

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

Half Year Report

It is expected that this report will be a **maximum of 2-3 pages** in length.

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 2024

Please note all projects that were active before 1 October 2024 are required to complete a Half Year Report.

Submit to: BCF-Reports@niras.com including your project ref in the subject line.

Project reference	<i>DPLUS166</i>
Project title	Improving identification of fish bycatch in the Antarctic krill fishery
Country(ies)/territory(ies)	British Antarctic Territory and South Georgia and The South Sandwich Islands
Lead Organisation	British Antarctic Survey
Partner(s)	Newcastle University, Royal Botanic Garden Edinburgh, MRAG
Project leader	<i>Philip Hollyman & Martin Collins</i>
Report date and number (e.g. HYR1)	<i>May 2024-September 2024 HYR3</i>
Project website/blog/social media	<i>https://www.bas.ac.uk/project/fish-by-catch-in-the-antarctic-krill-fishery/</i>

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

Although we are not looking for specific reporting against your indicators, please use this opportunity to consider the appropriateness of your M&E systems (are your indicators still relevant, can you report against any Standard Indicators, do your assumptions still hold true?). The guidance can be found on the resources page of the relevant fund website.

Output 1. The project is progressing well having completed output 1 and progressing through outputs 2 and 4. Since the last reporting period, the DNA extraction, PCR amplification and sequencing for both mitochondrial regions for all samples was completed, including samples received in late June 2024 and samples obtained from the Natural History Museum London. A phylogenetic analysis was carried out to observe the clustering pattern of the generated sequences to the reference sequence. A paper was submitted to the CCAMLR Fish Stock Assessment (FSA) working group, outlining the diversity of fish species uncovered with the genetic toolbox developed for the project (Annex 1). The results from output 1 were presented by L. Romero-Martinez at the ICES Annual Science Conference in September and won best poster (Please see <https://www.ices.dk/news-and-events/news-archive/news/Pages/ASC24awards.aspx>, and Annex 2 and 3). The award recognized that this work had broader implications and scope beyond the aims of the original project. The final step for completing output 1 is to upload the genetic data including primer sequences and metadata associated with each sample into GenBank, we are working with the Polar Data Centre (PDC, a NERC data centre) at BAS to help speed up the process and to create a link between the genetic data uploaded into GenBank with the metadata that will be available in the PDC website. We are planning for a peer reviewed paper from this work which will be led by L. Romero-Martínez.

Lastly, motivated by the proven efficacy of the genetic toolbox developed for the project, and building from the results of our genetic analysis of fish bycatch diversity, we have identified potential candidate species to investigate the genetic structure of populations that are most at risk of being caught as bycatch. For each of the two candidate species we have spare samples that have been collected by observers as part of the bycatch samples from the krill fishery.

Output 2. The systematic review has progressed well. The data extraction of relevant information on life history stages was completed, a total of 186 papers were read and those data extracted were subjected to a quality control process where all members of the team collaborated in cross checking the dataset. Following quality control of the data, it was possible to create a summary table for the top 20 species of fish bycatch. Important gaps in knowledge were identified as well as issues of data format amenable for extraction. The results of the completed systematic review were presented by W. Reid at the Challenger Society Conference and ICES Annual Science Conference in September (Annex 4) and relevant parts included in the manuscript submitted to CCAMLR FSA-working Group. The next steps will be to do further quality control by W. Reid and to draft a short paper, on the findings, as well as to start the inclusion of the relevant ecological information into the ID guide.

Output 3. The statistical modelling of the bycatch data has been challenging. The two data sets, C1 (vessel reporting data) and SISO (scientific observer data), supplied by CCAMLR have been difficult to reconcile. The initial descriptive analysis of C1 and SISO datasets led by PL, Phil Hollyman, indicated the heterogeneity between the two datasets, particularly in weight and count data, including poor overlap in species richness and number of fish recorded between the two datasets. There is interannual variation in both data sources with different species assemblages being dominant in different years. There are still issues that need to be resolved to undertake the spatial and temporal modelling, However, the PL P. Hollyman and W. Reid (Newcastle University) plan to meet in person in the coming months to resolve possible data cohorts that can be further explored from both datasets. We have revised our planned output for the spatio-temporal modelling means of verification. The aim is to produce an overview of the bycatch for the statistical areas before we progress to the more complex analysis. The latter will likely result in CCAMLR working group paper being prepared by the end of the project with a submitted peer reviewed manuscript dependent on the success of the modelling. We are also planning a second manuscript based on recommendations for bycatch data collection in the krill fishery moving forward, based on the issues we encountered.

Output 4. The first draft of the larval identification guide has been compiled. It put together the key morphological features of the different species and the pigmentation pattern characteristic of each species. Effort was made in colour coding identification features that will ease the identification process. Other relevant information such as spatial distribution was also included

based on species distribution records from open-access databases like FishBase and OBIS. The guide contained information from the Output 2 including spawning, hatching and occurrence of larval, juvenile and adults. This was to help observers narrow down the possible species that they could encounter in each of the statistical sub-areas (Annex 5). The draft was circulated by our collaborators at MRAG to newly deployed and senior fishery observers for feedback on readability and ease-of -use of the material. The feedback received was extremely positive with important suggestions, such as including photographs of larval fish at different degrees of damage were highly relevant and will be taken into consideration for the final version of the guide (Annex 6). In terms of output 4, we will complete the collection of photographic material to be included in the final document of the ID guide as well as succinctly summarise the relevant ecological data to be presented as a temporal occurrence table based on the findings from output 2.

We continue holding fortnightly meetings with the whole team to discuss progress and next steps, a weekly meeting is also held between the PL and the PDRA to keep track of all activities or urgent matters.

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.

Output 2. The systematic review took much longer than originally expected. Through the process, we have worked as a team to complete this task. A key lesson learned from the exercise was the time allocated to the task was less than required. We had a protocol which the team followed in order to extract information/ data. However, when undertaking a systematic review it is usual to review the methodological approach after about 100 to 150 papers to assess whether the data/ information is being extracted in an appropriate way. The method did not distinguish clearly enough between no data available and no data extractible. The two categories are slightly different and we did not distinguish between them in our database though a note was made within the comments in the systematic review software whereby we can go back a check and reassign papers. We were also too strict in some of the criteria which were subsequently relaxed meaning that we had to review some papers multiple times to extract the information. These will not have an impact on the budget nor the development of identification guides but may delay the planned peer reviewed paper.

Output 3. The statistical modelling of the data set has proved challenging. The methods by which these two data sets are collected differ. The C1 data set is generated by the vessel and largely contains larger fish while the SISO data set is collected from a subsample of Antarctic krill and is conducted by the fisheries observer. The exploratory analysis of the fish bycatch indicated that the composition of the two data sets were different. This is in itself an interesting result from which we are developing a manuscript and future recommendations for how the C1 bycatch should be collected and reported. A key problem with the C1 data was we had no way to estimate the “effort” put into sampling in order to make any catch per unit effort comparable across vessels. We have decided to just focus on the SISO data set for the spatial-temporal analyses and look at key bycatch species. These data should be comparable across the fisheries but it is unlikely that we will be able to scale the bycatch up to the whole catch due to the small volume of subsamples, which limits our ability to interpret the results. The aim is to plan for a CCAMLR working group paper for the statistical modelling along with an overview of the bycatch in different statistical areas. This will also include recommendations about changing to the bycatch sampling to allow more robust analysis in the future. The success of the statistical modelling will determine its suitability for peer reviewed publication.

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

Discussed with NIRAS:	No
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Formal Change Request submitted:	No
Received confirmation of change acceptance:	No
Change Request reference if known: A change request has not been submitted as we don't feel as through these issues have yet impacted the project enough to warrant a change to the log frame.	

4a. Please confirm your actual spend in this financial year to date (i.e. from 1 April 2024 – 30 September 2024)
Actual spend:

4b. Do you currently expect to have any significant (e.g. more than £5,000) underspend in your budget for this financial year (ending 31 March 2025)?
Yes No

4c. If you expect and underspend, then you should 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 to your project if necessary. Please DO NOT send these in the same email as your report.
NB: if you expect an underspend, do not claim anything more than you expect to spend this financial year.

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

None

6. Please use this section to respond to any feedback provided when your project was confirmed, or from your most recent annual report. If your project was subject to an Overseas Security and Justice Assistance assessment please use this space to comment on any changes to international human rights risks, and to address any additional mitigations outlined in your offer letters. Please provide the comment and then your response. If you have already provided a response, please confirm when.

There was only one point from the AR that needed addressing. It was recommended that this be addressed in the next AR, but we are happy to discuss it here.

“It would be useful if the project could briefly address engagement with international partners - see section 10 for more comments.”

The project has engaged with international organisations at several points over the last 6 months. Firstly the presentation of project outputs at the ICES annual science conference generated substantial conversation with several other research teams with similar interests. Specifically the Australian Antarctic Division, who have an extensive krill focussed research team. We are hopeful that this may lead to future collaborative funding applications. The work was also recently presented at CCAMLR WG-FSA, where it generated discussions with several international research teams that have an interest in krill fishery management. At the same meeting last year when we presented a project update, we asked for engagement in the form of samples of species we were missing. Whilst this initially generated interest, we ran into difficulties around shipping samples.

Checklist for submission

For New Projects (i.e. starting after 1st April 2024)	
Have you responded to any additional feedback (other than caveats) received in the letter you received to say your application was successful which requested response at HYR (including safeguarding points)? You should respond in section 6, annexes other requested materials as appropriate.	
If not already submitted, have you attached your risk register ?	
For Existing Projects (i.e. started before 1st April 2024)	
Have you responded to feedback from your latest Annual Report Review ? You should respond in section 6, annexes other requested materials as appropriate.	X
For All Projects	
Include your project reference in the subject line of submission email.	X
Submit to BCFs-Report@niras.com .	X
Have you clearly highlighted any confidential information within the report that you do not wish to be shared on our website?	X
Have you reported against the most up to date information for your project ?	X
Please ensure claim forms and other communications for your project are not included with this report.	X