



Darwin Plus: Overseas Territories Environment and Climate Fund Annual 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: 30th April 2023

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

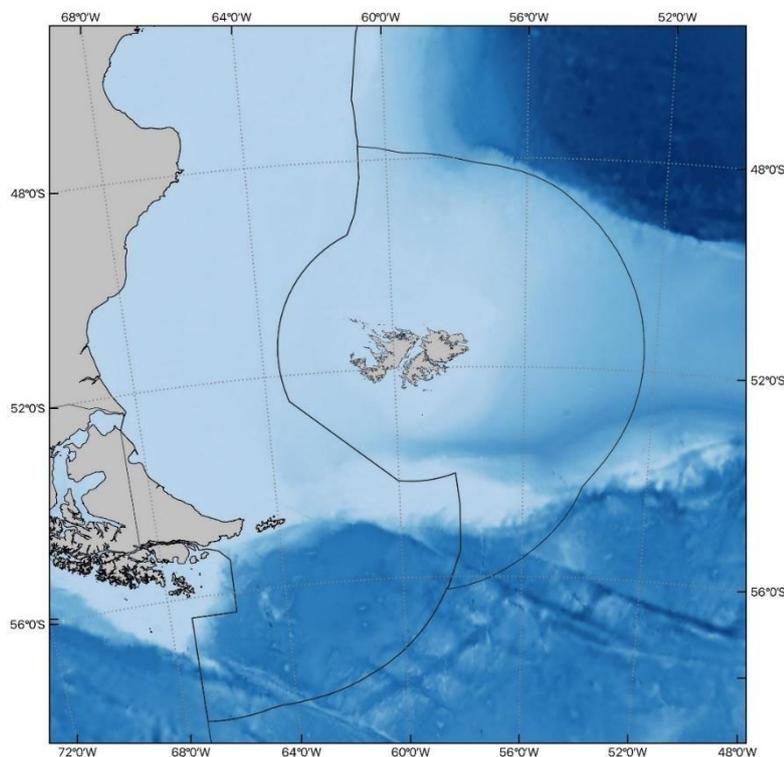
1 Darwin Plus Project Information

Project reference	DPLUS148
Project title	Climate Change Resilience in Falkland Islands Fisheries and Marine Ecosystem
Territory(ies)	Falkland Islands
Lead Partner	South Atlantic Environmental Research Institute (SAERI)
Project partner(s)	Falkland Islands Government, Directorate of Natural Resources, Fisheries Department (FIFD) Falkland Islands Government, Directorate of Policy and Economic Department (DEPD) Falkland Islands Fishing Companies Association (FIFCA) Oregon State University (OSU) British Antarctic Survey (BAS) Shallow Marine Surveys Group (SMSG)
Darwin Plus grant value	£316,882.00
Start/end dates of project	1 July 2021 – 30 March 2024
Reporting period (e.g. Apr 2022-Mar 2023) and number (e.g. Annual Report 1, 2)	April 2022 – March 2023 Annual report 2
Project Leader name	Dr Paul Brickle
Project website/blog/social media	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 Jesse van der Grient, Dr Al Baylis, Dr Paul Brickle, 25/4/2023

1. Project summary

The Falkland Islands (FI) economy is heavily reliant on its marine environment, particularly from fisheries, as well as tourism, shipping, and hydrocarbons. Indeed, the FI's coastal landscapes and seascapes are central to its economic success. The introduction of a fisheries conservation zone and management regime in 1986 transformed the economy from what was previously a solely agro-economy. Falkland Islands Government (FIG) revenue increased by 500%, securing self-sufficiency in all areas except military defence and external affairs. The fishery today is not large in global terms; total catches are about a third of those taken in the UK, for example. However, the fishery is unusual in that two species of squid account for 75% of catches. This makes the FI economy particularly susceptible to Climate Change (CC).

An aim of FIG is long-term sustainability of the fishery and marine environment to benefit future generations. This includes sustainable catches of commercial target species, reducing harmful impacts on bycatch species while maintaining ecosystem function. FI has not undertaken an assessment of the impacts that CC will have on its fisheries and marine ecosystems and is therefore unable to mainstream Climate Change Adaption into Fisheries and Oceans Governance. Nor is there currently an Ecosystem-based Approach to Fisheries Management (EAF). Recognising the need to sustain FI economy, and for holistic marine management across all sectors, there is a pressing need to understand CC impacts to fisheries and marine ecosystems to inform CCA. The project will address these issues through 1) the generation of baseline data, by conducting literature reviews and surveys, to better understand key



inshore species that support fisheries and ecosystems, 2) by conducting physiological tolerance and acclimation experiments of key species to understand the winners and losers. 3) Through workshops that explore CCA interventions which could inform decisions on whether to mainstream CCA and EAF into sustainable fisheries, conservation of marine ecosystems, governance, and policy.

Falkland Islands in relation to southern South America and their Conservation Zones.

2. Project stakeholders/partners

The Falkland Islands Government (FIG), Falkland Islands Fishing Companies Association (FIFCA), British Antarctic Survey (BAS), Oregon State University (OSU) and Shallow Marine Surveys Group (SMSG) are the key stakeholders and the main partners and have been directly involved in the project's formulation from its conception. In addition, representatives from the local tourism industry and the FI community have direct interest as the marine environment is key to the FI economy, their businesses and social well-being.

The project continues to actively engage with project partners and stakeholders. For example, quarterly Project Management Group (PMG) meetings have been held, and meeting notes are available on the project. The project manager (PM) also regularly interacts via email and calls with OSU and BAS as part of project planning and delivery (more below), and the PM also participates in online lab meetings with Dr Will White's lab (OSU). Dr Simon Morley (BAS) visited the Falkland Islands in July and August 2022, where he worked with the Project Manager (Dr Jesse van der Grient) to set-up and conduct physiological experiments on coastal species. Our BAS partner continues to provide advice on experiments and data analyses (WP 3). The use of the Fortuna aquaculture facilities via FIFCA allows us to regularly connect and interact with the fisheries stakeholders. Barend Stadler who manages the facilities has been vital in providing advice for the experimental setup and maintenance of the various animals. The continued support of Fortuna Ltd is playing a crucial role in the long-term use of the aquaculture facilities, which are currently undergoing renovation. Their renovation plans included the design of our more permanent location as an in kind contribution. This ensures a legacy for doing further physiological experiments in the Falkland Islands and highlights our strong relationship with industry. Stakeholders from the various fishing companies in FIFCA visited the facilities for a demonstration of the experiments, allowing the PM to talk about the importance of this work. This was very well received by the various representatives. SMSG continues to support this project via the provision of a boat and divers to collect animals for the experiments. SMSG is also key for conducting the quarterly zooplankton surveys. The FIG has been engaged in various ways. One person from the Environmental Office worked with the PM in some of the experiments to demonstrate what we do. The PM has also discussed possible options for the policy workshop that will occur Jan/Feb 2024 with FIG, to ensure it will meet aims to support FIG to mainstream EAF and CCA in their policy. Further, FIG Directorate of Natural Resources, Fisheries Department (FIFD) is engaged via the provision of zooplankton taxonomy training of the PhD student that works on the zooplankton survey material collected in this project. The PM is also working closely with another person in FIFD on ecosystem modelling. The PM has provided advice and feedback on their current ecosystem model (based on the Falkland Shelf) and the PM uses some of the parameter estimates and data in the modelling work for this project (based on the Falkland Inner and Outer Conservation Zone areas). The PM will visit OSU in

April and May, and the ecosystem modelling workshop is





SAERI @SAERI_FI · Sep 2, 2022

The physiology work of @Darwin_Defra funded Climate Resilience in the Falklands marine ecosystem; in collab with @BAS_News Simon Morley gave a showing on @FalklandsTV! This work would not have been possible

planned for 1-2 May and will take place in Newport, Oregon.



SAERI @SAERI_FI · 4h

Under the supervision of many cetaceans & seabirds, the @UKBCFs DPLUS148 project introduced PhD student Rhian Taylor, who arrived earlier in Feb, to zooplankton sampling in the #Falklands! It was a great day for science, and especially #womeninscience. Thanks to @bax_dr for joining!



You and 7 others



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All project partners are present as co-authors on a newly published review paper on the seasonal dynamics and trophic interactions across the food web in the Falkland Islands marine ecosystem in the [Advances in Marine Biology](#) based on work from Work package 2.

The project was further promoted to the public via various social media posts, newsletters, a public talk to the Falkland Islands Women Association, and appearances on the local TV

(<https://fitv.co.fk/news-and-events/how-climate-change-could-affect-the-falklands-marine-ecosystems/>) to talk about the physiology experiments. We are trying to organise another visit from FITV to join on one of the zooplankton surveys. The PM also organised the CREST Award Field Trip for Year 7 of the local school this year. We took the students rock pooling, collecting data to explore the gradient in animal diversity away from the sea. These activities allowed the project to engage with the wider public of the Falkland Islands. We currently have a FICS (local secondary school) student volunteering with sorting copepod sampling and she will join on a sampling survey, to provide her with marine research experience.





3. Project progress

3.1 Progress in carrying out project Activities

1.1 MoU signed and agreed by partners

The MoUs have all been signed and filed. The delivery of 1.1 is complete. MoUs are available on request.

1.2 PM recruited

PM started 1 April 2022. The delivery of 1.2 is complete.

1.3 PMG meeting held every Q

Project Management Group (PMG) meetings have been held every quarter since June 2022. Meetings have been scheduled for every quarter till March 2024. The delivery of 1.3 is on track. PMG meeting notes are available on the project website or on request.

1.4 Webpage created on SAERI and partners' website

A webpage is live and public facing on the SAERI website.

<https://www.south-atlantic-research.org/dplus148-climate-change-resilience-in-the-falkland-islands-fisheries-and-marine-ecosystem/>. The delivery of 1.4 is complete.

DPLUS148: CLIMATE CHANGE RESILIENCE IN THE FALKLAND ISLANDS FISHERIES AND MARINE ECOSYSTEMS



Background

The Falkland Islands (FI) historically lacked herbivorous mammals. The introduction of grazing animals has led to vegetation changes and soil erosion. The impact of these changes on wetland and aquatic habitats is not well-understood; limited past research suggests that water quality may remain fairly natural and is largely influenced by sea salt deposition and humic acids from peat runoff. Some studies, however, have shown evidence of human impacts, such as elevated nutrient concentrations in some ponds.

1.5 M&E Plan created

The M&E plan has been created and reviewed by the PMG. It is available to download on the project website (<https://www.south-atlantic-research.org/dplus148-documents/>). The delivery of 1.5 is complete.

1.6 Regular DPLUS reports (half yearly/yearly)

Half yearly reports have been completed and delivered in October 2021 and 2022. A yearly report has been completed and delivered in 2022. The delivery of 1.6 is on track.

2.1 At least 20 data sets synthesized to inform current knowledge and informs further data collection

49 datasets have been synthesized to cover trophic interactions in the Falkland Islands marine food web, ranging from zooplankton, cephalopods, to fishes, and higher trophic-level vertebrates. The datasets have been used to inform the literature review (see 2.2) and the synthesized datasets are available online (see 2.2). Further, this synthesis is underpinning the development of the Ecosystem (work package 4). 2.1 is complete.

2.2 1 literature review conducted and database created

The literature review has been conducted and turned into a manuscript, and the co-authors are representatives from all stakeholders in this project. The manuscript has been published by [Advances in Marine Biology](#). The synthesised datasets are available on the SAERI IMS-GIS/FIG data portal, indicating the geographical location or areas from the various datasets: <http://dataportal.saeri.org/dataset/synthesized-diet-studies-for-the-patagonian-shelf-with-a-focus-on-the-falkland-islands>. 2.2 is complete.

The Falkland Islands marine ecosystem: A review of the seasonal dynamics and trophic interactions across the food web

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Synthesized diet studies for the Patagonian Shelf, with a focus on the Falkland Islands

Published data on animal diets (stomach analyses; frequency of occurrence (FO%), dominance index of prey (N%)) from various species and trophic levels have been synthesized.

Data and Resources



References diet studies

A list of references from published studies.



2.3 20 inshore zooplankton/ichthyoplankton surveys conducted, ichthyoplankton and zooplankton identified by classical taxonomy and/or genetic barcoding

54 survey tracks in total have been sampled so far, and at least 18 more will be conducted to obtain samples in all seasons. Each survey track is composed of two types of nets (300 and 500 μm), and each sample is split into two (ethanol and formalin preservation), for genetic and classical taxonomic analyses. Classical taxonomy identification started in February upon the arrival of the PhD student that was recruited last year to support this part of the project. She will continue with the identification until June, and she will return to the Falkland Islands in October 2023 again. Between June and October, she will be (meta)barcoding fish larvae and copepod samples at the University of Aberdeen in further support of this project. The delivery of 2.3 is on track. The Falkland Islands Government has given a grant to support another year of zooplankton survey in support of the PhD.

2.4 10 Inshore *Loligo* egg survey conducted on eastern coasts to determine the spatial (bathymetric) extent of *Loligo* spawning areas

We have collated existing bathymetric and side-scan data and have used this existing information to inform, design and plan our surveys. We have also trialled underwater cameras and have built a sled to support the camera array that will be used on the survey. Hence, significant progress has been made and the surveys will be completed by June 2023 (to coincide with peak in spawning time of the Autumn

Spawning Cohort of *Doryteuthis gahi* to maximise the chance of observing squid egg masses). This year, we focused on designing the surveys by identifying high potential areas for squid egg masses in support of this work and building a sled to support the camera array. The slight delay in the survey work is the result of time required to design the survey and build the camera sled, which meant we missed the peak spawning period in 2022. The delivery of 2.4 is on track.

3.1 7 species capacity to cope with and acclimatise to the current and projected rates of climate change assess experimentally at a FI aquacultural facility

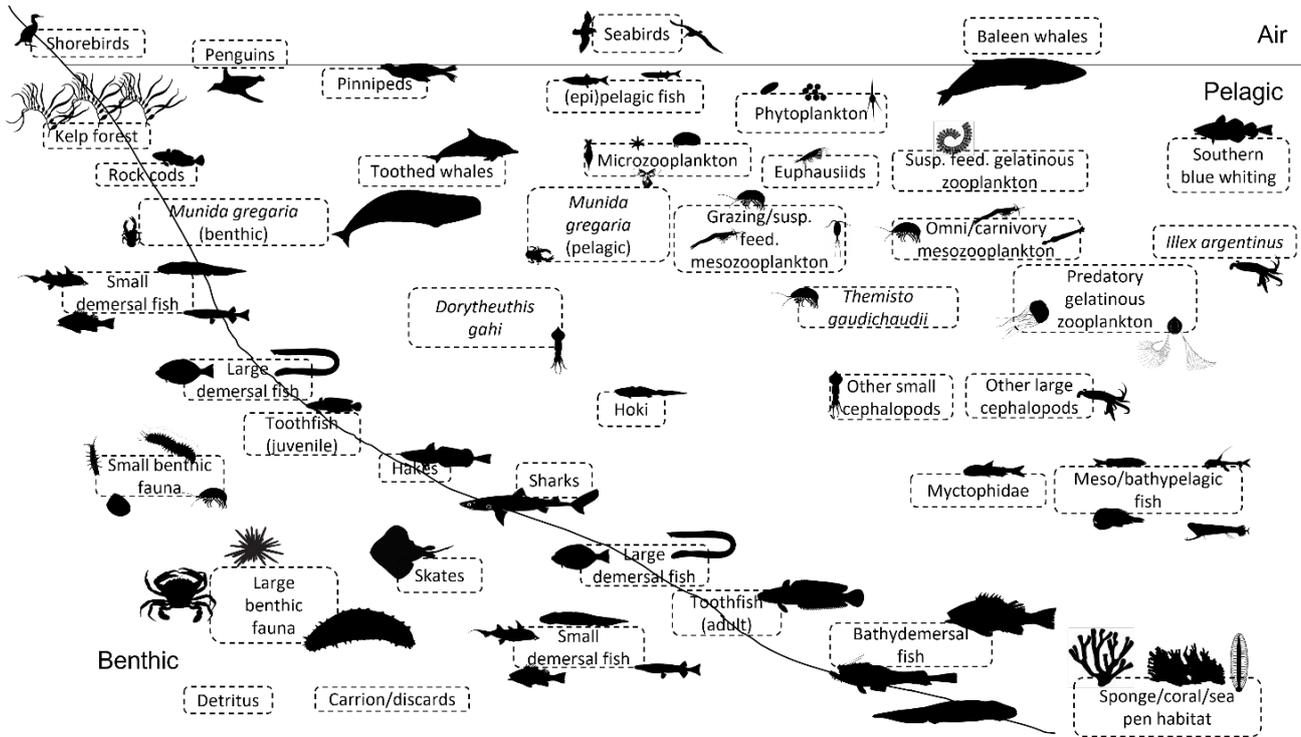
We have conducted experiments with 10 species (amphipods (2 species), welks, isopods (2 species), limpet, bivalve, pencil urchin, lobster krill, squid (egg masses)). The squid egg masses represented two spawning cohorts, and we tested two life stages of the lobster krill (juvenile and adult). We tried to maintain other species, including red urchin and *Themisto gaudichaudii*, but our setup was not correct for this. We further are complementing this work with a study of photophysiology on kelp in response to warming via the support of a NERC grant to use their diving PAM (Underwater Fluorometer – for studying in situ photosynthesis). Further, we are repeating the squid egg masses experiments in 2023, as some technological issues meant the experiments were terminated earlier than intended. However, the delivery of 3.1 is on track. This work also supported a bachelor thesis of a student from the University of Portsmouth, who conducted physiology experiments over the Christmas period.



Various animals are included in the physiology experiments, including limpets, bivalves, snails, isopods, urchins, and squid (squid egg masses)

4.1 A workshop with local and international experts (ecologists and modellers) will create a framework for the first ecosystem model for FI

Progress on work packages 2 and 3 have enabled us to plan and develop the workshop. The synthesized data allowed the PM to design an ecosystem model. At the same time, FIFD have designed an Ecopath model (based on the Falkland Shelf) and the PM provided advice and feedback on this model, and adopted some of the parameter estimates to inform the Ecopath with Ecosim model designed by her (based on the Falkland Islands Conservation Zones). Through PMG meetings, it was decided to host the workshop in Oregon, US, with the aim to discuss and evaluate the proposed model with ecosystem modeller experts for data-limited high-latitude environments. This workshop is planned for 1-2 May 2023. The delivery of 4.1 is on track.



4.2 PM in collaboration with partners build Ecosystem model in software Ecopath and Ecosim

The literature review from WPK2 provided us with a basis to design the ecosystem model, especially regarding what functional groups were present and had sufficient data for, especially regarding the trophic dynamics. This allowed us to design the static part (Ecopath) and we are designing the dynamic component (the Ecosim part). This work has been and is continuing to be done in collaboration with FIFD and OSU. The delivery of 4.2 is on track.

4.3 Develop the model to examine ecosystem effects of fishing, impacts of environmental change with data produced in WKP1&2

The Ecopath model (static model) has been designed and tested. Further, the Ecopath with Ecosim model (dynamic model) is being designed and tested. Fisheries data has been collected as part of this work. The PM is travelling to the U.S. in April 2023 to work further on model development and testing. The Ecopath with Ecosim (EwE) model to investigate climate change and fishing impact will be used as a case study in the upcoming workshop, which will focus on how to build and evaluate ecosystem models for data-limited high-latitude environments as part of an ecosystem-based approach to management. The invitations to participants have been sent out and we will have a hybrid meeting, hosted from Newport, Oregon, U.S. By the end of the workshop, the envisioned aim is to have an evaluated EwE that is reasonable for FI (reasonable in the sense of the data limitations that are associated with the Falkland Islands), and the results of the scenarios run regarding climate change effects and fishing. Further, there will be a discussion paper developed for best practices regarding ecosystem modelling in data-limited high-latitude environments. The delivery of 4.3 is on track.

3.2 Progress towards project Outputs

Output 1: Project Management Structure, monitoring and evaluation and communication tools established.

The project manager (PM) started 1 April 2022, and she started up Project Management Group meetings, which have been held every quarter. She finalised the MoUs with the various stakeholders, which are all agreed and signed. She created a webpage on the SAERI website and finalised the Monitoring and Evaluation Plan. The PM reports to DPLUS via half yearly and yearly reports.

Output 2: New environmental baselines understood and created by the synthesis of local and scientific knowledge surveys conducted (WKP2)

The synthesized datasets are available on the SAERI IMS-GIS/FIG data portal

Further, this work formed the basis for a literature review article that is published in the [Advances of Marine Biology](#) and informs the ecosystem model structure within the project.

The zooplankton community structure is being investigated as part of a PhD studentship that started in October 2022. The student is visiting the Falklands Islands between February and June 2023, during which she will work on identifying the zooplankton, which will inform on the importance of the nearshore ecosystem to the offshore ecosystems as nurseries and trophic linkages. This work is thus still ongoing. The delivery is on-track.

Preparations for the Loligo egg survey are underway. We have identified areas of interest that have high potential for the presence of eggs. To conduct the video camera survey, we are building a sled that will allow us to run transects from kelp forest areas and hard substrate areas. This will be ready by May, at which point the Autumn Spawning Cohort of *Doryteuthis gahi* will be present inshore for spawning. We are aiming to target this peak spawning time (May/June) for the survey, because it is the highest peak in spawning for *D. gahi*. Spawning occurs year-round, but there are two main spawning peaks in the year, one in Spring and one in Autumn. The Autumn Spawning Cohort generally is higher, and by targeting this peak we aim to maximise the chance of observing squid egg masses during the survey. The slight delay in the survey work is the result of the survey design and building of the sled, which meant we missed the peak spawning period in 2022.

Output 3: understanding physiological tolerances and acclimation responses of FI foundation species with current and projected rates of climate change (WPK3)

A seawater flow-through system was built at the FI aquaculture facility and experiments were conducted with squid eggs (*Doryteuthis gahi*), and various kelp-associated invertebrates. Respiration rates and mortality rates of various species were collected. Because of issues with the stability of power supply, the squid egg experiments were not completed. This issue has been resolved, and we will rerun the experiment again this year. Responses to temperature increases over the development period of the egg masses were visible, but the aim is to have results from both spawning stocks (the autumn spawning cohort and spring spawning cohort) to compare responses to projected climate change. The mortality experiments investigated responses to different rates of warming. Most of the short-term experiments are completed, and long-term experiments will be set up this year.

Experiments are ongoing and most will be completed and analysed by the end of 2023. Two projects have taken place, an acclimation project focusing on rates of change responses to warming and this will have been completed and analysed by October 2023, with the results captured in a report and scientific manuscript. The second project focuses on squid egg mass respiration rates. This work is repeated in 2023 because some technological failures (power cuts) influenced the data collection in 2022. The last experiments will finish in November 2023, after which the results will be captured in a report and scientific manuscript.

The PM and Dr Simon Morley (BAS) successfully applied for a loan of the NERC Diving PAM which arrived in February, and which is available for the rest of the year. This will be used to measure photophysiology rates in response to similar rates of warming to complement the animal data.

The rates of change experiments for animals supported an undergraduate student from the University of Portsmouth with his bachelor thesis work.

Output 4: an ecosystem model for the FI shelf developed in collaboration with local and international expertise (WPK4)

An Ecopath model has been developed and is currently being further developed as an Ecopath with Ecosim model. This model will form the basis of a workshop that will occur 1-2 May in the USA, and this work will be developed into a workshop report and scientific manuscript. Training material will be developed after the workshop, and the model and its results will be further demonstrated to partners and stakeholders via a seminar.

Output 5: EAF framework agreed by partners and stakeholders. CCA and EAF proposals submitted to FIG to inform decisions on whether to mainstream CCA and EAF into sustainable fisheries, conservation of marine ecosystems, governance and policy (WPK5).

There are no measurable indicators to report against for this reporting period. These are due in Y3.

3.3 Progress towards the project Outcome

The Project Outcome is “Proposed CCA and environmental variability and an ecosystems approach to fisheries management mainstreaming for fisheries governance/policy document, submitted to FIG Directorates for consideration.”

The project has made significant progress on most of the outputs (with the exception of output 5, which is planned for this coming year), and is on track to achieve all outputs of the project. The continued support and engagement of the various stakeholders has been key to the success so far as well as providing additional work that increases the value of this project and helps secure a legacy of the project in the Falkland Islands (e.g., via the more permanent location of the seawater flow-through system, modelling legacy, taxonomy training, diving PAM availability).

The indicators for measuring achievement of the project Outcome are still valid and are considered achievable.

There is no reason to suggest that this project is unlikely to achieve the desired Outcomes set out during the project proposal.

3.4 Monitoring of assumptions

Outcome

Assumptions:

- Relevant FIG Directorates continue to be open to the concept of mainstreaming CCA into fisheries using an EAF approach and remain fully engaged in the project.
- FIFCA members and stakeholders committed to the project and engage in project activities. Increased awareness and understanding results in positive action for fisheries and environmental management and governance.
- That the duration of the project is appropriate to inform policy and the implementation of EAF and CCA actions.
- COVID-19 impacts don't place restrictions on national and international travel.

Comments: The assumptions for the project are still relevant. The collaboration of FIG via FIFD on zooplankton taxonomy and ecosystem modelling indicate interest in the project and support for each other's work. The engagement with FIG Environmental Office by working together on experiments to demonstrate the work, and discussions regarding the workshop on policy that will be held in Dec 2023 or Jan 2024, indicate the continued interest of FIG to the concept of mainstreaming climate change adaptation (CCA) into fisheries using an ecosystem approach of fisheries management (EAF). FIFCA remains committed, especially demonstrated by their visit to the physiology experiments and our new, more permanent experiment setup that was included in their renovations of the aquaculture facilities as an in-kind contribution. We have received a lot of positive feedback from the public, especially via the FITV and Falkland Islands Women Association activities. The project is still on track, which means that the assumption for the planning of the workshop that will aid in informing policy and the implementation of EAF and CCA actions is still appropriate.

Output 1:

Assumptions:

- Recruitment results in appropriate candidates being appointed and available on island within a given timeframe.
- Continued resource from project partners available to engage with the project for its duration.
- Covid-19 impacts do not place restrictions on national and international travel.

Comments: The assumptions for outcome 1 are still relevant. Recruitment has been successful, and the project partners are engaged in various ways as described in sections 2 and 3.2.

Output 2:

Assumptions:

- Partners have the capacity and resource to contribute data and collaborate in the data synthesis report.
- Inshore survey vessel available at the required time.
- Weather conditions enable data collection within the proposed time periods.
- Covid-19 impacts do not place restrictions on local activities.

Comments: The assumptions for outcome 2 are still relevant. The contribution to the synthesis report is demonstrated by the publication. Weather conditions do play a role in sampling, but have not prevented sampling, as demonstrated by the successful collection thus far. The planning of further sampling, agreed by SMSG, demonstrates that the vessel is available.

Output 3:

Assumptions:

- Partner organisations remain able to contribute and train locally retained marine technicians.
- Partner organisation accommodates experimental equipment at a FI aquaculture facility.
- Covid-19 impacts do not place restrictions on national and international travel and local activities

Comments: The assumptions for outcome 3 are still relevant. The relocation of the experimental setup to a more permanent location demonstrates that willingness and support of this part of the project.

Output 4:

Assumptions:

- Partner and Stakeholders engage in the workshop within the given timeframe.
- Partners continue to contribute to WPK in a timely manner and collaborate with model development.
- Covid-19 impacts do not place restrictions on national and international travel.

Comments: The assumptions for outcome 4 are still relevant. The workshop is planned for 1-2 May, and collaborations with FIFD continue for both models.

Output 5:

Assumptions:

- Key FIG officials and stakeholders available for the workshop.
- FIG continues to engage and contribute to discussion and considerations around how to incorporate EAF and CCA in policy and governance.
- Buy-in secured through continuous engagement and workshops. Active FIG engagement.
- Covid-19 impacts do not place restrictions on national and international travel.

Comments: The assumptions for outcome 5 are still relevant.

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

The project will address the **Falkland Islands / UK Environmental Charter 2001**.

Guiding principles for the UK Government, the Government of the Falkland Islands and for the people of the Falkland Islands - specifically: 1) To recognise that all people need a healthy environment for their well-being and livelihoods and that all can help to conserve and sustain it; 2) To use our natural resources wisely, being fair to present and future generations; 3) To identify environmental opportunities, costs and risks in all policies and strategies. 4) To seek expert advice and consult openly with interested parties on decisions affecting the environment; 5) To aim for solutions which benefit both the environment and development; 6) To contribute towards the protection and improvement of the global environment; and 8) To encourage activities and technologies that benefit the environment.

Falkland Islands 'Islands Plan 2022-2026'.

The 'Islands Plan' is a Falkland Islands Legislative Assembly document that represents a shared vision and priorities for the Falkland Islands over four years. It articulates ambition for improvements and the actions we will take to deliver positive results, across a range of key areas, for the benefit of every resident. It connects our community's aspirations for protecting the environment, improving transport and communications links, and modernising our infrastructure, with the possibilities that exist to improve our prosperity, health and wealth for current and future generations.

Relevant sections and priorities include:

Fisheries

- Ensure responsible marine management including the implementation of new maritime legislation;
- Lead the development of a long-term plan, working with the fishing sector to ensure the right conditions to encourage development, sustainability and growth
- Make progress on regional fisheries conservation and management to ensure better sustainability and conservation of fish stocks, and improve ecosystem understanding;
- Work in partnership with our Falkland Islands fishing companies to ensure the fishery is responsibly managed and widely promoted, and to improve product visibility and reputation internationally

Environment

- Develop and implement a comprehensive environmental strategy including necessary regulations; Implement the 2030 Biodiversity Framework to preserve our natural environment;
- Encourage research into the Falkland Islands environment to provide greater understanding of ecosystems, biodiversity and wider influences;
- Fulfil our commitments under international treaties and agreements such as climate change accords and strive to mitigate our carbon footprint."

Environment Strategy Falkland Islands Biodiversity Framework

The Falkland Islands Environment Strategy (2021-2040) outlines the priorities required with regards to the wider Falkland Islands environment. The Strategy is underpinned by the implementation of Strategies and Action Plans. Climate change implications run through all elements of the threats identified in the Strategy.

Convention on Biological Diversity

UK's ratification to CBD was extended to the Falkland Islands in 2016. The project addresses the following targets: Aichi 4 (Natural Resources); 6 (Sustainable fisheries); 10 (Vulnerable Marine Ecosystems); 10 (Protected Areas); 14 (Essential Ecosystem Services).

United Nations Convention for the Law of the Sea (UNCLOS)

UNCLOS 61(2) coastal states take 'into account the best scientific evidence available to it' in determining conservation and management measures.'

5. Gender equality and social inclusion

SAERI's policy statement on Equality is:

"SAERI and its Group Companies (SGCs) are committed to ensuring that recruitment, promotion, training, development, assessment, benefits, pay, terms and conditions of employment, redundancy and dismissals are determined on the basis of capability, qualifications, experience, skills and productivity. SGCs are also committed to achieving a working environment, which provides equality of opportunity and freedom from unlawful discrimination on the grounds of race, sex, pregnancy and maternity, marital or civil partnership status, gender reassignment, disability, religion or beliefs, age or sexual orientation. This Policy aims to remove unfair and discriminatory practices within SAERI and to encourage full contribution from its diverse community."

We believe that better decisions are made by diverse groups, and believe that equality is thus wide and far-reaching. We actively uphold this approach in all we do and we ensure that all our partners have similar policies.

We acknowledge that attendance at stakeholder workshops or meetings may be limited by parental responsibilities and as such timings will be considered to be most appropriate (within the day) and education year (outside school holidays) both in the FI and internationally.

In the SAERI office, the current staff cohort is 60% female and 40% male. The PM is female.

Please quantify the proportion of women on the Project Board ¹ .	SAERI senior leadership team is 50% female (two of four directors).
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 .	The key project partners are DNR-Fisheries and FIFCA. Although our PMG is predominantly male (four of five PMG members), the director of DNR-Fisheries is female. Similarly, the chair of the FIFCA board is female.

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.

6. Monitoring and evaluation

As part of the Project Management Structure, the PM has completed a detailed Monitoring and Evaluation (M&E) plan in which a set of evaluation questions will be used to assess the effectiveness of the project's outcomes. Specific monitoring questions will be used to answer the evaluation questions and will be checked through indicators, data sources/methods to obtain the data, and the responsibilities for data collection (as mentioned in the MoU). The M&E plan has been submitted to the PMG and signed off by the group. The PM presents quarterly reports on the progress against the deliverables, M&E and a quarterly financial report to the PMG which will check that the project delivers its outputs on time, within the proposed budget, and that the quality of the outputs is of a high standard.

7. Lessons learnt

The physiology experiments were challenging both in terms of logistics and collecting a sufficient number of individuals for each species for experimental purposes. These individuals often had to be obtained by divers, but of course there is never a guarantee that you will find the species of interest. In hindsight, it would have been useful to build-in more time and opportunity for sample collection – although we highlight the physiology experiments are on-track and will be delivered. Further, power supply issues at the aquaculture centre and the sensitivity of heaters during the experiments, resulting in early termination. We have since rewired the heaters such that this does not occur in the future – but the lesson being that often equipment needed to be modified to work within our aquaculture facility, which was often a case of trial and error. Last, because of the delay in the recruitment of the PM, the project started in Autumn, and for most species it was not suitable to start climate change-related experiments at this time. Thus, the experiments started somewhat later than planned to wait for Spring and Summer. Hence, building in more time for potential failure/delay when running physiology experiments is one lesson learnt.

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

There were five comments on the last annual report, 1 of which was addressed in the last half-yearly report, and 4 of which needs to be addressed in this report.

1. Please ensure that all abbreviations/acronyms are written in full at least once in the report. (Required this annual report)

Greater care has been taken to ensure that abbreviation and acronyms are defined in the report this time.

2. Please provide evidence of how stakeholder engagement has influenced the project planning and decision making. (Required this annual report)

Section 2 describes in detail how stakeholders have been engaged within this project, ranging from zooplankton data collection, physiological work, and modelling advice. The largest influence on project planning from the PMG is demonstrated by the change in the first workshop planning, both in location and aim of the workshop. This will add value to the project, as a group of experts will come together to (i) discuss 'ecosystem modelling for data-limited high-latitude ecosystems' and (ii) use the Falkland Islands marine ecosystem model as a case study. Thus, we are expecting a larger discussion around ecosystems that benefit from ecosystem-based management approaches but may have limited data to inform such approaches, and an evaluation on the model produced in this project. We aim to have both these aims developed into two manuscripts.

In addition, the advice provided by Barend Stadler from the aquaculture facilities help improve the experimental approaches we are taking. The advice from SMSG regarding squid egg mass sampling and the squid egg surveys have been invaluable and have led to the development of better sampling designs.

3. Please account for any delayed activities i.e. in the case of this annual report, the MoU delay has not been fully justified. (Required last half-year report)

This was discussed in the last half year report, but briefly, the permanent PM finalised the MoUs for all stakeholders. Most were signed quickly, but the administration of OSU resulted in further delay. However, all MoUs have now been signed and are filed.

4. Please ensure that in future reports, all tools expected to arise from this study are fully specified. (Required this annual report)

One of the tools that will be developed here that can be used in fisheries management is the Ecopath with Ecosim model. This project is helping to build a legacy for ecosystem modelling in the Falkland Islands via the support of a PhD student in the FIFD on his Ecopath model, and the development of Ecopath with Ecosim (EwE). This coming year, the PM will develop training materials for this modelling environment that will be shared with various stakeholders. Last, this project is talking with other projects at SAERI to build upon this model to (i) provide training and support regarding modifying ecosystem models for different research aims, and (ii) encourage/provide support to develop the current EwE model with Ecospace included, which will be also beneficial for fisheries management.

Another legacy of this project is the experimental setup for physiology experiments in the aquaculture facilities in Stanley. The setup is already providing other projects with opportunities to run experiments (e.g., feeding trials), and this project is working towards setting up another PhD studentship that will use this setup.

5. Please ensure that evidence is provided to demonstrate that outcomes are still on track. (Required this annual report)

The progress described in section 3 demonstrates that this project is not only on track but is also achieving more objectives than it set out to do via the publication of the literature review, the complementary work of the diving PAM, the start of the PhD student, the extended aim of the first workshop, and the support and collaboration on modelling with FIFD. The progress is providing a legacy in the Falkland Islands for various aspects of the project already, which sets us up well for this year, when we will focus on how to incorporate an ecosystem-based approach to fisheries management in the Falkland Islands.

Some other comments were provided on the last report, including the question on how we can be sure that the stakeholders are still engaged. Via demonstrations, presentations and an appearance on national TV, the public has been engaged. Further planning of activities with the various project partners demonstrates the commitment of the whole PMG and other stakeholders for this project.

One other comment regarding progress towards outcome was raised, regarding how we know whether FIG is still open to the concept of mainstreaming climate change adaptation into fisheries using an ecosystem-based approach to fisheries management. The Falkland Islands is keenly aware that as a small Island Nation they are limited in climate mitigation on a global scale. Climate change is considered an issue in the Islands Plan 2023-2026 and in the Environment Strategy, and therefore a priority for FIG. The Islands are drying out, which influences peat erosion, and there are currently several projects going on with collaborators via PhD studentships in understanding what this means for terrestrial and kelp forest ecosystems. Further, the collaboration with FIFD on their Ecopath model (with isotopic work of the PhD student) revolves around an ecosystem-based approach to fisheries – but it is not focused on climate change. That is more the aim of the Ecopath with Ecosim model developed in this project. We thus believe that FIG is still engaged with this framework.

Darwin Plus identity has been rectified in the promotion of this project (previously, the Darwin Initiative logo has been used erroneously).

9. Risk Management

There are no new risks to report.

10. Other comments on progress not covered elsewhere

11. Sustainability and legacy

There is a good deal of interest in the project from the government and indeed from the fishing industry. This is evidenced by the financial contribution to the PhD studentship, as well as the support we are given by hosting us in the aquaculture facilities.

Our Exit Strategy is still valid:

“This project directly contributes to FI’s long-term vision for biodiversity, conservation and management targets. It will enable FIG to plan, manage the sustainable development of the marine environment.

The Impact is ‘EAF management in FI is developed, CCA to fishery and ecosystems are better understood with CCA Policy for fisheries and ocean governance/policy submitted to FIG for consideration.’ This will be delivered completely by in territory project staff and partners in support of international partners OSU and BAS, experts in the field who will work in the islands and provide later support remotely. It will fill key baseline understanding of the marine environment and will fill important gaps left by previous work and will inform future research and work streams to improve understanding.

For the first time it will provide an understanding of the ecosystem function in the Falkland Islands Conservation Zones through modelling and will enable insight into how CC will impact this system providing FIG, industry, science community and community tools to investigate options for CCA.

For sustainability and legacy there will be a suite of tools available and maintained/improved in territory that can be adsorbed into fisheries and ecosystem/environmental management. These include an ecosystem model (and available training materials), recommendations for the incorporation of EAF and CCA into fisheries governance, the availability of an experimental seawater flow-through setup for further physiology experiments or other work (e.g., feeding trials).

SAERI is a local FI organisation and has close working relationships with FIG and local stakeholders all with the motivation to ensure that this project provides a sustained legacy going forward. The Environment and Sustainable Management of our marine ecosystems has never been so important and this is evidenced by FIG’s new Environmental Strategy and the emphasis of the environment and sustainable management place in FIG’s Islands Plan.

12. Darwin Plus identity

The project’s outputs and outreach highlight that this project is a Darwin Initiative project. We have the Darwin Initiative logo on our website:

PROJECT FUNDING AND PARTNERS

The project is funded by the Darwin Initiative

Darwin Initiative's project DPLUS148



And also receives financial support from the Falkland Islands Government's Environmental Studies Budget.

PROJECT PARTNERS:

Our partners for this project are Falkland Islands Government Directorate of Natural Resources, Fisheries Department (FID) and Policy and Economic Development (DPED), Falkland Islands Fishing Companies Association (FIFCA), Oregon State University (OSU), British Antarctic Survey (BAS), and the Shallow Marine Survey Group (SMSG).



FALKLAND ISLANDS
Fishing Companies Association



British
Antarctic Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

The PM gave a talk to the Falkland Islands Women Association, where the Darwin Initiative logo featured both on the title slide and on the final slide of the talk:



The first publication of this project acknowledges the funding support from the Darwin Initiative for this project:

The Falkland Islands marine ecosystem: A review of the seasonal dynamics and trophic interactions across the food web

Acknowledgments

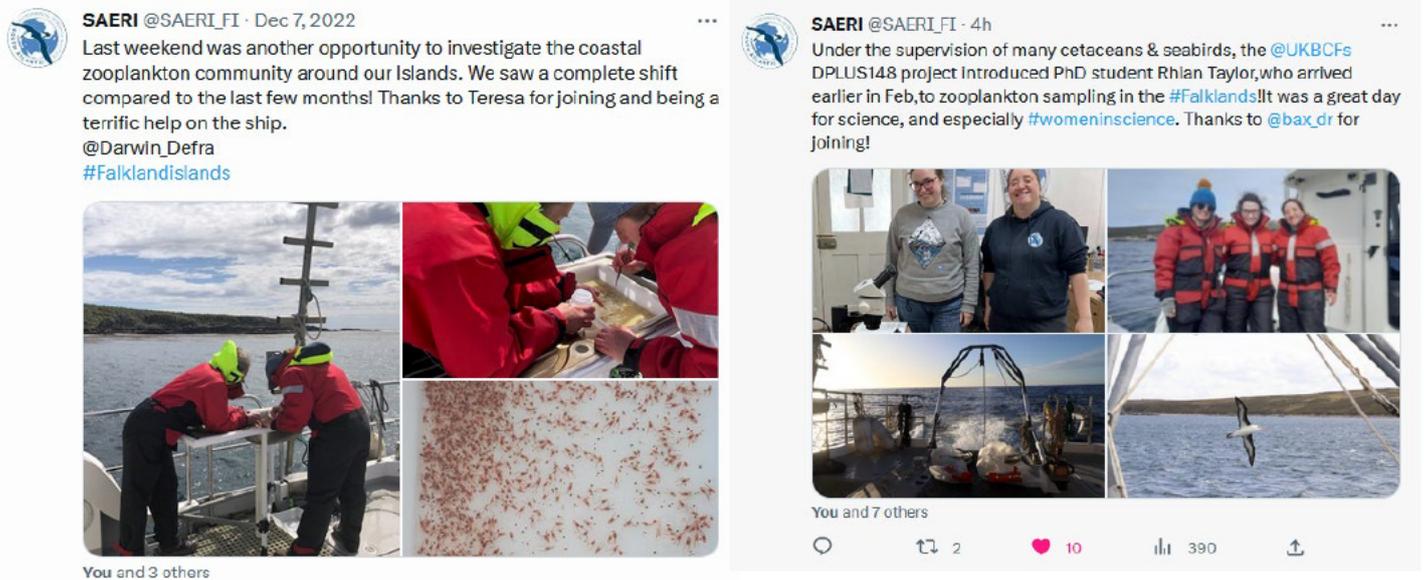
This work is funded by the Darwin Plus initiative as the DPLUS148 project. It is co-funded by the Falkland Islands Government Environmental Studies Budget.

During the FITV interviews, the PM acknowledged the Darwin Initiative support to this project.



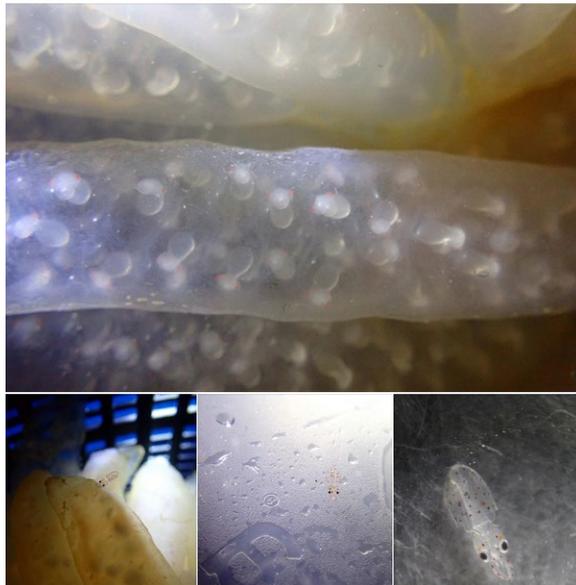
How Climate Change Could Affect the Falklands' Marine Ecosystems

During the various social media posts, the Darwin Initiative was included in the text of the posts, or the Initiative was tagged in the posts (for Twitter, because of the limited character allowance). Note the updated twitter handle for the later posts. E.g.:



SAERI - South Atlantic Environmental Research Institute
 21 September · 🌐

Still in time for #Squidtember! We are looking at the respiration rate of squid eggs in our Darwin Initiative #DarwinPlus climate resilience project in the Falkland Islands with British Antarctic Survey & Fortuna Ltd Group. This proxy for energy use can be used as a functional response in modelling climate change effects in the marine ecosystem. The first hatchlings are here! They are so adorable and tiny – just compare it to the writing of the Tupperware box it is temporarily... See more



13. Safeguarding

Has your Safeguarding Policy been updated in the past 12 months?	No
Have any concerns been investigated in the past 12 months	No
Does your project have a Safeguarding focal point?	No
Has the focal point attended any formal training in the last 12 months?	No [<i>If yes, please provide date and details of training</i>]
What proportion (and number) of project staff have received formal training on Safeguarding?	Past: 0% [and number] Planned: 0% [and number]

Has there been any lessons learnt or challenges on Safeguarding in the past 12 months?
Please ensure no sensitive data is included within responses. No

Does the project have any developments or activities planned around Safeguarding in the coming 12 months? If so please specify. No

14. Project expenditure

1.6.1 Table 1: Project expenditure during the reporting period (1 April 2022 – 31 March 2023)

Current Year's Costs	2022/23 Grant (£)	2022/23 Total actual Darwin Costs (£)	Variance %	Comments (please explain any variance)
Staff costs (from Section 6)				
Consultancy Costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items (from Section 7)				
Others (from Section 8)				
Audit costs				
TOTAL	136,965,00	136,965.02	0%	

Table 2: Project mobilising of matched funding during the reporting period (1 April 2022 – 31 March 2023)

	Matched funding secured to date	Total matched funding expected by end of project
Matched funding leveraged by the partners to deliver the project.		
Total additional finance mobilised by new activities building on evidence, best practices and project (£)		

15. OPTIONAL: Outstanding achievements or progress of your project so far (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).

File Type (Image / Video / Graphic)	File Name or File Location	Caption, country and credit	Online accounts to be tagged (leave blank if none)	Consent of subjects received (delete as necessary)
				Yes / No
				Yes / No
				Yes / No
				Yes / No
				Yes / No

2 Annex 1: Report of progress and achievements against logframe for Financial Year 2022-2023 – if applicable

Project summary	SMART Indicators	Progress and Achievements April 2021 - March 2022	Actions required/planned for next period
<p>Impact</p> <p>EAF capacity in FI developed, CCI to fishery and ecosystems better understood with advice and recommendations for CCA Policy for fisheries and ocean governance/policy submitted to FIG Directorates for consideration.</p>		<p>Physiological experiments have been set up and conducted to better understand potential impacts from ocean warming on kelp-associated animals. The initial results demonstrate differential responses between animal species, and changes in respiration rates. An ecosystem model has been developed as preparation to inform/investigate policy decisions. Datasets of Falkland Islands trophic interactions have been synthesized and are being used beyond this project already. Zooplankton baseline data have been collected to understand seasonal patterns and these are currently being analysed.</p>	
<p>Outcome Proposed CCA and environmental variability and an ecosystems approach to fisheries management mainstreaming for fisheries governance/policy document, submitted to FIG Directorates for consideration.</p>	<p>0.1 Proposed adaptation to climate change, variability and EAF approaches submitted to FIG Directorates for consideration.</p> <p>0.2 Adaptive capacity and resilience to climate change of FIFCA members strengthened by the end of the project.</p> <p>0.3 Impact of climate change on fisheries and FI ecosystem better understood by the end of the project through data synthesis, reports and</p>	<p>Progress has been made in obtaining baseline data for zooplankton species, an understudied group in the FI marine ecosystem. Responses of kelp-associated animals have been measured, and a static ecosystem model has been developed. These parts are part of the foundation to work towards mainstreaming CCA and EAF into policy in the Falkland Islands</p>	<p>Workshop held on ecosystem modelling in data-limited, high-latitude environments, using the Falklands as a case study</p> <p>Finalising the physiology experiments</p> <p>Conducting and analysing the Loligo survey</p> <p>Finalising the zooplankton survey and investigate seasonal changes</p>

Project summary	SMART Indicators	Progress and Achievements April 2021 - March 2022	Actions required/planned for next period
	papers adding a baseline informing future research/work.		Workshop held on mainstreaming EAF into policy in the Falkland Islands
Output 1. Project Management structure, monitoring and evaluation and communication tools established	1.1 MoU signed and agreed by partners. 1.2 PM Recruited. 1.3 PMG meeting held every Q. 1.4 Webpage create on SAERI and partners' websites. 1.5 M&E Plan created 1.6 Regular DPLUS reports (half yearly/yearly).	1.1 MoUs have been agreed and signed by all partners. 1.2 PM has been recruited and has been working on the project since April 2022 1.3 PMG meetings have been held every quarter since June 2022 and scheduled until March 2024. Meeting notes of every meeting are created and shared on the project website. 1.4 Webpage has been created and is used to share updates for the project. 1.5 M&E plan has been created and has been signed off by project partners. 1.6 Half Year reports were completed and submitted in October 2021 and 2022. Yearly report was completed and submitted in March 2022.	
Output 2. New environmental baselines understood and created by the synthesis of local and scientific knowledge surveys conducted (WPK2)	2.1 At least 20 data sets synthesised to inform current knowledge and informs further data collection. 2.2 1 literature review conducted and database increasing current baseline knowledge. 2.3 20 Inshore zooplankton/ichthyoplankton surveys conducted to augment the role of nearshore offshore connectivity. 2.4 10 inshore loligo egg survey conducted on eastern coasts to determine the spatial (bathymetric) extent of loligo spawning areas. This is key to fisheries management as the range (geographical and bathymetric) are not fully understood.	2.1 49 datasets have been synthesized. These have informed (in this project) the literature review and ecosystem model design. It further has provided support for the ecosystem model in FIFD and visiting researchers at SAERI focusing on kelp forests regarding data gaps. 2.2 A literature review has been conducted, and this work has been accepted for publication by Advances in Marine Biology . The synthesized datasets are hosted on the SAERI IMS-GIS/FIG data portal. 2.3 54 survey tracks have been completed, and at least 18 more will be collected. A PhD student has been recruited to analyse the data via classical taxonomy and metabarcoding. This will inform the inshore/offshore connectivity. 2.4 The survey has been designed, and the camera sled is being build. The actual survey is planned for May/June 2023 (Y3Q1)	

Project summary	SMART Indicators	Progress and Achievements April 2021 - March 2022	Actions required/planned for next period
Output 3. Understanding physiological tolerances and acclimation responses of FI foundation species with current and projected rates of climate change (WKP 3).	3.1 7 Key species capacity to cope with and acclimatise to the current and projected rates of climate change assessed experimentally at a FI aquaculture facility allowing un understanding of ‘winners’ and ‘losers’ to environmental change.	3.1 11 species were trialed to see if we could keep them alive in the tanks (important for control). 9 species were tested for physiology responses to warming, including capacity to cope and acclimatisation potential. Several experiments are still ongoing (e.g., long-term rate of change experiment) and one will be repeated (squid egg mass experiment) because of technological issues in 2022. The preliminary data showed promising results. The physiology report is due for October 2023.	
Output 4. An Ecosystem Model for the FI shelf developed in collaboration with local and international expertise (WP4).	4.1 A workshop with local and international experts (ecologists and modellers) will create a framework for the first ecosystem model for FI. 4.2 PM in collaboration with partners build Ecosystem model in software Ecopath with Ecosim enhancing understanding of ecosystem function. 4.3 Develop the model to examine ecosystem effects of fishing, impacts of environmental change with data produced in WPK1&2 creating a tool to inform fisheries management. 4.4 Training package created and 3 training seminars given to partners and scientists within FIFD and SAERI. Training video with worked example created building capacity in the FI and other OTs.	4.1 The workshop will take place May 2023 in Oregon, US. The first part (Ecopath) of the model is already developed, and the model is currently being extended to Ecopath with Ecosim. 4.2 The ecosystem model is developed in collaboration with FIFD and OSU. After the workshop, when the model has been evaluated by experts and developed according the best possible principles, the PM will organise a demonstration presentation of the model and results for various stakeholders. 4.3 Due in Y3Q2/Y3Q3 4.4 Due in Y3Q4/Y4Q1	
Output 5. EAF framework agreed by partners and stakeholders. CCA and EAF proposals submitted to FIG to inform decisions on whether to mainstream CCA and EAF into sustainable fisheries, conservation of	5.1 Conduct best practice review for EAF and explore gaps that may impede adoption in FI. 5.2 Review CCA principles and actions in fisheries Governance globally with a focus on small island nations.	5.1 Due in Y3Q3 5.2 Due in Y3Q4 5.3 Due in Y3Q4 5.4 Due in Y4Q1	

Project summary	SMART Indicators	Progress and Achievements April 2021 - March 2022	Actions required/planned for next period
marine ecosystems, governance and policy (WP5).	<p>5.3 Conduct workshop in FI to a) present best practice review for EAF b) explore options from gap analyses for improvement c) explore potential management/policy interventions to mitigate CC on fisheries and ocean management e) CCA and EAF recommendations submitted to FIG for consideration.</p> <p>5.4 Submit EAF proposals to FIG's Fisheries Committee.</p> <p>5.5 Submit EAF and CCA proposals to relevant FIG Directorates for consideration.</p>	5.5 Due in Y4Q1	

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

Project Summary	Measurable Indicators	Means of Verification	Important Assumptions
Impact: EAF capacity in FI developed, CCI to fishery and ecosystems better understood with advice and recommendations for CCA Policy for fisheries and ocean governance/policy submitted to FIG Directorates for consideration. (Max 30 words)			
Outcome: (Max 30 words) Proposed CCA and environmental variability and an ecosystems approach to fisheries management mainstreaming for fisheries governance/policy document, submitted to FIG Directorates for consideration.	<p>0.1 Proposed adaptation to climate change, variability and EAF approaches submitted to FIG Directorates for consideration.</p> <p>0.2 Adaptive capacity and resilience to climate change of FIFCA members strengthened by the end of the project.</p> <p>0.3 Impact of climate change on fisheries and FI ecosystem better</p>	<p>0.1 Reports on data synthesis and ecosystem model circulated to stakeholders</p> <p>0.2 Proposals and suggested approaches for the fisheries sector and FIG on CCA and EAF.</p> <p>0.3 Annual reports to FIG Directorates responsible for fisheries management and policy. CCI on fisheries and ecosystems</p>	<p>Relevant FIG Directorates continue to be open to the concept of mainstreaming CCA into fisheries using an EAF approach and remain fully engaged in the project. FIFCA members and stakeholders committed to the project and engage in project activities. Increased awareness and understanding results in positive</p>

	understood by the end of the project through data synthesis, reports and papers adding a baseline informing future research/work.	included in FI Fisheries Science Strategy and considered for Environmental and Fisheries Policy via proposal to relevant FIG Directorates	action for fisheries and environmental management and governance. That the duration of the project is appropriate to inform policy and the implementation of EAF and CCA actions. Covid-19 impacts don't place restrictions on national and international travel.
Outputs: 1. Project Management structure, monitoring and evaluation and communication tools established	1.1 MoU signed and agreed by partners. 1.2 PM Recruited. 1.3 PMG meeting held every Q. 1.4 Webpage create on SAERI and partners' websites. 1.5 M&E Plan created in. 1.6 Regular DPLUS reports (half yearly/yearly).	1.1 MoU signed, filed adhered to by partners. Y1Q4 1.2 Interim PM employment contract signed. Y1Q3. Permanent PM employment and contract signed by Y2Q1. 1.3 PMG meeting notes available on common platform. Starting Y2Q1. 1.4 Webpages live and public facing. Y2Q1. 1.5 M&E plan available on common online platform. Y2Q1. 1.1 DPLUS Reports available to project partners.	Recruitment results in appropriate candidates being appointed and available on island within given timeframe. Continued resource from project partners available to engage with the project for its duration. Covid-19 impacts do not place restrictions on national and international travel.
2. New environmental baselines understood and created by the synthesis of local and scientific knowledge surveys conducted (WPK2)	2.1 At least 20 data sets synthesised to inform current knowledge and informs further data collection. 2.2 1 literature review conducted and database increasing current baseline knowledge. 2.3 20 Inshore zooplankton/ichthyoplankton surveys conducted to augment the role of nearshore offshore connectivity.	2.1 Project data platform created with a public facing webGIS within the SAERI IMS-GIS/FIG data portal by Y2Q1 2.2 Synthesis report to the PMG and stakeholders by Y2Q1 2.3 Detailed report on the spatial and temporal variation in the plankton community structure quantifying the importance of the near shore ecosystem to the offshore and FI fisheries as nurseries	Partners have the capacity and resource to contribute data and collaborate in the data synthesis report. Inshore survey vessel available at the required time. Weather conditions enable data collection within the proposed time periods. Covid-19 impacts do not place restrictions local activities.

	<p>2.4 10 inshore loligo egg survey conducted on eastern coasts to determine the spatial (bathymetric) extent of loligo spawning areas. This is key to fisheries management as the range (geographical and bathymetric) are not fully understood.</p>	<p>and trophic linkages between Y2Q1 and Y3Q1. This provides further empirical evidence that the near shore environment and proposed MMA is key to sustaining fisheries and ecosystem function. Report re-focused for a scientific journal Y3Q2,Y3Q3.</p> <p>2.4 Loligo egg survey report delivered to PMG and stakeholders Y2 Q4/Y3Q1. Report re-focused for a scientific journal.</p>	
<p>3. Understanding Physiological tolerances and acclimation responses of FI foundation species with current and projected rates of climate change (WPK3).</p>	<p>3.1 7 key species capacity to cope with and acclimatise to the current and projected rates of climate change assessed experimentally at a FI aquaculture facility allowing an understanding of 'winners' and 'losers' to environmental change.</p>	<p>3.1 Results capture in a report and circulated to PMG and then stakeholders Y3Q2. Report re-focused for a scientific journal. Reports on project website</p>	<p>Partner organisation remains able to contribute and train locally retained marine technician. Partner organisation accommodates experimental equipment at a FI aquaculture facility. Covid-19 impacts do not place restrictions on national and international travel and local activities</p>
<p>4. An Ecosystem Model for the FI shelf developed in collaboration with local and international expertise (WP4).</p>	<p>4.1 A workshop with local and international experts (ecologists and modellers) will create a framework for the first ecosystem model for FI.</p> <p>4.2 PM in collaboration with partners build Ecosystem model in software Ecopath with Ecosim enhancing understanding of ecosystem function.</p> <p>4.3 Develop the model to examine ecosystem effects of fishing, impacts of environmental change with data produced in WPK1&2</p>	<p>4.1 Workshop report and recommendations circulated to PMG and stakeholders. Workshop report also uploaded to Project website Y2Q4.</p> <p>4.2 Ecosystem model development showcased to partners and stakeholders by presentation and demonstration seminars Y2Q4,Y3Q1.</p> <p>4.3 Model presented to partners and stakeholders through a report and demonstration seminar. Report uploaded to project website Y3Q2,</p>	<p>Partner and Stakeholders engage in the workshop within the given timeframe Partners continue to contribute WPK in a timely manner and collaborate with model development. Covid-19 impacts do not place restrictions on national and international travel.</p>

	<p>creating a tool to inform fisheries management.</p> <p>4.4 Training package created and 3 training seminars given to partners and scientists within FIFD and SAERI. Training video with worked example created building capacity in the FI and other OTs.</p>	<p>Y3Q3. Report re-focused for a scientific journal.</p> <p>4.4 Training seminars given and training video uploaded to the Project website Y3Q4,Y4Q1.</p>	
<p>5. EAF framework agreed by partners and stakeholders. CCA and EAF proposals submitted to FIG to inform decisions on whether to mainstream CCA and EAF into sustainable fisheries, conservation of marine ecosystems, governance and policy (WP5).</p>	<p>5.1 Conduct best practice review for EAF and explore gaps that may impede adoption in FI.</p> <p>5.2 Review CCA principles and actions in fisheries Governance globally with a focus on small island nations.</p> <p>5.3 Conduct workshop in FI to a) present best practice review for EAF b) explore options from gap analyses for improvement c) explore potential management/policy interventions to mitigate CC on fisheries and ocean management e) CCA and EAF recommendations submitted to FIG for consideration.</p> <p>5.4 Submit EAF proposals to FIG's Fisheries Committee.</p> <p>5.5 Submit EAF and CCA proposals to relevant FIG Directorates for consideration.</p>	<p>5.1 EAF best practice review report circulated to PMG, Stakeholders and uploaded to project website Y3Q3 Report re-focused for a scientific journal.</p> <p>5.2 CCA review report circulated to PMG, Stakeholders and uploaded to project website by Y3Q4.</p> <p>5.3 Workshop report produced and report circulated to PMG, Stakeholders and uploaded to project website Y3Q4.</p> <p>5.4 EAF paper submitted prepared for DNR to consider submitting to Fisheries Committee Y4Q1.</p> <p>5.5 Written acknowledgement by DPED that it has received and reviewed the relevant reports and that the contents and recommendations will inform policy development Y4Q1.</p>	<p>Key FIG official and stakeholders available for the workshop. FIG continues to engage and contribute to discussion and considerations around how to incorporate EAF and CCA in policy and governance.</p> <p>Buy-in secured through continuous engagement and workshops. Active FIG engagement.</p> <p>Covid-19 impacts do not place restrictions on national and international travel.</p>

Activities (each activity is numbered according to the output that it will contribute towards, for example 1.1, 1.2 and 1.3 are contributing to Output 1)

- 1.1 MoU signed and agreed by partners.
- 1.2 PM and PO Recruited.
- 1.3 PMG meeting held every.
- 1.4 Webpage create on SAERI and partners' websites
- 1.5 M&E Plan created.
- 1.6 Regular DPLUS reports (half yearly/yearly).
- 2.1 Desktop review establishes current knowledge and informs further data collection.
- 2.2 Review report and metadata catalogue delivered to Project partners
- 2.3 Inshore zooplankton/ichthyoplankton surveys undertaken
- 2.4 Inshore Loligo survey conducted using ROV
- 3.1 Specimens collected and species capacity to cope and acclimatise to projected rates of change ascertained
- 3.2 Results captured in a report and circulated to PMG and then stakeholders. Report re-focused for a scientific journal.
- 4.1 Host workshop in FI to create a framework for ecosystem model
- 4.2 Partners and PM build ecosystem model in relevant modelling environment (e.g. Ecopath with Ecosim)
- 4.3 PM and partners use model to examine the ecosystem effects of fishing, impacts of environmental change
- 4.4 Training package created and seminars given to partners and scientists in DNR
- 5.1 Conduct EAF best practice review and explore gaps that may impede adoption in FI
- 5.2 Review CCA principles and actions in fisheries governance with an emphasis on small Island nations
- 5.3 Conduct 2nd workshop in FI to present a) best practice review, b) explore options from gap analyses for improvement c) explore management/policy interventions to mitigate CC on fisheries and ocean management e) CCA and EAF submitted to FIG for consideration
- 5.4 Submit EAF and CCA proposals to FIG's Fisheries Committee
- 5.5 Submit EAF and CCA proposals to relevant FIG Directorates for consideration

4 Annex 3: Standard Indicators

4.1.1 Table 1 Project Standard Indicators

DPLUS Indicator number	Name of indicator using original wording	Name of Indicator after adjusting wording to align with DPLUS Standard Indicators	Units	Disaggregation	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Total planned during the project

4.1.2 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)
The Falkland Islands marine ecosystem: A review of the seasonal dynamics and trophic interactions across the food web	Journal article	Jesse van der Grient, Simon Morley, Alexander Arkhipkin, James Bates, Alastair Baylis, Paul Brewin, Michael Harte, J Wilson White, Paul Brickle	Female		Advances in Marine Biology	https://www.sciencedirect.com/science/article/abs/pii/S0065288123000019?via%3Dihub

5 Annex 4: Onwards – supplementary material (optional but encouraged as evidence of project achievement)

6 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.	n/a
Have you included means of verification? You should not submit every project document, but the main outputs and a selection of the others would strengthen the report.	x
Do you have hard copies of material you need to submit with the report? If so, please make this clear in the covering email and ensure all material is marked with the project number. However, we would expect that most material will now be electronic.	N/a
If you are submitting photos for publicity purposes, do these meet the outlined requirements (see section 15)?	n/a
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.	