Darwin Plus: Final Report

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

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

Submission Deadline: no later than 3 months after agreed end date.

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

Darwin Plus Project Information

Project reference	DPLUS168
Project title	Understanding increased FI seal bycatch to inform bycatch Action Plan
Territory(ies)	Falkland Islands
Lead Organisation	South Atlantic Environmental Research Institute (SAERI)
Project partner(s)	Falkland Islands Government Department of Natural Resources – Fisheries (DNR-Fisheries) Falkland Islands Fishing Companies Association (FIFCA)
Darwin Plus Grant value	£363,563
Start/end date of project	1 June 2022 – 31 May 2025
Project Leader name	Dr Alastair Baylis
Project website/Twitter/blog etc.	Organisation: https://www.south-atlantic-research.org/ SAERI twitter: @SAERI_FI SAERI facebook: https:facebook.com/SAERI/ SAERI blogs: https://www.south-atlantic-research.org/news
Report author(s) and date	Dr Javed Riaz & Dr Alastair Baylis 25/04/2025

1 Project Summary

The Falkland Islands are home to globally significant populations of seals and seabirds, including > 50% of the global population of South American fur seals (Fig. 1). Seal bycatch and seal-fishery interactions have historically been low. However, in 2017 seal-fishery interactions increased by > 900% in the Falkland Islands squid fishery. The introduction of SEDs reduced seal mortality substantially, but interactions continue at unprecedented levels and the seal bycatch issue continues to evolve, with higher levels of interactions now being reported in the finfish fishery. At present, seal-fishery interactions and SED effectiveness in the finfish fishery is poorly understood due to limited observer coverage. In addition, factors contributing to an increase in seal-fishery interactions are presently unknown. Combined, this lack of baseline data limits our ability to adapt and evolve mitigation efforts and national action plans. The project addresses these issues through the following:

Work Package (WP) 1 – Trial and deploy net cameras

The Falkland Islands squid trawl fishery has 100% observer coverage. In contrast, observer coverage in the finfish fishery is low (< 10%) and seal-fishery interactions are comparatively poorly understood. We will trial net cameras on the DNR-Fisheries pre-recruitment surveys with

the outlook to subsequently deploy on finfish vessels. The data collected will allow us to quantify the depth and frequency of net entry by seals, seal behavior, and interactions with SEDs OR SED efficiency. Ultimately, data will enable a better understanding of seal-fishery interactions within the finfish fishery.

WP2 – Occurrence of interactions in space and time

During the initial bycatch 'wave' in 2017, seals were brought back to the laboratory. Necropsies revealed that about 30 % were lactating female fur seals – implying colony origin was the Falkland Islands given the distance to other breeding colonies (e.g., Uruguay). To better understand the occurrence of interactions we will: (1) Track seal movements using satellite tags to understand behaviour and quantify spatial and temporal overlap with fisheries. (2) Determine whether seals are following vessels and are habituated to net feeding or whether interactions are driven by proximity to seal colonies.

WP3 - Factors that predict and increase bycatch risk

Develop mathematical models that combine observer data and tracking data (see WP 2) with environmental and operational data to quantify which variables explain and predict seal-fishery interactions. Provide recommendations on how findings can support and inform management. See Report 1 in the documents submitted along with the final report.

WP4 – Trophodynamic model and trophic changes over time

Use dietary data to quantify trophic links between seals and prey to facilitate ecologically sustainable development frameworks that are key to ecosystem-based fisheries management – a long-term goal of the DNR-Fisheries. We will Ecopath and Ecosim modelling approach and information on the distribution, abundance, and diet of finfish, squid and seals to understand their ecological roles and the importance of commercial caught species in seal diet. Recognizing limited seals dietary data exists, we will use DNA analysis to enhance knowledge contemporary diet, and compound specific stable isotope analysis of seal whiskers to understand dietary changes over time. See Reports 2, 3 and 4 in the documents submitted along with the final report.

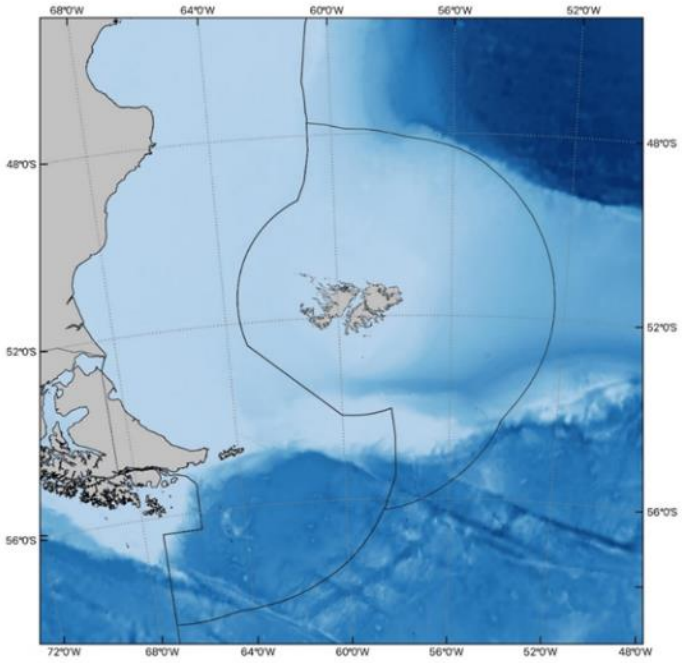


Fig. 1- The Falkland Islands in relation to southern South America and their Conservation Zones.

2 Project Partnerships

The project was designed as a collaborative project with the Falkland Islands Government (FIG) Department of Natural Resources (DNR) - Fisheries and the Falkland Islands Fishing Companies Association (FIFCA). Both FIG and FIFCA are also key stakeholders. The project has therefore, worked closely with both FIG and FIFCA during the project set-up phase and support received from our project partners to date, is exceptional.

Throughout the duration of the project, SAERI has actively engaged with project partners and stakeholders continuously during the project.

Specifically:

- DNR-Fisheries were part of the recruitment for the Net Camera Specialist, taking part in the interview process and in selection of the preferred candidate.
- Worked closely with DNR-Fisheries to identify suitable net cameras for the Falkland Islands trawl fishery.
- DNR-Fisheries (Dr Andreas Winter) and FIFCA enabled Megan Shapiro (DPLUS168 Net Camera specialist) to trial net cameras on the DNR-Fisheries recruitment survey and during commercial fishing (WP1)
- DNR-Fisheries have provided access to data, and guidance with regard to existing datasets held within DNR-Fisheries that could be relevant to modelling seal-fishery interactions (WP2 and WP3).
- FIFCA (Mr James Bates) provided the opportunity to talk at the Falklands Fishery Liaison Group on in February 2023. Alastair Baylis (DPLUS168) presented an overview of the project to industry representatives.
- FIFCA worked with the Net Camera Specialist to identify several opportunities for further camera deployments.
- All partners are involved in planning, monitoring and evaluation through the Project Management Group. Several Project Management Group meetings were held throughout the duration of the project, although we continuously met with both FIFCA and DNR-Fisheries during the project.
- All project partners are present as either co-authors or in the acknowledgements in both publications stemming from this research project. These are available open access here: https://doi.org/10.1016/j.gecco.2023.e02615 and here: https://doi.org/10.1093/icesjms/fsae161
- DNR-Fisheries have been actively involved in the collation of spatial, environmental and operational fisheries datasets, relevant to Work Package 3. They have also facilitated the use of their on-site laboratory to process seal biological samples, relevant to Work Package 4.
- All stakeholders have been actively promoted in various SAERI social media posts that have received significant public engagement (see screenshot throughout the report for examples).
- FIFCA and DNR-Fisheries were actively involved in meetings leading up to the final project workshop (shaping the content of the workshop), and were present at the workshop (held in July and October 2024, respectively). The final workshop is where key project findings were synthesized and we discussed how the research will shape ongoing monitoring and mitigation of seal-fishery interactions.

3 Project Achievements

3.1 Outputs

Output 1: Trial and deploy net camera

Achieved! 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 (Megan Shapiro). Over a seven-month period between January-August, net cameras were deployed on eight different fishing vessels. For each trawl, different positions and orientations on the net were tested in order to find the best view of the SED. Many different camera configurations and parameter set-ups were also tested, in order to find the best combination of settings to provide the best quality data. Like all gear trials, there was some troubleshooting required, which naturally comes with developing, testing and deploying technical equipment. Our net camera specialist was regularly in communication with the manufacturers, Williamson and Associates (WASSOC) to troubleshoot the issue encountered. This involves working to better protect and utilise the cameras on near-bottom trawls. Overall, our deployments captured 350 hours of underwater footage. A final report on the net camera trials was previously submitted with annual reports, and is available upon request.

Over a seven-month period between January- August, the specialist worked with DNR-Fisheries and FIFCA to facilitate eight deployments of trawl net cameras on two Loligo and six finfish vessels. In total, this captured 350 hours of underwater footage. With this collective effort, the specialist was able to create a protocol for fisheries observers and fishermen to follow, so that cameras can continue to be deployed across the fleet, independent of the specialists' oversight/technical expertise.

Activity 2: Occurrence of interactions in space and time

Achieved! A significant amount of progress was made on this work throughout the duration of this project, which hugely advances our understanding of South America fur seal distribution, habitat use and interaction with commercial fisheries

Over a three-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. 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). Compiling these data with other historical SAERI tracking efforts, we can now proudly say that SAERI has the largest movement datasets available for this fur seal species anywhere in the world.

This impressive dataset contains tracking information for 74 fur seals (19 adult males, 35 adult females and 20 pups), collected over the course of 10 years. Additionally, the tracking dataset also has an impressive temporal coverage, providing movement information throughout most of the fur seal annual cycle. With the wealth of fur seal movement information that we have collected and compiled as part of this project, progress has been made towards developing a population-level understanding of spatiotemporal overlap with commercial fisheries operating in the Falkland Islands and the broader Patagonian Shelf.

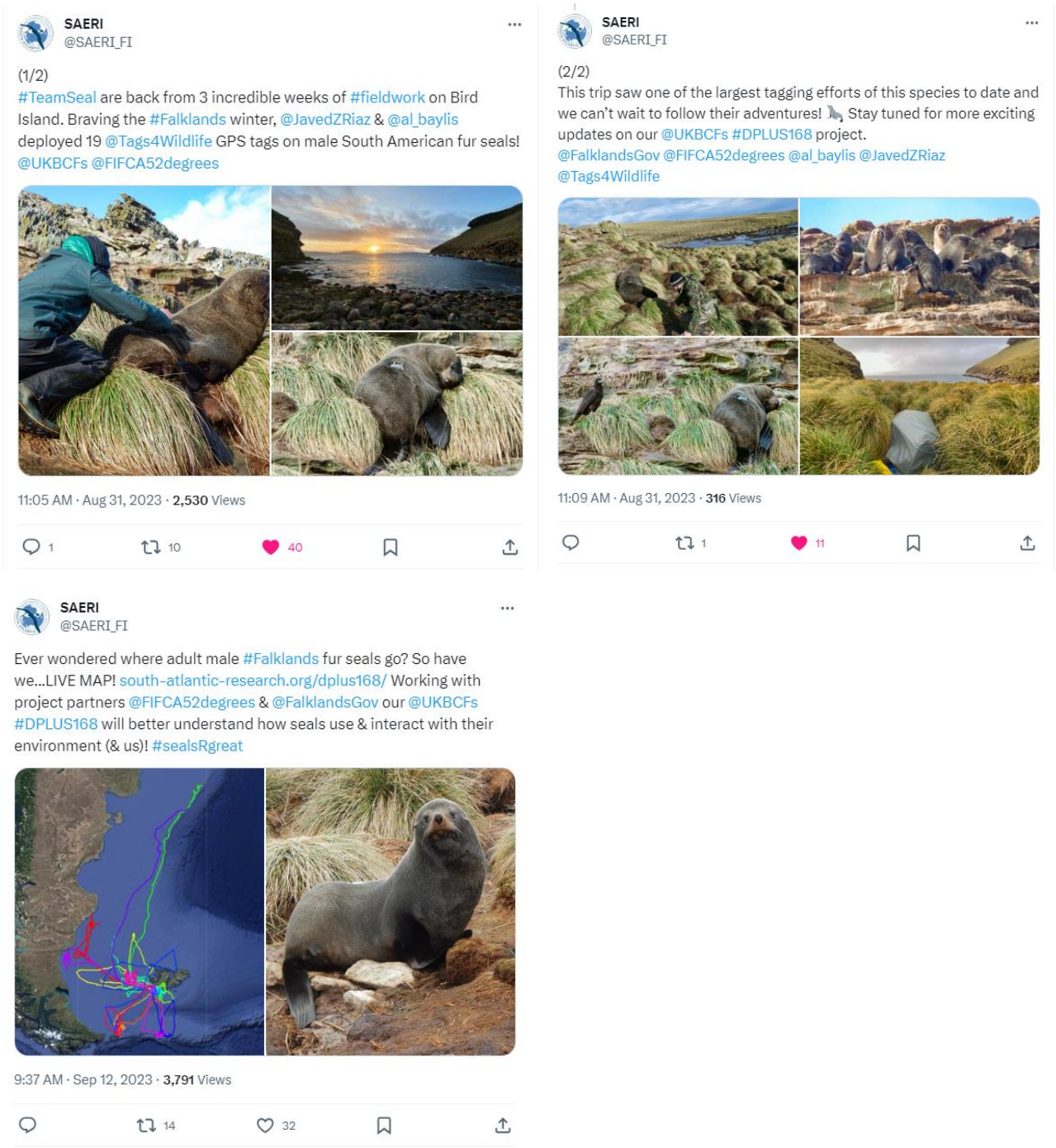
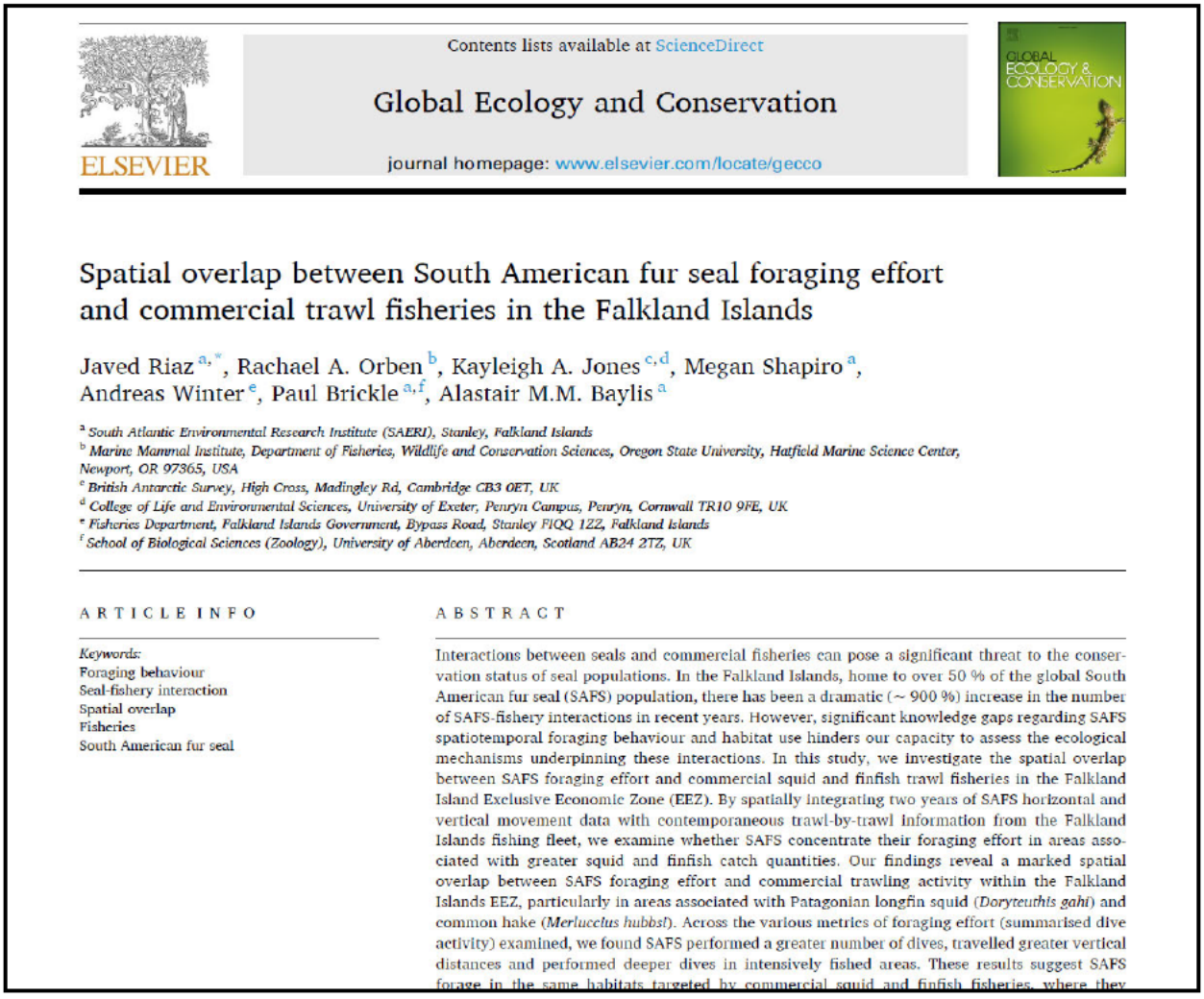


Fig. 2 - Screen captures of our social media posts on X (formerly Twitter) promoting the fur seal data collection

We recently published research using part of these tracking data in a highly regarded and open-access international scientific journal, *Global Ecology and Conservation* (GECCO) (Fig. 3). This publication made use of fur seal tracking data collected in 2018 and 2019 to examine the at-sea movement behaviour (spatial location and dive) of female fur seals at the Falklands Islands and spatial overlap with commercial trawl fisheries. The research 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.



Contents lists available at ScienceDirect

Global Ecology and Conservation

journal homepage: www.elsevier.com/locate/gecco

Spatial overlap between South American fur seal foraging effort and commercial trawl fisheries in the Falkland Islands

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South American fur seal

ABSTRACT

Interactions between seals and commercial fisheries can pose a significant threat to the conservation status of seal populations. In the Falkland Islands, home to over 50 % of the global South American fur seal (SAFS) population, there has been a dramatic (~ 900 %) increase in the number of SAFS-fishery interactions in recent years. However, significant knowledge gaps regarding SAFS spatiotemporal foraging behaviour and habitat use hinders our capacity to assess the ecological mechanisms underpinning these interactions. In this study, we investigate the spatial overlap between SAFS foraging effort and commercial squid and finfish trawl fisheries in the Falkland Island Exclusive Economic Zone (EEZ). By spatially integrating two years of SAFS horizontal and vertical movement data with contemporaneous trawl-by-trawl information from the Falkland Islands fishing fleet, we examine whether SAFS concentrate their foraging effort in areas associated with greater squid and finfish catch quantities. Our findings reveal a marked spatial overlap between SAFS 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*). Across the various metrics of foraging effort (summarised dive activity) examined, we found SAFS performed a greater number of dives, travelled greater vertical distances and performed deeper dives in intensively fished areas. These results suggest SAFS forage in the same habitats targeted by commercial squid and finfish fisheries, where they

Fig. 3 - Screen capture of our research article published in *Global Ecology and Conservation*

Using the whole combined fur seal tracking dataset, we have also published fur seal distribution and habitat use findings in a top international journal in the field; *Ecography* (https://doi.org/10.1111/ecog.07415) (Fig. 4). While this particular publication related to the spread of highly pathogenic avian influenza (HPAI) over the Patagonian Shelf, the compiled data represents a significant step towards developing a population-level understanding of habitat use and emerging threats – with a key threat potentially being spatiotemporal overlap with commercial fisheries in the region. By including new data on males and pups, the compiled dataset can enable insights into potential seal-fishery interactions for demographic groups that are not spatially constrained by the breeding season.

Analyses of the combined fur seal dataset have demonstrated that fur seals tagged at the Falkland Islands spend varying amounts of time in different jurisdictions over the Patagonian Shelf and the broader South Atlantic. The majority of their time at-sea was spent within the Falkland Islands EEZ (56.3%). Fur seal also spent substantial amounts of time within the Argentinian EEZ (43.5%). Interestingly, 1 pup ventured relatively far east into the South Georgia and South Sandwich Islands EEZ (9.1% time). Fur seals were also recorded in areas beyond national jurisdiction (29.8% time in the high seas). With these tracking data, we leveraged regional fisheries datasets obtained via Global Fishing Watch to quantify seal-fisheries spatial overlap. We specifically examined where the hotspots of potential seal-fishery interactions are likely to occur over the Patagonian Shelf, throughout each month of the year. This involved quantitative integration of time seals spent in particular areas with commercial fishing activity recorded in the same areas. In brief, we found a medium and high spatial overlap between fur seals and fisheries at all times throughout the year, with the exception of

summer months (November, December and January). In particular, the Loligo squid and finfish fishing areas within the Falkland Islands EEZ were consistently identified as hotspot areas for seal-fishery overlap. Throughout July – November, clear hotspots of overlap were also recorded further north over the boundary of the Argentine EEZ and Patagonian Shelf continental shelf (Fig. 5 – 7)

ECOGRAPHY

Research article

Coastal connectivity of marine predators over the Patagonian Shelf during the highly pathogenic avian influenza outbreak

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Ecography
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Christine N. Meynard
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Animal movement and population connectivity are key areas of uncertainty in efforts to understand and predict the spread of infectious disease. The emergence of highly pathogenic avian influenza (HPAI) in South America poses a significant threat to globally significant populations of colonial breeding marine predators in the South Atlantic. Yet, there is a poor understanding of which species or migratory pathways may facilitate disease spread. Compiling one of the largest available animal tracking datasets in the South Atlantic, we examine connectivity and inter-population mixing for colonial breeding marine predators tagged at the Falkland Islands. We reveal extensive connectivity for three regionally dominant and gregarious species over the Patagonian Shelf. Black-browed albatrosses (BBA), South American fur seals (SAFS) and Magellanic penguins (MAG) used coastal waters along the Atlantic coast of South America (Argentina and Uruguay). These behaviours were recorded at or in close proximity to breeding colonies and haul-out areas with dense aggregations of marine predators. Transit times to and from the Falkland Islands to the continental coast ranged from 0.2–70 days, with 84% of animals making this transit within 4 days - a conservative estimate for HPAI infectious period. Our findings demonstrate BBA, SAFS and MAG connectivity between the Falkland Islands and mainland South America over an expansive spatial network and numerous pathways, which has implications for infectious disease persistence, transmission and spread. This information is vital in supporting HPAI disease surveillance, risk assessment and marine management efforts across the region.

Keywords: Animal movement, Avian influenza, connectivity, Falkland Islands, HPAI

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www.ecography.org

Fig. 4 - Screen capture of our research article published in *Ecography*

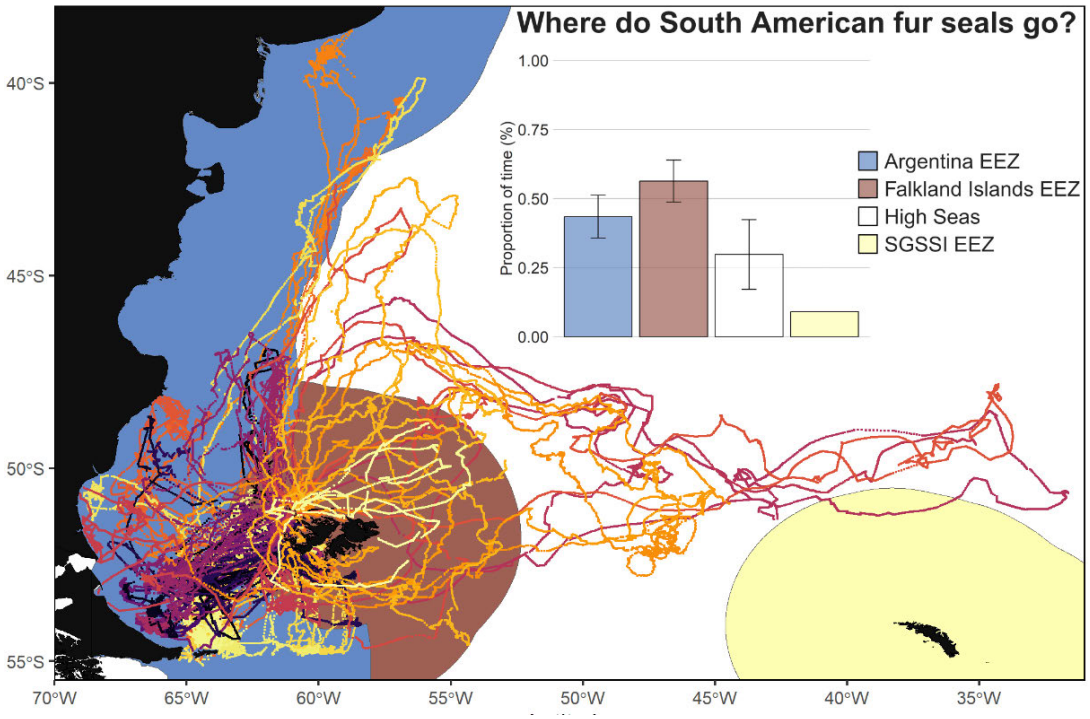

Fig. 5 - Map displaying the tracking data of 74 South American fur seals tagged at the Falkland Islands, and how their movements overlap with maritime boundaries in the region

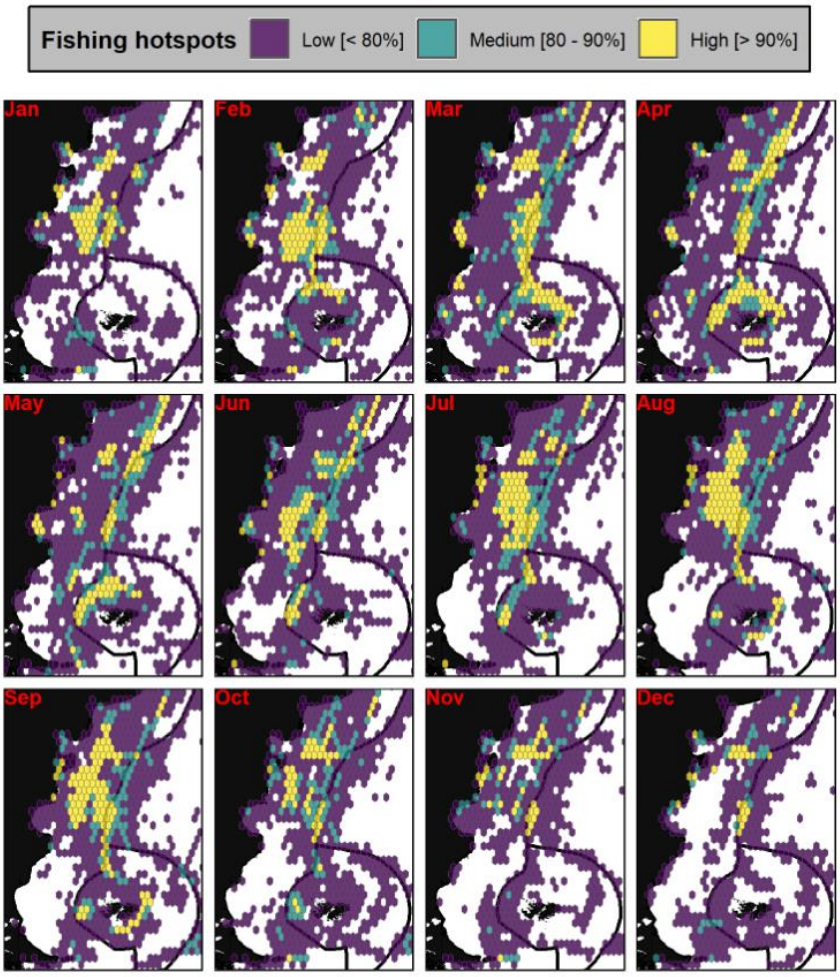

Fig. 6 - Map displaying hotspots of commercial fishing activity across the region per month. Data was obtained from the Global Fishing Watch database.

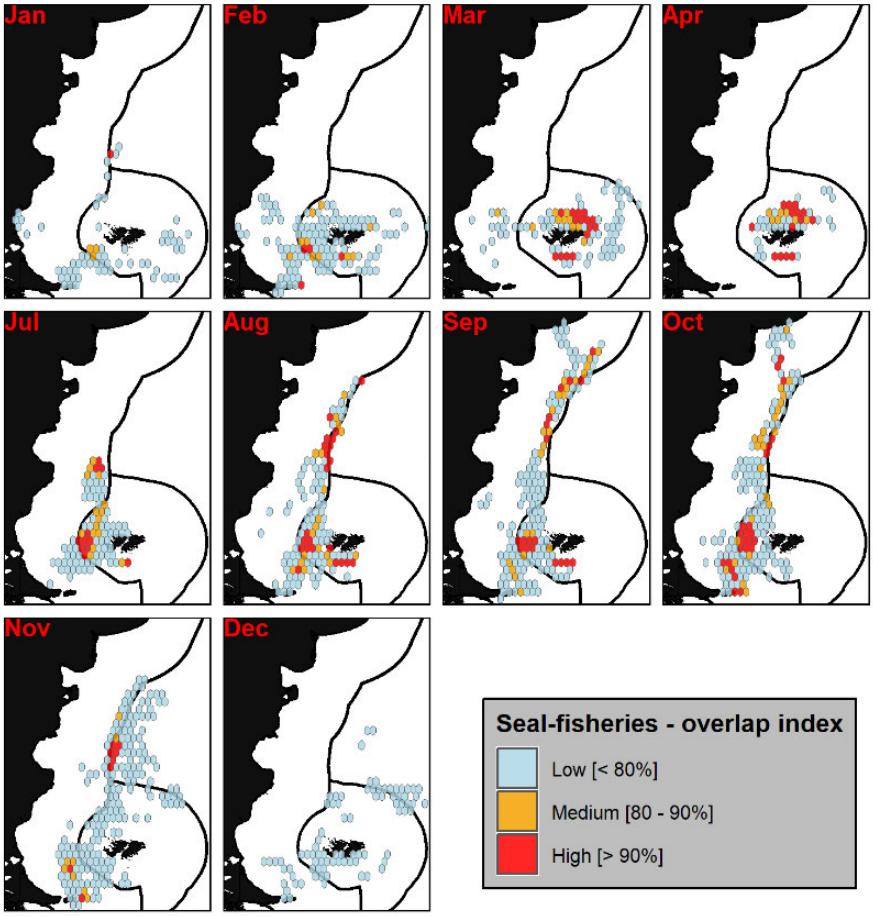

Fig. 7 - Map displaying the areas where there was a spatial overlap between seal tracking data and commercial fishing activity. These areas are identified as low, medium and high risk for seal-fishery interactions, according to each month of the year. Classifications are based on a quantitative approach integrating the amount of time seals spend and the extent of fishing activity recorded in particular areas.

Activity 3: Factors that predict an increase in bycatch risk

Achieved! This component of the work package has been completed and is featured in a research article published by a leading international journal: *ICES Journal of Marine Science* (https://academic.oup.com/icesjms/advance-article/doi/10.1093/icesjms/fsae161/7916773) (Fig. 8). The publication is part of the journal's special issue titled *"Improving conservation outcomes by reducing bycatch of long-lived species in commercial fishing gear"*.

Integrating complete and multi-year observer records with extensive ancillary (i.e. vessel logbook and oceanographic) datasets, we examine the operational and environmental factors influencing the occurrence of seal-fishery interactions. Our research findings show that seal-fishery interactions are a common and significant management challenge for the Loligo fishery, occurring in 32% of all trawls (Fig. 9)

The spatial and operational components of the Loligo fishery is a key factor in influencing seal-fishery interactions. Our quantitative modelling framework highlights that interactions most frequently occur in the main squid fishing grounds (the southern Loligo Box) during trawls associated with high catch quantities.

Additionally, assessment of long-term catch data (both finfish and squid) also suggests the increase in seal-fishery interactions may be caused by long-term trends in the Falkland Islands ecosystem structure and composition. The successive collapses in dominant finfish stocks over the past 20 years, may be constricting foraging resources available to seals, forcing a heightened competition with the fishery over Loligo resources (Fig. 9).

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Original Article

Seal-fishery interactions in the Falkland Islands—operational and environmental factors drive resource competition

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Abstract

Direct interactions between marine mammals and commercial fisheries are a worldwide conservation challenge. Observer programmes remain the most effective and reliable method for collecting data on these interactions. In the Falkland Islands—home to globally significant seal populations and commercial squid fisheries, seal-fishery interactions have escalated in recent years, prompting management concerns. Complete observer coverage within the squid fishery presents a valuable opportunity to investigate the nature, extent, and drivers of these interactions. Integrating multi-year observer records with extensive ancillary (i.e. vessel logbook and oceanographic) datasets, we examine the operational and environmental factors influencing the occurrence of seal-fishery interactions. Our findings show interactions most frequently occur in the main squid fishing grounds during trawls associated with high catch quantities. Assessment of long-term catch data (both finfish and squid) also suggests the increase in seal-fishery interactions may be caused by collapses in dominant finfish stocks over the past 20 years, constricting foraging resources available to seals. Taken together, our findings indicate resource competition may be a mechanism of interactions. To help mitigate this issue, we advocate for the development of ecosystem-based fisheries management, which considers the trophic effects of fishing practices and the energetic requirements of local marine predator populations.

Keywords: bycatch; interactions; fisheries; seal; Falkland Islands

Graphical abstract

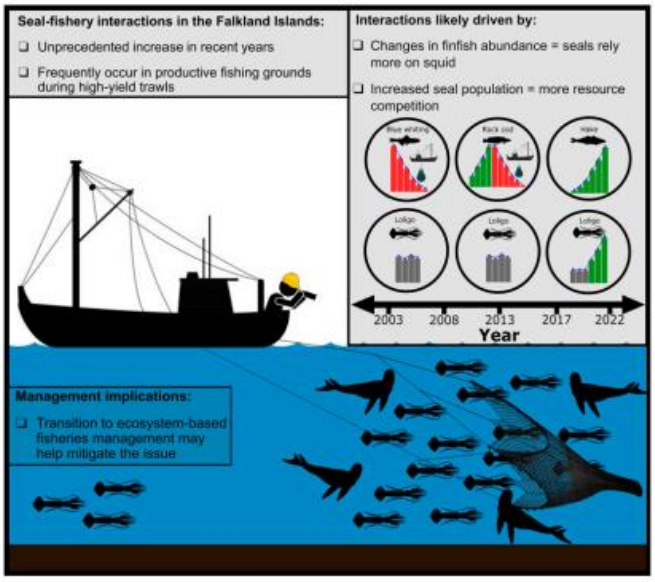
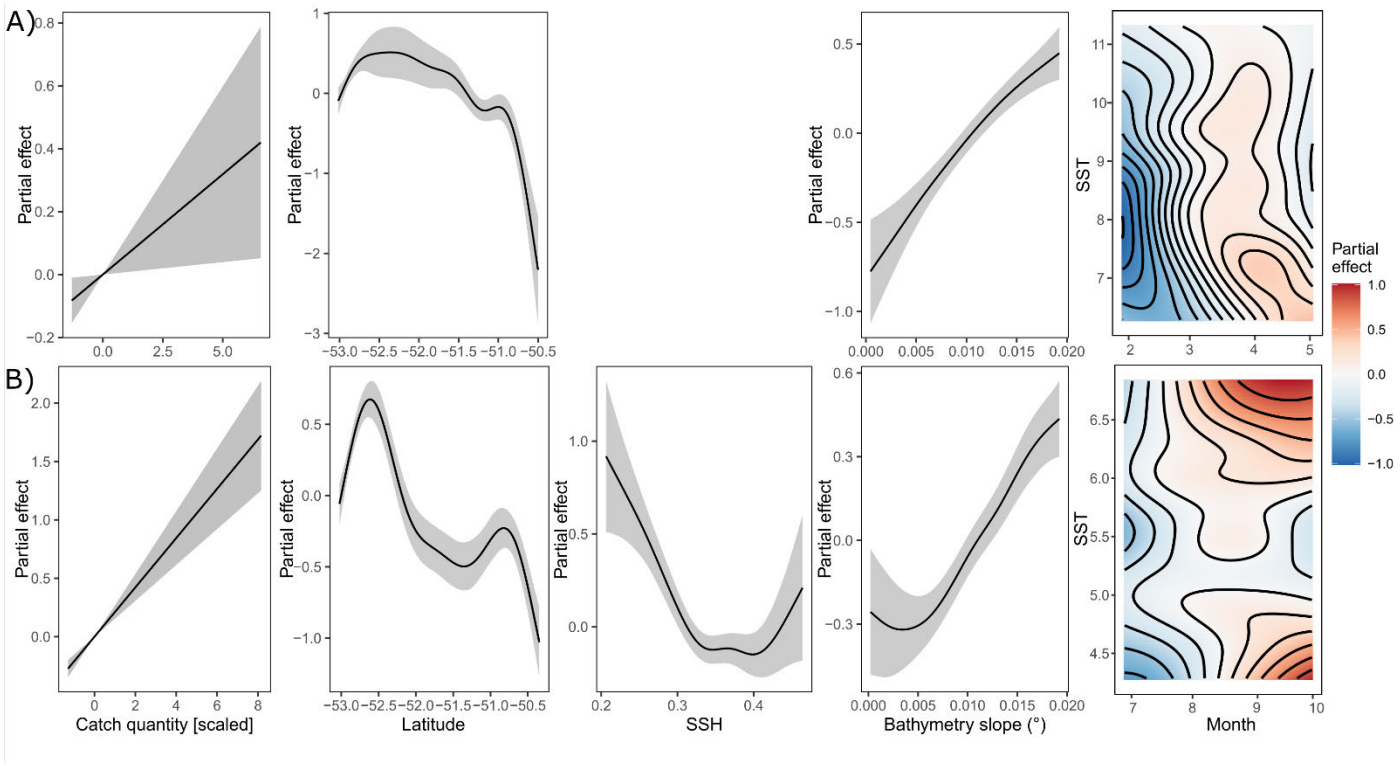


Fig. 8 - Screen capture of our research article published in *ICES Journal of Marine Science*



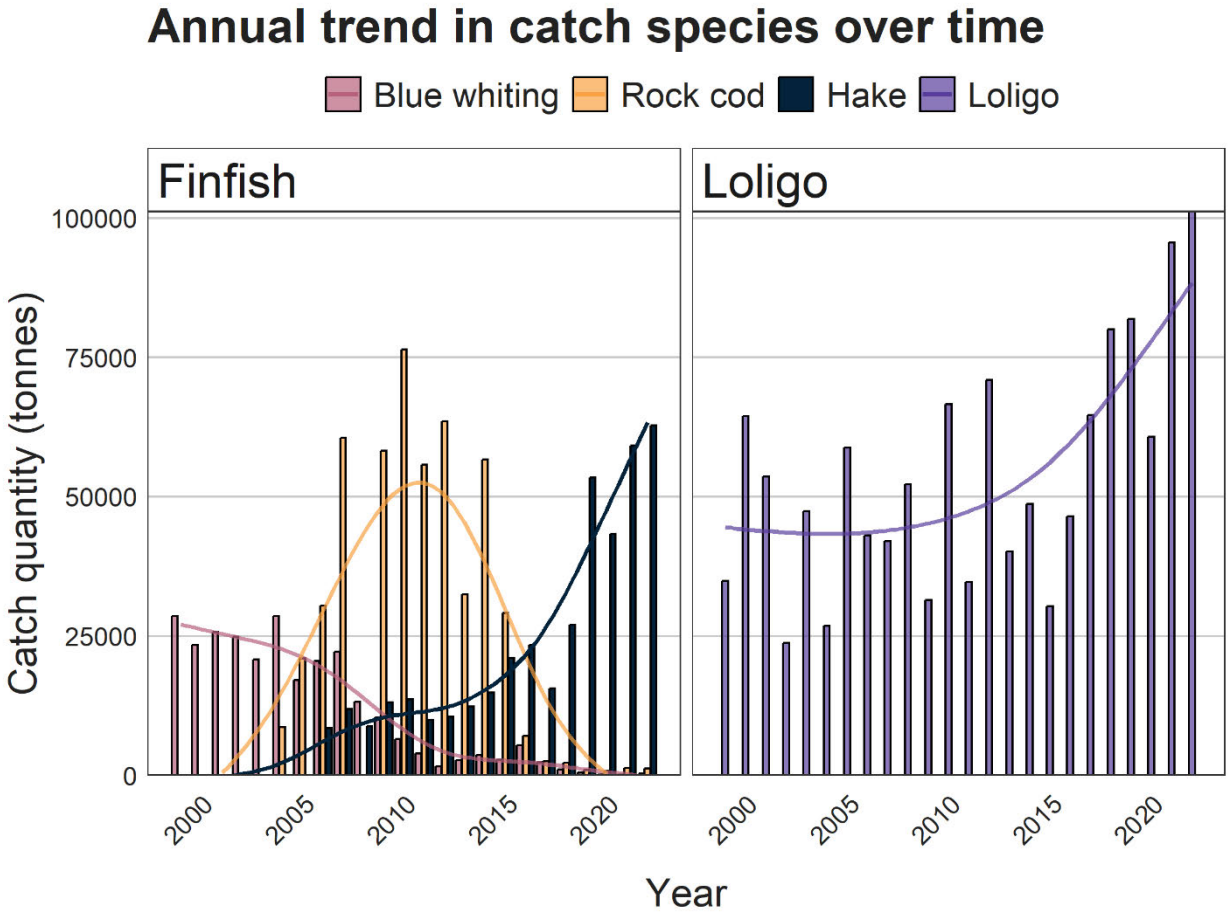


Fig. 9 - Figures from our research article published in *ICES Journal of Marine Science* showing modelling results and historical changes in the structure and composition of the Falkland Islands ecosystem over the past 20 years.

Activity 4: Trophodynamic model and trophic changes over time

Achieved! This work package required us to use dietary data to quantify trophic links between seals and prey. We achieved this using multiple different dietary and analytical techniques.

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 120 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.

We successfully shipped fur seal faecal samples to our collaborators based at the University of Edinburgh. These samples were examined using molecular analyses to generate insights into fur seal diet (report submitted along with this final project report). We also conducted visual analyses of hard parts within these faecal samples (Fig. 10). This work supported the notion that Loligo squid are integral components of fur seal diets in the Falklands, but also highlighted numerous fish species that were difficult to identify due to often heavily eroded otoliths. See also Report 3.

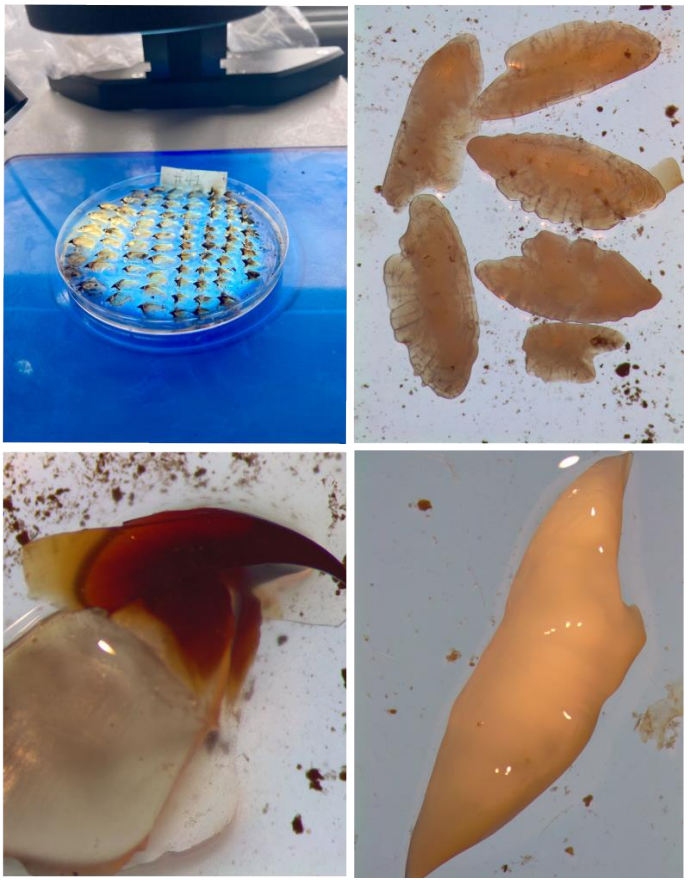


Fig. 10 - Example of squid and fish hard parts found in fur seal poo samples

We also analysed 910 segments from 49 whiskers of adult South American fur seals, including 23 from females and 26 from males. Whiskers represented between 1.4 and 5.4 years per individual (mean ± SD: 2.7 ± 0.6 years for males; 3.6 ± 0.8 years for females). Male $\delta^{15}N$ and $\delta^{13}C$ values ranged from 12.5 to 18.3% and from – 17.6 to – 14.0% respectively. Female values ranged from and from 12.2 to 18.3 % for $\delta^{15}N$ and from -16.8 to -14.1% for $\delta^{13}C$. We observed regular oscillations of $\delta^{15}N$ or $\delta^{13}C$ in numerous individuals of both sex (Fig. 2), with

more pronounced fluctuations in $\delta^{15}N$ compared to $\delta^{13}C$. Of note, declines in $\delta^{15}N$ and $\delta^{13}C$ values between 2011 and 2015 reflect a dietary shift to lower-trophic, pelagic prey like rock cod and Falkland herring, while post-2016 increases in $\delta^{15}N$ suggest greater reliance on higher-trophic species such as hake and squid. A sharp drop in isotopic values in 2023 likely signals reduced availability of these key prey items, especially for males, who may be more vulnerable to changes in fishery dynamics and anthropogenic pressures. See also Report 4.

Activity 5: Developing management actions

Achieved! During the project, we held multiple meetings with project partners (FIFCA and DNR-Fisheries); including a final project workshop. The purpose of these presentations was to synthesise our project findings and how the research has advanced our understanding of seal-fishery interactions in the Falkland Islands. A core objective of the final project meeting in October was also to engage with stakeholders regarding future research direction and discuss ideas for future research and monitoring. These discussions related to the project's legacy and future steps, specifically focusing on:

a) **Scientific research priorities:** Whether continued research and monitoring is required to further understand seal-fishery interactions, and how this could be achieved.
b) **Fishing operations and management**: Whether any adjustments are needed to better meet long-term sustainability and conservation targets, and how any potential measures could be implemented.

During the meeting final meeting, SAERI facilitated discussions about three key topics for future monitoring and mitigation:

1) Capacity to improve or refine fisheries data collection at sea
2) Seal population data gaps, and what is needed to improve assessment of possible conservation threats
3) Perspective from industry regarding the extent and priority of seal-fishery interactions

The key conclusions from these project discussions are provided below (Fig. 11 – 13). A full report and summary of the final workshop has been compiled and circulated to project partners. See also Report 5 and Report 6 which were submitted along with the final project report.

Fig. 11 - Project manager Dr Javed Riaz presenting DPLUS168 research progress at a meeting with stakeholders and project partner, held on July 17.

Fig. 12 - A presentation slide from the final project meeting held on 29 October outlining the meeting agenda and format

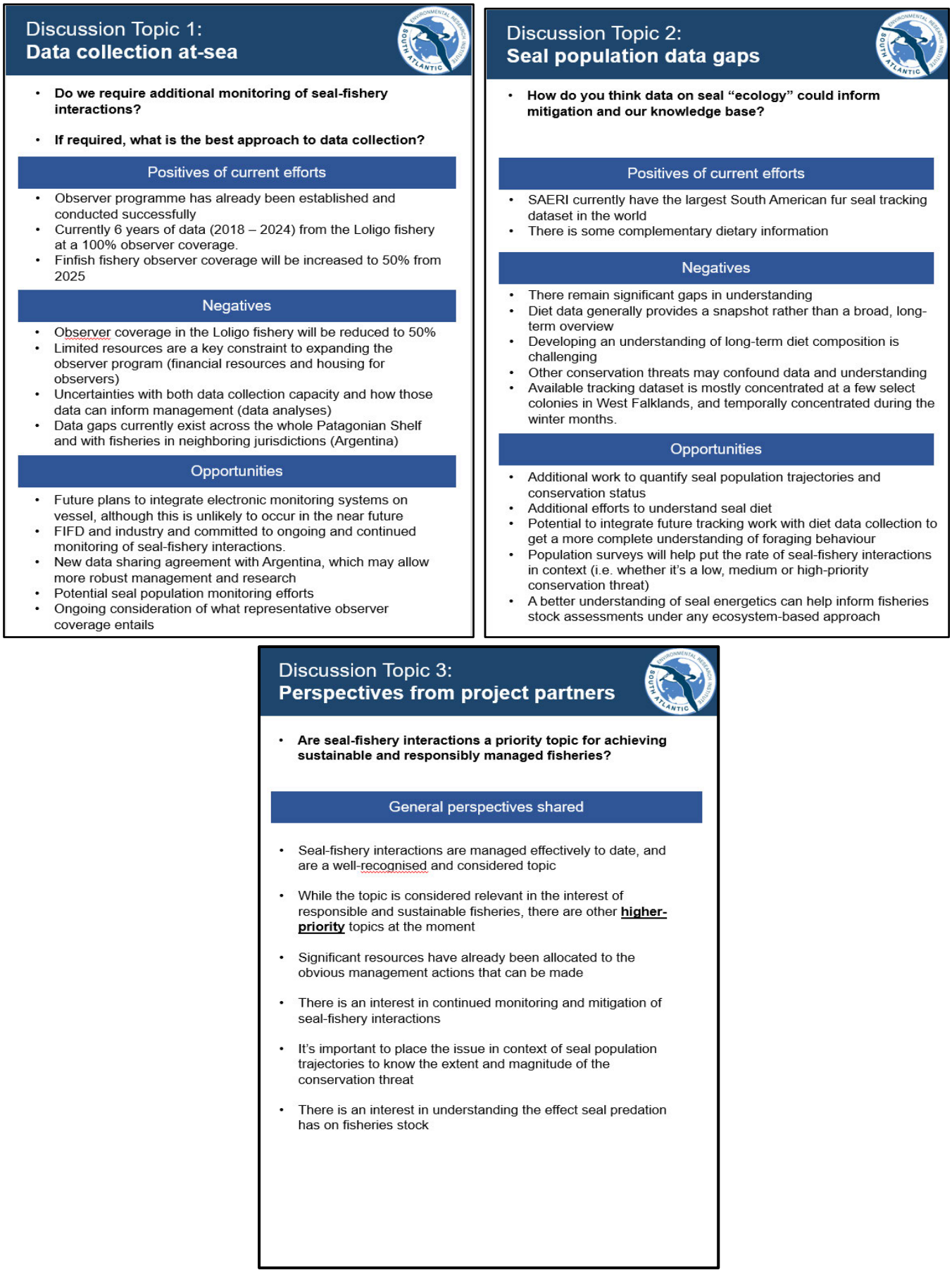


Fig. 13 - Recommendations presented and discussed at final project meeting held on 29 October outlining the meeting agenda and format

Other key research findings

Seal-fishery interactions in the Falkland Islands are likely to continue and evolve, becoming a long-standing management topic/consideration. To inform fisheries management strategies, it is important to understand if and how fishing operations are impacting of Falkland Islands pinniped population. This requires a comprehensive understanding of seal population dynamics and trends through time.

Unfortunately, our capacity to assess the conservation status of seals in the Falklands and the potential impact of increased seal-fishery interactions is limited by insufficient population data. Only a handful of Falklands seal population surveys have been conducted over the past 100 years. The paucity of information on seal population dynamics (i.e. standard rates of inter-annual growth, mortality, breeding success and variability) needs to be addressed to support robust and evidence-based management decisions.

Through this research project, we have conducted quantitative modelling and power analyses on simulated population data to demonstrate the importance of long-term population monitoring and at-sea observations of seal-fishery interactions in the Falkland Islands.

We simulated different rates of population decline (5 – 20%, factoring in natural population variability) over a 20-year period to understand the minimum time required to statistically detect population trends with annual population monitoring (Fig. 14). Our results show that if Falklands seal population are currently declining by 5 – 10%, we would only be able to detect this population trend with 8 – 9 years of annual monitoring. More significant rates of population declines (15 – 20%) are detectable after a shorter time-period, but still would require 5 – 6 years of annual monitoring. Although these results are based on data simulations, they demonstrate the importance of regular annual monitoring to determine seal population trends and potential threats to conservation status.

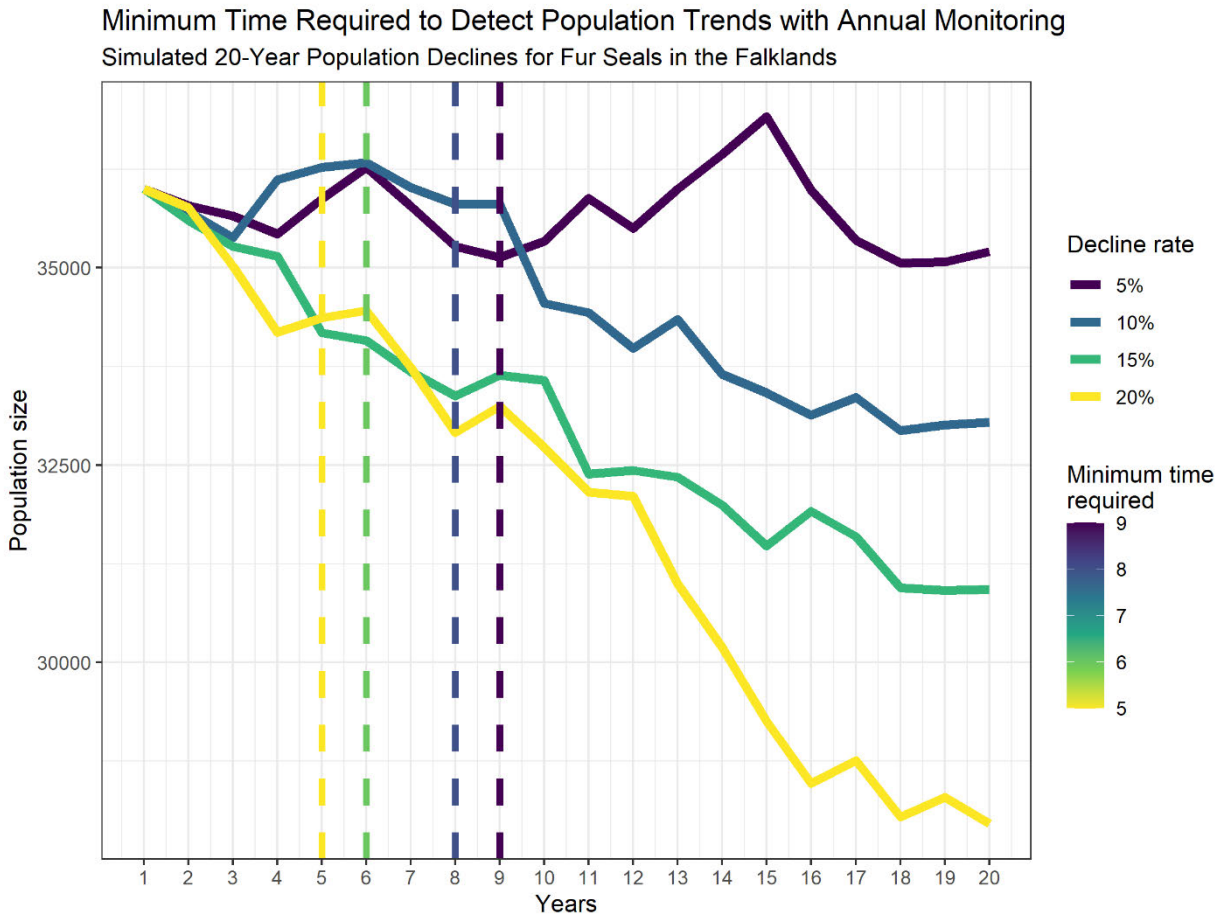


Fig. 14 – Results from power analyses showing the minimum time required to detect fur seal population trends with annual monitoring, based on simulated data

Additionally, we also conducted population simulations to demonstrate how seal-fishery-related mortalities may affect seal populations through time (Fig. 15). Assuming Falklands fur seal populations are in a steady state of growth, and using estimated fur seal population parameters (based on other fur seal species elsewhere), we simulated different rates of annual seal-fishery-related mortalities (2, 6, and 10%). This work demonstrates that low rates of seal-fishery-related mortalities (2%) are unlikely to affect seal population trajectories through time. However, population declines become much more apparent with higher rates of mortality. This work is important in demonstrating how robust information on seal-fishery-related mortalities is critical to inform fisheries management strategies around bycatch rates (i.e. in-season management triggers).

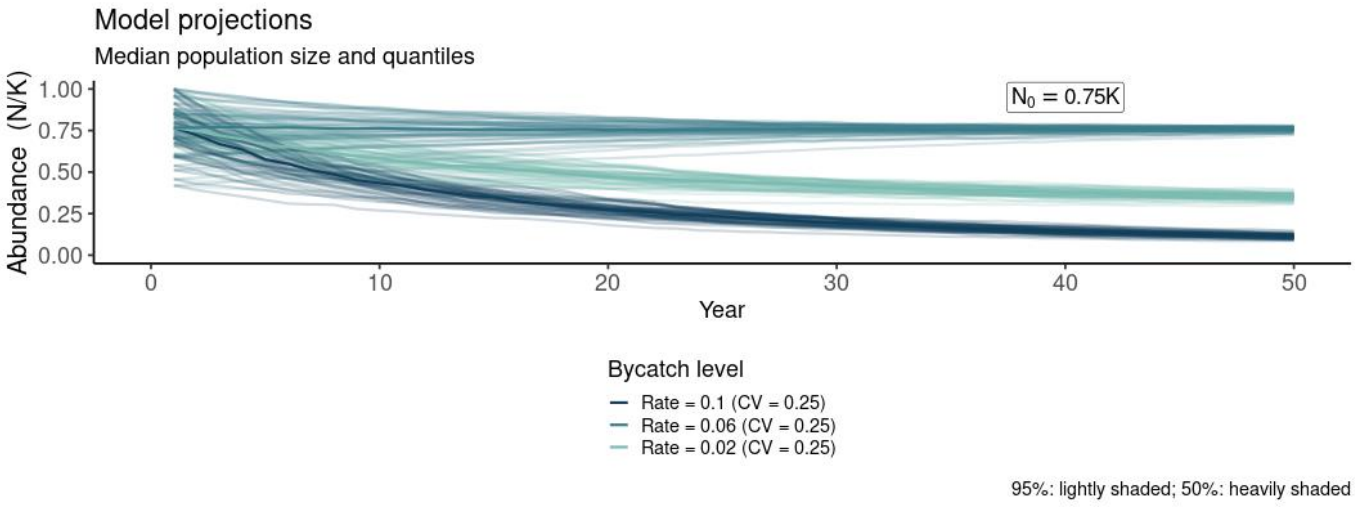


Fig. 15 - Results from model projections showing how varying levels of seal bycatch could affect population trajectories, based on simulated data

Project Outreach

- Our research project was featured in a media piece on the Falkland Islands TV: https://www.youtube.com/watch?v=_f1erRSGIsI&t=106s (Fig. 16)

Fig. 16 – Screenshot of project manager, Dr Javed Riaz being interviewed on FITV

- Research from the project was also recently presented to an international scientific audience at the 8th International Biologging Science Symposium held in Tokyo in March 2023 (Fig. 17)

Fig. 17 – Image of project manager, Dr Javed Riaz presenting our seal-fishery interactions research at the 8th International Biologging Science Symposium held in Tokyo in March 2023

- Our work was also featured in the inaugural Biodiversity Challenge Funds newsletter (Fig. 18).

Fig. 18 – Screenshot of Biodiversity Challenge Funds newsletter

- Significant social media attention and engagement, with one of our research tracking posts reaching 20,000 views on Twitter alone (Fig. 19)

Fig. 19 – Screenshot of our prominent social media post relating to the project

3.2 Outcome

We have achieved our project outcome, with significant, measurable and lasting progress towards the overall project outcome to establish: "*Robust baseline data which enables the factors that have contributed to an increase in seal-fishery interaction to be understood and provides informed, evidence-based recommendations for management mitigation efforts*".

Throughout research project valuable baseline data has been generated to help identify and ascertain the factors that have contributed to an increase in seal-fishery interactions. This is discussed in detail in the above section. In brief, we have:

1) Significantly improved understanding of fur seal distribution and the spatiotemporal areas of potential seal-fishery interactions

2) Identified a range of spatial, temporal and operational drivers of seal-fishery interactions

3) Developed a better understanding of fur seal diet and potential dietary overlap with commercial fisheries

4) Provided **AGREED** clear and evidence-based recommendations to project partners, including potential mitigation measures and future research required for effective monitoring and management.

3.3 Monitoring of assumptions

Outcome Assumptions

Assumption 1 Industry remains committed to the project and engage in project activities (industry are project partners)

Comments: Assumption remains valid. The project has received excellent support from industry, including via the PMG. This has been vital in facilitating the work of the Net Camera Specialist to deploy equipment on fishing vessel and indeed, in all phases of the project. The close working relationship between key project partners was crucial to the success of the project.

Assumption 2 Increased understanding results in positive action for seal-fishery management and governance.

Comments: Assumption remains valid. The project has received excellent support from industry and government project partners – which numerous discussions on how the findings of this research can translate into management and conservation.

Assumption 3 That the duration of the project is appropriate to inform policy.

Comments: Assumption remains valid. Our project progress to date highlights the aims and objectives are achievable within the lifetime of the project.

Assumption 4 Covid-19 impacts don't place restrictions on national and international travel

Comments: Assumption remains valid. The Project Manager and Camera Specialist arrived in the Falkland Islands in early 2023 – the project is no longer reliant on international travel.

Output Assumptions

Output 1: Net cameras trailed and deployed on vessels to quantify seal-fishery interactions with the finfish fishery

Assumption 1: Recruitment is successful in appointing a suitably qualified candidate

Comments: No longer relevant as recruitment was successful.

Assumption 2: Project Manager and specialist are able to travel.

Comments: No longer relevant as both project manager and specialist are on-island.

Assumption 3: Enough lead-in time is allocated for delays in the procurement and delivery of goods related to Covid-19 disruptions

Comments: Not relevant at this stage as there are no Covid-19 travel restrictions.

Assumption 4: Continued support of in-kind vessel time from partners.

Comments: Still relevant. Partners are part of the PMG and the project has received considerable support from project partners to date (as detailed in this annual report).

Output 2: Identify where seal-fishery interactions occur in space and time.

Assumption 1: Weather conditions enable fieldwork within the proposed time periods.

Comments: Still relevant for fieldwork efforts in 2024 – although project aims were met during 2023 field season

Assumption 2: Vessel available for charter

Comments: Assumption remains valid.

Assumption 3: Covid-19 impacts do not place restrictions local activities.

Comments: Assumption remains valid, although now considered to be low risk.

Output 3: Understand the factors that help predict interactions through the synthesis of available data and integration of additional data collected during project lifetime.

Assumption 1: Partners have the capacity and resources to contribute data and collaborate in the data synthesis

Comments: Still relevant.

Output 4: Establish trophic links between commercially caught finfish and squid species and seals, and trophic changes in seal diet over time.

Assumption 1: Partners have the capacity and resources to contribute data and collaborate in the data synthesis

Comments: Still relevant.

Assumption 2: Covid-19 impacts do not complicate or close DNA and stable isotope sample analysis at UK labs

Comments: Still relevant, but low risk.

Output 5: Stakeholders engaged, informed and project findings available and accessible

Assumption 1: Stakeholders engaged, informed and project findings available and accessible.

Comments: Still relevant.

4 Contribution to Darwin Plus Programme Objectives

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

The project continues to be relevant to a number of national and international obligations and strategies. On a national level, the project addresses FI Biodiversity Framework (2016-2030) priority areas, particularly coastal, shelf and marine species and ecosystems and natural

resource use. The project also directly supports the implementation of the Conservation and Wildlife Ordinance (protection of wildlife) and FIG's aspirations for Ecosystem Based Management (FI Environment Strategy 2021 – 2040). The project has provided recommendations to DNR-Fisheries and FIFCA that will help to shape a national seal bycatch Action Plan. The project also contributes to international obligations. These include CBD: Aichi 4 (Natural Resources); 6 (Sustainable fisheries); 10 (Vulnerable Marine Ecosystems). UNCLOS 61(2) coastal states take 'into account the best scientific evidence available to it' in determining conservation and management measures.' The project will also make important contribution towards FIG commitments to the CMS for Appendix I and II species.

4.2 Gender Equality and Social Inclusion (GESI)

Please quantify the proportion of women on the Project Board[1].	0%
Please quantify the proportion of project partners that are led by women, or which have a senior leadership team consisting of at least 50% women[2].	33%

GESI Scale	Description	Put X where you think your project is on the scale
Not yet sensitive	The GESI context may have been considered but the project isn't quite meeting the requirements of a 'sensitive' approach	
Sensitive	The GESI context has been considered and project activities take this into account in their design and implementation. The project addresses basic needs and vulnerabilities of women and marginalised groups and the project will not contribute to or create further inequalities.	X
Empowering	The project has all the characteristics of a 'sensitive' approach whilst also increasing equal access to assets, resources and capabilities for women and marginalised groups	
Transformative	The project has all the characteristics of an 'empowering' approach whilst also addressing unequal power relationships and seeking institutional and societal change	

From the start of DPLUS168, SAERI incorporated Gender Equality and Social Inclusion (GESI) by designing the project to be as accessible and flexible as possible. The project manager role was structured with flexible start and end dates to encourage a wider range of candidates to apply, including those with caring responsibilities or other constraints. Workshops and presentations were delivered at a variety of times and locations to accommodate different schedules and increase the opportunity for broader participation. In many cases, engagement was conducted one-on-one rather than in large group settings. This approach allowed

[1] A Project Board has overall authority for the project, is accountable for its success or failure, and supports the senior project manager to successfully deliver the project.

[2] Partners that have formal governance role in the project, and a formal relationship with the project that may involve staff costs and/or budget management responsibilities.

individuals to share their views openly and ensured all perspectives were captured and considered.

A key lesson learned was that continuous, tailored engagement leads to deeper and more representative participation than relying solely on public group sessions. By building flexibility into both staffing and engagement methods, the project helped create more equitable opportunities for involvement across different groups.

5 Monitoring and evaluation

The project was implemented as a partnership between SAERI, Falkland Islands Government (DNR-Fisheries), and FIFCA. These organizations are members of the PMG, whose main commitment and task is to monitor and steer the project. A draft Memorandum of Understanding (MoU) between all of the project partners was distributed at the first PMG meeting in March 2023. The MoU articulated the roles and responsibilities of all parties in the delivery of the project. While we initially planned for the PMG to meet quarterly, in reality, the Project Manager met with FIFCA and DNR-Fisheries continuously throughout the project, and often one to one, depending on the stage of project and work package. These more frequent meetings proved to be a more efficient and meaningful way to manage project M&E.

6 Lessons learnt

There have been several lessons learnt throughout this project.

One of the key challenges encountered during the project has been the variable utility of underwater camera footage obtained from net-mounted cameras. While these recordings are vital for documenting in-situ seal behaviour around fishing vessels, their quality is frequently compromised by turbidity and other oceanographic factors that limit visibility. As a result, discussions are ongoing with project partners to refine future sampling protocols and camera deployment strategies.

We also faced unforeseen difficulties in preparing fur seal whisker samples using laboratory facilities in the Falkland Islands. Accurate sub-sectioning of whiskers to 0.5 mg is essential for stable isotope analysis, yet the available laboratory scales—though technically calibrated to 0.1 mg resolution—proved inconsistent in practice. To mitigate the risk of exporting substandard samples, we initiated a small-scale validation by sending a test tray of samples to the UK. This necessary quality control step extended our original timeline. Ultimately, we opted to complete both the preparation and analysis of whiskers at our collaborators' laboratory in Glasgow. However, unexpected delays at UK Border Control significantly reduced the available window for lab processing. Despite these logistical setbacks, the project was successfully delivered in full and on-time.

7 Actions taken in response to Annual Report reviews

8 Sustainability and Legacy

The FI economy is heavily reliant on its marine environment particularly fisheries, which are central to its economic success. An aim of FIG is long-term sustainability of the fishery and marine environment to benefit of future generations. This includes sustainable catches of commercially targeted species, reducing harmful impacts on bycatch species while maintaining ecosystem function. There has been considerable interest from government and the fishing industry in this research project, as is evidenced by their involvement and support for the project (detailed in sections above).

The exit strategy is still valid. This includes overall project impact to produce recommendations and guidance for management, including how to advance recommendations agreed. SAERI is a local Falkland Islands organization and has close working relationships with FIG and industry, and will ensure the sustained legacy of the project going forward. For example, one legacy item is an interactive spatial webGIS database built for the project on an open-source platform that has no licensing costs and therefore ensures longevity. [redacted]

Additionally, the long-term management of the spatial database is ensured by having it embedded in the Falkland Islands IMS-GIS data centre (EDS), managed by a full time and skilled data manager already employed by SAERI. The database is built to enable easy updates. Knowledge transfer will ensure that awareness and use of the data/equipment produced by the project are firmly established before the project ends (WP5).

The project's impact and legacy are evidenced by the research articles, reports and datasets that have been compiled, published and distributed. This includes two open-access publications in leading international journals, as well as a Fisheries Committee paper submitted to DNR-Fisheries and FIFCA, containing recommendations for future monitoring and management of seal-fishery interactions in the Falkland Islands (see Report 6). Further, FIFCA and DNR-Fisheries members remain interested in this conservation/management topic, and agree that more work is required to meet long-term sustainability objectives of the fishery. The capital items – net cameras – will remain in the Falkland Islands and we will continue to work with DNR-Fisheries to deploy net cameras at strategic times during the fishing season. Legacy work, in the form of seal census, is already being planned for 2026.

9 Darwin Plus Identity

The Darwin Plus funding was recognised in every communication and public engagement event. The Darwin Plus logo was consistently displayed in presentations, social media posts and newsletters. The funding (through the UK government) was explained in presentations and meetings with stakeholders.

As a key example of this, the Darwin Plus logo was displayed to an international scientific audience at the 8th International Biologging Science Symposium held in Tokyo in March 2023. During this presentation, the Project Manager declared the project as being facilitated and supported by the Darwin Plus initiative. Please refer to Figure 16 - 19 above, for supporting evidence.

10 Risk Management

No new risks have arisen in the last 12 months in the project. No adaptations to the project design were necessary.

11 Safeguarding

[redacted]

12 Finance and administration

12.1 Project expenditure

Project spend (indicative) since last Annual Report	2024/25 Grant (£)	2024/25 Total actual Darwin Plus Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs	[redacted]			
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items				
Others				
TOTAL	75,669	75,669		

Staff employed (Name and position)	Cost (£)
Alastair Baylis – Project Lead	[redacted]
Javed Riaz – Project Manager	

Arelene Bowers – Finance Lead	[redacted]
TOTAL	

Consultancy – description and breakdown of costs	Other items – cost (£)
Noemie Friscourt – Analysis of isotope data and delivery of WP4	[redacted]
TOTAL	

Capital items – description	Capital items – cost (£)
NA	0
TOTAL	0

Other items – description	Other items – cost (£)
Data storage M&E, reporting and printing Vehicle usage contribution Audit	[redacted]
TOTAL	

12.2 Additional funds or in-kind contributions secured

Matched funding leveraged by the partners to deliver the project	Total
DNR-Fisheries vessel time	[redacted]
Fishing Industry vessel time	
DNR-Fisheries lab space	
SAERI overheads	
SAERI (A. Baylis)	
SAERI (A. Bowers)	
SAERI fieldwork equipment	
SAERI satellite tags	
DNR-Fisheries (A. Winter)	
TOTAL	

Total additional finance mobilised for new activities occurring outside of the project, building on evidence, best practices and the project	Total (£)
TOTAL	

12.3 Value for Money

The DPLUS168 Seal Bycatch Project represents strong value for money by addressing a significant conservation issue through evidence-based, collaborative, and cost-effective methods. With a relatively modest investment, the project has made significant progress toward understanding seal bycatch in the Falkland Islands' fishing industry—an issue with direct biodiversity and management implications.

The project's design ensured efficient use of resources by focusing on high-impact activities. These include deploying GPS tags and camera systems to gather behavioural data, analysing fishery interactions, and working directly with industry stakeholders to develop and test practical steps toward supporting ongoing mitigation efforts. This approach ensured that solutions are informed by robust science and tailored to local contexts, increasing the likelihood of uptake and long-term success. The also leveraged significant matched funding, including satellite tags, use of the DNR-fisheries patrol vessel (FPV Lillibet) to support of fieldwork (deploy and collect staff from a remote tussac island), and numerous commercial fishing vessels that trialed and deployed net cameras.

Further value was delivered through capacity building, with training provided to local staff and institutions, and capital items which remain on-island and available for use. This strengthens in-territory expertise and supports the sustainability of conservation efforts beyond the life of the project. Strong collaboration with government bodies, international researchers, and local fishers has amplified outcomes without significantly increasing costs. In sum, DPLUS168 has effectively leveraged Darwin Plus funding to deliver targeted, measurable conservation outcomes with lasting benefits—demonstrating excellent value for money through strategic planning, stakeholder engagement, and scalable solutions, summarized in Report 6.

13 Other comments on progress not covered elsewhere

14 OPTIONAL: Outstanding achievements of your project (300-400 words maximum). This section may be used for publicity purposes.

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

The DPLUS168 Seal Bycatch Project has delivered significant advances in understanding and addressing seal bycatch in the Falkland Islands' fishing industry—contributing to both biodiversity conservation and sustainable fisheries management.

One of the project's most notable achievements is the successful deployment of cutting-edge tracking and monitoring technologies to gather vital data on seal movements and behaviour. By using GPS tags and time-depth recorders, the team has generated the first high-resolution dataset on the spatial ecology of South American fur seals in the Falklands. Combined with remote camera systems on fishing vessels and at-sea observations, this work provides unprecedented insight into when, where, and how bycatch occurs.

This new knowledge has laid the foundation for science-based bycatch mitigation strategies in the context of ecosystem-based fisheries management. Collaborative engagement with the fishing industry and FIG has been a central component of the project's success. Through workshops, outreach, and data-sharing we have developed a co-designed approach to continuing bycatch mitigation efforts, which ensures that recommendations are both practical and widely supported.

The project has also delivered lasting capacity benefits. Local researchers and stakeholders received targeted training in tagging, monitoring, and data analysis, strengthening in-territory expertise and laying the groundwork for ongoing conservation efforts.

In terms of impact, the project has improved the Falkland Islands' understanding of marine mammal bycatch and informed policy discussions on how to reduce unintended interactions with wildlife. It has also helped raise the profile of seal conservation through media coverage, school outreach, and stakeholder engagement.

By combining rigorous science, effective partnerships, and a focus on practical outcomes, the DPLUS168 project has made a tangible contribution to the long-term protection of Falklands marine biodiversity. Its achievements reflect the strength of cross-sector collaboration and the potential for small, well-targeted projects to deliver high-impact results in UK Overseas Territories.

Annex 1 Report of progress and achievements against logframe for the life of the project

Project summary	SMART Indicators	Means of verification	Important Assumptions
Impact: The development of a national Action Plan for seal bycatch that contributes to an ecosystem based approach to fisheries management in the FI.			
Outcome: Robust baseline data enables the factors that have contributed to an increase in seal-fishery interactions to be understood and provides informed, evidence-based recommendations for management and mitigation efforts.	0.1 Major advance in baseline knowledge of seal-fishery interactions (Y3,Q4) 0.2 Recommendations for national seal bycatch Action Plan to key stakeholders (Y3, Q4)	0.1 Publication of tracking data on the FI IMS-GIS data centre portal http://dataportal.saeri.org/ and reports on SEDs, trophodynamic model, factors that contribute to increased by-catch circulated to stakeholders 0.2 Report on recommendations for a seal bycatch Action Plan and how to progress recommendations provided to DNR-Fisheries and stakeholders	Industry remains committed to the project and engage in project activities (industry are project partners) Increased understanding results in positive action for seal-fishery management and governance. That the duration of the project is appropriate to inform policy. Covid-19 impacts don't place restrictions on national and international travel
OUTPUT 1. Net cameras trailed and deployed on vessels to quantify seal-fishery interactions with the finfish fishery	1.1 Project Manager (x1) successfully recruited (by Y1, Q3). Specialist (x1) successfully recruited to lead net camera deployment (by Y1, Q3) 1.2 Net camera trial successfully completed on pre-recruitment survey (by Y2, Q3) 1.3 Net cameras deployed on at least 8 vessel/s (by Y2, Q4). If no seal interactions are recorded, we will report on overall SED operation	1.1 Employment contracts signed. 1.2 Field report submitted to industry and results detailed in DPLUS annual report 1.3 Synthesis report of both field seasons to the PMG and stakeholders and regular reports to DPLUS.	Recruitment is successful in appointing a suitably qualified candidate Project Manager and specialist are able to travel – we have recruited from the UK and Australia during the past year. Enough lead-in time is allocated for delays in the procurement and delivery of goods related to Covid-19 disruptions

Project summary	SMART Indicators	Means of verification	Important Assumptions
			Continued support of in-kind vessel time from partners. Partners will form part of the project management group, thereby ensuring partners help steer the project
Output 2 Identify where seal-fishery interactions occur in space and time.	2.1 At least 30 satellite link seal tags deployed by (by Y3, Q1) 2.2 One report on overlap with fisheries (by Y3, Q4)	2.1 Dedicated webGIS project page with tracking data *e.g.*, webGIS page 2.2 Report submitted to PMG and regular reporting to DPLUS	Weather conditions enable field work within the proposed time periods. Vessel available for charter Covid-19 impacts do not place restrictions local activities.
Output 3 Understand the factors that help predict interactions through the synthesis of available data and integration of additional data collected during project lifetime.	3.1 At least 10 variables related to seal-fishery interactions are collated (by Y2, Q1) 3.2 The 10 variables included in models to understand and predict seal-fishery interactions (by Y2, Q4)	3.1 FIG IMS-GIS data centre metadata catalogue updated and searchable 3.2 Report submitted to PMG and regular reporting to DPLUS	Partners have the capacity and resource to contribute data and collaborate in the data synthesis
Output 4 Establish trophic links between commercially caught finfish and squid species and seals, and trophic changes in seal diet over time.	4.1 At least 1 trophic model developed (using Ecosim and Ecopath software or similar) (by Y3, Q4) 4.2 DNA analysis of at least 60 seal scats completed (by Y2, Q4)	4.1 Trophic model showcased to stakeholders during workshop and report published on project website. 4.2 Report published on project website and submitted to PMG	Partners have the capacity and resource to contribute data and collaborate in the data synthesis Covid-19 impacts do not complicate or close DNA and stable isotope sample analysis at UK labs

Project summary	SMART Indicators	Means of verification	Important Assumptions
	4.3 Compound specific stable isotope analysis of at least 20 seal teeth completed (by Y2, Q4)	4.3 Report published on project website and submitted to PMG. Regular reporting to DPLUS	
Output 5 Stakeholders engaged, informed and project findings available and accessible.	5.1 PMG established, with representatives from DNR-Fisheries, industry and SAERI. M&E Plan created (Y1, Q2). 5.2 One stakeholder workshop on WP 1 (by Y3, Q4) 5.3 One stakeholder workshop on WP 2-4 (by Y3, Q4) 5.4 Consensus reached on recommendations for conservation and management (by Y3, Q4)	5.1 Terms of reference circulated to PMG and meeting minutes recorded. M&E Plan circulated 5.2 Training video/guide for net camera deployment provided to stakeholders and uploaded to the Project website Workshop report, including recommendations, list of attendees, and presentations circulated to stakeholders and published on the SAERI project website 5.3 Workshop report, including recommendations, list of attendees, and presentations circulated to stakeholders, PMG and published on the SAERI project website 5.4 Review report circulated to PMG, Stakeholders and uploaded to project website. Submit report to FIG's Fisheries Committee	Key FIG officials and stakeholders available for the workshop and continue to engage. Covid-19 impacts do not place restrictions on national travel. .

Annex 2 Project's full current logframe as presented in the application form (unless changes have been agreed)

Project summary	SMART Indicators	Progress and Achievements
Impact The development of a national Action Plan for seal bycatch that contributes to an ecosystem-based approach to fisheries management in the FI.		The project has made significant project progress on all of its work packages. Taken together, this body of work will underpin recommendations for a national plan of action. See **Report 1 and Report 6** and project website.
Outcome Robust baseline data enables the factors that have contributed to an increase in seal-fishery interactions to be understood and provides informed, evidence-based recommendations for management and mitigation efforts.	0.1 Major advance in baseline knowledge of seal-fishery interactions (Y3,Q4) 0.2 Recommendations for national seal bycatch Action Plan to key stakeholders (Y3, Q4)	0.1 Successfully completed. These are detailed in sections above. See also **Report 1** and project website. 0.2 Successfully completed. These are detailed in sections above. See also **Report 1** and project website.
Output 1. Net cameras trailed and deployed on vessels to quantify seal-fishery interactions with the finfish fishery	1.1. Project Manager (x1) successfully recruited (by Y1, Q3). Specialist (x1) successfully recruited to lead net camera deployment (by Y1, Q3) 1.2 Net camera trial successfully completed on pre-recruitment survey (by Y2, Q3) 1.3 Net cameras deployed on at least 8 vessel/s (by Y2, Q4). If no seal interactions are recorded, we will report on overall SED operation	1.2 Successfully completed. 1.2. Successfully completed. Report previously submitted along with annual report. 1.3. Successfully completed. Report previously submitted along with annual report.
1.1 Project Manager (x1) and Specialist to lead net camera deployment (x1) recruited		1.1 Successfully completed.
1.2 Net cameras trialled with DNR-Fisheries		Successfully completed. Report previously submitted and available upon request.
1.3 Rollout of net cameras to fishing vessels with DNR-Fisheries		1.3 Successfully completed. Net cameras have been deployed on commercial fishing vessels during

Project summary	SMART Indicators	Progress and Achievements
		commercial operations. Report previously submitted and available upon request.
Output 2 Identify where seal-fishery interactions occur in space and time.	2.1 At least 30 satellite link seal tags deployed by (by Y3, Q1) 2.2 One report on overlap with fisheries (by Y3, Q4)	2.1 Successfully completed. 2.2 Successfully completed. Report available on project website. https://www.south-atlantic-research.org/dplus168-bycatch-documents/ See also **Report 1** submitted with final report.
2.1 Deploy biologging tags on seals		2.1 Successfully completed. See **Report 1** and project website.
2.2 Results presented in a report delivered to PMG. Report re-focused for a scientific journal.		2.2 Successfully completed. See **Report 1** and project website.
Output 3 Understand the factors that help predict interactions through the synthesis of available data and integration of additional data collected during project lifetime.	3.1 At least 10 variables related to seal-fishery interactions are collated (by Y2, Q1) 3.2 The 10 variables included in models to understand and predict seal-fishery interactions (by Y2, Q4)	3.1 Successfully completed 3.2 Successfully completed. Report available on project website https://www.south-atlantic-research.org/dplus168-bycatch-documents/ See **Report 1** and project website.
3.1 Desktop review, data collated and metadata stored on the IMS-GIS data centre portal		3.1 Successfully completed
3.2 Review report and metadata catalogue delivered to Project partners		3.2 Successfully completed. Metadata catalogue was presented during the PMG and is publicly available on the SAERI webpage.
Output 4 Establish trophic links between commercially caught finfish and squid species and seals, and trophic changes in seal diet over time.	4.1 At least 1 trophic model developed (using Ecosim and Ecopath software or similar) (by Y3, Q4) 4.2 DNA analysis of at least 60 seal scats completed (by Y2, Q4)	4.1 Development of a trophic model and showcase to stakeholders. Report submitted along with final project report. See **Report 2** and project website. 4.2 Successfully completed. Report submitted along with final project report. See **Report 3** and project website.
4.1 PM build trophic model in relevant modelling environment (*e.g.* Ecopath with Ecosim)		Successfully completed. Report submitted along with final project report. See **Report 2** and project website.
4.2 Undertake and report on DNA analysis on seal scat		Successfully completed. Report submitted along with final project report. See **Report 3** and project website.

Project summary	SMART Indicators	Progress and Achievements
4.3 Undertake and report on compound-specific stable isotope analysis on seal teeth		Successfully completed. We used seal whiskers and bulk tissue analysis for stable isotope analysis to understand change over time. Report submitted along with final project report. See **Report 4** and project website.
Output 5 Stakeholders engaged, informed and project findings available and accessible.	5.1 PMG established, with representatives from DNR-Fisheries, industry and SAERI. M&E Plan created (Y1, Q2). 5.2 One stakeholder workshop on WP 1 (by Y3, Q4) 5.3 One stakeholder workshop on WP 2-4 (by Y3, Q4) 5.4 Consensus reached on recommendations for conservation and management (by Y3, Q4)	5.1 Successfully completed. We have had quarterly PMGs as planned. 5.2 Successfully completed. Project partners and stakeholders have been provided with an operational guide for net cameras and the works have been made available on the SAERI website. 5.3 Successfully completed. Project partners attended two workshops in July 2024 and October 2024. A report from these workshops has been circulated to project partners and submitted along with final project report. See **Report 5** and **Report 1**. 5.4 Successfully completed. Recommendations for conservation and management were discussed in project workshops. A workshop report has been circulated to project partners and a Fisheries Committee paper has been delivered to FIG, with agreed recommendations. FAC paper submitted along with final report. See **Report 5** and **Report 6.**
5.1 PMG established, with representatives from DNR-Fisheries, industry and SAERI		5.1 PMG was established, with the first PMG held in March. Meeting notes are available on request.
5.2 Conduct workshop/present findings on WP1		Successfully completed. Workshop report submitted, along with final project report.
5.3 Conduct workshop, compile and publish agreed recommendations for seal-bycatch		Successfully completed. Workshop report and draft Fisheries Committee paper submitted, along with final project report. See **Report 5** and **Report 6.**

Annex 3 Standard Indicators

DPLUS Indicator number	Name of indicator	Units	Disaggregation	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Total planned during the project
DPLUS168-1	Rollout of net cameras to fishing vessels with DNR-Fisheries	Number	New	0	8	0	8	8
DPLUS168-2	Improved understanding of seal habitat use through deployment of biologging tags	Number	Improved	18	19	0	37	30
DPLUS168-3	Collect and analyse seal dietary data	Number	Improved	0	130	0	130	80
DPLUS168-5	Trophic model developed	Number	New	0	0	0	0	1
DPLUS168-4	Peer-reviewed publications improving knowledge of seal-fishery interactions	Number	Improved	0	1	2		2
DPLUS168-6	Conduct workshop, compile and publish agreed recommendations for seal-bycatch	Number	New	0	0	2	2	2

Table 1 Project Standard Indicators

DPLUS Indicator number	Name of indicator	Units	Disaggregation	Year 1 Total	Year 2 Total	Year 3 Total	Total achieved	Total planned
E.g. DPLUS-A01	E.g. Number of people in eligible countries who have completed structured and relevant training	People	Men	20	10	50	60	80
E.g. DPLUS-A01	E.g. Number of people in eligible countries who have completed structured and relevant training	People	Women	30	0	10	30	40
E.g. DPLUS-B01	E.g. Number of new or improved habitat management plans available and endorsed	Number	New	1	0	1	2	2
E.g. DPLUS-B01	E.g. Number of new or improved habitat management plans available and endorsed	Number	Improved	1	0	2	3	3

Table 2 Publications

Title	Type (e.g. journals, manual, CDs)	Detail (authors, year)	Gender of Lead Author	Nationality of Lead Author	Publishers (name, city)	Available from (e.g. weblink or publisher if not available online)
Spatial overlap between South American fur seal foraging effort and commercial trawl fisheries in the Falkland Islands	Journal	2023 Javed Riaz, Rachael A. Orben, Kayleigh A. Jones, Megan Shapiro, Andreas Winter, Paul Brickle, Alastair M.M. Baylis	Male	Australian/British	Global Ecology and Conservation	https://doi.org/10.1016/j.gecco.2023.e02615
Coastal connectivity of marine predators over the Patagonian Shelf during the highly pathogenic avian influenza (HPAI) outbreak	Journal	2023 Javed Riaz, Rachael A. Orben, Amandine Gamble, Megan Tierney, Paulo Catry, José P. Granadeiro, Letizia Campioni, Alastair M. M. Baylis	Male	Australian/British	Ecography	https://doi.org/10.1111/ecog.07415

Title	Type (e.g. journals, manual, CDs)	Detail (authors, year)	Gender of Lead Author	Nationality of Lead Author	Publishers (name, city)	Available from (e.g. weblink or publisher if not available online)
Seal-fishery interactions in the Falkland Islands – operational and environmental factors drive resource competition	Journal	Javed Riaz, Tobias Büring, Jesse van der Grient, Andreas Winter, Brendon Lee, Paul Brickle, Alastair Baylis	Male	Australian/British	ICES Journal of Marine Science	https://doi.org/10.1093/icesjms/fsae161
Report 1: DPLUS168 Seal Bycatch – Finale project report (to stakeholders)	Report	Javed Riaz & Alastair Baylis	Male	Australian/British	SAERI	SAERI
Report 2: Exploring the effects of changes in the Falkland Islands marine ecosystem structure and functions	Report	Jessie van der Grient	Female	Dutch	SAERI	SAERI
Report 3: DNA analysis of South American fur seal scats	Report	Silvia Perez-Espona	Female	Spain	SAERI	SAERI
Report 4: New Insights into the trophic ecology of South American fur seals breeding at the Falkland Islands	Report	Noemie Friscourt	Female	French	SAERI	SAERI

Title	Type (e.g. journals, manual, CDs)	Detail (authors, year)	Gender of Lead Author	Nationality of Lead Author	Publishers (name, city)	Available from (e.g. weblink or publisher if not available online)
Report 5: DPLUS168 Seal Bycatch Workshop Report	Report	Javed Riaz	Male	Australian/British	SAERI	SAERI
Report 6: Fisheries committee paper – seal bycatch in the Falkland Islands (draft)	Report	Javed Riaz & Alastair Baylis	Male	Australian/British	SAERI	SAERI

Annex 5 Supplementary material (optional but encouraged as evidence of project achievement)

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 BCF-Reports@niras.com putting the project number in the Subject line.	x
Is your report more than 10MB? If so, please discuss with BCF-Reports@niras.com about the best way to deliver the report, putting the project number in the Subject line. All supporting material should be submitted in a way that can be accessed and downloaded as one complete package.	x
If you are submitting photos for publicity purposes, **do these meet the outlined requirements (see section 14)?**	x
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
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.	