



Department  
for Environment  
Food & Rural Affairs



Foreign &  
Commonwealth  
Office



Department  
for International  
Development



## Darwin Plus: Overseas Territories Environment and Climate Fund Project Application Form

Submit by **2359 GMT Monday 29 August 2016**

Please read the [Guidance](#) before completing this form.

Information to be extracted to the database is highlighted blue. Blank cells may render your application ineligible

### Basic Data

<b>1. Project Title</b> (max 10 words)	<b>Population recovery of right whales in South Georgia waters</b>		
<b>2. UK OT(s) involved</b>	Government of South Georgia and the South Sandwich Islands	<b>Letter of support from OT government attached?</b>	Yes
<b>3. Start Date:</b>	01/04/17		
<b>4. End Date:</b>	31/12/19		
<b>5. Duration of project (no longer than 36 months)</b>	33 months		

Summary of Costs	2017/18	2018/19	2019/20	Total
<b>6. Budget requested from Darwin</b>	£80,139	£136,109	£95,863	£312,111
<b>7. Total value of matched funding</b>	£159,056	£172,535	£51,193	£382,783
<b>8. Total Project Budget (all funders)</b>	£239,195	£308,643	£147,056	£694,894
<b>9. Names of Co-funders</b>	British Antarctic Survey, Woods Hole Oceanographic Institute, University of St Andrews, NERC, Instituto Aqualie, <b>EU BEST</b> , University of Barcelona			

<b>10. Name, address and contact details of lead applicant organisation (responsible for delivering outputs, reporting and managing funds)*</b>	British Antarctic Survey, High Cross, Madingley Road, Cambridge CB3 0ET
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\* Notification of results will be by email to the Project Leader named in Question 12

### 11. Type of organisation of Lead applicant. Place an x in the relevant box.

OT GOVT	UK GOVT	UK NGO	Local NGO	International NGO	Commercial Company	Other (e.g. Academic)	X
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**12. Partners in project. Please provide details of the partners in this project and provide a CV for the individuals listed.** You may copy and paste this table if necessary

Details	Project Leader	Project Partner 1	Project Partner 2
Surname	Jackson	Carroll/Hall	Leaper
Forename(s)	Jennifer	Emma/Ailsa	Russell
Post held	Research Scientist	PDRA/Research Professor	Research scientist
Institution (if different to above)		University of St Andrews	International Fund for Animal Welfare, UK
Department	Ecosystems	School of Biology	
Telephone/Skype			
Email			

Details	Project Partner 3	Project Partner 4	Project Partner 5
Surname	Moore	Rowntree	Zerbini/Andriolo
Forename(s)	Michael	Vicky	Alexandre/Artur
Post held	Professor	Research Associate Professor/Director of the Right Whale Program	President/Executive Director
Institution (if different to above)	Woods Hole Oceanographic Institute	University of Utah, USA/ Ocean Alliance	Instituto Aqualie
Department		Department of Biology	
Telephone/Skype			
Email			

Details	Project Partner 6	Project Partner 7	Project Partner 8
Surname	Groch	Cheeseman	Aguilar / Vighi
Forename(s)	Karina	Ted	Alex / Morgana
Post held	Director	Founder	Professor/ PDRA
Institution (if different to above)	Projeto Baleia Franca	Happywhale.com	University of Barcelona
Department			
Telephone/Skype			
Email			

**13. Has your organisation been awarded Darwin Initiative funding before (for the purposes of this question, being a partner does not count)? If yes, please provide details of the most recent awards (up to 6 examples).**

Reference No	Project Leader	Title

DPLUS054	Dr Phil Trathan	Managing Antarctic krill fisheries: Identifying candidate marine areas for protection
EIDCF013	Dr David Barnes	South Atlantic wilderness: assessment of Tristan da Cunha's seabed biodiversity
EIDCF005	Dr Iain Staniland	Darwin Southern Sea Lion Programme
18019	Dr David Barnes	Mapping benthic biodiversity of the South Georgia continental shelf and slope
DPLUS009	Dr Phil Trathan	Antarctic and Sub-Antarctic Marine Protected Areas: using penguin tracking data to identify candidate areas

**14. If your answer to Q13 was No, provide details of 3 contracts previously held by your institution that demonstrate your credibility as an implementing organisation.** These contracts should have been held in the last 5 years and be of a similar size to the grant requested in this application. (If your answer to Q13 was Yes, you may delete these boxes, but please leave Q14)

#### 15. Key Project personnel

**Please identify the key project personnel on this project, their role and what % of their time they will be working on the project.** Please provide 1 page CVs for these staff, or a 1 page job description or Terms of Reference for roles yet to be filled. Please include more rows where necessary.

Name (First name, surname)	Role	Organisation	% time on project	1 page CV or job description attached?
Jennifer Jackson	Project Leader and population modeller	British Antarctic Survey	5	Yes
Phil Trathan	Oceanographic analysis	British Antarctic Survey	2	Yes
Gabriele Stowasser	Stable isotope analysis	British Antarctic Survey	2	Yes
Emma Carroll	Genetic analysis	University of St Andrews	27	Yes
Ailsa Hall	Hormone assays	University of St Andrews	2	Yes
Alex Zerbini	Satellite tracking	Instituto Aqualie	9	Yes
Russell Leaper	Acoustic monitoring and analysis	International Fund for Animal Welfare	9	Yes
Susannah Calderan	Acoustic monitoring	Independent Contractor	6	Yes
Karina Groch	Photo-matching	Projeto Baleia Franca	1	Yes
Vicky Rowntree	Photo-matching	Ocean Alliance	1	Yes
Michael Moore	Body condition analysis	Woods Hole Oceanographic Institute	2	Yes
Morgana Vighi	Catch record analysis	University of Barcelona	21	Yes

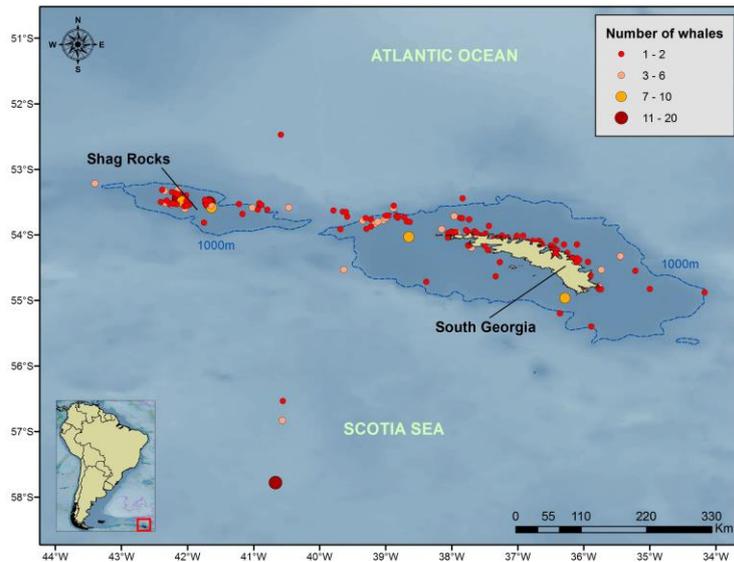
#### Project Details

**16. Project Outcome Statement:** Describe what the project aims to achieve and what will change as a result. (30 words max). You can copy and paste from Q26.

Survey of South Georgia southern right whale feeding ground **recovery**, post whaling. Characterises distribution, diversity, habitat use, health and calving ground connections, **and abundance and recovery status following whaling.**

**17. Background:** (What is the current situation and the problem that the project will address? How will it address this problem? What key OT Government priorities and themes will it address? (200 words max)

Southern right whales are slowly recovering from whaling and are the most commonly seen whale in South Georgia (SG) waters. This feeding population is likely one of the **most significant Antarctic krill consumers in SG waters**, but its distribution, abundance and **population recovery status** has not been investigated.



This summer feeding ground has been directly linked, through photo-identification and satellite tagging, to winter calving grounds at Peninsula Valdés (PV), Argentina. PV has had **high calf mortalities in the last decade, causes of which are unknown**. Growing evidence indicates that SG environmental conditions influence whale population dynamics, suggesting foraging success is a primary factor influencing reproductive-rates.

It is therefore timely and important to conduct **surveys** of the feeding ground, to investigate **prey sources, habitat-use between seasons and** in relation to krill fishing within the Marine Protected Area, **population abundance and connectivity** with calving areas, **health and population recovery status**.

This project addresses GSGSSI\* Strategic Objectives, to:

- Conserve the Territory's environment,
- Enhance knowledge of biodiversity and habitats through research, monitoring and review, establishing scientific baselines to assess environmental change,
- Manage fisheries to highest international standards of operation, stewardship and sustainability,
- Establish arrangements for monitoring/ assessing MPA performance, providing evidence for management decisions.

\*Government of South Georgia and the South Sandwich Islands

**18. Methodology:** Describe the methods and approach you will use to achieve your intended outcomes and impact. Provide information on how you will undertake the work (materials and methods) and how you will manage the work (roles and responsibilities, project management tools etc). Give details of any innovative techniques or methods. (500 words max)

This innovative project takes a multi-disciplinary approach to maximise data-collection and outcomes. All fieldwork will be scrutinised by the BAS/Cambridge University Animal Procedures and Ethics Review Committee, prior to seeking appropriate permits from the GSGSSI.

During yacht-based surveys (**February 2019**), whales will be located using visual searches and innovative passive acoustic technology. Modified DiFAR-sonobuoys deployed across the survey

area detect whales by recording the direction and intensity of sounds. They will be continuously monitored 24-7 by acousticians. When weather conditions permit, we will carry out:

- (1) Photo-identification from the boat or from an unmanned aerial vehicle. Photos will be used for individual identification and body condition assessments.
- (2) Skin-sampling via biopsy dart, for genetic and stable isotope analysis.
- (3) Blubber-sampling with a slightly larger biopsy dart (<20 encounters) for health assessment.
- (4) Satellite tracking (10 whales) to assess distribution, movements and habitat-use.
- (5) Zooplankton collection during a concurrent cruise for stable isotope analysis of candidate whale prey.

## Analyses

(1) SG photo-identifications will be matched with those collected in a January 2018 EU BEST cruise, as well as from the calving ground catalogues collected off Argentina (3,085 whales, >70% of the population; Project Partner [PP] Rowntree) and Brazil (700+ whales; PP Groch). Photogrammetry analysis of whale body condition will be conducted at Woods Hole (PP Moore). **Inter-annual resightings within SG will be used to calculate SG abundance.**

(2 and 5) Stable carbon and nitrogen isotope analyses of whale skin and potential prey species will be conducted to evaluate habitat-use and identify prey sources of right whales residing in SG waters. Analyses (conducted by Stowasser at BAS) will identify the trophic positioning of these whales in the SG ecosystem.

Amplification of mitochondrial DNA control region sequences and microsatellite genotypes will be conducted at BAS (Jackson) and St Andrews University (PP Carroll) respectively. Genetic methods will measure (i) diversity, and (ii) differentiation from calving grounds. Population assignment will measure the level of association of SG right whales with calving grounds along the southwest Atlantic coast. **Microsatellite genotypes will be compared with those collected in a January 2018 cruise in order to measure re-sightings of individuals and calculate abundance.**

(3) Blubber samples will be analysed at St Andrews University (PP Hall), to measure stress and reproductive hormone levels.

(4) Analyses of satellite tracks and habitat-use will be coordinated by PP Zerbini, with oceanography data collated by Trathan (BAS). Data will be combined to construct a right whale distribution model for the SG ecosystem. Acoustic analyses of whale distribution will be conducted (PP Leaper and Andriolo).

**(5) Southwest Atlantic catch records from logbooks and import records will be examined and summarised by Vighi (University of Barcelona) to measure past right whale exploitation levels and patterns.**

**(6) Population modelling of the recovery of SG right whales from whaling will be conducted using measurements of abundance (1 & 3) and catch data (5) in Bayesian framework by PL Jackson.**

## Management and products

Skype project planning meetings will be held quarterly. Two project meetings will be held; **one to update stakeholders on research (Jan 2019), another to communicate results and develop a management strategy with southern right whale researchers and stakeholders during a 3 day end of project workshop at BAS, Cambridge (Nov 2019).**

Public engagement will be conducted through a field blog, media reports and real-time whale tracking at [www.bas.ac.uk](http://www.bas.ac.uk).

*Key reports:*

Cruise report for GSGSSI (April 2019).

Whale habitat-use report for CCAMLR EMM Scientific Committee (June 2019) contributing data for krill management modelling (published as scientific paper).

Whale connectivity and health status report and recommendations for IWC Scientific Committee (May 2019) to contribute to IWC Conservation Management Plan for right whales (published as scientific paper).

GSGSSI Survey report, conclusions and workshop recommendations (Nov 2019).

**19. How does this project:**

- a) Deliver against the priority issues identified in the assessment criteria
  - b) Demonstrate technical excellence in its delivery
  - c) Demonstrate a clear pathway to impact in the OT(s)
- (500 words max)

This project is designed to **improve the conservation, protection and management of the marine environment around the UK OTs** by providing significant new information about the **abundance and habitat-use** of one of the most significant krill consumers using SG waters, which will be contributed to CCAMLR and to the **IWC and IUCN**. Connectivity, health and **population status** data will also contribute key information to the IWC Conservation Management Plan for the population; IWC have identified this population as a conservation concern due to high calf mortalities and other prominent threats. The contribution of information to CCAMLR, identifying whale hotspot areas and prey sources, is designed to **promote sustainable fisheries within the UK OT** by informing CCAMLR krill-fishery management models. Multiple datasets collected during this project (genetics, photo-ID, health and habitat-use) characterising the *baseline* status of this population will be open-access and used to **help develop policies and management plans** with the GSGSSI (i.e. MPA planning and future strategic plan development) and develop a framework for **subsequent monitoring** as whale populations recover from exploitation. This work contributes to (1) the Convention on Biological Diversity, through **identifying components of biological diversity important for conservation and sustainable use and monitoring these components**, and (2) the general principle for CMS parties (all right whale range states) **to promote, co-operate in and support research relating to migratory species**.

A highly experienced team will deliver this project using combined skills and experience in conducting the planned work. The field team have many seasons of field experience and logistics, including in Southern Ocean waters (see CVs and Institutional Capacity). The approaches that we will use are innovative and will allow high quality data to be collected more rapidly than usual for whale field surveys; by using passive acoustics to localise whales and deploying receivers across the survey area we expect to reduce searching time between encounters. Our team has excellent skills in data management and analysis, and a demonstrated track record of conducting and publishing surveys and translating them into policy outcomes through government reports and the IWC and CCAMLR Scientific Committees.

The GSGSSI are key project stakeholders and this survey meets a number of their strategic targets (see Q20). They will be included in **all project planning and implementation meetings** for two-way feedback during project development. Additional key OT institutes and NGOs (including the South Atlantic Environmental Research Institute and Falkland Islands Conservation), will be invited to a project results workshop in **November 2019**, where **conservation recommendations** will be identified that will underpin the official project report to the GSGSSI, summarising the survey results. The field survey report provided to GSGSSI will be designed to allow **accurate replication** of all protocols for future population monitoring. Key feedbacks include: input of whale data to **future MPA planning**, scientific reports to CCAMLR and the IWC addressing scientific recommendations.

We will make all photo-identifications and satellite tracks of right whales available for sharing

with the Antarctic tourist industry, to facilitate public engagement in this project during surveys and after survey completion.

**20. Who are the stakeholders for this project and how have they been consulted (include local or host government support/engagement where relevant)? Briefly describe what support they will provide and how the project will engage with them. (250 words max)**

### **GSGSSI**

The main stakeholder is the GSGSSI; their engagement with the project is essential to ensure the legacy of this work. The research team will liaise with the GSGSSI through quarterly project meetings, development of reports and through a project completion meeting where recommendations and future work will be agreed by scientists, and stakeholders. We will work closely with GSGSSI to ensure necessary permits for operating in SG are in place.

### **International Whaling Commission**

The Head of Science and Chair of the IWC Scientific Committee strongly support this initiative (see attached LoS) as it addresses a number of IWC scientific and conservation recommendations and will contribute substantially to the IWC Conservation Management Plan for southwest Atlantic right whales. IWC will also host the photo-identification catalogue generated by the survey on their server. Results will be communicated to the IWC through presentations to Scientific Committee.

### **CCAMLR**

Reports on habitat-use and distribution of right whales in SG krill fishery management area 48.3 will be provided to CCAMLR in order that right whales can be considered in spatial krill fishery management plans and ecosystem model development.

### **Antarctic Tour Operators**

We will invite tourist cruise operators to the final project workshop, upload our photographs to crowd-sourced tourist photo-ID website happywhale.com, and communicate project results to the tourism industry through PP Cheeseman. The intent is to encourage tourists and their guides to provide right whale photographs and sightings, to assist in building information about this population.

**21. Institutional Capacity:** Describe the implementing organisation's capacity (and that of partner organisations where relevant) to deliver the project. (500 words max)

BAS/NERC has a long history of Antarctic scientific research supported by a dedicated Operations group to facilitate successful execution of all Antarctic logistics and ensure the highest safety standards are maintained. BAS laboratories are equipped to carry out high-quality DNA and isotope research. BAS have been instrumental in producing science underpinning selection and design of marine protected areas, including the 2009 designation of the South Orkney Islands Southern Shelf Marine Protected Area. BAS were also critically involved in the South Georgia and South Sandwich Islands Marine Protected Area planning workshop held in April 2012. PL Jackson is a key member of the IWC's Scientific Committee as Chair of the Southern Hemisphere subcommittee and has conducted multiple assessments of recovering whale populations, including the population assessment for New Zealand right whales.

University of St Andrews scientists will investigate population-connectivity and cetacean health. The Molecular Ecology in the Marine Environment Lab within the Scottish Ocean Institute,

founded by Prof Gaggiotti and Dr Carroll, was established in 2014 to generate high-quality genomic data. Dr Carroll currently leads a global collaboration of 28 researchers from 21 research institutes in 11 countries investigating southern right whale population connectivity using stable isotopes, conventional genetic and next-generation genomic sequencing methods.

Ocean Alliance (PP Rowntree) has compiled a large catalogue (3,085 right whales) individually photo-identified off Península Valdés, Argentina over the past 45 years. The catalogue is managed and annually updated by Rowntree. She will search the Península Valdés catalogue for matches with the whales photo-identified off SG to find individuals that use both areas, **as well as matching SG whales between years**. Projeto Baleia Franca (PP Director Groch) holds a catalogue of 700+ photo-identifications collected along the southern coast of Brazil, which will also be searched for matches in the SG catalogue.

Instituto Aqualie (PPs Andriolo and Zerbinì) has been developing satellite telemetry technology for large whales for over 15 years in partnership with many organizations including the Australian Antarctic Division, the Marine Mammal Laboratory/NOAA-US. They have led or collaborated on >15 research projects to deploy satellite-transmitters to humpback, right, blue, fin and sperm whales in various ocean basins, including Antarctic waters.

Russell Leaper (International Fund for Animal Welfare) will be responsible for managing the acoustic work. He has many decades experience developing acoustic methods to study and count whales. Much of his research has been conducted from small sailing vessels and has also included extensive fieldwork from a range of vessels in the Southern Ocean. He has participated on research cruises developing use of DiFAR sonobuoys to locate and track baleen whales in the Southern Ocean so has precedent with conducting field surveys of this type.

**PPs Aguilar and Vighi (University of Barcelona) have extensive experience collecting and interpreting historical whaling records, and hold data archives of specific whaling voyages, including daily geographic locations of whaling vessels and encounters with SRWs. These data have been used in previous analyses of right whale distribution, foraging patterns and catches in the North and South Pacific and South Atlantic.**

**APPLICANTS SEEKING £100,000 OR OVER CAN PROCEED TO QUESTION 26**

**APPLICANTS SEEKING LESS THAN £100,000 ARE NOT REQUIRED TO COMPLETE THE LOGICAL FRAMEWORK AT QUESTION 26 HOWEVER YOU MAY FIND IT A USEFUL EXERCISE TO HELP YOU STRENGTHEN YOUR PROJECT**

**26. LOGICAL FRAMEWORK**

Darwin Plus projects will be required to report against their progress towards their expected outputs and outcome if funded. This section sets out the expected outputs and outcome of your project, how you expect to measure progress against these and how we can verify this.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p><b>Impact:</b>                      Integrate whale abundance, status and habitat use data into GSGSSI MPA planning, CCAMLR krill management models, IWC Conservation Management Plan, supporting objectives of the Conventions on Biological Diversity and on Conservation of Migratory Species, and to IUCN Cetacean Specialist Group</p>			
<p><b>Outcome:</b>                      To establish and publish baseline data on the status and recovery levels of South Georgia southern right whale feeding grounds, post whaling. Characterise abundance, distribution, diversity, habitat use, health and calving ground connections for conservation management.                      (Max 30 words)</p>	<p>The project will provide the first baseline data on the feeding ground abundance and recovery population status of southwest Atlantic southern right whales.                      This data will contribute to (i) the GSGSSI's marine management through interim and final publicly available reports, in particular to inform MPA monitoring and review processes, (ii) CCAMLR krill spatial management modelling framework, (iii) the IWC Conservation Management Plan for this population</p>	<p>0.1 Five week field survey                      0.2 Satellite tracking of ten whales                      0.3 Photo-identification and microsatellite genotype matching between South Georgia over two field seasons and with Argentine and Brazilian calving grounds                      0.4 Stable isotope data from up to 20 whales and 100 zooplankton samples to determine whale prey                      0.5 Collation of all available right whale sightings data                      0.6 Hormone assays and body condition photographs from up to 20 whales.                      0.7 Collation of oceanographic data associated with SG marine ecosystem                      0.8 Calculate abundance and feeding ground connectivity with</p>	<p>Requires that fieldwork is successfully achieved. Two possible hindrances:                      (1) Equipment failure (data cannot be collected). To mitigate against this at least two items of all equipment required for conducting the fieldwork will be carried, including cameras, biopsy rifles, hexacopters, multiple sonobuoys, hydrophones, tag deployment systems. All equipment is well maintained and serviced.                      (2) Bad weather (data cannot be collected). The 30-day length of the survey is designed to minimise the impact of bad weather on data collection. We take into account 3 bad weather days in 10 to give 21 survey days, and use acoustic localisation to maximise data collection opportunities when</p>

Project summary	Measurable Indicators	Means of verification	Important Assumptions
		<p>Argentina and South Africa</p> <p>0.9 Collate right whale catch history data from southwest Atlantic</p> <p>0.10 Conduct population modelling of the historical trajectory of right whales in the southwest Atlantic to measure population status and recovery levels.</p>	<p>weather permits.</p> <p>(3) Personnel injury. All personnel are highly experienced with working on small boats and with fieldwork of this nature. The vessel will remain close to the north coast of South Georgia for the duration of the survey, within one day's sailing of King Edward Point station if urgent medical assistance is required. All personnel have first aid training.</p> <p>Mark resight abundance estimation requires that there are resightings of whales between years. To maximise resight opportunities we will (1) acoustically localise whales using sonobuoys to maximise encounter rates, (2) encourage tourist photo-ID submissions via Project Partner Cheeseman (<a href="http://www.happywhale.com">www.happywhale.com</a>), (3) use microsatellite genotypes to identify siblings and parents and conduct mark recapture using very close-kin. We will also minimise risk by using alternate means of measuring abundance, through analysis of (i) sightings data, (ii) acoustic detection densities and (iii) quantifying connectivity with SG calving ground (where abundance estimates are available)</p>

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p><b>Outputs:</b></p> <p>1. Report to GSGSSI on (i) <b>status assessment</b> of southern right whale SG distribution, habitat use and recovery patterns in the southwest Atlantic, (ii) <b>risks</b> to the population, (iii) <b>recommended actions</b> to mitigate risks</p>	<p>Data compiled from cruise and combined with other sightings, incorporated into a single document available externally for viewing on the website of the GSGSSI.</p> <p>Provides a baseline for measuring change in species characteristics in response to impacts, including climate change.</p>	<p>1.1 Achievement of 0.1-0.6 above</p> <p><b>1.2 Report for future MPA planning</b></p> <p><b>1.3 Falklands based workshop on project plans and feedback with stakeholders including GSGSSI in Feb 2019</b></p> <p><b>1.4 UK based workshop in Nov 2019</b> with stakeholders including GSGSSI to share results and agree report recommendations</p>	<p>None envisaged</p>
<p>2. Report <b>key whale habitat use</b> data to CCAMLR through a scientific paper to the <b>EMM Working Group</b> for consideration within <b>spatial management proposals for regional krill fishery development.</b></p>	<p>Right whale habitat use patterns in SG waters provided in 2019 <b>scientific report</b> to CCAMLR EMM group. This group has never previously considered information on whale habitat use in relation to krill fishery discussions. This is therefore a precedent breaking initiative.</p>	<p>2.1 Information from 0.2, 0.4, 0.5 and 0.7 integrated into ARC GIS database and made publicly accessible through <a href="http://www.bas.ac.uk">www.bas.ac.uk</a></p> <p>2.2 Report for CCAMLR prepared and publicly available through <a href="http://www.ccamlr.org">www.ccamlr.org</a></p>	<p>Assumes that a CCAMLR report on whale habitat use will be acceptable for discussion by the CCAMLR Scientific Committee who do not traditionally consider whales in their ecosystem management discussions.</p> <p>To address the risk that this information is rejected, we will seek recommendation for this work during the <b>delayed 2018</b> joint IWC/CCAMLR meeting on ecosystem modelling through multiple IWC and CCAMLR Project Partners who will be involved in this joint meeting.</p>
<p><b>3. Report right whale connectivity and health assessment data to the IWC</b> to address multiple scientific recommendations and concerns</p>	<p>Right whale health and connectivity parameters will be provided in a 2019 <b>scientific report</b> to IWC Scientific Committee. The GSGSSI</p>	<p>3.1 Information from 0.3, 0.4 and 0.6 collated into summary of population connectivity, diversity and health status which will be provided in a</p>	<p>None envisaged</p>

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p>regarding threats and data gaps and contribute to the <b>IWC Conservation Management Plan</b> for this population.</p>	<p>final report (output 1) will also be submitted as further information. A series of <b>recommendations and ways in which this work addresses Conservation Management Plan</b> concerns will also be drafted for <b>endorsement</b> by the IWC Scientific Committee.</p>	<p>report to IWC, publicly available through <a href="http://www.iwc.int">www.iwc.int</a></p>	
<p><b>4. Calculate right whale depletion levels and recovery status in the southwest Atlantic, considering the population abundance in South Georgia and strength of linkages with calving areas.</b></p>	<p><b>4.1 Complete population abundance and assessment paper in Nov 2019, for publication. Present for endorsement by the IWC scientific committee.</b> Contribute to IUCN Cetacean Specialist Group for next threat status determination for southern right whales.</p>	<p>4.1 Catch series to be provided to the IWC Secretariat for databasing where it will be publicly accessible. 4.2 Population assessment model made available as open source code in R 4.3 Recorded endorsement of (i) abundance metric, and (ii) population status estimate by IWC scientific committee.</p>	<p>Abundance and connectivity measurement may require application of a variety of approaches. For example there is a risk that no whales are resighted between years for mark-recapture analysis. However two field seasons of data collection means estimation of connectivity with Brazil/Argentina will be more robust. Without resights we will use the connectivity estimate to derive a measure of the proportion of whales using SG from those grounds, and use established abundance estimates from breeding grounds as primary modelling info to establish population status.</p>
<p><b>5. Create strong collaborative network of stakeholders to sustain project results, assist with further monitoring and broaden scope of baseline surveys to other whale species</b></p>	<p>5.1 Collaborative workshop at the close of the project involving all stakeholders in Stanley, Falkland Islands in order to communicate results and agree final recommendations arising from project and future work. 5.2 Right whale photos made open</p>	<p>5.1 Workshop report publicly available (output 1), 5.2 Press release and news report about workshop generated by BAS and through Project Partner press teams. 5.3 happywhale.com tracks photo submissions during and after project</p>	<p>Through engagement with OT stakeholders throughout the project period, and including stakeholder-assisted development of conservation management recommendations, we hope to maximise chances of sustainability following this baseline work. Feedback into key scientific bodies</p>

Project summary	Measurable Indicators	Means of verification	Important Assumptions
	access through public databases including through Antarctic tour industry portal happywhale.com and results promoted through stakeholder linkages to encourage future submission of right whale photographs for identification and matching.	to evaluate impact of project awareness on tourist interest in the project.	(IWC and CCAMLR) as well as the IWC Conservation Management Plan will also provide internationally recognised recommendations which will provide additional impetus for assisting development of a South Georgia and South Sandwich Islands whale monitoring program in the future.
<p><b>Activities</b> (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)</p> <p>Activity 1.1 Virtual project planning meeting with all project partners and key stakeholders in GSGSSI in May 2017 with subsequent M&amp;E meetings every six months.</p> <p>Activity 1.2.1 Obtain permits from GSGSSI and Animal Ethics approvals for fieldwork and scientific procedures.</p> <p>Activity 1.2.2 Equipment purchase, permit applications, shipping of equipment to Falkland Islands as British Antarctic Survey cargo.</p> <p>Activity 1.3 Travel to Falkland Islands for pre-cruise workshop in Stanley, Falkland Islands to discuss cruise details and expected outcomes with OT government officials, NGOs and Antarctic tour operators.</p> <p><b>Activity 1.4 Survey embarks from Stanley, Falkland Islands for 5 weeks</b></p> <p>Activity 1.4.1 Deploy DiFAR sonobuoys and use sonobuoy transmissions and sightings to locate whales</p> <p>Activity 1.4.2 Skin samples collected from all encountered whales (50)</p> <p>Activity 1.4.3 Photographs collected of all encountered whales (50-60, head shots collected via hexacopter)</p> <p>Activity 1.4.4 Satellite tracking of up to 10 whales (PP Zerbini and Andriolo)</p> <p>Activity 1.4.5 Blubber samples collected from 10-20 whales (PP Carroll)</p> <p>Activity 1.4.6 Photogrammetry measurements taken by hexacopter from 10-20 whales</p> <p>Activity 1.4.7 Blog about survey on British Antarctic Survey website, using blog, twitter and media outlets to share photos and videos from the voyage.</p> <p>Activity 1.5 Biological samples shipped from the Falkland Islands to UK as British Antarctic Survey cargo in April 2018, transported at appropriate storage temperature.</p> <p>Activity 1.6.1 Provide photo-ID catalogue to regional associates in Brazil and Argentina, also IWC secretariat for open access hosting and happywhale.com. Circulate copies of catalogue to tour operators working in the South Georgia region in order to encourage crowd-sourced photo submissions</p> <p>Activity 1.6.2 Project Partners (Rowntree and Groch) conduct photo-ID matching with Argentine and Brazilian calving grounds. <b>Project Partner Rowntree will also conduct photo-ID matching between the two South Georgia survey years to identify any resights.</b></p> <p>Activity 1.7.1 Compile acoustic and sightings data <b>from cruise years 1 and 2</b> (PP Leaper and PL Jackson)</p>			

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p>Activity 1.7.2 Compile oceanographic data <b>over two years of surveys to put sightings and satellite tracks in oceanic context</b> (Trathan at BAS)</p> <p>Activity 1.7.3 Construct right whale habitat models (PP Zerbini)</p> <p><b>Activity 1.8.1 Provide cruise report, distribution patterns and habitat use analysis to International Whaling Commission (June 2019)</b></p> <p><b>Activity 1.8.2 Report on right whale habitat use patterns <b>from two years of surveys</b> to South Georgia government (Sept 2019)</b></p> <p>Activity 1.9.1 Zooplankton and whale isotope analysis (Stowasser at BAS)</p> <p>Activity 1.9.2 Whale prey identification (Stowasser at BAS)</p> <p>Activity 1.10.1 DNA extraction, microsatellite genotyping &amp; mitochondrial DNA sequencing (PL Jackson, PP Carroll)</p> <p>Activity 1.10.2 Measure population diversity of South Georgia and differentiation from calving ground, as well as matching microsatellite genotypes of individuals with those available from Península Valdés calving ground <b>and with the 2018 SG survey</b> (PP Carroll)</p> <p>Activity 1.10.3 Measure assignment of South Georgia whales to calving grounds using global dataset held (PP Carroll)</p> <p>Activity 1.11.1 Assay stress hormones in blubber samples e.g. cortisol (PP Hall)</p> <p>Activity 1.11.2 Assay progesterone to measure pregnancy in blubber-sampled whales identified as female (PP Hall)</p> <p>Activity 1.12 Photogrammetry analysis of whale body condition from photos (PP Moore)</p> <p><b>Activity 1.13 Organise UK workshop in Nov 2019 with project partners and stakeholders to present science outputs from SG field surveys, conclude population recovery status of southwest Atlantic right whales and write conservation management recommendation report to GSGSSI.</b></p>			
<p>Activity 2.1 Summarise results from Activities 1.4 and 1.7 to prepare CCAMLR scientific report on right whale habitat use</p> <p><b>Activity 2.2 Project member (Trathan) present report to CCAMLR EMM meeting discussing the relative consumption of krill by penguins, seals and whales and the necessity for considering cetaceans in krill fisheries management</b></p>			
<p>Activity 3.1 Summarise results from activities 1.4, 1.6, 1.9, 1.10, 1.11 and 1.12 into IWC scientific report on right whale connectivity and health status on SG feeding grounds <b>using all SG data collected to date.</b></p> <p><b>Activity 3.2 Present report to IWC Scientific Committee meeting</b></p>			
<p>Activity 4.1 PDRA Vighi to conduct in-depth review of southwest Atlantic right whale catches using historical material, including logbooks and import records. Generate a catch series (or series of catch series to capture the catch uncertainty).</p> <p>Activity 4.2 PL Jackson, PP Carroll, PP Zerbini and PP Leaper to measure SG right whale abundance using mark recapture information from two seasons of surveys, also considering estimates derived from density data obtained from acoustic monitoring and sightings.</p> <p>Activity 4.3 PL Jackson, PP Carroll and PP Zerbini use connectivity data (Activity 3.1) to quantify the degree of connection between SG and PV and</p>			

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p>measure abundance as proportion of PV abundance.</p> <p>Activity 4.4 PL Jackson to build a density dependent Bayesian population modelling framework to assess the recovery status of southwest Atlantic right whales using results from activities 4.1, 4.2 and 4.3 above.</p> <p>Activity 4.5 <b>Present report to IWC Scientific Committee meeting for feedback and to obtain endorsement of the abundance calculations and population status estimates.</b></p> <p>Activity 5.1 <b>Organise a 3 day project summary workshop in UK, with 1 day open to all, presenting science summaries, and 2 days open to steering group and OT representatives</b> to discuss and agree conservation recommendations, including South Georgia Government, key Falkland Islands environmental research institutes and NGOs and Antarctic tour operators. Krill fishery representatives will also be invited.</p> <p><b>Activity 5.2 Compile conservation recommendations from steering group and stakeholders into project summary report</b></p> <p>Activity 5.3 Write Darwin summary project report</p> <p>Activity 5.4 Audit of project expenditure</p>			

**27. Sustainability:** How will the project ensure benefits are sustained after the project has come to a close? If the project requires ongoing maintenance or monitoring, who will do this? (200 words max)

We aim to develop stakeholder engagement throughout this project such that, following project completion, surveys of whale numbers, habitat use and migratory movements become a core part of GSGSSI strategic planning. We will liaise closely with GSGSSI throughout, providing significant input to the MPA planning through a stakeholder workshop in February 2019, and a **future-facing workshop on South Georgia right whales and status in November 2019, gathering key OT personnel and stakeholders to evaluate project results and consider priority actions for further monitoring collaboratively.** Developing good linkages with other key community stakeholders within the Falkland Islands OT through the two project workshops will be used for identifying collaboration opportunities, raising interest in this knowledge gap and developing a **network of stakeholders** with the resources to develop whale monitoring programs following project completion.

Providing an open-access photo ID database of right whales to happywhale.com will enable the tourist industry to **contribute to this catalogue in future**, contributing to continued data gathering for the population. Jackson and Cheeseman will continue to promote this data collection within the Antarctic tour industry after project completion.

Results will be sustained via peer-reviewed papers and reports to relevant stakeholders and international organisations, including IWC and CCAMLR.

**28. Open access:** All outputs from Darwin Plus projects should be made available on-line and free to users whenever possible. Please outline how you will achieve this. (200 words max)

All reports to stakeholders will be made available online through GSGSSI website, and the IWC and CCAMLR data portals. Satellite tracking data will be published live to a map on the BAS website and available for download, with assistance of the BAS web manager to ensure tracks are published promptly, allowing media to track progress of the project and data to be fully available to the public. All distribution data will be published to the Global Biodiversity Information Facility at the end of the project.

Photo-identifications of right whales will be made available through the online portal happywhale.com and through the IWC servers.

Genetic data generated by the project will be published through Genbank (DNA sequence data) or Datadryad (microsatellite genotype data).

**29. Monitoring & Evaluation:**

Describe, referring to the Indicators above, how the progress of the project will be monitored and evaluated, making reference to who is responsible for the project's M&E. Darwin Initiative projects are expected to be adaptive and you should detail how the monitoring and evaluation will feed into the delivery of the project including its management. M&E is expected to be built into the project and not an 'add' on. It is as important to measure for negative impacts as it is for positive impact.

(Max 500 words)

Financial monitoring will take place at the British Antarctic Survey and through an external audit at the end of the project as required by the Darwin Fund.

Our project steering committee will be composed of all project staff (the Project Leader and Partners), a stakeholder representing the GSGSSI, and a stakeholder representing the IWC (see attached Letters of Support). Virtual meetings of the steering committee will be held every six months, with clear milestones and delivery dates developed from the project timeline shown in Q32. We will use Skype and teleconference facilities to connect at these meetings in order to keep travel costs low. Each meeting will review outputs, goals, problems arising and expenditures to date against the budget. PL Jackson is responsible for ensuring the project's progress is monitored and evaluated and for organising the quarterly meetings.

Independent feedback on project progress will be elicited from research scientists within the IWC Scientific Committee in **May 2018**, solicited through submission and discussion of a field report to the sub-committee with expertise on right whales, health assessments and ecosystem modelling.

Two workshops will also be held during the course of the project in order to monitor progress and feed back to stakeholders. **The first workshop will be held where the OT government is based, just prior to the field survey in January 2019, and will update local stakeholders on project progress and provide opportunities for feedback and discussion. The second workshop will be held in the UK at the end of the project in November 2019 to summarise results and agree recommendations and discuss conservation management and monitoring strategies for the future with project partners and stakeholders.**

Monitoring and Evaluation costs will accrue from allocation of staff time either through salaries supported by Darwin or provided as in-kind time by Steering Group members. The values for M&E that are given in the budget relate to T&S costs for the two workshops, as other meetings will either be held virtually or are supported through other funding sources.

Number of days planned for M&E	5
Total project budget for M&E	<b>£13,000</b>
Percentage of total project budget set aside for M&E	<b>3.4%</b>

**30. Financial controls:** Please demonstrate your capacity to manage the level of funds you are requesting. (Who is responsible for managing the funds? What experience do they have? What arrangements are in place for auditing expenditure?)

Finances will be controlled by BAS through the fully audited RCUK Shared Business Service. A unique budget cost centre will be created for the project. Expenditure of funds will be overseen by the project steering committee with ultimate oversight by the Project Leader who will manage day-to-day disbursements and hold ultimate budgetary responsibility. The Project Leader has managed the laboratory budget and other expenditures for her research group since 2012 and successfully managed consumables budgets for other BAS/NERC projects. Finances will be independently audited at the end of the project.

Please complete the separate Excel spreadsheet which provides the Budget for this application. Some of the questions earlier and below refer to the information in this spreadsheet. If you are requesting over £100,000 from Darwin Plus, you must complete the full spreadsheet.

### 31. Value for Money

Please explain how you worked out your budget and how you will provide value for money through managing a cost effective and efficient project. You should also discuss any significant assumptions you have made when working out your budget. (200 words max)

Budgets were developed using best-price quotes for equipment and information on travel and subsistence available through a Falkland Islands travel agency and UK government daily subsistence rates.

#### *Lead Organisation:*

PL Jackson (5%): project planning, implementation, population assessment modelling and report preparation, Stowasser (2.2%): sample preparation and stable isotope analysis, Trathan (2.2%): collating oceanographic data for habitat-use analysis. Overhead costs capped at 40%.

#### *Project Partners:*

St Andrews PDRA Carroll (27%): biopsy sampling, DNA amplification and genotyping for abundance, connectivity and diversity analysis, Instituto Aqualie: expert satellite-tracker at £216/day for 40 days (£8,640), expert acousticians for localising whales (£220/day) for 40 days plus one month of acoustic analysis (£4,611), photo-ID matching between years and with Argentine (Rowntree) and Brazilian (Groch) calving grounds, £3000 total. PDRA Vighi (21%): catch series compilation.

#### *Other costs*

Falkland Islands travel, three days subsistence (£139/day) for (i) seven cruise participants (2018/19). Travel/subsistence for 15 workshop participants (Nov 2019, £12,000 travel/accommodation, £1000 subsistence). Survey vessel charter, £2115/day for 40 days. Consumables include ten satellite tags (£24,600), sonobuoys (£14,000), biopsy-darts (£1,414) in year 1 (these require permits and shipping and have a long lead time), ARGOS satellite-time to locate whales (£4,125), genetic and isotope analyses. The hydrophone array assists with acoustic whale detection.

**32. Provide a project implementation timetable that shows the key milestones in project activities. Complete the following table as appropriate to describe the intended workplan for your project**

Please add/remove columns to reflect the length of your project. For each activity (add/remove rows as appropriate) indicate the number of quarters it will last, and shade only the quarters in which an activity will be carried out. The workplan can span multiple pages if necessary.

Activity	No. of months	Year 1				Year 2				Year 3			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	
Output 1													
1.1 Project planning meetings	33	Orange		Orange		Orange		Orange		Orange		Orange	
1.2 Cruise planning, permitting and shipping of equipment	8		Red			Red	Red	Red					
1.3 Project workshop in the Falkland Islands	1								Black				
1.4 South Georgia right whale survey	1								Blue				
1.5 Shipping of samples back to UK	2									Red			
1.6 Photo-ID matching with calving areas and between years	2									Cyan	Cyan		
1.7 PP Zerbini Right whale habitat-use analysis	3									Cyan		Cyan	
1.8 Project progress reports to IWC, GSGSSI	6										Black	Black	
1.9 PP Stowasser whale diet analysis	6									Cyan	Cyan		
1.10 PP Carroll Genetic analysis of diversity and connectivity	10									Cyan	Cyan	Cyan	Cyan
1.11 PP Hall Stress hormone analysis	6										Cyan	Cyan	
1.12 PP Moore Body condition analysis	4										Cyan	Cyan	
1.13 UK workshop summarising cruise findings	4											Maroon	
Output 2													
2.1 Prepare CCAMLR & IWC scientific reports on habitat use	6									Maroon			
2.2 PP Trathan present to CCAMLR Scientific Committee	1										Maroon		
2.3 Publish sightings data to GBIF	1										Maroon		
Output 3													
3.1 PP Carroll, Hall and Rowntree prepare IWC report on connectivity and health status	6									Black	Black		
3.2 Present health status report to IWC Scientific Committee	1										Maroon		

Output 4														
4.1 PP Vighi Right whale catch history analysis														
4.2 Calculate right whale abundance														
4.3 Estimate connectivity between Peninsula Valdes and SG														
4.4 Conduct population assessment of southwest Atlantic right whale recovery														
<b>4.5 Prepare report to IWC Scientific Committee.</b>														
Output 5														
5.1	Project summary workshop, developing recommendations	1												
5.2	<b>Complete GSGSSI project report, combining recommendations from Output 4.1 and Output 1.13</b>	2												
5.3	Darwin project reports	21												
5.4	Audit of project expenditure	1												

### CERTIFICATION

On behalf of the trustees/company\* of British Antarctic Survey, a constituent part of the Natural Environment Research Council

I apply for a grant of £312,111 in respect of **all expenditure** to be incurred during the lifetime of this project based on the activities and dates specified in the above application.

I certify that, to the best of our knowledge and belief, the statements made by us in this application are true and the information provided is correct. I am aware that this application form will form the basis of the project schedule should this application be successful. (*This form should be signed by an individual authorised by the lead institution to submit applications and sign contracts on their behalf.*)

- I enclose CVs for key project personnel and letters of support.
- I enclose the most recent 2 years of signed and audited/independently verified accounts.

<b>Name (block capitals)</b>	MARGARET CLARK
<b>Position in the organisation</b>	HEAD OF FINANCE

**Signed**  **Date:**

**If this section is incomplete the entire application will be rejected. You must provide a real (not typed) signature. You may include a pdf of the signature page for security reasons if you wish. Please write PDF in the signature section above if you do so.**

## Application Checklist for submission

	Check
Have you read the <a href="#">Guidance</a> ?	X
Have you read the current <b>Terms and Conditions</b> for this fund?	X
Have you <b>checked the Darwin Plus website</b> immediately prior to submission to ensure there are no late updates?	X
Have you provided <b>actual start and end dates</b> for your project?	X
Have you provided your <b>budget based on UK government financial years</b> i.e. 1 April – 31 March and in GBP?	X
Have you checked that your <b>budget is complete</b> , correctly adds up and that you have included the correct final total on the top page of the application?	X
Has your application been <b>signed by a suitably authorised individual?</b> (clear electronic or scanned signatures are acceptable in the email)	X
Have you included a <b>1 page CV for all the key project personnel?</b>	X
Have you included a <b>letter of support from the applicant organisation, main partner(s) organisations and the relevant OT Government?</b>	X
Have you included a <b>copy of the last 2 years' annual report and accounts</b> for the lead organisation?	X

Once you have answered the questions above, please submit the application, not later than midnight **2359 GMT Monday 29 August 2016** to [Darwin-Applications@ltsi.co.uk](mailto:Darwin-Applications@ltsi.co.uk) using the first few words of the project title **as the subject of your email**. If you are e-mailing supporting documentation separately please include in the subject line an indication of the number of e-mails you are sending (e.g. whether the e-mail is 1 of 2, 2 of 3 etc). You are not required to send a hard copy.

DATA PROTECTION ACT 1998: Applicants for grant funding must agree to any disclosure or exchange of information supplied on the application form (including the content of a declaration or undertaking) which the Department considers necessary for the administration, evaluation, monitoring and publicising of Darwin Plus. Application form data will also be held by contractors dealing with Darwin Plus monitoring and evaluation. It is the responsibility of applicants to ensure that personal data can be supplied to the Department for the uses described in this paragraph. A completed application form will be taken as an agreement by the applicant and the grant/award recipient also to the following:- putting certain details (i.e. name, contact details and location of project work) on the Darwin Initiative and Defra/FCO/DFID websites (details relating to financial awards will not be put on the websites if requested in writing by the grant/award recipient); using personal data for the Darwin Initiative postal circulation list; and sending data to Governor's Offices outside the UK, including posts outside the European Economic Area. Confidential information relating to the project or its results and any personal data may be released on request, including under the Environmental Information Regulations, the code of Practice on Access to Government Information and the Freedom of Information Act 2000.