

## 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: 31<sup>st</sup> October 2023**

<b>Project reference</b>	DPLUS168
<b>Project title</b>	Understanding increased FI seal bycatch to inform bycatch Action Plan
<b>Country(ies)/territory(ies)</b>	Falkland Islands (FI)
<b>Lead partner</b>	South Atlantic Environmental Research Institute (SAERI)
<b>Partner(s)</b>	Falkland Islands Government Department of Natural Resources – Fisheries (DNR-Fisheries) Falkland Islands Fishing Companies Association (FIFCA)
<b>Project leader</b>	Dr Alastair Baylis (project report written by Dr Javed Riaz).
<b>Report date and number (e.g. HYR1)</b>	HYR2
<b>Project website/blog/social media</b>	Organisation: <a href="https://www.south-atlantic-research.org/">https://www.south-atlantic-research.org/</a> SAERI Twitter: @SAERI_FI SAERI Facebook: <a href="https://www.facebook.com/S4ERI/">https://www.facebook.com/S4ERI/</a> SAERI blogs: <a href="https://www.south-atlantic-research.org/news/">https://www.south-atlantic-research.org/news/</a>

**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).**

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.

	Activity	No. of months	Year 2 (23/24)			
			Q1	Q2	Q3	Q4
<b>Activity 1</b>						
1.1	Project Manager (x1) and Specialist to lead net camera deployment (x1) recruited	3	<b>No activities Y2</b>			
1.2	Develop and trial net cameras, with DNR-Fisheries	4				
1.3	Rollout of net cameras to fishing vessels with DNR-Fisheries	2				
<b>Activity 2</b>						
2.1	Deploy biologging tags on seals	2				
2.2	Results presented in a report delivered to PMG. Report re-focused for a scientific journal.	2.5				
<b>Activity 3</b>						
3.1	At least 10 variables from FIFD data collated	1.5				
3.2	10 variables identified and included in models to understand and predict seal-fishery interactions	3				
<b>Activity 4</b>						
4.1	At least 1 trophic model developed using Ecosim and Ecopath software	5				
4.2	DNA analysis of at least 60 seal scats completed	2				
4.3	Compound specific stable isotope analysis of at least 20 seal teeth completed	3				
<b>Activity 5</b>						
5.1	PMG established, with representatives from DNR-Fisheries, industry and SAERI. M&E Plan created	0.5				
5.2	One stakeholder workshop on WP 1	1	<b>No activities Y2</b>			
5.3	One stakeholder workshop on WP 2-4	1				
5.4	Consensus reached on recommendations for conservation and management	2				

Although the project has made solid progress to date it is on track to deliver on all of its work packages. We describe below how the project has progressed in relation to the project implementation timeline above.

#### Activity 1: Trial and deploy net camera

As part of this project, we set out to trial net cameras on the DNR-Fisheries bottom trawl vessels within the Falkland Islands fishing fleet. This work was successfully completed by our net-camera specialist. Over a 7-month period between January- August, net cameras were deployed on 8 different fishing vessels. These deployments captured 350 hours of underwater footage (Activity 1.2). Using these data, a standard operating procedure (SOP) for deploying net cameras on fishing nets was created. The purpose of the SOP was to allow fisheries observers and fishermen to independently continue with net camera deployments without the need for a specialist. We are currently preparing a report for the Project Management group (PMG) and stakeholders.

#### Activity 2: Occurrence of interactions in space and time

A number of key components of this work package are now completed. Over a 3-week period in August 2023, fieldwork was conducted at the Bird Island fur seal colony. This trip was a huge success. We deployed 19 satellite tags on male fur seals (Fig.1; Activity 2.1). These satellite tags will collect several months' worth of data for each seal, providing us with critical information about their movement ecology and habitat use (Fig. 2). These tracking efforts are poised to generate one of the largest movement datasets available for this South American fur seal species. With this information, we'll be able to examine the extent and frequency in which male fur seals are interacting with the Falkland Islands fishery.

Additionally, work conducted as part of this work package has recently been published in a highly regarded and open-access international scientific journal, *Global Ecology and Conservation* (Fig. 3; Activity 2.2). This publication made use of existing fur seal tracking data collected in 2018 and 2019 to examine the at-sea movement behaviour (spatial location and dive) of female fur seals in the Falklands Islands and spatial overlap with commercial trawl fisheries. The study demonstrated a distinct spatial overlap between female fur seal foraging effort and commercial trawling activity within the Falkland Islands EEZ, particularly in areas associated with Patagonian longfin squid (*Doryteuthis gahi*) and common hake (*Merluccius hubbsi*). Importantly, the publication discussed the implications of the research (and the project) within the broader context of local prey-field dynamics and fisheries management in the Falkland Islands. Full publication available here: <https://doi.org/10.1016/j.gecco.2023.e02615>

SAERI @SAERI\_FI (1/2) #TeamSeal are back from 3 incredible weeks of #fieldwork on Bird Island. Braving the #Falklands winter, @JavedZRiaz & @al\_baylis deployed 19 @Tags4Wildlife GPS tags on male South American fur seals! @UKBCFs @FIFCA52degrees



11:05 AM · Aug 31, 2023 · 2,530 Views

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SAERI @SAERI\_FI (2/2) This trip saw one of the largest tagging efforts of this species to date and we can't wait to follow their adventures! Stay tuned for more exciting updates on our @UKBCFs #DPLUS168 project. @FalklandsGov @FIFCA52degrees @al\_baylis @JavedZRiaz @Tags4Wildlife



11:09 AM · Aug 31, 2023 · 316 Views

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**Figure 1 – Twitter post promoting the successful fieldwork conducted on Bird Islands is August 2023**

SAERI @SAERI\_FI Ever wondered where adult male #Falklands fur seals go? So have we...LIVE MAP! [south-atlantic-research.org/dplus168/](https://south-atlantic-research.org/dplus168/) Working with project partners @FIFCA52degrees & @FalklandsGov our @UKBCFs #DPLUS168 will better understand how seals use & interact with their environment (& us)! #sealsRgreat



9:37 AM · Sep 12, 2023 · 3,791 Views

14 32

**Figure 2 – Twitter post promoting the movement data from the 19 male South American fur seals tagged at the Bird Island colony in the Falkland Islands**



**Figure 3 – Research output from our project published in the highly regarded international journal *Global Ecology and Conservation*.**



**Figure 4 – Promotion of this new research output on Twitter by project manager Dr Javed Riaz. This research was widely received, with the post reaching over 10,500 engagements.**

### Activity 3: Factors that predict an increase in bycatch risk

This component of the work package has been progressing well and is on its way to being marked complete. To examine the influence of different parameters on seal-fishery interaction events, we used trawl-by-trawl data provided by FIFD and extracted and calculated a range of variables (Table 1). Broadly, we sought to obtain a suite of explanatory variables that could be reasonably expected to influence seal foraging behaviour and at-sea decisions to interact with trawl operations (Activity 1; Activity 2). This resulted in the selection of 13 different variables which are currently being configured and inputted in mathematical modelling efforts (Fig. 5). These 13 variables consist of various operational (n = 3), spatiotemporal (n = 5) and environmental (n = 5) metrics corresponding to the location and timestamp of each individual trawl. These variables were carefully considered and were selected based on their known capacity to mediate prey availability and influence the movement and foraging behaviour of air-breathing marine predators.

Covariate type	Predictor	Description
Operational	Catch quantity	Total catch quantity (kg) of Loligo recorded for each trawl
	Trawl duration	Total duration of each trawl occurring within the Loligo Box
	Catch per unit effort (CPUE)	$CPUE = Catch\ quantity \div Trawl\ duration$
Spatiotemporal	Trawl location	Latitudinal coordinates of the end trawl position. Latitude was considered an appropriate metric of trawl location given the north-south geometry of the Loligo Box positioned over the shelf-break.
	Vessel clustering (near-real-time)	For each trawl, we calculated how many other trawling operations occurred within a 20 km distance and a 5-hour window.
	Vessel clustering (time lag)	As for the near-real-time clustering, although within a 24-hour time window
	Distance to land	Vessel distance (km) to nearest land feature, indicative of possible seal resting area.
	Time of year	Calendar month (1 – 12) vessel trawl activity occurred
Environmental	Sea surface temperature (SST)	Measured daily in °C at a 0.01° spatial resolution.
	Sea surface height (SSH)	Measured daily in m at 0.25° spatial resolution.
	Bathymetry (BATH)	Sea floor depth (m) at a 0.02° × 0.02° spatial resolution.
	Bathymetry slope (BSlope)	Gradient (°) of the sea floor calculated from bathymetry data (0.02° × 0.02° spatial resolution)
	Eddy kinetic energy (EKE)	Measured daily (cm <sup>2</sup> /s <sup>2</sup> ) at a 0.25° × 0.25° spatial resolution. Calculated consistent with (Reisinger et al. 2018) as:  $EKE = 0.5 (U^2 + V^2)$  Where U and V represent the horizontal (zonal) and vertical (meridional) geostrophic velocity, respectively.

**Figure 5 – Summary table of the 13 different operational, spatiotemporal and environmental predictors compiled for bycatch modelling work.**

### Activity 4: Trophodynamic model and trophic changes over time

This work package requires us to use dietary data to quantify trophic links between seals and prey. During our recent fieldwork on Bird Island in August 2023, we collected seal whiskers from the 19 male fur seals we tagged. In addition to these samples, we also scoured the island and collected over 100 poo samples. Both of these sample datasets can yield critical insight into fur seal diet and trophodynamics. Molecular and visual analyses of poo samples can provide information about the relative importance of commercially caught species, whilst compound-specific stable isotope analysis of whiskers will tell us whether there have been any changes in diet over time.

Lab work to process and prepare these fur seal biological samples is well underway. Poo samples were processed and prepared for visual and molecular analyses in October 2023, while stable isotope preparation and analysis of seal whiskers has been organised for November 2023.



**Figure 6 – Images from recent lab work in October 2023 processing and analysing seal poo samples. The left photo shows project lead Dr Alastair Baylis sorting poo samples. The right photo shows some of the prey items we were able to identify from seal poo samples (e.g. krill carapace and squid beaks).**

Activity 5: Developing management actions

To support the alignment of long-term management objectives and actions towards a national bycatch plan, it is important to meet regularly with an established PMG to discuss project findings and direction. A PMG has been successfully established which consists of representatives from DNR-Fisheries (Dr Andreas Winter; FIFD), industry (James Bates; FIFCA) and SAERI (Dr Javed Riaz, Dr Alastair Baylis and Dr Paul Brickle). The PMG met on 30/03/2023 and 25/10/2023. In these meetings, all members were briefed on the project's progress and advice was sought regarding project direction, particularly in relation to work package 5 objectives which involve stakeholder workshops.

**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.**

There is a significant risk that our second planned field season will be impacted by avian influenza (HPAI), which has now reached South Georgia. We are in the process of planning mitigation, should the second season be discontinued due to HPAI. While this would cause a significant disruption to planned project activities, given the success of the first field season, we are confident that we can continue to deliver the project objectives on time.

**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

Formal Change Request submitted: No

Received confirmation of change acceptance      No

Change request reference if known:

**4a. Please confirm your actual spend in this financial year to date (i.e. from 1 April 2023 – 30 September 2023)**

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 2024)?**

Yes     No     Estimated underspend:    £

**4c. 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.****

**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?**

There are currently no issues to report.

**If you are a new project and you received feedback comments that requested a response, 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.**

**All new projects (excluding Darwin Plus Fellowships and IWT Challenge Fund Evidence projects) should submit their Risk Register with this report if they have not already done so.**

**Please note: Any planned modifications to your project schedule/workplan can be discussed in this report but **should also** be raised with NIRAS 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](mailto: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**