

Darwin Plus: Overseas Territories Environment and Climate Fund Annual Report

To be completed with reference to the "Project Reporting Information Note"
(<https://dplus.darwininitiative.org.uk/resources/information-notes/>).

It is expected that this report will be a **maximum** of 20 pages in length, excluding annexes)

Submission Deadline: 30th April 2022

Darwin Plus Project Information

Project reference	DPLUS139
Project title	Improving Falklands marine management effectiveness for marine higher predators.
Territory(ies)	Falkland Islands (FI)
Lead partner	South Atlantic Environmental Research Institute (SAERI)
Project partner(s)	Joint Nature Conservation Committee (JNCC)
Darwin Plus grant value	£85, 460
Start/end dates of project	01 August 2021 - 30 April 2023
Reporting period (e.g. Apr 2021-Mar 2022) and number (e.g. Annual Report 1, 2)	August 2021 - Mar 2022 Annual report 1
Project Leader name	Alastair Baylis
Project website/blog/social media	https://www.south-atlantic-research.org/home/dplus139-tracking-seabirds-and-seals-in-the-falkland-islands/
Report author(s) and date	Alastair Baylis

1. Project summary

Marine Protected Areas (MPAs) are key ocean conservation strategies to stem the wave of biodiversity loss, to improve ecosystem resilience, and achieve sustainable resource use. In response to the UK's commitments to meet Aichi Target 11 adopted by the Convention on Biological Diversity (CBD) (10% of global oceans ecologically representative MPAs by 2020), the Falkland Islands (FI) (Fig.1) started a process of Marine Spatial Planning (MSP) in 2014, which culminated in a network of proposed Marine Managed Areas (MMAs) (DPLUS0071) - a term that includes MPAs, but creates a broader remit to balance socio-economic and environmental objectives. DPLUS0071, concluded in March 2021, and delivered policy recommendations for designating FI MMAs. However, the FI MMA process has not had an opportunity to fill MHP data gaps. Existing tracking data (1999-2019) for several globally significant MHP populations (e.g., Thin-billed prions) does not exist, or is a temporal snap-shot, meaning data are not fit for purpose. In addition, threats to Marine Higher Predators (MHP) outside of MMAs and indeed, transboundary threats beyond FI jurisdiction, have not been assessed.

There is an urgent, overdue need for innovative approaches to fill data gaps. This project will address critical data gaps through an intensive field program and will identify high conservation priority at-sea areas to feed into MMA categorization, using a range of statistical models (e.g., hidden markov models) and methods (e.g., Important Marine Mammal Areas (IMMAs), Key Biodiversity Areas (KBAs)) and provide objectively defined priority area boundaries, with

uncertainty made interpretable to decision makers. In doing so, we will inform and fine-scale the FI MMA process so that categorization is informed by priority at-sea areas. For areas that fall outside proposed MMAs, a spatial risk assessment framework will be developed to feed into the existing FI MSP toolbox and support holistic management and long-term strategic environmental policy (i.e., ecosystem-based management), by identifying areas where commercial activities could require more scrutiny.

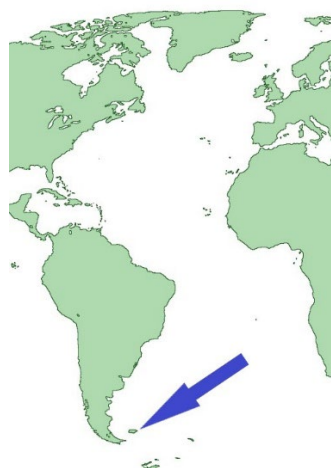


Figure 1: Location of the Falkland Islands.

Through the following interrelated work packages, the project will deliver:

WP1: Fill pressing data gaps

To inform this application, we collated all FI telemetry data (1999-2020) and identified gaps, selecting species and sites representative of FI MHP. To fill data gaps, state-of-the-art tracking technology will be used to record animal movements. Fieldwork will take place over 2-years and four globally significant breeding colonies (> 1 % global population). Seabird GPS tags (Nano-fix GEO-mini - < 2 % body mass) will be taped to feathers. Seal GPS tags (WC-TDR 10F) will be glued to fur. Migratory species will be tracked during the breeding season. Year-round residents will be tracked during breeding and non-breeding periods. We will focus primarily on Black-browed albatross, Thin-billed prions, Rockhopper penguins, Imperial Shags, and South American fur seals.

WP2: Baseline data to inform MMA adaptive design and promote holistic marine management
Quantify spatial use (within and outside of FI waters) using the latest analytical approaches and identify high conservation priority at-sea areas. We will combine and analyze new and existing data using state-space mathematical models to standardize data, account for tag location accuracy error, and compare overlap between MHP and MMAs. Popular methods (kernel density estimation) to identify priority areas (e.g., IBA/KBA) are sensitive to user defined model parameters - often arbitrarily chosen (e.g., smoothing parameter) - and the same data can yield different priority areas, depending on model parameters used. This uncertainty is rarely made interpretable to decision makers. We will identify priority at-sea areas and quantify uncertainty using a range of methods. For areas outside MMAs, we will assess overlap with commercial activities (e.g., fisheries) and whether management is captured by national/international policy.

WP3: Stakeholder engagement, webGIS

Final data products will be presented to stakeholders at a workshop. For areas outside MMAs, we will devise a risk assessment framework for commercial activities. All data will be available through the Falkland Islands IMS-GIS data center.

Through these work packages, the project will result in Robust baseline data and evidence base from high conservation priority areas for MHP inform MMA policy and management.

2. Project stakeholders/partners

The project has completed its first field season and therefore engagement was focused on establishing the project and preparing for fieldwork. The project partners (SAERI and JNCC) worked closely to plan and execute the field work.

South Atlantic Environment Research Institute (SAERI): SAERI is the lead organisation and based in the host country. Dr Alastair Baylis is the project lead and Project Manager (PM). Alastair runs the project administration, engagement, fieldwork and analysis. The project is supported by SAERI's Executive Director Dr Paul Brickle, SAERI's Deputy Director (Business & Programmes) Teresa Bowers and SAERI's office staff (Arlene Bowers and Amy Constantine) with general administration, finance outreach and logistics. Alastair works closely with Dr Megan Tierney (JNCC project partner) who provides support on all aspects of the project, including and of most relevance to this annual report, fieldwork design.

The Falkland Islands Government (FIG): FIG is one of the primary key stakeholders on the islands. Establishing the project required regular engagement with FIG, as the primary project stakeholder. Research permits to conduct fieldwork were submitted to the Falkland Islands Environment Committee for consideration. The Environment Committee includes government, industry and the general public – hence it is a useful platform to deliver formal updates to a range of project stakeholders. Research permits were approved. We have provided FIG with a fieldwork report of the first season, which was also submitted to the Environment Committee. The report is available on our project [website](#).

Local community outreach: SAERI were invited to take part in the Careers Day at the Falkland Island Community School (FICS), which involved a two-hour session in which the students were able to try out different practical's and learned about the career paths of SAERI scientists. The PM introduced students to animal tracking and tracking technology, and showcased the tags purchased using Darwin Initiative funding (brief overview of careers day can be found [here](#)).

Local and international outreach: Regular posts on SAERI's social media provide updates on the project, particularly field preparation and fieldwork. SAERI currently have 2,133 followers on [Facebook](#) and 2,948 followers on [Twitter](#). Social media posts reach out to both a local and international audience with an interest in SAERI's science. Examples of Facebook posts and Tweets are provided in Figure 2. The project also featured in SAERI's newsletter (Southern Currents – available [here](#)).



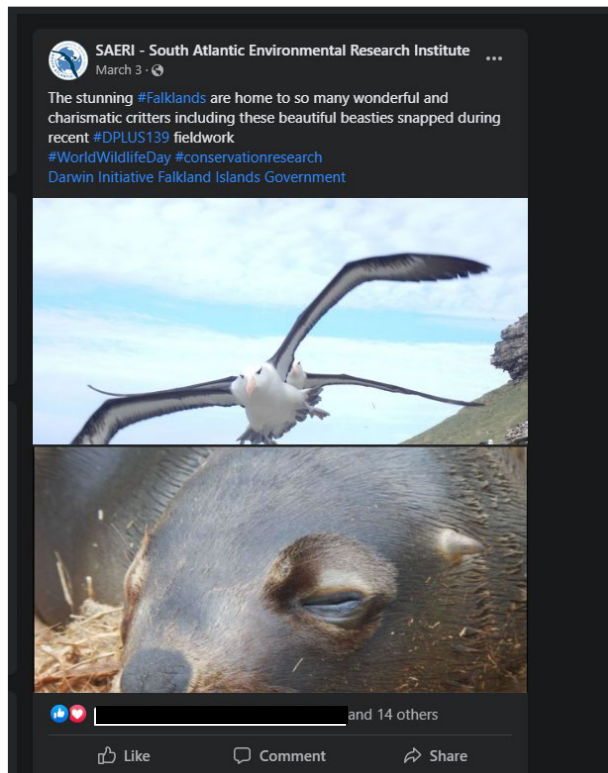


Figure 2. Examples of recent posts showcasing DPLUS139 activities, and using hash tag DPLUS139.

The PM also presented the framework for DPLUS139 at a Caribbean seabird workshop that aimed to identify seabird biodiversity hotspots in the Caribbean and generate wider discussion across UKOTs. The workshop was held in November 2021 and a copy of the talk is available on request. The link to the project website (non-SAERI project, led by the University of Liverpool) is <https://caribbeanseabirds.weebly.com/current-project.html>. See also Annex 3.1

3. Project progress

3.1 Progress in carrying out project Activities

The key activities for the period 1 August 2021 to 30 March 2022 relate to Output 1

Output 1: Tracking data gaps filled for globally significant MHP populations, including the largest breeding colonies of Thin-billed prions, Gentoo penguins, Rockhopper penguins and South American fur seals, for which data presently does not exist, and GPS data for Black-browed albatross over winter, which does not exist.

Summary: All planned activities for this reporting period have been completed.

1.1 Recruit the Project Field Assistant


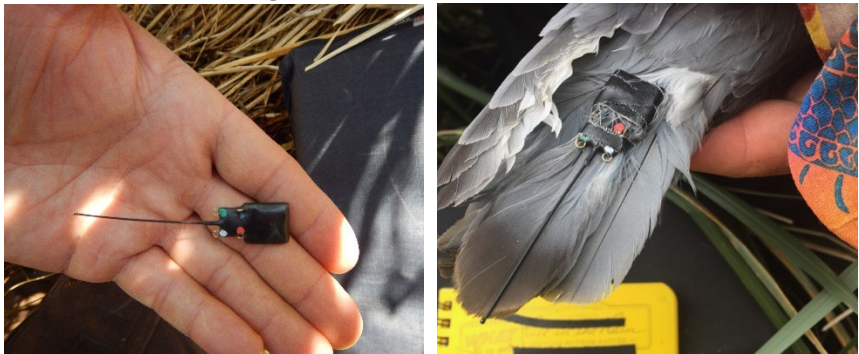

Progress to date: Recruitment of a Project Field Assistant is complete. To more efficiently undertake fieldwork, we are now operating two separate field teams that will deploy tags at different locations over the austral summer. To enable this, we successfully recruited a FI resident with seabird experience to lead the second field team.

1.2 Organise and undertake intensive fieldwork, and write fieldwork report. Make report available on-line.

Research permits to conduct fieldwork on seabirds and seals were submitted to the Falkland Islands Environment Committee. Research permits were approved. We have successfully completed the first summer field work. The winter and following summer field seasons are now being planned. Tags for seabirds and seals were purchased and arrived in the FI in time for the first field season (November 2022). This necessitated capital purchases, in advance of project funds being received, to ensure project fieldwork could proceed as planned. Existing satellite tags (in-kind contribution from SAERI) were deployed on fur seals in late October 2021.

In total, 59 Rockhopper penguins (*Eudyptes chrysocome*) were tracked at two sites (Steeple Island and Bird Island), and 29 Black-browed albatross (*Thalassarche melanophris*) and 11 Thin-billed prions (*Pachyptila belcheri*) at one site (Bird Island). A total of 225 individual foraging trips were recorded. We also deployed 10 tags on South American fur seals (*Arctocephalus australis*) at Flat Jason Island, with post-weaning dispersal trips being recorded. The type of tracking device, and an image of how it is attached, for each species tracked is provided in Table 1. A field work report is available on the project website [here](#).

Table 1. Type of tracking device (tag) used on each species tracked in the first field season of the project.

Species tracked	Tag used
Rockhopper penguins	NanoFix Geo (15 g) 
Thin-billed prions	NanoFix Geo mini (<2 g) 
Black-browed albatross	Mr. Lee & Pathtrack tags (<30 g) 

Output 2. Conservation value of proposed MMAs in a global context is understood (specifically with regard to MHP).

Summary: None of the activities in Output 2 apply to the current reporting year.

Output 3. Key stakeholders and decision makers engaged and informed, specifically with regard to MHP at-sea spatial distribution and MMA relevance to MHP. Data integrated into MMA, MSP and EIA processes.

Summary: None of the activities in Output 3 apply to the current reporting year.

3.2 Progress towards project Outputs

Output 1: Tracking data gaps filled for globally significant MHP populations, including the largest breeding colonies of Thin-billed prions, Gentoo penguins, Rockhopper penguins and South American fur seals, for which data presently does not exist, and GPS data for Black-browed albatross over winter, which does not exist.

The key activities for the period 1 August 2021 to 30 March 2022 relate to Output 1. Tracking data gaps filled for globally significant MHP populations, including the largest breeding colonies of Thin-billed prions, Gentoo penguins, Rockhopper penguins and South American fur seals, for which data presently does not exist, and GPS data for Black-browed albatross over winter, which does not exist.

As described in section 3.1, we successfully completed our first field season, during which 59 Rockhopper penguins were tracked at two sites, 29 Black-browed albatross, 11 Thin-billed prions and 10 South American fur seals tagged at one site. In total, 235 foraging trips were recorded across the three sites tracked (Figure 3). To more efficiently undertake fieldwork, we operated as two separate field teams, which deployed tags at different locations over the same austral summer time period.

A field report is available on the project website [here](#).

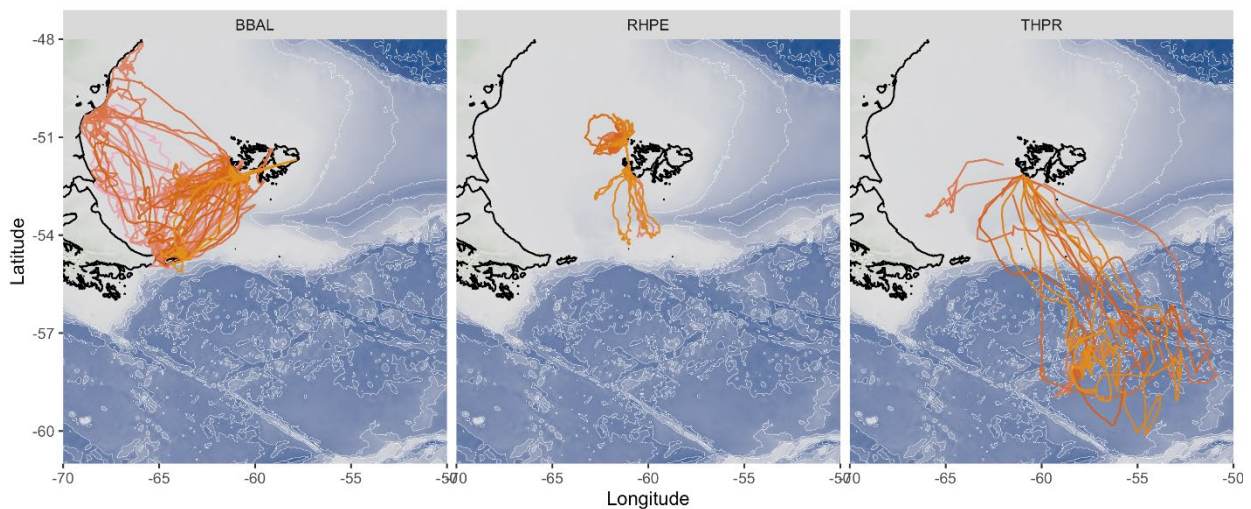


Figure 3: Example of tracking data for Black-browed albatross (BBAL), Rockhopper penguins (RHPE) and Thin-billed prions (THPR) collected during the 2021/22 austral summer.

Output 2. Conservation value of proposed MMAs in a global context is understood (specifically with regard to MHP).

Summary: None of the activities in Output 2 apply to the current reporting year.

Output 3. Key stakeholders and decision makers engaged and informed, specifically with regard to MHP at-sea spatial distribution and MMA relevance to MHP. Data integrated into MMA, MSP and EIA processes.

Summary: None of the activities in Output 3 apply to the current reporting year.

3.3 Progress towards the project Outcome

The overall project outcome is for high conservation priority at sea areas for marine predators to provide robust baseline data and evidence base to inform Marine Managed Areas policy and management. The indicators (0.1 Major advance in baseline knowledge of 5 globally significant populations) are relevant and appropriate for achieving the outcome.

To achieve this Outcome, intensive fieldwork is required to fill data gaps and provide baseline data. The data gaps were identified through developing the funding application for DPLUS139. Therefore, we had already compiled much of the tracking data available for the Falkland Islands (**Indicator 2.1**), and had identified suitable species and sites, which helped guide our fieldwork. The first field season has enabled significant strides toward the overall project outcome. A second field season will take place in project year 2 (**Indicator 1.1**). The combined data will enable more robust predictive models to be developed and high conservation priority areas to be identified (Indicator 0.2).

The project has completed all year 1 activities. It is therefore highly likely that the project will achieve the outcome by the end of the project funding

3.4 Monitoring of assumptions

Outcome

Assumptions:

- High conservation priority at-sea areas identified
- High conservation priority at-sea areas support proposed MMAs
- High conservation priority at-sea areas are amenable to management

Comments: The assumptions for the project outcome are still relevant. The outcome will only be achieved if high conservation priority at-seas areas are identified.

Output 1: Tracking data gaps filled

Assumptions:

- No national Falkland Islands Covid-19 travel restrictions (as has been the case since May)
- Enough lead-in time is allocated for delays in the procurement and delivery of goods related to Covid-19 disruptions
- Recovery rates of loggers attached to birds and seals are sufficient to provide data required. We have budgeted for a large number of loggers
- Charter boat is available and FIG permission to visit offshore islands granted. SAERI already works closely with a number of charter boat operators, and FIG is our project partner.

Comments: There were no national COVID-19 travel restrictions, which enabled fieldwork to go ahead. This assumption is still relevant for the 2022/23 field season. We also covered the capital costs of the project to ensure the first field season could be undertaken - therefore the assumption of lead in time for the procurement of goods in Output 1 is fulfilled. Recovery rates of loggers was high (96 %) and we have enough loggers to successfully undertake a second field season - therefore the assumption is fulfilled. Finally, we worked closely with a charter boat operator to access field sites, and while the assumption that a charter boat is available in Y2 is still valid, we have identified a suitable charter for 2022.

Output 2: Conservation value of proposed MMAs in a global context is understood (specifically with regard to MHP)

Assumptions:

- Data owners of existing data are willing to contribute data. We have previously collaborated with data owners on two peer reviewed publications e.g., <https://www.nature.com/articles/s41598-019-44695-1>

Comments: Existing data has been collated and therefore the assumption for Output 2 was fulfilled.

Output 3: Key stakeholders and decision makers engaged and informed, specifically with regard to MHP at-sea spatial distribution and MMA relevance to MHP. Data integrated into MMA, MSP and EIA processes.

Assumptions:

- Key people attend workshop and consensus achieved on workshop findings

Comments: The assumptions for Output 3 still hold true and are still relevant. A project workshop can only be successful if enough people are interested in participating in the workshop.

4. Project support to environmental and/or climate outcomes in the UKOTs

Although the project has only completed its first field season, it has already filled data gaps for some of the largest breeding populations of seabirds and seals in the Falkland Islands. Combined with analysis planned in project Y2, this data will be used to identify high priority conservation areas at-sea and relate these to the proposed FI MMAs. During the lifetime of the project, it will support FI achieve international commitments. Specifically, this project will make an important contribution towards FIG meeting CBD objectives, in particular Aichi Targets 5 (loss of habitat), 11 (protected areas), 10 (Vulnerable Ecosystems) and 19 (biodiversity knowledge improved). The project will also make important contribution towards FIG commitments to the Agreement of the Conservation of Albatross and Petrels (ACAP; specifically, Article II; Article III c, d, h; Article VI and elements of Annex 2 – the Action Plan), and CMS for Appendix I and II species (cetaceans, fur seals, sea lions).

The project will also help FIG achieve national commitments including the FI Biodiversity Framework (2016-2030) priority areas, particularly coastal, shelf and marine species and ecosystems and contributes to the environmental commitments of the FI Island Plan 2018-2022 (protect globally significant biodiversity). The project covers priority species and actions identified in the FI ACAP Implementation Plan – specifically black-browed albatross and actions calling for fine-scale analyses of foraging distribution and overlap with fishing effort (A6.2.2), identification of foraging hotspots and use information to inform management decisions, including in relation to identification of MPAs in FI waters (A6.2.6) and ensuring a coordinated and collaborative approach to tracking work on FI (A6.2.4/6.2.5). It will help FIG to meet commitments under the FI Environment Charter, including commitments 2 (wise use of natural resources), 5 (solutions which benefit the environment and development), 7 (safeguard native species, habitats) and 10 (study and celebrate environmental heritage as a future treasure).

5. OPTIONAL: Consideration of gender equality issues

In the SAERI office, the current staff cohort is 60% female and 40% male, and SAERI has an equal opportunities policy as part of its internal policy framework. Two of the three key project staff are female.

6. Monitoring and evaluation

The project is governed by SAERI, with our project partner JNCC. Both project leaders (Alastair Baylis and Megan Tierney) are based in the Falkland Islands. We have monitored and evaluated project progress through regular meetings between SAERI and JNCC. The suitability of this approach is evidenced through the successful initiation of the project, and the partners have demonstrated that they work well together. Indicators of achievements is the evidence produced by each activity; section 3 outlines how these feed into the project outputs and outcomes.

7. Lessons learnt

The value of being an UKOT organisation, where the project is being implemented, cannot be understated. The project would not have been possible without a project manager being based permanently in the Falkland Islands, along with a ready-made network of stakeholders. The project, with JNCC partners, provides a breadth and depth of local and international expertise. Given the project also involves substantial remote area fieldwork, the advantage of having local expertise also cannot be understated. It enabled complex fieldwork (two field teams across the islands) to be undertaken with relative ease. In addition, the opportunity to join the careers day, although not scheduled as project activities, provides an opportunity to engage with local events strengthens the breath of outreach and awareness – something that would not be possible if the project manager was not Falkland Islands based.

Equipping animals with biologging tags is not new. But there is now a bewildering range of GPS tags available made by numerous companies (e.g., solar powered tags, those able to communicate with base-stations, Fastloc processing), allowing greater flexibility in how, when and where we track animals. Purely from a data perspective, animal behaviour influences tag performance, and selecting the wrong tag could compromise fieldwork, simply because the data collected might not be fit for purpose. We were fortunate to draw upon our network of seabird colleagues, who recommended tags with which they had prior experience. This helped ensure a successful field season, including tracking species that had previously not been tracked in the Falkland Islands.

8. Actions taken in response to previous reviews (if applicable)

NA

9. Other comments on progress not covered elsewhere

The main risks to the project are logistics based – in particular access to charter vessel and access to field locations. We have identified field work locations and a charter boat for 2022/23 and feel that we have adequately mitigated these risks. We were recently successful in a CASE PhD project aimed to understand the movements of imperial shags at the Falkland Islands. While the PhD will extend beyond the end of this project, some data will be available to feed into this project.

10. Sustainability and legacy

The project has only recently completed its first field season. Accordingly, the majority of outreach has been associated with preparing for field work, rather than having an opportunity to present project findings. Year 2 will see a series of public engagement activities that we envisage will increase interest. The project is perfectly positioned to feed into the FIG led MMA public consultation, and provide objective, science based, evidence related to MHPs and MMAs. Our exit strategy is still valid. The tags purchased will be used for long term monitoring

of marine predators, providing a lasting legacy. The tags will be based at SAERI and will be logged in SAERI's equipment database where there is a system for booking equipment in and out as required. The interactive project spatial webGIS database (Y2, Q1) will be built on an open-source platform that has no licensing costs and therefore ensures longevity. Additionally, the long-term management of the spatial database is ensured by having it embedded in the Falkland Islands IMS-GIS data centre, managed by a full time and skilled data manager already employed by SAERI. Making FIG and industry aware of this data, is a key element of the project and as such has been given its own work package (WP3) to ensure that it maintains a high profile through project delivery. Note however that WP3 was not due to commence in this reporting period.

11. Darwin identity

The Darwin Initiative funding was recognised in every communication and public engagement event. The logo was displayed in presentations and the Darwin Initiative was recognised in social media – please see examples in Figure 2 and those listed below.

- Several Facebook posts and tweets in which the Darwin Initiative was tagged (see 2 above). SAERI [Facebook](#) and [Twitter](#)
- SAERI Newsletter [here](#).
- Careers Day presentation to year 7, 8 and 9 students at FICS [here](#)
- Caribbean seabird workshop (hosted by University of Liverpool November 2021)
- Project website [here](#).
- Guest web blog related to recent scientific paper [here](#).

12. Impact of COVID-19 on project delivery

There was no impact of COVID-19 on project delivery. However, FIG will remove all COVID-19 restrictions from the 4 May 2022. Therefore, COVID-19 could cause significant disruption to fieldwork in 2022.

13. Safeguarding

Please tick this box if any safeguarding violations have occurred during this financial year.

If you have ticked the box, please ensure these are reported to ODA.safeguarding@defra.gov.uk as indicated in the T&Cs.

SAERI has a comprehensive safeguarding policy that formally outlines policy principles and responsibilities within the organisation and includes a designated safeguarding officer (DSO).. In preparing the project, SAERI has sent a copy of its safeguarding policy to JNCC. All project activities which have taken place thus far have adhered to the safeguarding policy.

14. Project expenditure

Table 1: Project expenditure during the reporting period (1 April 2021 – 31 March 2022)

Project spend (indicative) in this financial year	2021/22 D+ Grant (£)	2021/22 Total actual D+ Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs	██████	██████	██████	
Consultancy costs	██████	██████	██████	
Overhead Costs	██████	██████	██████	
Travel and subsistence	██████	██████	██████	
Operating Costs	██████	██████	██████	
Capital items	██████	██████	██████	As per discussion with LTS, ██████ moved from 'other' to capital items to better support project delivery
Others (Please specify)	██████	██████	██████	As per discussion with LTS, ██████ moved from 'other' to capital items to better support project delivery
TOTAL	██████	██████		

15. OPTIONAL: Outstanding achievements of your project during the reporting period (300-400 words maximum). This section may be used for publicity purposes

I agree for the Darwin Secretariat to publish the content of this section (please leave this line in to indicate your agreement to use any material you provide here).

- We were recently successful in a CASE PhD project aimed to understand the movements of imperial shags at the Falkland Islands. The PhD stems from the current DPLUS139 project and will further strengthen the project legacy.
- Paper published in Ecological Applications that was in-part related to the current project. Manuscript available at the following:
<https://esajournals.onlinelibrary.wiley.com/doi/10.1002/eap.2426>

Checklist for submission

	Check
Different reporting templates have different questions, and it is important you use the correct one. Have you checked you have used the correct template (checking fund, type of report (i.e. Annual or Final), and year) and deleted the blue guidance text before submission?	X
Is the report less than 10MB? If so, please email to Darwin-Projects@ltsi.co.uk putting the project number in the Subject line.	X
Is your report more than 10MB? If so, please discuss with Darwin-Projects@ltsi.co.uk about the best way to deliver the report, putting the project number in the Subject line.	
Have you included means of verification? You should not submit every project document, but the main outputs and a selection of the others would strengthen the report.	X
Do you have hard copies of material you need to submit with the report? If so, please make this clear in the covering email and ensure all material is marked with the project number. However, we would expect that most material will now be electronic.	X
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.	