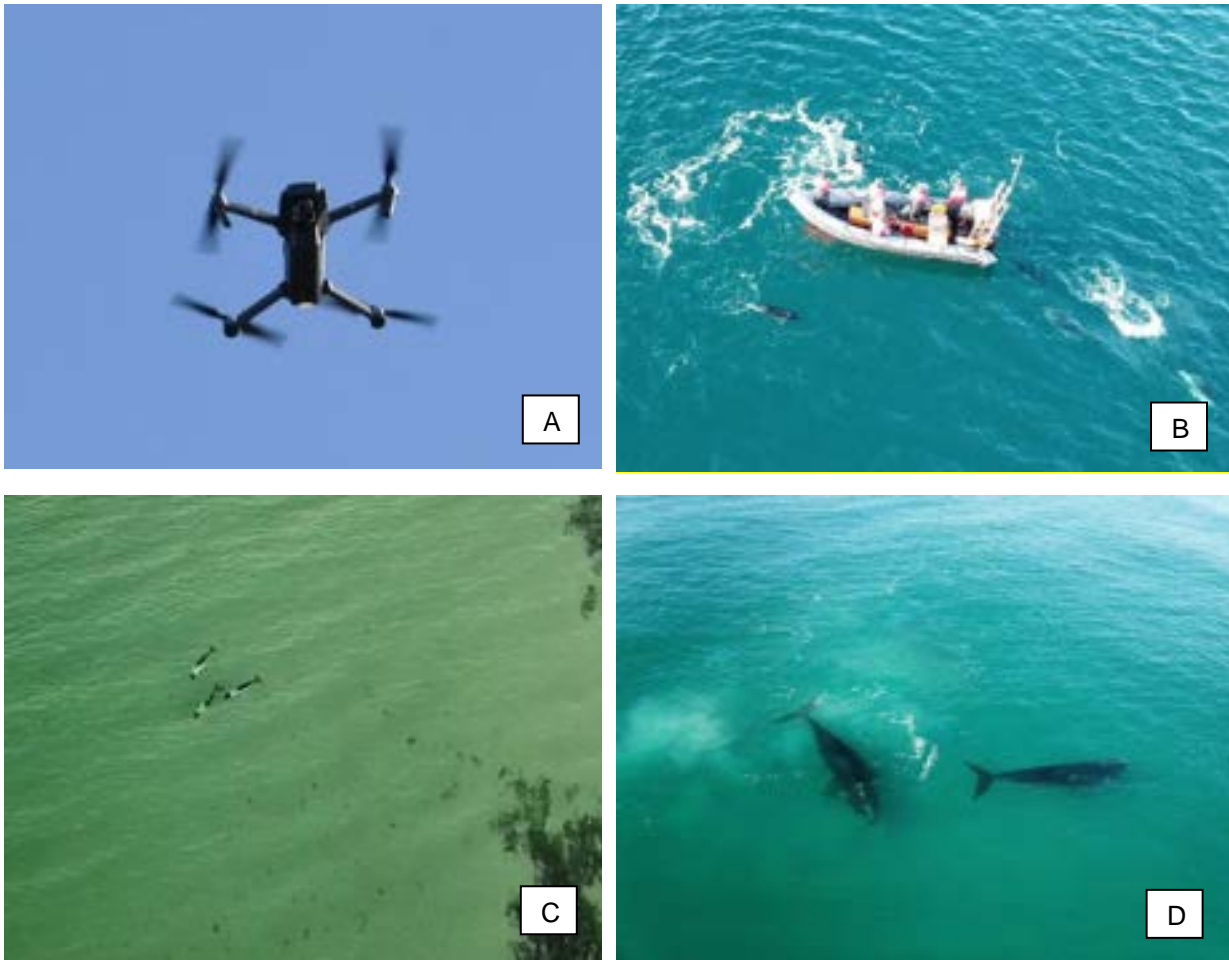
**Example 3:** Field work was carried out with cost saving having care to buy less-processed and therefore cheaper food that allowed a saving of about £80 per survey for a total of £480 that were used for **extra time at sea**. The participation to the conference in Italy, homeland of the project manager, also allowed saving for the hotel and meals costs (£450).



**Figure 32** - A. The vessel *Condor* used for the survey in the west; B. Observers on the *Condor* roof; the *HMS Enterprise* of the Royal Navy in South Georgia; D. Maria looking for whales on the upper deck of the *HMS Enterprise*.

**Example 4:** Due to the change of platform for the wide-island survey from a vessel to an aircraft (see section 5.1) a **small pilot project was developed** with the aim to use a drone to estimate the diving time of dolphins (**Figure 33**). One of the disadvantages of the aerial survey is that due to the high speed of the survey platform, availability of animals at the surface is usually low. To address dolphin availability, meaning the percentage of time dolphins are visible at surface (or just below), observation from land was carried out unsuccessfully. Dolphin availability will provide a factor to correct upward the animal abundance estimated in **Output 2** (Section 3.2). The use of a drone to estimate dolphin availability was discussed and approved by the steering Committee and results until now have been positive. A total of 110 minutes have been recorded with several groups of Peale's dolphins (group size ranging from 2 to 6). Only 20 minutes were recorded with Commerson's dolphins due to their low abundances in areas nearby Stanley. Data collection will be carried out after the end of the project to allow scalable post-hoc correction.

The value of this project in terms of cost and time was estimated around £3,000



**Figure 33** - A. The DJI Mavic Pro drone used to estimate the diving time of the dolphins; B. Peale's dolphins around the zodiac during a focal survey; C. Commerson's dolphins along the coast; D. Encounter with southern right whales at Volunteer Point in the winter of 2018.

# Annex 1

Project's original (or most recently approved) logframe (if your project has a logframe), including indicators, means of verification and assumptions. N.B. Insert your full logframe. If your logframe has changed since your application and was approved by a Change Request the newest approved version should be inserted here, otherwise insert the logframe from your application. If your application's logframe is presented in a different format in your application, please transpose into the below template. Please feel free to contact [Darwin-Projects@ltsi.co.uk](mailto:Darwin-Projects@ltsi.co.uk) if you have any questions regarding this.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p><b>Impact:</b> Inshore marine resources, habitats and species of the Falkland Islands are managed on a sustainable basis within an ecosystem based planning approach that ensures the long-term maintenance of biodiversity.</p>			
<p><b>Outcome:</b> Established baseline data on the abundance, distribution, natural history and genetic diversity of the Falklands inshore cetacean populations to provide a scientific basis for conservation and ecosystem-based marine management initiatives.</p>	<p>0.1 Biologically assessed Conservation Status and updated SAP available to ensure population-units have sufficient numbers, geographic distribution, genetic diversity and habitat to provide a stable population.</p>	<p>0.1 Submission of provisional SAP to FIG Environmental Planning Committee (FIG EPD) with baseline data appendix to Species Action Plan.</p>	<p>0.1 Outputs 2-6 provide sufficient timely data to inform on conservation status. Local stakeholders engage in SAP drafting for which focussed meetings and tele-conferencing of external stakeholders has been accounted for in budget. Annual scheduling of committee meeting dates is currently unknown and hence final approval may fall outside project completion dates however once entered into the approval process the draft SAP should progress with FIG and SAERI permanent staff.</p>
	<p>0.2 Prioritised research plan published and available to mesh identified needs for future research and meshing of project data into planning initiatives, EIAs, etc.</p>	<p>0.2 Prioritised research plan submitted to FIG EPD along with SAP.</p>	<p>0.2 As above.</p>
	<p>0.3 Project data are held within the South Atlantic Information Management and GIS Centre for inclusion within national planning</p>	<p>0.3 Data received and meta data catalogue updated accordingly by SAERI IMS &amp; GIS centre.</p>	<p>0.3 None as funding and personnel are confirmed through MoU with FIG.</p>

	i.e. Marine Spatial Planning/Ecosystem Assessment		
<b>Output 1. Capacity Building for cetacean research.</b>	<p><b>Staff</b> 1.1 x2 Project Staff employed and in place by 20<sup>th</sup> October 2016 for 2 years.</p> <p><b>Volunteers</b> 1.2 Volunteer database with 20 names held within FC &amp; SAERI specific to scientific field work with capacity for maintenance.</p> <p>1.3 x10 local volunteers provided with training in cetacean ID, survey methodology, distance estimation, safe boat operations, HSE (through classroom introduction and field work teaching component) and partake in survey.</p> <p>1.4 Established protocols for x2 per annum volunteer-ship interns from external bodies and partner organisations (during programme and a new personnel resource for the future).</p> <p>1.5 x1 central communal store of cetacean survey and volunteer safety equipment established sufficient for 6 person survey teams for current and future research.</p>	<p><b>Staff</b> 1.1 Contract of employment with SAERI.</p> <p><b>Volunteers</b> 1.2 Volunteer database on SAERI mainframe with maintenance included in staff job description / contract (Office Administrator).</p> <p>1.3 Training course attendance and feedback forms recorded from attendees, field survey log.</p> <p>1.4 x2 interns present within Falklands during 4 month field season and on SAERI records and volunteer insurance.</p> <p>1.5 Inventory of central store and equipment available for cetacean research held by SAERI &amp; FC.</p>	<p><b>Staff</b> 1.1 Project partners assist in recruitment and vetting in timely manner to ensure qualified staff with capacity to train others.</p> <p><b>Volunteers</b> 1.2 Assistance and coordination with FC (project partner) to share and coordinate existing volunteer register and capacity. Targeted recruitment to those with biological experience within islands.</p> <p>1.3 Training will be coordinated with FC to obtain synergy with sei whale project and maximise numbers and availability.</p> <p>1.4 Effective promotion and recruitment with partner organisation and others. Has been discussed and potential confirmed during project planning.</p> <p>1.5 Access to be shared between SAERI &amp; FC of project capital equipment and coordinated.</p>

	<p><b>Awareness</b></p> <p>1.6 Cetacean ID resources distributed to lodges and operators (x20) and available on-line and downloaded (x30 times).</p> <p>1.7 Web resources available on-line for cetacean ID, volunteer protocols, non-technical general interest articles &amp; project outputs and accessible by volunteers and community (x visits / month).</p> <p>1.8 Published 4 articles in local media and 1 television news segment on Falklands news during project.</p>	<p><b>Awareness</b></p> <p>1.6 Print shop distribution and web-page statistics.</p> <p>1.7 Web-page, blog and facebook page statistics</p> <p>1.8 Copy of news articles within local media.</p>	<p><b>Awareness</b></p> <p>1.6 The draft cetacean-ID guide proved popular during the pilot study and upgraded version will be promoted and distributed.</p> <p>1.7 Web-page set up to record statistics and updates linked to Falklands community news pages.</p> <p>1.8 None - during the pilot survey high levels of interest were shown by all media outlets representing a high level of community interest and engagement.</p>
<p><b>Output 2.</b>  <b>Island-wide Transect Survey</b>  <b>Island-wide population estimate and species distribution maps for Commerson's dolphin, Peale's dolphin and sei whale and model of abundance.</b></p>	<p>2.1 60 day island-wide vessel based transect survey undertaken and completed by April 2017.</p> <p>2.2 Island-wide population estimate and distribution maps for Commerson's dolphin, Peale's dolphin and sei whale published by July 2017 and available to stakeholders and FIG EPD.</p> <p>2.3 Environmental and habitat covariant model of abundance at island-wide scale published by July 2017 and available to stakeholders and FIG EPD.</p>	<p>2.1 Daily operation production report submitted to PMS immediately post survey.</p> <p>2.2 Receipt from FIG EPD.</p> <p>2.3 Receipt from FIG EPD.</p>	<p>2.1 Vessel availability has been confirmed but as there are few alternatives early confirmation of a replacement will allow scheduling and minimise any maintenance risks in advance of survey. Weather downtime allowance has been incorporated in duration.</p> <p>2.2 Pilot survey has defined sampling effort and protocols to ensure statistically robust results.</p> <p>2.3 Sufficient animals and covariates collected for analysis. Pilot study determined encounter rate and sampling based upon this.</p>

	2.4 Data available to marine planning and EIA assessments.	2.4 Receipt and meta data from SAERI IMS & GIS centre.	2.4 None as funding and personnel are confirmed through MoU with FIG.
<b>Output 3. Repeat transect focal study at 3 focal study sites. Data on finer-scale spatial drivers of distribution, seasonal occurrence and key habitats.</b>	3.1 Field survey undertaken at 3 focal study sites during summer and winter periods (Nov/Dec 2016; Jun/Jul 2017, Nov/Jan 2017/18).  3.2 Data on habitat association and key habitats for protection presented at completion of project.  3.3. Data on seasonal patterns of occurrence between summer and winter survey periods presented at completion of project.	3.1 Daily operation production report submitted to PMS immediately post field survey work.  3.2 Receipt from FIG EPD. Receipt and meta data from SAERI IMS & GIS centre.  3.3 Receipt from FIG EPD. Receipt and meta data from SAERI IMS & GIS centre.	3.1 Pilot project results allow definition of sample sites in first year with additional sites determined after island-wide survey. Weather downtime has been allowed for in survey periods. Sites selected to minimise weather/sea-state impacts. Vessel attraction may influence results however a number of alternative sampling regimes are available to reduce influence and will be confirmed and applied. Winter work will be of lower effort. Day-length and weather conditions have been allowed for.  3.2 & 3.3. None as funding and personnel are confirmed through MoU with FIG
<b>Output 4. Passive acoustic monitoring focal study at one of the focal study sites. Data on temporal drivers of distribution and seasonal sensitivity.</b>	4.1 C-Pod PAM units (x7) deployed at 1 site for 18 months.	4.1 Survey log submitted to PMS and deployment periods detailed in final report submitted to FIG EPD.	4.1 Loss of some units would limit the level of data but not preclude analysis. Pilot survey has modified moorings to reduce kelp fouling and no units have been lost. Winter conditions may limit winter servicing however flexibility in deployment periods allow scheduling for vessel availability and weather.

	4.2 Analysis of temporal occurrence by habitat type and temporal drivers (season, month, diel and tidal) presented by recorded attendance.	4.2 Receipt from FIG EPD. Receipt and meta data from SAERI IMS & GIS centre.	4.2 None as funding and personnel are confirmed through MoU with FIG.
<b>Output 5. Photo-identification focal study at 3 focal study sites for residency, dispersal, population structure &amp; recruitment and population estimate. Residency, ranging patterns and spatial scale of movement with reference to susceptibility to localised impacts and appropriate scale of management units.</b>	5.1 Centralise photo-ID database established on the islands with SAERI IMS & GIS centre.  5.2 Photo-ID conducted at 3 distinct sites over 2 summer seasons and 1 winter period.  5.3 Spatial ranging analysis of ranging patterns of same animal sightings.  5.4 Mark-recapture population estimate for dolphin populations at focal study sites.	5.1 MoU internally within SAERI for provision of database.  5.2 Photos entered on populated database at SAERI with statistics on entry numbers.  5.3 Receipt from FIG EPD. Receipt and meta data from SAERI IMS & GIS centre.  5.4 Receipt from FIG EPD. Receipt and meta data from SAERI IMS & GIS centre.	5.1 Internal agreement between project staff and SAERI.  5.2 Not all dolphins need be identifiable. Analysis of photos suggests sufficient numbers of Commerson's, with lesser number of Peale's, will be identifiable to provide for analysis. 5.3 & 5.4 None as funding and personnel are confirmed through MoU with FIG.
<b>Output 6. Genetic diversity focal study at 2 of the focal study sites Population identification between South American conspecifics and potential sub-populations within the Falklands. Defining scale of management units</b>	6.1 Biopsy collection conducted at 2 sites in first year to target 50 samples.  6.2 Training in biopsy sampling given to x2 project staff and x2 volunteers.  6.3 Report and interpretation of results detailing genetic separation of populations from South America and Kerguelen Islands, and the degree of internal genetic separation into Falklands sub-	6.1 Field report detailing any reactive reactions submitted to FIG EPD.  6.2 Training feedback forms collated.  6.3 Receipt from FIG EPD.	6.1 Allowance made for weather downtime and if unable to collect during first sampling period training will be given to local operatives for continuation during focal studies.  6.2 Dates scheduled in advance to confirm volunteer availability. Project staff will be given experience and can subsequently assist with training.  6.3 Sufficient sample sizes obtained (see above)

	<p>populations between sampled sites.</p> <p>6.4 Physical samples held and available for potential future studies and analysis (including natural isotopes, contaminants, etc.).</p> <p>6.5 Genetic sequencing held in digital archives and nationally and internationally within Open access databases (e.g. GenBank) .</p>	<p>6.4 Receipt of storage.</p> <p>6.5 Final data archived with international digital repository ie GenBank with receipt and access. Receipt and meta data from SAERI IMS &amp; GIS centre.</p>	<p>6.4 Final decision to be taken on whether sample security and ease of access for study is best met by storage in Falklands or alternative facility to encourage these additional analyses.</p> <p>6.5 International storage is standardised and available being encouraged by peer review journal whilst national storage is confirmed through MoU with FIG.</p>
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**Activities** (each activity is numbered according to the output that it will contribute towards, for example 1.1, 1.2 and 1.3 are contributing to Output 1)

**1.0 Capacity Building & Awareness for Cetacean Research**

1.1 Steering group formed from Partners, MoU signed detailing roles and responsibilities.

1.2 Project Manager (PM) & Project Officer (PO) job descriptions finalised by Steering Group and advertised internationally (partners assisting in recruitment publicity and applicant vetting).

1.3 PM and PO recruited through interview, appointed, if not local relocate to Falkland Islands (allowance has been made for recruitment advertising, telephone interviews and relocation allowance / flights).

1.4 Current FI equipment and resources for cetacean survey assessed and resources compiled (what, who and where) with lacking equipment sourced through in-kind partner loan or sourced, purchased and freighted for project. Allowance has been made for ordering and freight times to the Falklands.

1.5 Current equipment located in central pooled store and inventoried equipment list held. Where central pooling is unfeasible (zodiac & RIB) agreement signed with partner/owner for availability .

1.6 Volunteer database established and maintained in partnership with Falklands Conservation (FC), public media announcement and focussed targeting of personnel with biological training such as at FIG fisheries department. During the summer period in Falklands availability may at times be difficult and allowance is made for use of x2 interns to form the core of the volunteer group. Strong liaison with FC established in recruitment and training to mesh with potential parallel study on sei whales.

1.7 Volunteer training resources established including cetacean ID guide, step-wise survey protocols, safe boating practises, HSE guidelines – provided and available in printed format and on-line.

1.8 Training given to x10 local volunteers incorporating class-room taught introduction and field-example at local location. Experience and instruction given in distance estimation.

1.9 Volunteer intern recruitment established with academic partners with capacity for x2 intern positions per annum / field season.

1.10 Volunteer intern recruitment and arrival.

1.11 Project web-page creation with on-going maintenance to include monthly update with general interest progress article, field blogs and final posting of project outputs. During periods of field survey at remote sites update may be limited but blog progress will be posted when available to provide community update.

1.12 Regular update of local media with non-technical summary of activities and findings to promote project and awareness of inshore cetaceans. Penguin News (local newspaper) and FITV (local television station).

1.13 Cetacean ID guide, summary project data and vessel procedures shared with FC to incorporate outreach to nascent cetacean watching enterprises and viewing clients to increase profile and understanding of inshore cetaceans.

## **2.0 Island-wide Transect Survey**

2.1 Review and collation of all extant data-sources on inshore cetaceans from disparate sources with archiving in one central location, secured within SAERI IMS & GIS centre.

2.2 Vessel availability and dates confirmed at earliest opportunity. A suitable vessel has been confirmed in planning however alternative vessels are limited and early confirmation will ensure vessel availability and that any maintenance periods are conducted in advance of requirements.

2.3 Review and design confirmation of island-wide transect survey based upon pilot survey results. Design and procedures signed off by steering group.

2.4 Survey execution plan and logistics including personnel, resources, timings, data collection protocols and HSE risk assessments and safe-working practises. Work practises and HSE applicable to the conditions of the Falklands and of sufficient standard to meet responsibilities to volunteers and academic institutions.

2.5 60 day island-wide survey conducted in Feb/Mar 2017 to best coincide with seasonal sei whale occurrence inshore to maximise the ancillary benefits of the survey beyond the focal species of Commerson's dolphin and Peale's dolphin.

2.6 Analysis of results and publication of findings (Apr – Jul 2017).

2.7 Final report circulated to all local stakeholders and FIG EPD.

2.8 Storage of data and preparation of meta-data files with SAERI IMS & GIS centre.

## **3.0 Repeat Transect Surveys at 3 focal study sites**

3.1 Selection of 1 primary site and 1 secondary site for focal study in Year 1 based upon the results from the Darwin pilot study. A further 1-2 sites will be defined in Year 2 subject to the findings of the island-wide survey conducted in the first summer field season.

3.2 Design of repeatable focal area transect surveys and sampling protocol. Signed off by peer review of steering group.

3.3 Fieldwork execution plan including personnel, resources, accommodation, timings and bookings, data collection protocols, HSE risk assessment and safe-working practises for all components of focal study. Work practises and HSE applicable to the conditions of the Falklands and of sufficient standard to meet responsibilities to volunteers and academic institutions.

3.4 Field based study in year 1 at primary site and reduced effort at secondary site to encompass x2 summer seasons (2 months each ) and x1 winter season (reduced sampling dependent upon weather). See timeline for clarity. Sufficient field data collection periods have been planned for to allow for weather conditions limited survey with weather downtime. Sites will be chosen to minimise the influence of weather by allowing survey in different zones depending upon wind direction. If severe

attractive motion of dolphins to the survey boat platform occurs limiting the validity of habitat association survey will be supported by shore based observation and theodolite tracking which has the same resource cost.

3.5 Identification of additional focal sites for Year 2 – sampling in Year 2 will be repeated at the primary and secondary sites determined within Year 1, but survey will be extended to additional sites in Year 2 if required. Additional sites only survey in the second year. See timeline for clarity.

3.6 Collation and data analysis of results detailing patterns of occurrence, seasonality, level of association to habitats and identifying key habitats for protection.

3.7 Final report circulated to all local stakeholders and FIG EPD.

3.8 Preparation of meta-data files, submission and archiving of data in secure storage with SAERI IMS & GIS centre.

#### **4.0 Passive Acoustic Monitoring**

4.1 Selection of 1 focal study site (primary or secondary site determined in 3.1) for (x7) C-pod deployments in varying water depths and habitats for 18 month period.

4.2 Servicing of C-Pods on 4 month deployment schedule. Flexibility in deployment duration will assist in ensuring vessel availability for servicing visits.

4.3 Analysis of temporal occurrence by habitat type and temporal drivers (season, month, diel and tidal). Loss of 1 or 2 units would limit but not preclude analysis. The pilot survey has field trialled different mooring configurations to remove kelp fouling issues and no units have been lost.

4.4 Define periods of increased utilisation and seasonal sensitivity for susceptibility to risks and for EIA.

4.5 Final report circulated to all local stakeholders, FIG EPD and PMS.

4.6 Data submitted and data receipt from SAERI IMS & GIS centre.

#### **5. Photo-identification study for residency, dispersal, population structure & recruitment and population estimate.**

5.1 Establish Photo-ID & fin database. Unpopulated database established within SAERI.

5.2 Photography during survey, processing and archived GIS geo-tagged images to ID / GIS databases. Populated database held at SAERI. Assumes sufficient weather and boat conditions for photography. Weather downtime accounted for in planning.

5.3 Spatial analysis of ranging patterns of same animal sightings.

5.4 Mark-recapture population estimate for dolphin populations at focal study sites.

5.5 Final report circulated to all local stakeholders, FIG EPD and PMS.

5.6 Data submitted and receipt from SAERI IMS & GIS centre.

#### **6. Genetic diversity**

6.1 Training visit of experienced biopsy darter (x6 local people trained).

6.2 Collection of small biopsy samples in conjunction with focal studies in Year 1 at primary and secondary focal study sites. Sufficient weather and boat conditions for collection of biopsy samples mitigated by accounting for weather downtime in planning. Dependent upon permit for collection of biopsy samples from Environmental

Planning Office, Government of the Falkland Islands. This is currently in review and FIG have been fully included in the design of the current project from conception and is supportive of it.

6.3 Field collection report on any reactive behaviours.

6.4 Laboratory Analysis of Samples at Oregon State University.

6.5 Report and interpretation of results detailing genetic separation of Falkland populations from South America and Kerguelen Islands, degree of internal genetic separation within Falklands sub-populations.

6.6 Final report circulated to all local stakeholders, FIG EPD and PMS.

6.7 Data submitted and receipt from SAERI IMS & GIS centre.

6.8 Return and archiving of physical samples for potential future studies and analysis (including natural isotopes, contaminants, etc.) Final decision to be taken on whether sample security and ease of access for study is best met by storage in Falklands or alternative facility.

6.9 Genetic digital sequencing data archived with international repository, e.g. GenBank.

## Annex 2 Report of progress and achievements against final project logframe for the life of the project (if your project has a logframe)

Project summary	Measurable Indicators	Progress and Achievements for the life of the project
<p><b>Impact:</b></p> <p>Inshore marine resources, habitats and species of the Falkland Islands are managed on a suitable basis within an ecosystem based planning approach that ensures the long-term maintenance of biodiversity</p>		<p>The novel information provided that this project (e.g. stock identity, abundance estimate, and distribution) contributed to a better knowledge of the regional and global biodiversity and will allow decision makers to develop efficient strategy for the management of species and sites.</p>
<p><b>Outcome</b></p> <p>Established baseline data on the abundance, distribution, natural history and genetic diversity of the Falklands inshore cetacean populations to provide a scientific basis for conservation and ecosystem-based marine management initiatives</p>	<p>0.1 Biologically assessed Conservation Status and updated SAP available to ensure population-units have sufficient numbers, geographic distribution, genetic diversity and habitat to provide a stable population.</p> <p>0.2 Prioritised research plan published and available to mesh identified needs for future research and meshing of project data into planning initiatives, EIAs, etc.</p> <p>0.3 Project data are held within the South Atlantic Information Management and GIS Centre for inclusion within national planning i.e. Marine Spatial Planning/Ecosystem Assessment</p>	<p>0.1 The updated version of the SAP was submitted to the EPD. The document includes a review of the objectives in the light of the new information available about genetic characterization, abundance estimation of the populations, and distribution of coastal dolphins. Data will be submitted (in part they are already been submitted) to the IUCN scientific committee for future assessment of the risk of extinction.</p> <p>0.2 Research plan for the future have been included in the SAP. Among the suggestions there is the need to: repeat the aerial survey in winter; investigate feeding activities and interactions with sea lions; carry out some extra tissue sampling on both species.</p> <p>0.3 Data and metadata have been submitted to the ISM-GIS Datacentre and are available to on-going national spatial planning, inshore ecosystem-based fishery assessment, natural capital project, etc.</p>
<p><b>Output 1. Capacity Building for cetacean research.</b></p>	<p><b>Staff</b></p> <p>1.1 x2 Project Staff employed and in place by 20<sup>th</sup> October 2016 for 2 years.</p> <p><b>Volunteers</b></p> <p>1.2 Volunteer database with 20 names held within FC &amp; SAERI specific to scientific field work with capacity for maintenance.</p>	<p>Successfully achieved. Indicator appropriate. Contract available at SAERI</p> <p>Successfully achieved. Indicator appropriate. Database available at FC.</p>

	<p>1.3 x10 local volunteers provided with training in cetacean ID, survey methodology, distance estimation, safe boat operations, HSE (through classroom introduction and field work teaching component) and partake in survey.</p> <p>1.4 Established protocols for x2 per annum volunteer-ship interns from external bodies and partner organisations (during programme and a new personnel resource for the future).</p> <p>1.5 x1 central communal store of cetacean survey and volunteer safety equipment established sufficient for 6 person survey teams for current and future research.</p> <p><b>Awareness</b></p> <p>1.6 Cetacean ID resources distributed to lodges and operators (x20) and available on-line and downloaded (x30 times).</p> <p>1.7 Web resources available on-line for cetacean ID, volunteer protocols, non-technical general interest articles &amp; project outputs and accessible by volunteers and community (x visits / month).</p> <p>1.8 Published 4 articles in local media and 1 television news segment on Falklands news during project.</p>	<p>Successfully achieved. Indicator appropriate. Evidence provided in section 3.1.</p> <p>Successfully achieved. Changes explained in section 5.1. Indicator appropriate. Evidence provided in section 3.1.</p> <p>Successfully achieved. Indicator appropriate.</p> <p>Successfully achieved. Indicator appropriate. Evidence provided in section 3.1.</p> <p>Successfully achieved. Indicator appropriate. Evidence provided in section 3.1.</p> <p>Successfully achieved. Indicator appropriate. Evidence provided in section 3.1.</p>
<p>Activity 1.1</p> <p>Steering group formed from Partners, MoU signed detailing roles and responsibilities.</p>		<p>Completed.</p>

<p>Activity 1.2 1.2 Project Manager (PM) &amp; Project Officer (PO) job descriptions finalised by Steering Group and advertised internationally (partners assisting in recruitment publicity and applicant vetting).</p>	<p>Completed.</p>
<p>Activity 1.3 PM and PO recruited through interview, appointed, if not local relocate to Falkland Islands (allowance has been made for recruitment advertising, telephone interviews and relocation allowance / flights).</p>	<p>Completed.</p>
<p>Activity 1.4 Current FI equipment and resources for cetacean survey assessed and resources compiled (what, who and where) with lacking equipment sourced through in-kind partner loan or sourced, purchased and freighted for project. Allowance has been made for ordering and freight times to the Falklands.</p>	<p>Completed.</p>
<p>Activity 1.5 Current equipment located in central pooled store and inventoried equipment list held. Where central pooling is unfeasible (Zodiac &amp; RIB) agreement signed with partner/owner for availability.</p>	<p>Completed.</p>
<p>Activity 1.6 Volunteer database established and maintained in partnership with Falklands Conservation (FC), public media announcement and focussed targeting of personnel with biological training such as at FIG fisheries department. During the summer period in Falklands availability may at times be difficult and allowance is made for use of x2 interns to form the core of the volunteer group. Strong liaison with FC established in recruitment and training to mesh with potential parallel study on sei whales</p>	<p>Completed.</p>
<p>Activity 1.7 Volunteer training resources established including cetacean ID guide, step-wise survey protocols, safe boating practises, HSE guidelines – provided and available in printed format and on-line.</p>	<p>Completed.</p>
<p>Activity 1.8</p>	<p>Completed.</p>

Training given to x10 local volunteers incorporating class-room taught introduction and field-example at local location. Experience and instruction given in distance estimation.		
Activity 1.9 Volunteer intern recruitment established with academic partners with capacity for x2 intern positions per annum / field season.		Completed.
Activity 1.10 Volunteer intern recruitment and arrival.		Completed.
Activity 1.11 Project web-page creation with on-going maintenance to include monthly update with general interest progress article, field blogs and final posting of project outputs. During periods of field survey at remote sites update may be limited but blog progress will be posted when available to provide community update.		Completed.
Activity 1.12 Regular update of local media with non-technical summary of activities and findings to promote project and awareness of inshore cetaceans. Penguin News (local newspaper) and FITV (local television station).		Completed.
Activity 1.13 Cetacean ID guide, summary project data and vessel procedures shared with FC to incorporate outreach to nascent cetacean watching enterprises and viewing clients to increase profile and understanding of inshore cetaceans.		Completed.
<b>Output 2.</b> <b>Island-wide Transect Survey</b> <b>Island-wide population estimate and species distribution maps for Commerson's dolphin, Peale's dolphin and sei whale and model of abundance.</b>	2.1 60 day island-wide vessel based transect survey undertaken and completed by April 2017.	Successfully achieved. Changes presented in section 5.1. Indicator appropriate. Evidence provided in section 3.1.
	2.2 Island-wide population estimate and distribution maps for Commerson's dolphin, Peale's dolphin and sei whale published by July 2017 and available to stakeholders and FIG EPD.	Successfully achieved. Indicator appropriate. Evidence provided in section 3.1. Research agreement with Falkland Islands Government Air Service (FIGAS) available on request at SAERI.
	2.3 Environmental and habitat covariant model of abundance at island-wide scale published by Dec 2017 and available to stakeholders and FIG EPD.	Partially achieved (analyses on-going and expected for mid-2019). Indicator appropriate.

	2.4 Data available to marine planning and EIA assessments.	Successfully achieved. Indicator appropriate. Evidence provided in section 3.1.
Activity 2.1 Review and collation of all extant data-sources on inshore cetaceans from disparate sources with archiving in one central location, secured within SAERI IMS & GIS centre.		Completed.
Activity 2.2 Vessel availability and dates confirmed at earliest opportunity. A suitable vessel has been confirmed in planning however alternative vessels are limited and early confirmation will ensure vessel availability and that any maintenance periods are conducted in advance of requirements.		Completed.
Activity 2.3 Review and design confirmation of island-wide transect survey based upon pilot survey results. Design and procedures signed off by steering group.		Completed.
Activity 2.4 Survey execution plan and logistics including personnel, resources, timings, data collection protocols and HSE risk assessments and safe-working practises. Work practises and HSE applicable to the conditions of the Falklands and of sufficient standard to meet responsibilities to volunteers and academic institutions.		Completed.
Activity 2.5 60 day island-wide survey conducted in Feb/Mar 2017 to best coincide with seasonal sei whale occurrence inshore to maximise the ancillary benefits of the survey beyond the focal species of Commerson's dolphin and Peale's dolphin.		Completed.
Activity 2.6 Analysis of results and publication of findings (August – January 2018).		Abundance estimate achieved. Estimate of habitat covariant model of abundance in progress (results submitted to international conferences – see Indicator 3.1).
Activity 2.7 Final report circulated to all local stakeholders and FIG EPD.		Completed.
Activity 2.8 Storage of data and preparation of meta-data files with SAERI IMS & GIS centre.		Completed.
<b>Output 3. Repeat transect focal study at 3 focal study sites.</b>	3.1 Field survey undertaken at 3 focal study sites during summer and winter periods (Nov/Dec 2016; Jun/Jul 2017, Nov/Jan 2017/18).	Successfully achieved. Changes presented in section 5.1. Indicator appropriate. Evidence provided in section 3.1.

<p><b>Data on finer-scale spatial drivers of distribution, seasonal occurrence and key habitats.</b></p>	<p>3.2 Data on habitat association and key habitats for protection presented at completion of project.</p> <p>3.3. Data on seasonal patterns of occurrence between summer and winter survey periods presented at completion of project.</p>	<p>Successfully achieved. Indicator appropriate. Evidence provided in section 3.1.</p> <p>Successfully achieved. Indicator appropriate. Evidence provided in section 3.1.</p>
<p>Activity 3.1 Selection of 1 primary site and 1 secondary site for focal study in Year 1 based upon the results from the Darwin pilot study. A further 1-2 sites will be defined in Year 2 subject to the findings of the island-wide survey conducted in the first summer field season.</p>		<p>Completed.</p>
<p>Activity 3.2 Design of repeatable focal area transect surveys and sampling protocol. Signed off by peer review of steering group.</p>		<p>Completed.</p>
<p>Activity 3.3 Fieldwork execution plan including personnel, resources, accommodation, timings and bookings, data collection protocols, HSE risk assessment and safe-working practises for all components of focal study. Work practises and HSE applicable to the conditions of the Falklands and of sufficient standard to meet responsibilities to volunteers and academic institutions.</p>		<p>Completed.</p>
<p>Activity 3.4 Field based study in year 1 at primary site and reduced effort at secondary site to encompass x2 summer seasons (2 months each ) and x1 winter season (reduced sampling dependent upon weather). See timeline for clarity. Sufficient field data collection periods have been planned for to allow for weather conditions limited survey with weather downtime. Sites will be chosen to minimise the influence of weather by allowing survey in different zones depending upon wind direction. If severe attractive motion of dolphins to the survey boat platform occurs limiting the validity of habitat association survey will be supported by shore based observation and theodolite tracking which has the same resource cost.</p>		<p>Completed.</p>
<p>Activity 3.5 Identification of additional focal sites for Year 2 – sampling in Year 2 will be repeated at the primary and secondary sites determined within Year 1, but survey will be extended to additional sites in Year 2 if required. Additional sites only survey in the second year. See timeline for clarity.3.6</p>		<p>Completed.</p>

Activity 3.6 Collation and data analysis of results detailing patterns of occurrence, seasonality, level of association to habitats and identifying key habitats for protection.		Completed.
Activity 3.7 Final report circulated to all local stakeholders and FIG EPD.		Completed.
Activity 3.8 Preparation of meta-data files, submission and archiving of data in secure storage with SAERI IMS & GIS centre.		Completed.
<b>Output 4.</b> <b>Passive acoustic monitoring focal study at one of the focal study sites.</b> <b>Data on temporal drivers of distribution and seasonal sensitivity.</b>	4.1 C-Pod PAM units (x7) deployed at 1 site for 18 months.	Successfully achieved. Changes presented in section 5.1. Indicator appropriate. Evidence provided in section 3.1.
	4.2 Analysis of temporal occurrence by habitat type and temporal drivers (season, month, diel and tidal) presented by recorded attendance.	Successfully achieved. More analyses required and on-going. Indicator appropriate. Evidence provided in section 3.1.
Activity 4.1 Selection of 1 focal study site (primary or secondary site determined in 3.1) for (x7) C-pod deployments in varying water depths and habitats for 18 month period.		Completed.
Activity 4.2 Servicing of C-Pods on 4 month deployment schedule. Flexibility in deployment duration will assist in ensuring vessel availability for servicing visits.		Completed.
Activity 4.3 Analysis of temporal occurrence by habitat type and temporal drivers (season, month, diel and tidal). Loss of 1 or 2 units would limit but not preclude analysis. The pilot survey has field trialled different mooring configurations to remove kelp fouling issues and no units have been lost.		Completed.
Activity 4.4 Define periods of increased utilisation and seasonal sensitivity for susceptibility to risks and for EIA.		Completed.
Activity 4.5 Final report circulated to all local stakeholders, FIG EPD and PMS.		Completed.
Activity 4.6 Data submitted and data receipt from SAERI IMS & GIS centre.		Completed.

<p><b>Output 5.</b>  <b>Photo-identification focal study at 3 focal study sites for residency, dispersal, population structure &amp; recruitment and population estimate. Residency, ranging patterns and spatial scale of movement with reference to susceptibility to localised impacts and appropriate scale of management units.</b></p>	<p>5.1 Centralise photo-ID database established on the islands with SAERI IMS &amp; GIS centre.</p> <p>5.2 Photo-ID conducted at 3 distinct sites over 2 summer seasons and 1 winter period.</p> <p>5.3 Spatial ranging analysis of ranging patterns of same animal sightings.</p> <p>5.4 Mark-recapture population estimate for dolphin populations at focal study sites.</p>	<p>Successfully achieved.  Changes presented in section 5.1. Indicator appropriate. Evidence provided in section 3.1.</p> <p>Successfully achieved.  Indicator appropriate. Evidence provided in section 3.1.</p> <p>Successfully achieved.  Indicator appropriate. Evidence provided in section 3.1.</p> <p>Partially achieved.  Extra analyses are needed due to the large amount of data – Results expected at the end of 2019. Indicator appropriate. Evidence provided in section 3.1.</p>
<p>Activity 5.1  Establish Photo-ID &amp; fin database. Unpopulated database established within SAERI.</p>		<p>Completed.</p> <p>An improved database to manage large set of data is in preparation (see Section 4).</p>
<p>Activity 5.2  Photography during survey, processing and archived GIS geo-tagged images to ID / GIS databases. Populated database held at SAERI. Assumes sufficient weather and boat conditions for photography. Weather downtime accounted for in planning.</p>		<p>Completed.</p>
<p>Activity 5.3  Spatial analysis of ranging patterns of same animal sightings.</p>		<p>Partially completed.</p> <p>Extra analyses ongoing and results are expected for the end of 2019.</p>
<p>Activity 5.4  Mark-recapture population estimate for dolphin populations at focal study sites.</p>		<p>Partially completed.</p> <p>Extra analyses ongoing and results are expected for the end of 2019.</p>
<p>Activity 5.5  Final report circulated to all local stakeholders, FIG EPD and PMS.</p>		<p>Completed.</p>
<p>Activity 5.6  Data submitted and receipt from SAERI IMS &amp; GIS centre.</p>		<p>Completed.</p>
<p><b>Output 6.</b>  <b>Genetic diversity focal study at 2 of the focal study sites</b></p>	<p>6.1 Biopsy collection conducted at 2 sites in first year to target 60 samples for each species.</p>	<p>Successfully achieved.  Indicator appropriate. Evidence provided in section 3.1.</p>

<p><b>Population identification between South American con-specifics and potential sub-populations within the Falklands.</b></p> <p><b>Defining scale of management units</b></p>	<p>6.2 Training in biopsy sampling given to x2 project staff and x2 volunteers.</p> <p>6.3 Report and interpretation of results detailing genetic separation of populations from South America and Kerguelen Islands, and the degree of internal genetic separation into Falklands sub-populations between sampled sites.</p> <p>6.4 Physical samples held and available for potential future studies and analysis (including natural isotopes, contaminants, etc.).</p> <p>6.5 Genetic sequencing held in digital archives and nationally and internationally within Open access databases (e.g. GenBank).</p>	<p>Successfully achieved. Indicator appropriate. Evidence provided in section 3.1.</p> <p>Successfully achieved. Indicator appropriate. Evidence provided in section 3.1.</p> <p>Successfully achieved. Indicator appropriate. Evidence provided in section 3.1.</p> <p>Successfully achieved. Indicator appropriate. Evidence provided in section 3.1.</p>
<p>Activity 6.1 Training visit of experienced biopsy darter (x6 local people trained).</p>	<p>Completed.</p>	
<p>Activity 6.2 Collection of small biopsy samples in conjunction with focal studies in Year 1 at primary and secondary focal study sites. Sufficient weather and boat conditions for collection of biopsy samples mitigated by accounting for weather downtime in planning. Dependent upon permit for collection of biopsy samples from Environmental Planning Office, Government of the Falkland Islands. This is currently in review and FIG has been fully included in the design of the current project from conception and is supportive of it.</p>	<p>Completed.</p>	
<p>Activity 6.3 Field collection report on any reactive behaviours.</p>	<p>Completed.</p>	
<p>Activity 6.4 Laboratory Analysis of Samples at Oregon State University.</p>	<p>Completed.</p>	
<p>Activity 6.5</p>	<p>Completed.</p>	

Report and interpretation of results detailing genetic separation of Falkland populations from South America and Kerguelen Islands, degree of internal genetic separation within Falklands sub-populations.	
Activity 6.6 Final report circulated to all local stakeholders, FIG EPD and PMS.	Completed.
Activity 6.7 Data submitted and receipt from SAERI IMS & GIS centre.	Completed.
Activity 6.8 Return and archiving of physical samples for potential future studies and analysis (including natural isotopes, contaminants, etc.) Final decision to be taken on whether sample security and ease of access for study is best met by storage in Falklands or alternative facility.	Completed.
Activity 6.9 Genetic digital sequencing data archived with international repository, e.g. GenBank.	Completed.

## Annex 3 Standard Measures


Code	Description	Totals (plus additional detail as required)
<b>Training Measures</b>		
1	Number of (i) students from the UKOTs; and (ii) other students to receive training (including PhD, masters and other training and receiving a qualification or certificate)	(i) 6 (ii) 3
2	Number of (i) people in UKOTs; and (ii) other people receiving other forms of long-term (>1yr) training not leading to formal qualification	(i) 1
3a	Number of (i) people in UKOTs; and (ii) other people receiving other forms of short-term education/training (i.e. not categories 1-5 above)	(i) 11 (one-by-one training) Further training was provided to: - 20 students Y6 at the Junior School in Stanley→Kelp and its value - 60 students Y1 (in 2017 and 2018) at the Junior School in Stanley→Mammals and marine mammals - 7 students (different ages) at the Junior School of Port Howard→Dolphin photo-identification - all students at the Junior School in Stanley→One ocean of problems - all students at the high school in Stanley→Monitoring techniques for cetaceans  (ii) 20
3b	Number of training weeks (i) in UKOTs; (ii) outside UKOTs not leading to formal qualification	(i) 10
4	Number of types of training materials produced. Were these materials made available for use by UKOTs?	11 (protocols, materials from the photo-id course, ID-cards – Materials made available for use by UKOTs - see Annex 4 for the links).
5	Number of UKOT citizens who have increased capacity to manage natural resources as a result of the project	7
<b>Research Measures</b>		
9	Number of species/habitat management plans/ strategies (or action plans) produced for/by Governments, public authorities or	1 (SAP) 1 (Research Plan)

Code	Description	Totals (plus additional detail as required)
	other implementing agencies in the UKOTs	
10	Number of formal documents produced to assist work in UKOTs related to species identification, classification and recording.	21 (12 reports, 5 protocols, 2 catalogues, 2 ID cards)
11a	Number of papers published or accepted for publication in peer reviewed journals written by (i) UKOT authors; and (ii) other authors	(i) 3 paper in progress (ii) 3 peer reviewed abstracts presented at international conferences.
11b	Number of papers published or accepted for publication elsewhere written by (i) UKOT authors; and (ii) other authors	(ii) 1
12b	Number of computer-based databases enhanced (containing species/genetic information). Were these databases made available for use by UKOTs?	2 Photo-ID databases, available at the SAERI IMS-GIS Datacentre – available for use by UKOTs.
13a	Number of species reference collections established. Were these collections handed over to UKOTs?	1 the mtDNA haplotypes database is available at the international DNA repository GenBank.
13b	Number of species reference collections enhanced. Were these collections handed over to UKOTs?	N/A
<b>Dissemination Measures</b>		
14a	Number of conferences/seminars/workshops/stakeholder meetings organised to present/disseminate findings from UKOT's Darwin project work	1 webinar 3 international conferences (1 at the ECS 2018 and 2 at the SOLAMAC 2018) 1 presentation to MLAs 5 steering committee meetings 15 presentations to the public  (see <b>Annex 4</b> for link to the documents)  Over 30 individual meetings with stakeholders
14b	Number of conferences/seminars/workshops/stakeholder meetings attended at which findings from the Darwin Plus project work will be presented/ disseminated	1, the 2 <sup>nd</sup> World Marine Mammal Science Conference in 2019 at Barcelona, Spain ( <a href="https://www.marinemammalscience.org/conference/2019-2nd-world-marine-mammal-science-conference/">https://www.marinemammalscience.org/conference/2019-2nd-world-marine-mammal-science-conference/</a> )
<b>Physical Measures</b>		
20	Estimated value (£s) of physical assets handed over to UKOT(s)	£9,598.79
21	Number of permanent educational/training/research facilities or organisation established in UKOTs	N/A

<b>Cod e</b>	<b>Description</b>	<b>Totals (plus additional detail as required)</b>
22	Number of permanent field plots established in UKOTs	N/A
23	Value of resources raised from other sources (e.g., in addition to Darwin funding) for project work	<b>136,438</b>

## Annex 4 Publications

Type * (e.g. journals, manual, CDs)	Detail (title, author, year)	Nationality of lead author	Nationality of institution of lead author	Gender of lead author	Publishers (name, city)	Available from (e.g. weblink, contact address, annex etc)
Conference Poster	Abundance of Commerson's and Peale's dolphins in inshore waters of the Falklands Islands estimated by aerial survey, Costa M., Garcia Rojas M.I., Baker S., Heinrich S., 2018	Italian	Falkland Islands	F	Proceeding of the 32th ECS Conference	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Costa_etal_ECS_2018.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Costa_etal_ECS_2018.pdf</a>
Conference Abstract	Cetacean abundance in the inshore waters of the Falklands Islands, Costa M., Garcia Rojas M.I., Baker S., Heinrich S., 2018	Italian	Falkland Islands	F	Proceeding of the XII Congreso SOLAMAC	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Costa_etal_2018_XIICongresoSOLAMAC_final.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Costa_etal_2018_XIICongresoSOLAMAC_final.pdf</a>
Conference Abstract	<i>Dolphins of the kelp</i> - genetic diversity and population structure of Commerson's and Peale's dolphins around the Falkland (Malvinas) Islands, Baker S., Steel D, Costa M., Brickle P., Pimper L., Pérez-Alvarez M.J., Poulin E., Acevedo J., Olavarria C., 2018	USA	USA	M	Proceeding of the XII Congreso SOLAMAC	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Dolphins-of-the-kelp_final_SOLAMAC_2018.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Dolphins-of-the-kelp_final_SOLAMAC_2018.pdf</a>
Report	<i>Dolphins of the kelp</i> - genetic diversity and population structure of Commerson's and Peale's dolphins around the Falkland Islands, Baker S., 2017	USA	USA	M	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE17_biopsy-report_20Jun17.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE17_biopsy-report_20Jun17.pdf</a>

Report*	<i>Dolphins of the kelp</i> - genetic diversity and population structure of Commerson's and Peale's dolphins around the Falkland Islands, Baker S., Steel D., Costa M., Brickle P., Pimper L.E., Pérez-Alvarez M.J., Poulin E., Acevedo J., Olavarria C., 2018	USA	USA	M	SAERI	Document not public yet – To open, click the icon below   DOKE_NGS_genetic differentiation_07Sep
Report	Aerial Survey Report, Costa M., 2017	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Aerial_Survey_Report_18Marc-8May_2017.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Aerial_Survey_Report_18Marc-8May_2017.pdf</a>
Report	Field Report Focal 1, Costa M., 2017	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE_FieldReport_1_Focal1_21Nov-22Dec2016.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE_FieldReport_1_Focal1_21Nov-22Dec2016.pdf</a>
Report	Field Report Genetic, Costa M., Baker S., Cazzola M. 2017	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE_FieldReport_2_Genetic_03-12Jan2017.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE_FieldReport_2_Genetic_03-12Jan2017.pdf</a>
Report	Field Report Focal 2, Costa M., 2017	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE_FieldReport_3_Focal2_01Jun-06Aug2017.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE_FieldReport_3_Focal2_01Jun-06Aug2017.pdf</a>
Report	Field Report Focal 3, Costa M., 2018	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE_FieldReport_4_Focal3_01Nov-22Dec2017.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE_FieldReport_4_Focal3_01Nov-22Dec2017.pdf</a>
Report	Field Report Focal 4, Costa M., Cazzola M., 2018	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE_FieldReport_5_Focal4_5Feb-20Mar2018-.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE_FieldReport_5_Focal4_5Feb-20Mar2018-.pdf</a>
Report	Field Report Focal 5, Costa M., Cazzola M., 2018	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE_FieldReport_6_Focal5_5Jun-14Aug2018.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE_FieldReport_6_Focal5_5Jun-14Aug2018.pdf</a>
Report	C-POD Report, Munro G., 2018	British/Falkland Islands	Falkland Islands	M	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE-Cpod-GM-Report.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE-Cpod-GM-Report.pdf</a>

Report	Condor Survey, Costa M., 2018	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Condor_Survey_Report_21Feb-01Mar2017.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Condor_Survey_Report_21Feb-01Mar2017.pdf</a>
Report	South Georgia – HMS Enterprise, Garcia M., Costa M., 2017	Colombian	Falkland Islands	F	SAERI	This file has high quality pictures and its size exceed the 20MB allowed by the website. It available upon request.
Protocol	Aerial Survey protocol, Costa M., 2017	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE_Aerial_Survey_Protocol_Data_Collection_2017.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE_Aerial_Survey_Protocol_Data_Collection_2017.pdf</a>
Protocol	Focal Study protocol, Costa M., 2016	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE_Focal_Survey_Protocol_Data_Collection_2017.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE_Focal_Survey_Protocol_Data_Collection_2017.pdf</a>
Protocol	Photo-ID Matching protocol, Costa M., Garcia M., 2016	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE_PhotoID_Matching_Protocol_2017.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE_PhotoID_Matching_Protocol_2017.pdf</a>
Protocol	Condor Data Collection Protocol, Costa M., 2017	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Condor_Protocol_Data_Collection_2017.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Condor_Protocol_Data_Collection_2017.pdf</a>
Protocol	HMS Enterprise survey data collection protocol, Costa M., 2017	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/12/DOKE_Enterprise_Protocol_Data_Collection_2017.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/12/DOKE_Enterprise_Protocol_Data_Collection_2017.pdf</a>
Catalogue	Commerson's dolphin, Costa M., Taylor M., Cazzola M., 2018	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2017/08/Commersons-dolphin-Catalogue-Areas-AB-May17.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2017/08/Commersons-dolphin-Catalogue-Areas-AB-May17.pdf</a>
Catalogue	Peale's dolphin, Costa M., Cazzola M., 2018	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2017/08/La_Catalogue_for_web_March17.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2017/08/La_Catalogue_for_web_March17.pdf</a>
Darwin Newsletter	Dolphin biodiversity in the Falkland Islands' waters	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Darwin-Newsletter-May-2018-IDB-FINAL.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Darwin-Newsletter-May-2018-IDB-FINAL.pdf</a>

Magazine	Studying dolphins of the kelp Falkland Islands, Costa M., 2017	Italian	Falkland Islands	F	The Ministry of Defence Sustainability Magazine	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Studing_Dolphins_of_the_Kelp_Sanctuary_46_2017.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Studing_Dolphins_of_the_Kelp_Sanctuary_46_2017.pdf</a>
Penguin News	Falklands dolphin study underway, M. Garcia, 2016	Colombian	Falkland Islands	F	Penguin News	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Pnews_1_December2016.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Pnews_1_December2016.pdf</a>
Penguin News	Dolphins of the kelp Update: Exploration of West Falklands, L. Hamilton, 2017	British	Falkland Islands	F	Penguin News	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Pnews_2_March2017.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Pnews_2_March2017.pdf</a>
Penguin News	Cetacean Awareness Day shines a light on whales and dolphins, M. Garcia, 2017	Colombian	Falkland Islands	F	Penguin News	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Pnews_3_August2017.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Pnews_3_August2017.pdf</a>
Penguin News	Dolphins of the kelp SAERI cetacean study takes to the waves for photo-identification, M. Costa, 2018	Italian	Falkland Islands	F	Penguin News	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Pnews_4_May2018.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Pnews_4_May2018.pdf</a>
Penguin News	A rather surprising intruder, M. Cazzola, 2018	Italian	Falkland Islands	M	Penguin News	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Pnews_5_21Sept2018.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Pnews_5_21Sept2018.pdf</a>
Blog (based on interview)	Auf Wal-Survey mit HMS ENTERPRISE im Südatlantik, Von Wurche B., 2017	Germany	Germany	F	MEERTEX	<a href="http://scienceblogs.de/meertext/2017/04/20/auf-wal-survey-mit-hms-enterprise-im-suedatlantik/">http://scienceblogs.de/meertext/2017/04/20/auf-wal-survey-mit-hms-enterprise-im-suedatlantik/</a>
Blog	An 'appealing' dusky, Cazzola M., 2018	Italian	Falkland Islands	M	SAERI	<a href="https://www.south-atlantic-research.org/an-appealing-dusky/">https://www.south-atlantic-research.org/an-appealing-dusky/</a>
Blog	Working in the Falkland Islands, Guest A., 2017	British/Falkland Islands	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/working-in-the-falkland-islands/">https://www.south-atlantic-research.org/working-in-the-falkland-islands/</a>
Species ID card	Commerson's dolphin, Costa M., 2016	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Species_identification_card_FI_Cc.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Species_identification_card_FI_Cc.pdf</a>

Species ID card	Peale's dolphin, Costa M., 2016	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Species_identification_card_FI_La.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Species_identification_card_FI_La.pdf</a>
Photo-identification material	Marking and capturing: a gentle introduction & Code of conduct, status of conservation, and ethics in marine mammal science, Costa M., 2017, 27/01 and 03/02 2018	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/CetaceanPhotold_Course_1_2_2018.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/CetaceanPhotold_Course_1_2_2018.pdf</a>
Photo-identification material	Pre-matching procedure & Matching procedure and tricks, Taylor M., 2017, 27/01 and 03/02 2018	British	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/CetaceanPhotold_Course_3_4_5_2018.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/CetaceanPhotold_Course_3_4_5_2018.pdf</a>
Photo-identification material	What we do with photo-id data, Costa M., 2017, 27/01 and 03/02 2018	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/CetaceanPhotold_Course_6_7_2018.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/CetaceanPhotold_Course_6_7_2018.pdf</a>
Photo-identification material	How can I help?, Taylor M., 2017, 27/01 and 03/02 2018	British	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/CetaceanPhotold_Course_How-you-can-help_9_2018.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/CetaceanPhotold_Course_How-you-can-help_9_2018.pdf</a>
Webinar	What News About Dolphins, Costa M., 2018	Italian	Falkland Islands	F	SAERI/CIEMM	<a href="file:///C:/2%20DOKE/DOKE%20in%20the%20media%20Feb%2017/Presentation%20Given/20180207%20Webinar%20CIEMM%207Feb18/What%20news%20about%20dolphins%20of%20the%20Falkland%20Islands.htm">file:///C:/2 DOKE/DOKE in the media Feb 17/Presentation Given/20180207 Webinar CIEMM 7Feb18/What%20news%20about%20dolphins%20of%20the%20Falkland%20Islands.htm</a>
Scientific paper	Indicative title: Abundance of coastal cetaceans in the Falkland Islands from aerial survey, Costa M., et al., in preparation	Italian	Falkland Islands	F	SAERI	A draft is available upon request
Scientific paper	Abundance and predictive habitat modelling of cetaceans of the Falkland Islands, Costa M., et al., in preparation	Italian	Falkland Islands	F	SAERI	Not available yet (analyses on going)

Scientific paper	Abundance, residency, and habitat utilisation of Commerson's (Cephalorhynchus commersonii) and Peale's dolphins (Lagenorhynchus australis) in the Falkland Islands, Costa M., et al., in preparation	Italian	Falkland Islands	F	SAERI	Not available yet (analyses on going)
Public talk	Cetacean introduction, Costa M., 26/01/2017	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Cetacean_an_introduction_HMS-Enterprise_26Jan17.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Cetacean_an_introduction_HMS-Enterprise_26Jan17.pdf</a>
Public talk	Dolphins of the kelp, Garcia M., 27/01/2017	Colombian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Dolphin_of_the_kelp_HMS-Enterprise_27Jan17.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Dolphin_of_the_kelp_HMS-Enterprise_27Jan17.pdf</a>
School talk	Dolphins of the kelp, Costa M., Garcia M., Hamilton L., Bamford C., 30/03/2017	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Dolphin_of_the_kelp_CommunitySchool_30March17.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Dolphin_of_the_kelp_CommunitySchool_30March17.pdf</a>
Public talk	Hear About Falkland Flipping Dolphins, Costa M., Garcia M., 20/04/2017	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Hear_About_Falkland_Flipping_Dolphins_CommunityTalk_20Apr17.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Hear_About_Falkland_Flipping_Dolphins_CommunityTalk_20Apr17.pdf</a>
Public talk Farmer Week	Dolphins of the kelp, Costa M., 06/11/2017	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DolphinsOfTheKelp_FarmWeek4Jul17_2.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DolphinsOfTheKelp_FarmWeek4Jul17_2.pdf</a>
School talk	Mammals, Marine mammals, and cetaceans, Costa M., 2017	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Marine_mammals_PrimatySchool_25-26July17.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Marine_mammals_PrimatySchool_25-26July17.pdf</a>
Public talk Stanley Museum	Cetaceans of the Falklands, Costa M., 2017	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/CetaceanOfTheFalklands_6Nov17.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/CetaceanOfTheFalklands_6Nov17.pdf</a>
Environment al Committee Falkland Islands talk	Dolphins of the kelp, Costa M., 2017	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/EnvironmentCommittee_15Dec17.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/EnvironmentCommittee_15Dec17.pdf</a>

Woman Association talk	Cetaceans of the Falklands, Costa M., 2018	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Women_Association_ChamberOfCommerce_26Feb18_19-20.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Women_Association_ChamberOfCommerce_26Feb18_19-20.pdf</a>
Tall Ship tenacious talk	Dolphins of the kelp, Costa M., 2018	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE_Tall_Ship_Tenacious_4Mar18.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE_Tall_Ship_Tenacious_4Mar18.pdf</a>
Port Howard talk	Dolphins of the kelp, Costa M., 2018	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE_PortHoward_23Mar18.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE_PortHoward_23Mar18.pdf</a>
School talk	Marine Forest, Costa M., Golding N., 2018	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/MarineForests_IJS_Year6_Final_4Jul18.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/MarineForests_IJS_Year6_Final_4Jul18.pdf</a>
School talk	Mammals, Marine mammals, and cetaceans, Costa M., 2018	Italian	Falkland Islands	F	SAERI	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Marine_mammals_PrimarySchool_23-25July18.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/Marine_mammals_PrimarySchool_23-25July18.pdf</a>

## Annex 5 Darwin Contacts

<b>Ref No</b>	DPLUS042
<b>Project Title</b>	Dolphins of the kelp: Data priorities for Falkland's inshore cetaceans
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## Annex 6 Supplementary material (optional but encouraged as evidence of project achievement)

Type	Available from
DOKE Minutes -Steering Committee Meeting 13Feb2017	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE-Minutes-Steering-Committee-Meeting-3-13Feb2017.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE-Minutes-Steering-Committee-Meeting-3-13Feb2017.pdf</a>
DOKE Minutes -Steering Committee Meeting 29Jun2017	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE-Minutes-Steering-Committee-Meeting-4-29Jun2017.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE-Minutes-Steering-Committee-Meeting-4-29Jun2017.pdf</a>
DOKE Minutes -Steering Committee Meeting 24Oct2017	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE-Minutes-Steering-Committee-Meeting-5-24Oct2017.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE-Minutes-Steering-Committee-Meeting-5-24Oct2017.pdf</a>
DOKE Minutes -Steering Committee Meeting 5Mar2018	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE-Minutes-Steering-Committee-Meeting-6-5Mar18.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE-Minutes-Steering-Committee-Meeting-6-5Mar18.pdf</a>
DOKE Minutes -Steering Committee Meeting 10Jul2018	<a href="https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE-Minutes-Steering-Committee-Meeting-7-10Jul18.pdf">https://www.south-atlantic-research.org/wp-content/uploads/2018/11/DOKE-Minutes-Steering-Committee-Meeting-7-10Jul18.pdf</a>

### List of documents attached

- DOKE\_list\_Equipment\_Jun17 (list of DOKE research equipment)
- Cetacean Species Action Plan 2018-2018 (draft submitted to the Falkland Islands Government for review)

### Checklist for submission

	Check
<b>Is the report less than 10MB?</b> If so, please email to <a href="mailto:Darwin-Projects@itsi.co.uk">Darwin-Projects@itsi.co.uk</a> putting the project number in the Subject line.	X
<b>Is your report more than 10MB?</b> If so, please discuss with <a href="mailto:Darwin-Projects@itsi.co.uk">Darwin-Projects@itsi.co.uk</a> about the best way to deliver the report, putting the project number in the Subject line.	
<b>Have you included means of verification?</b> You need not submit every project document, but the main outputs and a selection of the others would strengthen the report.	X
<b>Do you have hard copies of material you want to submit with the report?</b> If so, please make this clear in the covering email and ensure all material is marked with the project number.	
Have you involved your partners in preparation of the report and named the main contributors	X
Have you completed the Project Expenditure table fully?	X
Do not include claim forms or other communications with this report.	