

Biodiversity Challenge Funds Projects Darwin Initiative, Illegal Wildlife Trade Challenge Fund, and Darwin Plus Half Year Report

Note: If there is any confidential information within the report that you do not wish to be shared on our website, please ensure you clearly highlight this.

Submission Deadline: 31st October 2022

Project reference	DPLUS089
Project title	Integrating genetic approaches into sub-Antarctic deep sea research and management
Country(ies)/territory(ies)	South Georgia and the South Sandwich Islands
Lead partner	University of Essex (UoE)
Partner(s)	Cefas
Project leader	Dr Michelle Taylor
Report date and number (e.g. HYR1)	Year 4 – half year (April-Oct 2022)
Project website/blog/social media	NA

1. Outline progress over the last 6 months (April – Sept) against the agreed project implementation timetable (if your project has started less than 6 months ago, please report on the period since start up to end September).

Activities commenced	Current state
1.1 Collection and cataloguing of deep-sea coral samples and transported to the UK.	Completed
1.2.1 Specimens identified to highest possible level by Dr Taylor.	Completed
1.2.2 Research technician hired half way through year 1 to undertake genetic laboratory work.	Completed
1.2.3 Specimens of target species have DNA extracted, quality controlled, UCE libraries prepared, DNA sequenced	Completed
1.2.4 Research assistant hired half way through year 2 to undertake bioinformatics analyses.	On-going
1.2.5 Connectivity of locations across SGSSI and wider sub-Antarctic analysed, and population structure investigated.	On-going
1.3 Results written into a report for GSGSSI.	On-going
1.4 Results written into a report for CCAMLR.	On-going

2.1.1 Genetic data formatted for Genbank and species identification and metadata formatted for GBIF.	Not completed (see section 5)
2.1.2 Genetic data submitted to Genbank and species information to GBIF for quality control.	Not completed (see section 5)
2.2 Species records submitted to GBIF, WoRMS, OBIS and BODC.	Not completed (see section 5)
2.3 New species descriptions written for peer-review publication (e.g. <i>Zootaxa</i> , <i>Polar Biology</i>) and submitted to WoRMS.	On-going
3.1 Deep sea biodiversity analysis conducted and integrated into reports to GSGSSI and CCAMLR.	On-going
4.1 Genomic connectivity publication written for submission to peer-review journal such as <i>Molecular Ecology</i> , <i>BMC Evolutionary Biology</i> etc.	On-going
4.2 Diversity / biogeography of deep sea biodiversity of the SGSSI region publication written for submission to peer review journals such as <i>Deep Sea Research I</i> , <i>Polar Biology</i> , <i>Marine Ecology Progress Series</i> .	Completed
4.3 Donation of samples to NHM and disseminate results to the wider audience.	Completed

The primary activity in this time period has been the extensive connectivity and population structure analysis of the 4 deep-sea octocoral species that we have the most data for. An academic paper describing the connectivity of these species is well under way.

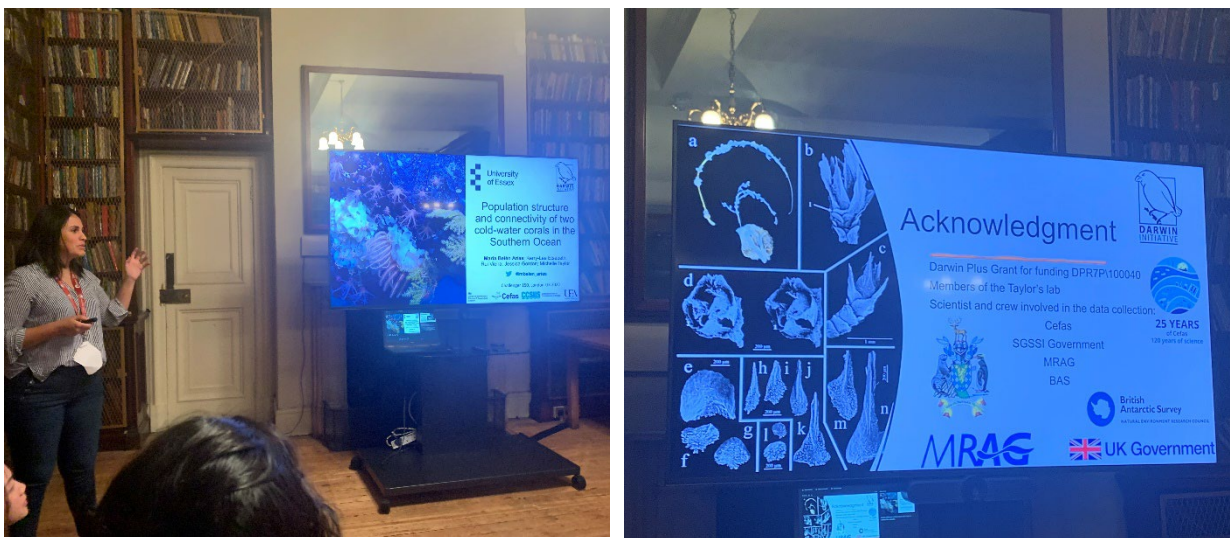
Preliminary results were discussed with the Government of SGSSI (Dr Mark Belchier) to support the UK and SGSSI governments in the CCAMLR meeting in Oct-Nov 2022. Due to geopolitical sensitivities, Government of SGSSI and the FCDO did not consider it opportune to present outputs of this project to CCAMLR in 2022. These are, however, expected to be presented in the 2023 Commission meeting. The project team is preparing a briefing paper that, alongside other peer-review manuscripts already published or under review, will inform the SGSSI MPA review process in 2023.

Cefas and the Natural History Museum also have a Memorandum of Understanding to encourage, develop and extend cooperation in natural sciences. The Discovery 99 collections have been donated to the Natural History Museum who will ensure the curation, long-term storage, and access sharing of biological collection resources, including molecular voucher specimens. They are housed as a collection at the Natural History Museum in London and available to the wider scientific community to undertake further studies. At the present, a number of PhD students (including UK, France and

Ireland) are undertaking their studies using material donated to the NHM under the scope of this project.

Available outputs were also presented by the project-funded Postdoctoral researcher, Dr. Maria Belen Arias, at the Challenger Society Conference 2022 (6-8 September 2022), marking the 150th anniversary of the Challenger expedition, held in person at the Royal Geographical Society, Natural History Museum and Imperial College in London (<https://www.nhm.ac.uk/our-science/science-events/the-challenger-society-conference-2022-in-london.html>).

In addition to this, Dr. Vieira co-convoked a topical session to drive interdisciplinary discussions around science needs to support the goals of the UN Decade of Ocean Science for Sustainable Development.



The legacy of this project is ensured by the active contributions by Dr. Taylor and Dr. Vieira to the Southern Ocean Regional Working Group of Challenger 150 Programme (<https://challenger150.world/>).

The papers for section 4.2 are:

Downie, A. L., Vieira, R. P., Hogg, O. T., & Darby, C. (2021). Distribution of vulnerable marine ecosystems at the South Sandwich Islands: results from the Blue Belt Discovery Expedition 99 deep-water camera surveys. *Frontiers in Marine Science*, 652. Available at: <https://doi.org/10.3389/fmars.2021.662285>

Hogg, O. T., Downie, A. L., Vieira, R. P., & Darby, C. (2021). Macrobenthic Assessment of the South Sandwich Islands Reveals a Biogeographically Distinct Polar Archipelago. *Frontiers in Marine Science*, 1173. Available at: <https://doi.org/10.3389/fmars.2021.650241>

2. Give details of any notable problems or unexpected developments/lessons learnt that the project has encountered over the last 6 months. Explain what impact these could have on the project and whether the changes will affect the budget and timetable of project activities.

The Covid-19 pandemic negatively impacted the normal ways of working expected for this project (e.g. lab work, transport of samples, meetings and conference attendance).

These were exceptional circumstances and we do acknowledge the spanners thrown up by the situation. In recent months, work has been much smoother, with no notable delays.

3. Have any of these issues been discussed with NIRAS-LTS International and if so, have changes been made to the original agreement?

Discussed with NIRAS-LTS: No

Formal Change Request submitted: No

Received confirmation of change acceptance No

Change request reference if known:

4a. Do you currently expect to have any significant (e.g. more than £5,000) underspend in your budget for this year?

Yes No Estimated underspend: £

4b. If yes, then you need to consider your project budget needs carefully. Please remember that any funds agreed for this financial year are only available to the project in this financial year.

If you anticipate a significant underspend because of justifiable changes within the project, please submit a re-budget Change Request as soon as possible. There is no guarantee that Defra will agree a re-budget so please ensure you have enough time to make appropriate changes if necessary. Please DO NOT send these in the same email as your report.

5. Are there any other issues you wish to raise relating to the project or to BCF management, monitoring, or financial procedures?

The research working on this project is due to finish at the end of November 2022. At this point we will have drafts of reports finished. Given peer-reviewed publications are still in preparation it is unlikely that activities 2.1.1, 2.1.2 and 2.2 will be completed within the project lifetime but they are required for publication, and therefore expected to be completed in early 2023. We would like to ask advice on if Darwin prefers to leave the grant open and wait for completion or close with the knowledge this has to be actioned for publication?

If you are a new project and you received feedback comments that requested a response (including the submission of your risk register), or if your Annual Report Review asked you to provide a response with your next half year report, please attach your response to this document.

Please note: Any planned modifications to your project schedule/workplan can be discussed in this report but **should also be raised with NIRAS-LTS International through a Change Request. **Please DO NOT send these in the same email.****

Please send your **completed report by email** to BCF-Reports@niras.com. The report should be between 2-3 pages maximum. **Please state your project reference number, followed by the specific fund in the header of your email message e.g. Subject: 29-001 Darwin Initiative Half Year Report**