

Darwin Plus: Overseas Territories Environment and Climate Fund

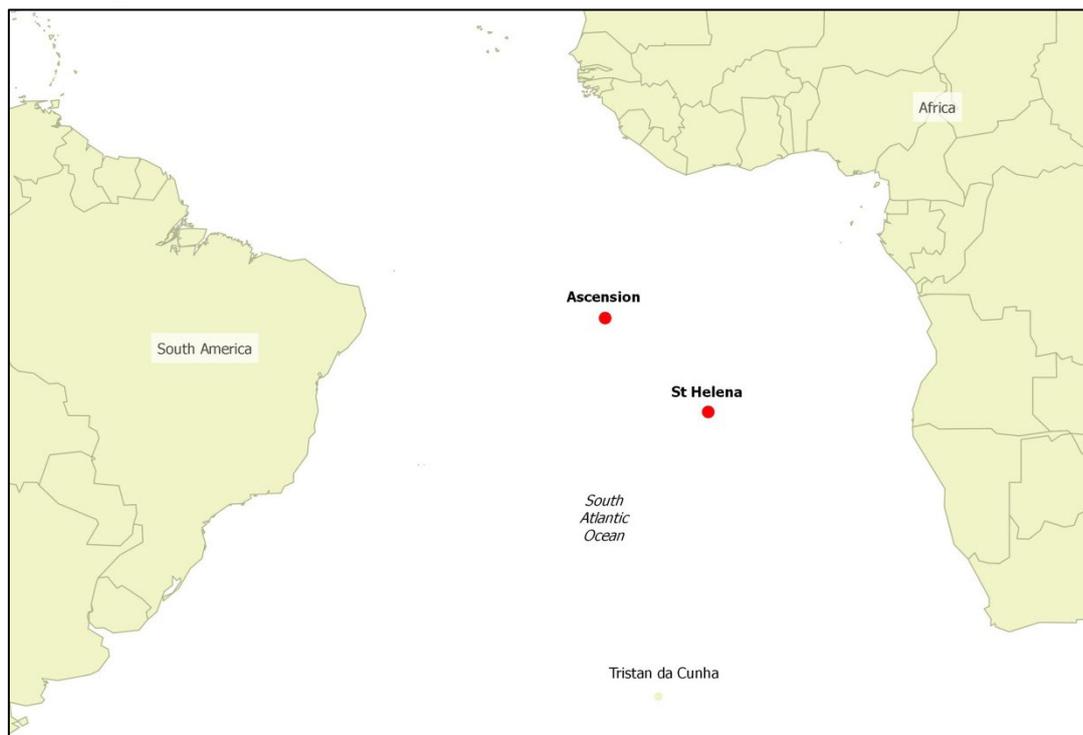
Final Report

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

DarwinProject Information

Project Ref Number	DPLUS018
Project Title	Taxonomic and conservation status of Oceanodroma storm petrels in the South Atlantic
Territory(ies)	St Helena and Ascension Island, South Atlantic
Contract Holder Institution	St Helena Government
Partner Institutions	Royal Society for the Protection of Birds (RSPB), Ascension Island Government, Queens University, St Helena National Trust
Grant Value	£43,430
Start/end date of project	April 2014 - September 2015
Project Leader	Miss Annalea Beard
Project website	http://www.rspb.org.uk/forprofessionals/science/research/details.aspx?id=363023 http://www.nationaltrust.org.sh/taxonomic-and-conservation-status-of-oceanodroma-storm-petrels-in-the-south-atlantic/
Report author and date	Miss Annalea Beard December 2015

1 Project Overview



Two of the most remote islands in the world, Saint Helena and Ascension Island are situated in the South Atlantic Ocean. St Helena is 1200 miles from southern Africa and 1800 miles from South America. Ascension Island is 810 miles northwest of St Helena. The storm-petrels are the least well-known species of the seabird assemblage of St Helena and Ascension, and have traditionally been viewed as conspecific with *Oceanodroma castro* which is widespread throughout the North Atlantic and Pacific. However, recent work by two of the project partners on the *Oceanodroma castro* complex of the North Atlantic has revealed the presence of several “cryptic” species, new to science, that breed on the same islands as *O. castro* but at different times of year. Published work by St Helena Government and RSPB has revealed similar seasonal breeding populations on St Helena: the South Atlantic populations differ in morphology and vocalisations from those breeding in the North Atlantic. It is therefore probable that endemic, but as yet un-described, storm petrel species exist on St Helena and Ascension. The conservation status of the storm petrels of St Helena and Ascension crucially hinges on a correct understanding of their taxonomic affinities with other Atlantic and Pacific populations of *Oceanodroma* storm petrels. If these populations are considered sufficiently distinct to warrant classification as one or more new species, their small population size and highly restricted global distribution, would confer high conservation importance on these populations. In order to rigorously assess their taxonomic, and hence conservation status this project will make genetic comparisons with existing data from North Atlantic and Pacific populations, and employ new techniques to survey the seasonal populations on both St Helena and Ascension thus establishing a baseline for longer-term monitoring and informing the development of conservation and management plans.

2 Project Achievements

2.1 Outcome

This project has gone a long way to fulfilling the proposed outcome of “clarifying the conservation status of the two seasonal populations of storm petrels on Ascension and St Helena”. The South Atlantic populations of *Oceanodroma* storm petrel appear to be genetically, physically and vocally significantly different to other *Oceanodroma castro* populations globally. It is also recommended that the populations from each South Atlantic Island be managed separately as they may represent separate subspecies. However a number of other research questions were identified during the project, some of which could not be addressed within the timeframe (Annex 4, 5). Findings have been drafted for publication until which time clarification of the species taxonomic status will not be accepted by the wider scientific community. Identifying the location and size of each colony proved problematic as described in 2.2.2, 2.2.3 as the methodology proved ineffective in some areas. As a consequence the South Atlantic populations are not quite ready to be reassessed under the IUCN criteria. This project has involved large amounts of training of staff to ensure the conservation and management of the South Atlantic *Oceanodroma* populations is continued post project.

2.2 Outputs

1. Clarify taxonomic status of seasonal populations of storm-petrels on St Helena and Ascension

During the course of the project after collecting some preliminary data on morphometric, vocalisations and vocal recognition it was recognised that additional DNA analysis was needed to resolve any subspecies differences within the four seasonal South Atlantic populations. Queens University agreed to carry out in addition to the mitochondrial and microsatellite analysis, double-digest randomly amplified DNA sequencing (ddRADseq) to screen thousands of loci. A short report on the findings from the genetic analysis can be found in Annex 4. In summary it recognises the South Atlantic *Oceanodroma* populations to be a distinct Evolutionary Significant Units (ESU) with each island (Ascension and St Helena) warranting separate management units (MUs).

The analysis of the morphometric, vocalisations and vocal recognition data (Annex 5) supports the DNA analysis suggesting that the four seasonal populations of *Oceanodroma* storm petrels from Ascension and St Helena form two groupings, one on each island, with little differentiation between seasons at each location. The populations of both islands are distinct, each with recognisable call differences, and the birds of Ascension are also distinctive morphologically, with longer and thicker bills and a more deeply forked tail than their counterparts on St Helena.

Both reports identify additional work still needed to be completed before the South Atlantic *Oceanodroma* population's taxonomic status can be verified and recognised in the scientific community. It is hoped that in the near future the findings will be published in a scientific journal.

2. Estimate made of storm petrel breeding population size on Egg Island (St Helena) and Boatswain Bird Island (Ascension)

Using the spatially-explicit capture-recapture model to create abundance estimates from the mist netting mark recapture data collected on Egg Island for the seasonal populations during the project proved highly successful (Annex 6). St Helena Government can now use this baseline estimate to gauge future population changes and formulate appropriate management strategies and conservation plans appropriately. This novel technique has multiple applications to other bird species globally and it is hoped that the results of this research will be disseminated to the public in the near future. This element of the project enabled Ascension Island staff and multiple stakeholders from St Helena to be fully trained in the use of mist netting at an active seabird colony and gave them extensive experience in processing large numbers of seabirds fast and efficiently. These skills were then put into practice on Ascension Island during the following field seasons.

Access to Boatswain Bird Island during the cool season was not feasible despite multiple attempts. This was an identified risk and despite the project extension to enable another opportunity to collect important ecological data from the cool season this output failed to be achieved. Genetic and morphometric data were able to be collected from the mainland during June 2014 however verification of an active breeding population and collection of recordings of nest burrow calls during this season on Boatswain Bird Island was not possible.

Fieldwork on Boatswain Bird Island during November 2014 concluded that daytime playback surveys to assess breeding density would not be a suitable technique given the low response rate. Staff from St Helena were trained in the survey technique during that time and attempted to replicate the survey on Egg Island during their known peak breeding season in December 2014. Storm petrels during the 2014 hot season on Egg Island also exhibited an extremely low response rate to playback during both the day and night. Identifying an alternative survey technique to quantify breeding density of the South Atlantic storm petrel populations will be difficult given the cryptic nature.

3. Other areas where storm-petrels breed identified using sound recordings

The higher estimated cost of the automated sound recorders for the project meant that fewer could be purchased and deployed at different locations on St Helena and Ascension. Two different types of automated sound recorders were deployed onto St Helena and Ascension. The "Songmeters" purchased from Wildlife Acoustics produced higher quality recordings than the RSPB produced recorders. Operation, programming and downloading was also far simpler than the alternative sound recorder trialled.

522 hours of recording were collected in the cool season; 40 two hour recordings from four locations on Ascension's mainland and 221 two hour recordings from three offshore islands off St Helena's coastline. During the hot season 662 hours of recordings were collected; 38 two hours of recordings from three locations on Ascension's mainland and 293 two hour recordings from five locations at St Helena. These recordings have been catalogued in a database and are currently stored by St Helena Government as a reference collection.

The acoustic recogniser developed by the manufacturer of the SoundID software from the 60 template vocalisations sourced from recordings made from St Helena's cool season failed to accurately positively detect storm petrel vocalisations. Manual screening of the recordings

allowed identification of locations where storm petrels were consistently found to be present on St Helena (Annex 7.), however due to the time constraints not for Ascension. Manual screening allowed identification of one new potential breeding colony off St Helena's coastline, visual verification of actively nesting storm petrels were made on Thomson Valley Island during 2014 hot season.

Calculation of a call rate and assessment of the local density from vocal activity was also not possible in the project timeframe and budget. Alternative techniques were researched and sourced from private sector specialists and initially proved promising but was solely reliant on their voluntary help. The use of automated sound recorded to gain an estimation of density from vocal activity has been proven to work for other *Oceanodroma* species (Dr Raine pers. comms.) Future use of this technique in the South Atlantic will be dependent on additional funding and time to perfect an acoustic recogniser suitable for these populations. It is recommended that future data processing be outsourced to a private sector specialist for efficiency.

2.3 Sustainability and Legacy

All the research necessary for reviewing the taxonomic status of the *Oceanodroma castro* populations in the South Atlantic has been completed, dissemination of the findings to the wider scientific community through publication (which have been drafted) will leave an international legacy. The abundance estimates from Egg Island generated from this project have given a baseline from which future population changes can be gauged, this will be a lasting legacy of this project on St Helena.

Eleven staff from St Helena Government and five staff from Ascension Island Government who have gained training under this project are permanent employees and they will continue with the work and long term monitoring established under this Darwin project. The resources provided by this project both in terms of capital items and databases and resources will remain with the respective Overseas Territory Governmental departments.

Strong partnerships have been established during this project between the two South Atlantic territories as well as with other key international stakeholders which will continue throughout future research into the *Oceanodroma* species. There will be a continuation of contacts with individuals from other Overseas Territories, sharing relevant knowledge and resources. Queens University in particular is committed to furthering the knowledge into the genetic diversity of *Oceanodroma castro* complex globally and currently has a PhD research student continuing the genetic analysis of the South Atlantic populations within a global context.

3 Project Stakeholders

The major stakeholders are the five project partners St Helena Government (SHG), Ascension Island Government (AIG), the St Helena National Trust (SHNT), the Royal Society for the Protection of Birds (RSPB) and Queens University in Canada.

There were extensive discussions by email and telephone in the development of this project proposal and all parties have been engaged regularly through the stakeholder group as the project has been progressing.

During the SHG staffs visit to Ascension in June 2014 both STH and AIG staff received training in the use of a playback lures at a mist net during a (potential) breeding season from Dr Will Miles from the RSPB as well as training in DNA collection techniques from visiting PhD researcher Miss Rebecca Taylor from Queens University. In November 2014 SHG and AIG staff received further training in the use of playback census techniques from Dr Mark Bolton from the RSPB. In December 2014 AIG staff received extensive training from SHG staff in ringing and mist netting on an active breeding seabird colony. All Egg Island fieldwork at St Helena would not have been possible without the support of local volunteers in the SHNT and the St Helena Nature Conservation Group (SNCG). Other collaborators include the British Trust for Ornithology (BTO) who supplied the rings and ringing technical advice without which the project would not be able to individually identify storm petrels and therefore establish a population estimate for Egg Island.

4 Lessons learned

The main lesson learnt from this project is the importance of developing close working relationships and exchanging skills between the UKOT's. Given the remoteness of both St Helena and Ascension yet their proximity to each other the similarities in the issues each territory have to deal with shouldn't be underestimated and there is a lot still to be learnt from each other. The logistics of interisland working and shipping specialist consultants/equipment in the short time frame proved more complex than initially identified in the project outline. Continuous reviewing of the progress a project is making in meeting its objective is extremely important. Periodic reviewing of this project identified that additional DNA analysis was necessary to fulfil the project outputs and within the timeframe. It also identified that an extension could benefit the project in fulfilling all outputs; however had all elements of the project gone to plan the original proposed timeframe would have been sufficient for completion.

4.1 Monitoring and evaluation

The initial methodology for this project was changed through the course of the project however the final output remained the same. After there was a change in project leader it was established, through reviewing of the existing data at the time that the proposed genetic analysis would not be enough to distinguish within species differences. Additional genetic analyses were funded through agreed redistribution of the budget and completed within the timeframe of the project (Annex 4).

Due to accessibility problems on Boatswain Bird Island (BBI) on Ascension Island and the inability to collect important ecological data on Ascension's cool season population the project was granted a six month extension, however access to BBI was still not possible during the following 2015 cool season. All possible alternative data that could be collected from Ascension's mainland to assist in completing the project outcomes were completed however some data gaps still remain as explained in Section 3.

4.2 Actions taken in response to annual report reviews

A webpage was created on the St Helena National Trust website (see Darwin project information for link) to promote the project and Darwin Plus's involvement. As the DNA analysis results show (Annex 4) the blood samples collected were more than adequate for determining potential subspecies differences. The findings were backed up by the morphometric, vocalisation and vocal recognition analysis (Annex 5).

5 Darwin Identity

The Darwin logo has been used on all published material to date; fieldwork reports, press releases and in newspaper articles. When radio interviews were given reference was always given to the work being funded by the Darwin Initiative.

6 Finance and administration

6.1 Project expenditure

Project spend (indicative) since last annual report	2015/16 Grant (£)	2015/16 Total actual Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs				
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				

Capital items				
Others				
TOTAL				

Staff employed (Name and position)	Cost (£)
TOTAL	

Consultancy – description of breakdown of costs	Other items – cost (£)
TOTAL	

Capital items – description	Capital items – cost (£)
Climbing and safety equipment External hard drives for storage of sound files Reference literature Ringing equipment Autonomic sound recording equipment SoundID software Offshore island fieldwork equipment	
TOTAL	

Other items – description	Other items – cost (£)
TOTAL	

6.2 Additional funds or in-kind contributions secured

Source of funding for project lifetime	Total (£)
Ascension Island Government (Capital Equipment 1,670, staff 1,250)	
St Helena Government (staff costs)	
Royal Society for the Protection of Birds (RSPB) (staff consultancy)	
Queens University (staff costs)	
TOTAL	

Source of funding for additional work after project lifetime	Total (£)
TOTAL	

6.3 Value for Money

St Helena Government has a stringent procurement process which entails getting several quotes and ensuring value for money of all services/products purchased and these regulations were adhered to for all items/services acquired under this project.

Annex 1 Standard Measures

Code	Description	Totals (plus additional detail as required)
Training Measures		
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)	0
2	Number of (i) people in UKOTs; and (ii) other people receiving other forms of long-term (>1yr) training not leading to formal qualification	0
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)	12 British, 9 St Helenian males 8 British, 5 St Helenian females
3b	Number of training weeks(i) in UKOTs; (ii) outside UKOTs not leading to formal qualification	0
4	Number of types of training materials produced. Were these materials made available for use by UKOTs?	3 (morphometric measurement guide, sound recording programming and DNA sampling protocol) made available to relevant stakeholders within the project.
5	Number of UKOT citizens who have increased capacity to manage natural resources as a result of the project	5 St Helenian females 6 St Helenian males
Research Measures		
6	Number of species/habitat management plans/ strategies (or action plans) produced for/by Governments, public authorities or other implementing agencies in the UKOTs	0
7	Number of formal documents produced to assist work in UKOTs related to species identification, classification and recording.	4
8a	Number of papers published or accepted for publication in peer reviewed journals written by (i) UKOT authors; and (ii) other authors	0

Code	Description	Totals (plus additional detail as required)
8b	Number of papers published or accepted for publication elsewhere written by (i) UKOT authors; and (ii) other authors	0
9b	Number of computer-based databases enhanced (containing species/genetic information). Were these databases made available for use by UKOTs?	3, two made available; ringing database and sound recording catalogue
9a	Number of species reference collections established. Were these collections handed over to UKOTs?	1 DNA from South Atlantic population kept at Queens University
9b	Number of species reference collections enhanced. Were these collections handed over to UKOTs?	0
Dissemination Measures		
14a	Number of conferences/seminars/workshops/stakeholder meetings organised to present/disseminate findings from UKOT's Darwin project work	6 stakeholder meetings
14b	Number of conferences/seminars/workshops/stakeholder meetings attended at which findings from the Darwin Plus project work will be presented/ disseminated	0
Physical Measures		
20	Estimated value (£s) of physical assets handed over to UKOT(s)	
21	Number of permanent educational/training/research facilities or organisation established in UKOTs	
22	Number of permanent field plots established in UKOTs	
23	Value of resources raised from other sources (e.g., in addition to Darwin funding) for project work	

Annex 2 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. contact address, website)

Annex 3 Darwin Contacts

Ref No	DPLUS018
Project Title	Taxonomic and conservation status of <i>Oceanodroma</i> storm petrels in the South Atlantic
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Name	Miss Annalea Beard
Role within Darwin Project	Project Leader
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Partner 2	
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Role within Darwin Project	Project Partner
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Partner 3	
Name	Dr Vicki Friesen
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Role within Darwin Project	Genomic analysis
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Partner 4	

Name	Director
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Role within Darwin Project	Fieldwork support
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