# Darwin Plus Main & Strategic: 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 2025**

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

## • Darwin Plus Project Information

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|---|---|
| Scheme (Main or Strategic) | Main |
| Project reference | DPR10S2_1020 |
| Project title | A cross-UKOT camera network to enhance marine predator conservation |
| Territory(ies) | British Antarctic Territory, Falkland Islands, Gibraltar, Montserrat, Ascension Island, South Georgia and the South Sandwich Islands |
| Lead Organisation | Oxford Brookes University |
| Project partner(s) | Ascension Island Government<br>Antarctic Research Trust (Falklands)<br>British Antarctic Survey (Antarctica)<br>Gibraltar Botanic Gardens<br>Montserrat National Trust and Government of Montserrat Department of the Environment<br>SGSSI Government |
| Darwin Plus grant value | GBP 397,772 |
| Start/end dates of project | Original 01/05/2022-30/03/2025<br>Approved extension to 30/03/2026 |
| Reporting period (e.g. Apr 2024-Mar 2025) and number (e.g. Annual Report 1, 2) | Annual report 2025 |
| Project Leader name | Tom Hart |
| Project website/blog/social media | https://seabirdwatch.org/<br>https://www.penguinwatch.org/ |
| Report author(s) and date | Tom Hart and Laure Cugniere, June 2025 |

## 1. Project summary

Seabird and other marine species are threatened globally by anthropogenic pressures like pollution, bycatch, and climate change. Seabird numbers, our primary taxa, have declined by nearly 70% over the past 50 years. While there are many local efforts to protect marine species, access to evidence is hampered by logistical constraints and a lack of reporting tools. We aim to produce tools to be applied across UKOTs to lower the barrier to entry of modern techniques to spatially map and monitor key marine species.

The ability of UKOTs to collect and analyse evidence at the scale required to inform the conservation of marine species remains significantly limited by resources and the logistical constraints linked to remote monitoring. Current monitoring efforts are opportunistic, expensive, and inconsistent and data processing techniques, like AI or distributed citizen science require specific expertise, hence many marine colonies being data deficient and their conservation scarce. Local conservation strategy and international treaties highlight the need to boost monitoring to better inform conservation. A previous Darwin Plus project (DPR9S2\1016) also noted that financial and logistical hurdles limited the feasibility of automation for territories, an issue that we can now address.

Recent technology applications of drones and timelapse cameras to land nesting marine species have huge potential to provide such evidence at a modest cost. We have demonstrated the feasibility of this novel approach and successfully trained numerous partners in the polar regions and the UK. If we can train OTs, help them test new methods to collect the evidence needed on their priority taxa and set up a reporting structure across a range of UKOTs, this can serve as a proof of concept to expand to all UKOTs and significantly boost UK marine conservation.

See Evidence 1-11 on progress in Annex 4. Some links can also be found where relevant. All the Evidence available will be compiled and attached to the End of Project Report to be submitted by June 2026.

## 2. Project stakeholders/partners

**Antarctic Peninsula, Falkland Islands, South Georgia and the South Sandwich Islands**

The Penguin Watch project was developed in the Falklands, South Georgia and South Sandwich Islands (SGSSI) as well as the Antarctic Peninsula prior to this Darwin Plus project. We now monitor more than 100 sites across all three territories, more than all the other Antarctic Treaty Nations put together. As part of this Darwin Plus project, we have focused on strengthening our existing partnerships to work more strategically with the local NGOs and government to identify the evidence gaps that our monitoring network can address.

- We have worked with the British Antarctic Survey - BAS and joined a Darwin Plus collaborative project DPLUS186 to collect evidence for biodiversity conservation in the South Sandwich Islands for which a final report will be submitted at the end of June 2025. We are also working to bring Dr Susie Grant (BAS Marine Biogeographer) and Dr Claire Waluda (BAS CCAMLR rep) on a joint trip to South Georgia next season to discuss how to best inform the next South Georgia Terrestrial Protected Area review (5-year cycle).
- Based on our knowledge and experience in the field, we have worked with the SGSSI Government to review their drone legislation based on the latest evidence. The legislation will be enforced for the next Antarctic season.
- We are working closely with the Friends of South Georgia, the South Georgia Heritage Trust and Jasmine Lee (research fellow) to host a strategic workshop in September 2025 to discuss the need for an island wide biodiversity census on South Georgia. Our contribution to such an effort would be leading on the monitoring of bird counts.
- Falklands Conservation who is monitoring seabirds year-round on the islands but focuses on different islands. We have donated two drones to the NGO and have provided drone training and data analysis training to Amanda Kuepfer (Seabird Ecologist). We have analysed a subset of their seabird census data and generated a new indicator of population health similar to the living planet index method. Moving forward, Falklands Conservation will be able to reproduce this analysis yearly in order to better address drivers of change.
- Antarctic Peninsula – Together with the British Antarctic Survey, Tom Hart, project leader has provided key evidence of the state of tourism and its impact on Antarctic biodiversity to the UK Parliament. (Evidence: https://committees.parliament.uk/writtenevidence/124734/pdf/ and https://committees.parliament.uk/writtenevidence/130143/pdf). Additionally, we have

created a free WhatsApp group for cruise ship naturalists and researchers to exchange knowledge on the region's conservation efforts. The group is now followed by 412 contributors and active weekly, even off season. Our goal with this group is to lower barriers to stakeholder communications and give both naturalists and researchers access to previously inaccessible knowledge.

Seabird Watch, the smaller offshoot of Penguin Watch has historically been deployed to the UK and the Arctic region. With this Darwin Plus project, we aimed to assist new territories, interested in our automated monitoring method, in deploying cameras and learning to conduct drone surveys as well as storing and analysing the data.

- On Ascension Island, we have been working with the Environment Department staff to deploy time-lapse cameras on key tern and boobie colonies as per the government's conservation priorities. They have also been provided a drone and are now fully trained and permitted to conduct seabird count surveys. This partnership has already resulted in the extension of their terrestrial protected area to protect the boobie colony extension.
- On Montserrat, we have been working closely with the Department of the Environment to deploy time-lapse cameras on key tropicbird colonies as per the government's conservation priorities. Tropicbirds on Montserrat are burrow/crevice nesters, so we are piloting time-lapse camera monitoring for a representative number of nests to provide a basic baseline of reproductive behaviour. However, the cameras have highlighted cats as a significant threat leading to whole colony breeding failure for two years running. We are now working with the government to develop short-term solutions for key breeding sites protection while looking for further funding to start an invasive species control programme. We have also provided a drone and fully trained government staff who are now permitted to conduct seabird count surveys on the island. Finally, following the discovery of least tern breeding attempts on the island (on two separate sites), representing a range extension for the species, we have provided match funding to create a secured breeding platform at one site. If successful, this will be the first confirmed breeding colony on Montserrat and provide us with key data on the species breeding behaviour in the region.
- Finally, on Gibraltar, we have provided a drone and full training to the team of the Gibraltar Botanic Gardens leading the gull census on the island. We have also funded their GVC drone training permitting them to fly over human populated areas as most of their gulls are now breeding in populated areas. On the island, gull populations are closely monitored and controlled to avoid conflict with the airport. With this new tool in hand, the island will be able to better understand breeding behaviour and populations to adapt their species control to other drivers of changes thus avoiding collapse.

## 3. Project progress

### 3.1 Progress in carrying out project Activities

**Output 1 - Marine species health index guidelines established to support the development of partners conservation priorities and UKOTs conservation policy**

1.1 Sign a memorandum of understanding with all the OTs involved.

- Signed by all partners.

1.2 Train field staff to maintain camera networks and fly drones safely and legally.

- All partners have received either or both training depending on identified territory needs.

1.3 Run time-lapse cameras over selected species and sites for at least 2 consecutive years.

- All but one territory have now collected camera data for at least two years. Gibraltar does not have two years of data yet.

1.4 Conduct a drone survey over each species colony for at least 2 consecutive years.

- All but one territory have conducted yearly to monthly drone surveys for at least two consecutive years over key colonies. While Gibraltar has not yet conducted surveys during breeding season, they are now fully trained and accredited. There were unusual

delays for our partners due permitting requirements to fly in Gibraltar over populated areas and near an airport. So far flights were not successful due to the aggressive nature of yellow-legged gulls.

1.5 Historical records collected and processed.

- Historical records, when available, have been collected. We are in the process of collating the information in a format that can be analysed. We are working on a standardised analysis for population data using a hierarchical General Additive Model, for which we can create an automated pipeline in R.

1.6 Project data processed via citizen science platforms (i.e., Penguin Watch, Seabird Watch).

- Yes, all data submitted to us has been processed.

1.7 Raw and processed data (including distribution maps) uploaded on repositories.

- No, in progress. This is why we have requested an extension.

1.8 Health index guidelines agreed among UKOT partners.

- Not signed off, but in progress. This is why we have requested an extension.

1.9 Peer reviewed publications submitted for review (minimum of two publications during the lifespan of the project).

Flynn, C. M., Juarez Martinez, I., Hart, T. & Lynch, H. J. Demographic rates of Adélie penguins from Approximate Bayesian Computation and time-lapse cameras. Ecography, submitted.

Martinez, I. J., Kacelnik, A., Jones, F., Hinke, J., Dunn, M., Raya Rey, A. & Hart, T. Different phenological responses to climate change in three sympatric penguin species. Journal of Animal Ecology in revision.

Jackson, M., Clarkin, E., Ryan, C., Santangelo, M., Stephenson, B., Blakesee, M., Forbes, S., Kirchner, R., Searle Pineda, A., Wolff, A. & Hart, T. The Biodiversity of Peter I Island—The Most Remote Island in the World. *Nature Notes* https://doi.org/10.10012/ece3.7163

Edney, A. J., Danielsen, J., Descamps, S., Jónsson, J. E., Owen, E. Merkel, F., Stefánsson, R. A., Wood, M. J., Jessopp, M. J., & Hart, T. (2024) Using citizen science image analysis to measure seabird phenology. *Ibis* https://doi.org/10.1111/ibi.13317

Edney, A. J., Hart, T., Jessopp, M. J., Banks, A., Clarke, L. E., Cugniere, L., Elliot, K. H., Juarez-Martinez, I., Kilcoyne, A., Murphy, M., Nager, R. G., Ratcliffe, N., Thompson, D. L., Ward, R. M. & Wood, M. J. (2023) Best practice for using drones in seabird monitoring and research. http://marineornithology.org/article?rn=1544

Flynn, C., Hart, T., Clucas, C. & Lynch, H. (2023) Penguins in the anthropause: COVID-19 closures drive gentoo penguin movement among breeding colonies https://doi.org/10.1016/j.biocon.2023.110318

Talis, E.J., Che-Castaldo, C., Hart, T., McRae, L. & Lynch, H. J. (2023) Penguindex: a Living Planet Index for Pygoscelis species penguins identifies key eras of population change. *Polar Biology* https://doi.org/10.1007/s00300-023-03148-2

1.10 Research brief shared with key stakeholders for each significant project findings.

We have shared the changes in the logframe, but all of these have reflected changes requested by partners.

**Output 2 - Artificial Intelligence (AI) tool modified, re-development and tested for new taxa for data processing to speed up access to evidence made accessible in the time frame of the project**

2.1 Finalise the coding and testing of the AI recognition algorithm on Seabird Watch existing data for macaroni and rockhopper penguins as well as shags, cormorants, and boobies.

2.2 Code and start testing a new recognition algorithm for Sooty tern using data collected from Ascension and Least tern for Montserrat during the first two years of the project.

- The AI tool can count any flat image from a time-lapse camera and a drone survey for seabirds if it is not a mixed colony. We have not found a species it could not identify as long as the image quality is good enough for the human eye to identify a bird. An example of the tool is currently hosted here https://huggingface.co/spaces/nikigoli/countgd for collaborators to test any new scenarios. Collaborators in Oxford University are now turning this into a portal that can be used by anyone to bulk analyse their images.

2.3 Challenging project data processed using the algorithm to refine its training.

- Considering the success of our tests, we are now working on making the AI workable on 3D images as well as eggs and chicks. With AI technology fast advancing, our algorithm will probably eventually differentiate species in mixed colonies but that will not be feasible during the lifespan of this project. The algorithm cannot currently count beyond 900. At present we are working on a work around of tiling images to resolve this issue before the tool goes live.

2.4 Produce progress reports to interested UKOT partners.

- Progress to date has been reported during meetings. A formal report will be distributed as soon as the online platform is available (fall 2025).

**Output 3 - Online open access web portal to fill critical knowledge gaps in UKOT and improve policymakers access to marine health research evidence**

3.1 Discuss UKOT gaps and evidence needed to agree on portal requirements.

This has been ongoing. There have been some concerns raised about data access and making analysis directly available to partners. We are working on tools that do this.

3.2 Write and publish a R code for data access.

- Accomplished in Year 1-2.

3.3 Design a front-end and application mapping tools back-end for data entry tools (i.e., portal).

- Complete, but lacking data. This is the main reason we have asked for an extension - we haven't got enough data to demonstrate this and finalise feedback with partners.
- A prototype of the countring software is available here: https://huggingface.co/spaces/nikigoli/countgd
- And a prototype for automated nest detection https://github.com/niki-amini-naieni/CountVid

3.4 Publish and promote an online database for UKOT marine monitoring data to key stakeholders (i.e., governments, conservation NGOs, researchers, and relevant fishing and tourism industry stakeholders).

- We are waiting for a complete working demonstration of this database from the developer so that we can finalise feedback with UKOT partners. However, we are also working on lightweight alternatives following preliminary feedback from a number of the partners. A couple of UKOTs have also expressed concern about data controls. These UKOTs have mentioned that data collected with partners are often controlled by third parties, hard to interpret or simply inaccessible to them. Since the start of this project, advances in AI as well as statistical infrastructure mean that, so long as a data format is agreed, we can use R shiny infrastructure online to process data. This is a fundamental shift in thinking in that the cost and effort in database management is removed and that it puts more control in the hands of UKOT decision makers.

**Output 4 - Establish a cross-UKOTs network aimed at facilitating knowledge exchange, cross-training and lowering barriers to marine predator conservation**

4.1 Host a series of training workshops (yearly) to identify needs, train the trainers locally (e.g., drone use, set up and maintenance of camera network) and, for year 3, define the mechanisms for knowledge exchange between participating partners and project continuation beyond the Darwin Plus grant.

- Accomplished at territory level due to differences in needs and skills. This has encouraged us to find a new path for knowledge exchange. We have been in discussions for the last 8 months with the UKOT Conservation Forum to start a task

force on biodiversity monitoring and knowledge exchange within their framework. All our partners are involved to a degree with the forum and their annual events.

4.2 Make training resources freely available on the project portal.

- Achieved, but not on the project portal. All the documents have been sent by emails to the partners as this is more easily accessible to them due to limited bandwidth. We have developed camera monitoring and drone teaching resources stemming from Edney et al. 2022 and shared these. We have also sought Chartered Institute of Ecology and Environmental Management (CIEEM) accreditation for this course.

4.3 Host regular partner meetings and publish progress reports.

- Yes, we have had two meetings with each of the project partners in the last year. In addition, we hosted Falklands Conservation on an 8-day statistics and camera monitoring course.
- All Darwin Plus reports have been sent to all partners prior to submission.

4.4 Draft network marine monitoring strategy with project partners and present at the UKOTCF conference.

- We are currently working with the UKOTCF to launch a biodiversity monitoring working group which will involve all the partners interested in joining. The first task of the working group will be to draft a UKOT seabird conservation pathway and horizon scan.

## 3.2 Progress towards project Outputs

**Output 1 - Marine species health index guidelines established to support the development of partners conservation priorities and UKOTs conservation policy**

1.1 Monitoring network establishment

The network has been established in all territories.

1.2 Population trend analysis

See worked example from the Falkland Islands - we have developed a hierarchical GAMM and are gaining feedback from other UKOTs to determine whether we can re-apply to other population data to respond to their local decision making needs. Estimation of demographic rates are being reviewed as a methods paper:

Flynn, C. M., Juarez Martinez, I., Hart, T. & Lynch, H. J. Demographic rates of Adélie penguins from Approximate Bayesian Computation and time-lapse cameras. Ecography, submitted.

1.3 Local capacity development

While this is still ongoing, we have provided key training to the partner of four territories, namely Ascension Island (drone training, data processing, time-lapse camera training), Montserrat (drone training, time-lapse camera training), Gibraltar (drone training) and the Falkland Islands (stat training for data analysis). For the other two territories that do not have local partners – SGSSI and the Antarctic Peninsula, the work is conducted by the Project Lead and his team of volunteer researchers.

**Output 2 - Artificial Intelligence (AI) tool modified, re-development and tested for new taxa for data processing to speed up access to evidence made accessible in the time frame of the project**

2.1 Algorithm development

We have been working with the Visual Geometry Group (VGG) in Oxford since 2012 to make AI accessible to image based conservation problems. https://www.robots.ox.ac.uk/~vgg/publications/2016/Arteta16/arteta16.pdf They have published and we have been using the penguin counter since 2016.

More recently, Niki Amini-Naieni, doctoral researcher, has published an updated method applicable to a much wider range of seabirds. https://huggingface.co/spaces/nikigoli/countgd We continue to work with this group to make the algorithm more directly accessible to seabird ecologists (open access online). We (Oxford Brookes University and the VGG) have been nominated for the Earthshot Prize.

We are working on an updated paper and website to take practitioners through the pipeline for image based monitoring.

https://www.authorea.com/doi/full/10.22541/au.162686380.02020424

**Output 3 - Online open access web portal to fill critical knowledge gaps in UKOT and improve policymakers access to marine health research evidence**

3.1 Data access package

Not complete, we are requesting an extension to complete this. We have a beta version, we are populating it with data to test. However, see below.

3.2 Online portal development

A couple of UKOTs have expressed concern about data controls. These UKOTs have mentioned that data collected with partners are often controlled by third parties, hard to interpret or simply inaccessible to them. There are also issues of bandwidth for most of those territories. We aim to complete this deliverable but are also looking at a lightweight alternative that gives the territories more control over their data. Since the start of this project, advances in AI as well as statistical infrastructure mean that, so long as a data format is agreed, we can use R shiny infrastructure online to process data. This is a fundamental shift in thinking in that the cost and effort in database management is removed and that it puts more control in the hands of UKOT decision makers.

3.3 Database completion

We have been discussing the use of the GBIF database (with a personal data portal) as an alternative to our database. This is particularly relevant when considering the upkeep of the platform. While we have built the database, we are also looking at making it lighter weight (see above).

**Output 4 - Establish a cross-UKOTs network aimed at facilitating knowledge exchange, cross-training and lowering barriers to marine predator conservation**

4.1 Field skills transfer

We have now visited all of the UKOT partners and trained them up in the drone survey best practice (Edney et al. 2022) and cameras (Edney et al. 2024). We are still working on the database and data pipeline (non field skills).

4.2 Knowledge exchange network

For the knowledge exchange, we are working with the UK Overseas Territory Conservation Forum http://www.ukotcf.org/ to present two - fold, a short presentation at their meeting in September to present our workflow and gather feedback, then a focussed meeting on timelapse and drone imagery monitoring in spring 2026. We are also proposing a session at the World Seabird Conference in Hobart 2026.

4.3 Regional monitoring strategy

Within Antarctica, we are working with the British Antarctic Survey and the Australian Antarctic Division to develop a regional monitoring strategy. We have been working on one analysis that ingests all count, phenology or reproductive success and reports an index of change.

Waluda, C.M., Bahlburg, D., Collins, M. A., Emmerson, L., Fenney, N., Hart, T., Humphries, G., Johannessen, E. D., Kawaguchi, S., Kelly, N., Kruger, L., Meyer, B., Santa Cruz, F., Santos , M. and the CCAMLR Secretariat (2025) A review of ecosystem monitoring in Subarea 48.1 to identify gaps and inform future enhanced monitoring programmes in support of CCAMLRs conservation objectives. WG-EMM-2025/17

Emmerson, L., Hart, T., Hinke, J., Kim, J-H. Kruger, L., Korczak-Abshire, M., Santos, M.M., Juáres, M. A., Olmastroni, S. Davydenko, S., Milinevsky, G., Waluda, C., Dunn, M. & C. Southwell (2024) Spatial breadth and utility of circum-Antarctic camera network for monitoring seabird breeding colonies as a tool to enhance CEMP WG-EMM-2024/29

Once we have feedback from this approach, we will propose to other UKOTs as part of the UKOTCF meeting.

### 3.3 Progress towards the project Outcome

**Outcome: Produce a field-to-policymaker evidence pipeline enabling UKOT governments and stakeholders to obtain near-real time evidence (local and regional) on marine population trends and reduce monitoring cost**

0.1 Policy integration

While the pipeline is not finalised at this stage our findings have already fed into local policy:

- Ascension Island Terrestrial Protected Area extension
- SGSSI drone legislation review
- Invasive species management review in Montserrat

0.2 Network sustainability

We have submitted a John Ellerman Foundation grant to fund a two-year project aimed at policy development based on Penguin Watch and Seabird Watch data as continuation funding the project currently funded by Darwin Plus. Additionally, we are in discussion with both Ascension Island and Montserrat to submit Darwin Local to address specific findings of this project (i.e., invasive species management for Montserrat and the deployment of a commercial drone with higher operational efficiency to boost terns monitoring on Ascension). We are also in discussion with the South Georgia Heritage Trust and Friends of South Georgia Island to conduct a seabird and survey as part of a whole island biodiversity census.

0.3 Data analysis completion

We are continuing to work on this. As part of a workshop on seabird monitoring in Iceland, we engaged with 15 seabird ecologists including one from our partner at Falklands Conservation. We got hierarchical GAMMs (General Additive Mixed Model) working across a range of scenarios. It reflects the fact that not every site is not counted every year so the true populations cannot just be adding up the counts available yearly but should include the latest estimate of the populations for the uncounted sites as well. We proved this working model and training to Falklands Conservation and analysed all available census data of their Gentoo penguin populations and handed over the analysis and training for them to work with.

### 3.4 Monitoring of assumptions

**Outcome: Produce a field-to-policymaker evidence pipeline enabling UKOT governments and stakeholders to obtain near-real time evidence (local and regional) on marine population trends and reduce monitoring cost**

1. Industry stakeholders and local management agencies are amenable to incorporating the evidence into their conservation strategies and policy.
    a. Holds true. Notably SGSSI and Ascension Islands have updated legislation to account for evidence.
2. Additional evidence available sufficiently improved OTs conservation management capacity to benefit marine predator populations.
    a. This holds true - as above. In addition to this, Montserrat continues to ask for additional help.
3. There is government support for enacting new conservation regulations.
    a. Holds true - this year we have been asked to provide scientific support for drone regulations.
4. Involved policymakers will use the output 3 to inform their decision-making process.
    a. Holds true. Last year we were in the SGSSI MPA review process, this year in the TPA review. Ascension asked for help with booby monitoring.

**Output 1** Marine species health index guidelines established to support the development of partners conservation priorities and UKOTs conservation policy

5. Sufficient data collected for the aggregated evidence to be representative of the key project species populations health.
    a. Holds true for all territories involved and with limitation for Montserrat due to cat predation on camera monitored colonies and Gibraltar due to heightened sensitivity of target species to drones.
6. Partners able to provide access to historical records.
    a. Holds true when existing. In Montserrat historical records were partially lost to the volcanic eruption and are limited to anecdotal species presence and absence.

**Output 2 - Artificial Intelligence (AI) tool modified, re-development and tested for new taxa for data processing to speed up access to evidence made accessible in the time frame of the project**

7. Sufficient data collected to train the computer vision tool for the project species.
    a. Holds true.
8. Existing algorithm works on morphologically similar species with no significant training.
    a. Holds true. The computer vision tool is outperforming original predictions and seems to work on all seabird species involved.

**Output 3 - Online open access web portal to fill critical knowledge gaps in UKOT and improve policymakers access to marine health research evidence**

9. Continued support from local management agencies and industry stakeholders.
    a. This holds true, but we might need to be more flexible with the approach between different OTs. It is possible that one portal will not work for everyone.
10. No technical challenges delay the development of the database.
    a. We have had delays in this. There has been a mismatch between the developer and data providers as to what parameters should look like. We have nearly resolved this.
11. Partners and key stakeholders perceive the value of using the database and agree to support the development and testing of the platform.
    a. Delayed - we need the portal to be live before we can evaluate this.
12. Partners and users are aligned in terms of portal requirements.
    a. Delayed - we need the portal to be live before we can evaluate this.

**Output 4 - Establish a cross-UKOTs network aimed at facilitating knowledge exchange, cross-training and lowering barriers to marine predator conservation**

13. Selection and retention of qualified staff (i.e., trainer) among member organisations.
    a. Holds true, though it is important to highlight that capacity in UK Overseas Territories is stretched which has created delays in the implementation of the project.
14. Practitioners see value in attending and willing to connect and share experience with other territories on seabird monitoring and marine conservation.
    a. Holds true. We will host our first biodiversity monitoring task force meeting in Spring 2026 and will launch the task force at the next UKOT Conservation Forum online conference in September 2025.
15. More UKOT governments are willing to explore the monitoring method and join the network to develop a UKOT-wide Marine Monitoring Strategy and Network (supported by successful project results).
    a. Holds true- but will be determined by the UKOTCF meeting.

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

**Strategic long-term outcomes for the natural environment:** Produce a field-to-policymaker evidence pipeline enabling UKOT governments and stakeholders to obtain near-real time evidence (local and regional) on marine population trends and reduce monitoring cost

- Progress this year to support this outcome:
    - Beta platform to process drone survey for count through artificial intelligence made available to partners
    - GVC drone training for two staff members of the Gibraltar Botanic Gardens for the partner to independently lead on population counts
    - Assisting (time and finance) Montserrat Environment Government in setting up of an artificial platform to encourage Least tern breeding on the island. This effort was introduced after the project lead confirmed least tern breeding on island with egg sightings. Successful breeding is not confirmed yet and the platform will allow both safe breeding for birds attempting to breed on industrial jetty and to study phenology (terns do not nest in place making remote monitoring difficult).
    - GSGSSI drone legislation review to improve disturbance regulations.
    - Ascension Island has been fully independent in conducting monthly surveys of seabird colonies for the last 12 months. We have however provided a PhD student time to assist with peak season drone surveys of the whole island in October 2024.

## 5. Gender Equality and Social Inclusion (GESI)

| 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. | |
| **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 | x |
| **Transformative** | The project has all the characteristics of an 'empowering' approach whilst also addressing unequal power relationships and seeking institutional and societal change | |

Our team of researchers conducting fieldwork for this project in the Falkland Islands, SGSSI and the Antarctic Peninsula was composed of 8 female researchers and 6 males. They all got access to equal training opportunities and out of 7 expeditions, 4 were led by female researchers. Additionally, in Ascension Island, Montserrat and Gibraltar, the main fieldwork conducted by the lead team has a 50/50 balance and our partners across all territories have strong female teams.

Fieldwork on cruise ships and in remote sites can be a stressor and our team have active discussion prior to going and upon return addressing our policy on fieldwork behaviours and what stressors may be encountered and how to address them to the best of our capacity. No issues were reported this year.

## 6. Monitoring and evaluation

The project was evaluated over the last 12 months assessing progress to produce SMART indicators and emerging challenges as well as expenditure. The project submitted two change requests in the last 12 months to update the log frame based on progress and to request a one year no cost extension to finalise results and exit strategy. Despite significant delays in implementation due to emerging challenges (e.g., Montserrat partners off for 12 months to complete an MSc, species level sensitivity to drone surveys, cat predation on target species), the project is on track to produce positive environmental outcomes on all six territories though not necessarily an exact match to the originally planned outcome.

## 7. Lessons learnt

Based on the development of this project and the hurdles faced during implementation, we would suggest a simpler log frame for projects involving numerous territory partners, particularly if a number of those territories are new to the methodology. We have faced a number of delays in implementation due to limited time available of both the lead team and partners but also due to a number of unknowns when deploying our monitoring methods in new territories/new species (e.g., colonies failing due to cat predation as an unknown prior to project, variation in sensitivity of seabirds to drone surveys, no historical records). We would also like to report to the Darwin Plus committee that the level of reporting required for Darwin Plus projects may preclude multi-territory approach altogether.

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

The project is managed using an adaptive strategy based on new findings. This strategy was originally submitted in the proposal to account for the implementation of our monitoring methods in three new territories. As a result, and following discussion with BCF, we have submitted an annual change request with an edited log frame to account for the shifts in implementation to address new findings and risks. The latest review on our log frame pertaining primarily to the wording of Outcomes and Outputs, and certain SMART indicators (feedback on change request submitted in April 2024) was addressed in our change request for a year (no cost) extension approved in June 2025. No feedback was provided for the latest log frame submitted. The lead team and our partners have found this process taxing in terms of reporting load using our little time available to constantly try to reformulate SMART indicators based on reviews instead of focusing on project implementation. We also seem to be marked down for this approach in the feedback.

## 9. Risk Management

No emerging risk was identified in the last 12 months.

## 10. Scalability and durability

As part of the project, we have supplied 4 drones to the Falkland Islands, Gibraltar, Montserrat and Ascension Island and provided the appropriate training for the partners to conduct drone seabird surveys for population counts yearly. Three out of the four territories have been conducting regular drone surveys over the last 2 years with Gibraltar having further requirements for training (due to flights in airport/populated areas) and species sensitivity to drones delaying surveys. Additionally, our team has been leading the drone survey for SGSSI, the Antarctic Peninsula and part of the Falkland Islands where no partner is present on sites. Finally, Ascension and Montserrat have received time-lapse camera training as well as data analysis training in order for them to become fully autonomous at the end of the project. However, we aim to remain involved with all partners and find further funding opportunities to further develop the monitoring network on Ascension and Montserrat. We are working on a data agreement beyond the lifespan of the project so that territories can process the data using our tools. We do not own any rights to their data but could ask permission to use it in aggregated forms for regional trend studies in the future.

## 11. Darwin Plus identity

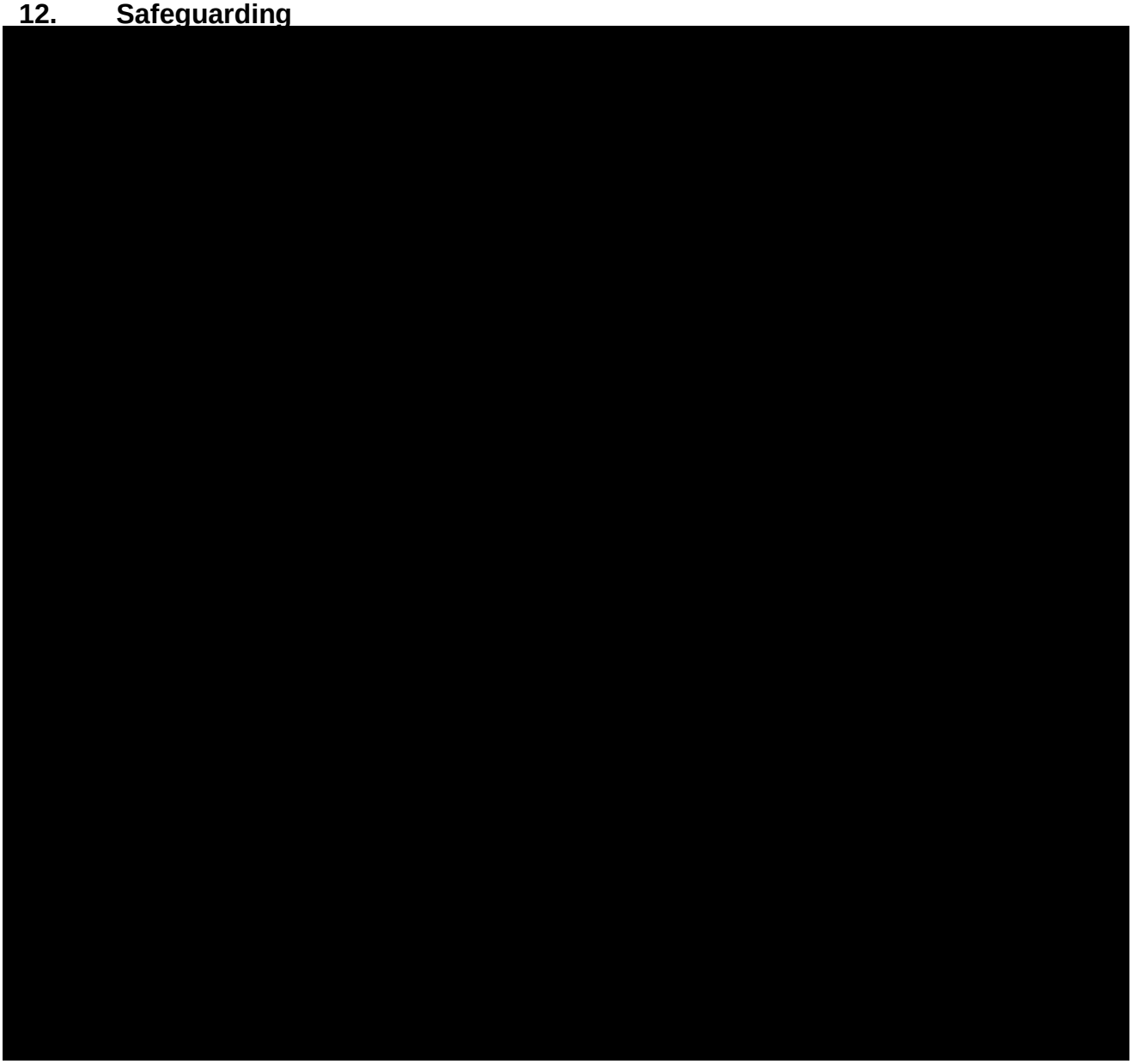
The Darwin Plus logo is included on the research page of Penguin Watch citizen science and it will also be available on our new engagement platform targeted at decision-makers and citizen scientists to be launched in July 2025. Additionally, although the Penguin Watch social media platforms are currently paused due to ethical concerns and time commitment, some of our partners like the Ascension Government have tweeted our visits.

As part of this Darwin Plus project, we have created a knowledge exchange WhatsApp group for researchers and tour operators naturalists to share knowledge. The platform is now followed by over 400 members and is active weekly. Members typically share the latest research, ask questions about latest research findings and community held knowledge. The funding source for this project is acknowledged in the group description prior to

Our fieldwork researchers have also conducted Power Point presentation on our research to guest onboard cruise ships with three different tour operators over seven separate expeditions in the Southern Ocean between December 2024 and January 2025 (i.e., Lindblad Expeditions-National Geographic, Quark Expeditions and Hurtigruten Expeditions). The Darwin Plus logo featured on all presentations.

Finally, we have been working on developing an online engagement platform targeting our citizen scientists, decision-makers and the general public on which Darwin Plus features as an organisation supporting our seabird research.

## 12. Safeguarding



[redacted]

## 13. Project expenditure

**Table 1: Project expenditure during the reporting period (1 April 2024 – 31 March 2025)**

| Project spend (indicative) in this financial year | 2024/25 D+ Gran (£) | 2023/25 Total actual D+ Costs (£) | Variance % | Comments (please explain significant variances) |
|---|---|---|---|---|
| Staff costs | [redacted] | | | |
| Consultancy costs | | | | |
| Overhead Costs | | | | |
| Travel and subsistence | | | | |
| Operating Costs | | | | |
| Capital items | | | | |
| Others (Please specify) | | | | |

| | | | | |
|---|---|---|---|---|
| | [redacted] | | | |
| Audit costs | | | | |
| **TOTAL** | **98,931** | **102,900.81** | | |

[redacted]

**Table 2: Project mobilised or matched funding during the reporting period (1 April 2024 – 31 March 2025)**

| | Secured to date | Expected by end of project | Sources |
|---|---|---|---|
| Matched funding leveraged by the partners to deliver the project (£) | [redacted] | | |
| Total additional finance mobilised for new activities occurring outside of the project, building on evidence, best practices and the project (£) | | | |

## 14. Other comments on progress not covered elsewhere

The project log frame has been refined in the last 12 months to account for last year change request review as well as adaptive management strategies. The year extension will allow us to focus on producing results as well as setting up an exit strategy involving additional funding (e.g., grant proposal with the South Georgia Heritage Trust, Darwin Local with Montserrat, John Ellerman Foundation grant for policy lobby) as well as the launch of a UKOT-wide biodiversity monitoring task force co-hosted with UKOT Conservation Forum.

The main issue faced by our project is limited time available to implement a large-scale monitoring method on multiple territories over only a 3-year project. The chance of starting from partnership development to end with sufficient data to produce ecological changes in that period is challenging.

One of the main hurdles faced is the administrative burden related to an adaptive project. If we were to envision a similar project, we would have to downscale the outputs and anticipated outcomes significantly to allocate sufficient staff time to change requests and reporting.

## 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 to edit and use the following for various promotional purposes (please leave this line in to indicate your agreement to use any material you provide here).

Outstanding achievements:

- Ascension Island - Boobi protected area extension in Ascension with the incredible work of our partners and the support of drone evidence collected as part of this project.
- South Georgia and the South Sandwich Islands - SGSSI Government drone legislation update
- Project lead testimony to the Environmental Committee of the UK Parliament reporting on the state of Antarctic's biodiversity which was in part based on the data collected as part of this Darwin Plus project

Photos and videos for publicity are available upon request.

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

- **Annex 1: Report of progress and achievements against logframe for Financial Year 2024-2025**

| Project summary | Progress and Achievements April 2024 - March 2025 | Actions required/planned for next period |
|---|---|---|
| **Impact**<br><br>**Establish a cost-effective, near real-time marine monitoring system across 6 UK Overseas Territories that directly informs policy decisions and improves conservation outcomes by May 2027.** | | |
| **Outcome**<br><br>**Produce a field-to-policymaker evidence pipeline enabling UKOT governments and stakeholders to obtain near-real time evidence (local and regional) on marine population trends and reduce monitoring cost** | | |

| | | |
|---|---|---|
| Outcome indicator<br><br>0.1 Policy Integration | **Progress:** Pipeline findings have already influenced local policy decisions in multiple territories:<br><br>Ascension Island Terrestrial Protected Area extension<br><br>SGSSI drone legislation review<br><br>Invasive species management review in Montserrat Evidence demonstrates early policy impact despite pipeline still being finalized. | Present workflow at UKOTCF meeting in September 2025, establish focused monitoring meeting for spring 2026, propose session at World Seabird Conference in Hobart 2026. |
| Outcome indicator<br><br>0.2 Network Sustainability | **Progress**: multiple funding applications submitted for continuation including,<br><br>John Ellerman Foundation grant for two-year policy development project,<br><br>Darwin Local discussions with Ascension Island and Montserrat for specific conservation actions,<br><br>Partnerships with South Georgia Heritage Trust for whole island biodiversity census,<br><br>Secured funding from private donors and HX Hurtigruten Expeditions to conduct a whole island survey on Saunders in the Falklands. | Secure continuation funding, formalize partnerships through UKOTCF framework, establish sustainable monitoring protocols. |

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| Outcome indicator<br><br>0.3 Data Analysis Completion | **Progress**:<br>Model for population trend analysis generated and being presented to partners for approval. AI fully functioning. | Feeding data collected into models and AI in Year 4. |
| **Output 1**<br><br>**Marine species health index guidelines established to support the development of partners conservation priorities and UKOTs conservation policy** | | |
| Output indicator 1.1<br><br>Monitoring Network Establishment | **Progress**: Network established in all 6 territories. All partners signed memorandums of understanding. Camera networks operational for 2+ years in all territories except Gibraltar. Drone surveys conducted for 2+ consecutive years in most territories, with Gibraltar now fully trained and accredited. | Completed |

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| Output indicator 1.2<br><br>Population Trend Analysis | **Progress**: Hierarchical GAMM developed for population trend analysis, demonstrated with Falkland Islands data. Multiple peer-reviewed publications submitted/published (7 publications to date). AI algorithm successfully counting seabirds across species when image quality permits.<br><br>Developed hierarchical General Additive Model for standardized population analysis with automated R pipeline. Demographic rate estimation methods under peer review. Historical records collected and being standardized for analysis. | Complete data repository uploads, finalize automated analysis pipeline, launch user-friendly online portal with R Shiny infrastructure. |
| Output indicator 1.3<br><br>Local Capacity Development | **Progress**: Training provided to 4 territories (Ascension Island, Montserrat, Gibraltar, Falkland Islands) in drone operations, camera monitoring, and statistical analysis. Training resources developed and shared, seeking CIEEM accreditation for courses. | More training to be provided as needs arise in year 4. |
| **Output 2.**<br><br>**Artificial Intelligence (AI) tool modified, re-development and tested for new taxa for data processing to speed up access to evidence made accessible in the time frame of the project** | | |

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| Output indicator 2.1.<br><br>Algorithm Development | **Progress**: The AI tool successfully counts seabirds from time-lapse cameras and drone surveys for any species in non-mixed colonies. Tool hosted at https://huggingface.co/spaces/nikigoli/countgd for collaborator testing. Oxford University VGG is developing an open access user portal for bulk image analysis with our support. Algorithm being enhanced for 3D images, eggs, and chicks. Current limitation: cannot count beyond 900 individuals. | Address counting 900 limitations, develop capability for mixed colonies, complete online platform launch (fall 2025), publish updated methodology paper. |
| **Output 3.**<br><br>**Online open access web portal to fill critical knowledge gaps in UKOT and improve policymakers access to marine health research evidence** | | |
| Data Access Package | **Progress**: Front-end and back-end design complete. Addressing partner concerns about data control and accessibility. Exploring lightweight R Shiny alternative that provides more territorial control over data. Considering GBIF database integration for sustainability. | To be completed in year 4. |
| Online Portal Development | **Progress**: R code for data access completed in Years 1-2. Beta version of portal developed but requires data population for testing. | Finalise feedback with collaborators |

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| Database Completion | **Progress**: Database built but exploring lighter-weight alternatives due to bandwidth limitations and data sovereignty concerns from partners. Working on enhanced data control features. | Launch working demonstration, finalize partner feedback, implement enhanced data control features, complete database population. |
| **Output 4.**<br><br>**Establish a cross-UKOTs network aimed at facilitating knowledge exchange, cross-training and lowering barriers to marine predator conservation** | | |
| Field Skills Transfer | **Progress**: All UKOT partners visited and trained in drone survey best practices and camera monitoring. Training resources shared via email due to bandwidth limitations. Hosted 8-day statistics and camera monitoring course for Falklands Conservation. | Completed. |
| Knowledge Exchange Network | **Progress**: Working with the UKOT Conservation Forum to establish a biodiversity monitoring task force. All partners involved with forum activities. Regular partner meetings conducted (two meetings per territory in last year). | Launch UKOTCF biodiversity monitoring working group, present at UKOTCF meeting September 2025, host focused monitoring meeting spring 2026. |

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| Regional Monitoring Strategy | **Progress**: Antarctic regional strategy development with British Antarctic Survey and Australian Antarctic Division. Comprehensive ecosystem monitoring review completed for CCAMLR. Circum-Antarctic camera network utility assessment published. | Propose regional approach to other UKOTs following UKOTCF meeting feedback, draft UKOT seabird conservation pathway and horizon scan. |

- **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:** Establish a cost-effective, near real-time marine monitoring system across 6 UK Overseas Territories that directly informs policy decisions and improves conservation outcomes by May 2027. | | | |
| **Outcome:**<br><br>Produce a field-to-policymaker evidence pipeline enabling UKOT governments and stakeholders to obtain near-real time evidence (local and regional) on marine population trends and reduce monitoring cost | ■ **0.1 Policy Integration**<br><br>All 6 UKOTs formally revise policy/strategy related to marine conservation to incorporate specific evidence from the monitoring project.<br><br>100% of UKOTs' marine strategies contain at least 3 direct references to project data findings.<br><br>Provide tailored policy briefs and draft language for each UKOT.<br><br>Revisions address territory-specific conservation priorities identified in baseline assessment.<br><br>Complete all strategy revisions by Q1 Y3, validated through formal decision-maker survey by project end (May 2027).<br><br>■ **0.2 Network Sustainability**<br><br>■ At least 4 of 6 UKOTs (66%) issue formal commitments to maintain the camera network beyond project end. | 0.1 Comprehensive review of the latest version of the Marine Conservation Strategy of each participating OT.<br><br>0.2 Interview of partners and Overseas Territories government (baseline at the beginning of the project and again by project end).<br><br>0.3 Produced evidence uploaded to output 3. | Industry stakeholders and local management agencies are amenable to incorporating the evidence into their conservation strategies and policy.<br><br>Additional evidence available sufficiently improved OTs conservation management capacity to benefit marine predator populations.<br><br>There is government support for enacting new conservation regulations.<br><br>Involved policymakers will use the output 3 to inform their decision-making process. |

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| | Signed memoranda of understanding or budget allocations from UKOT governments.<br><br>Develop territory-specific sustainability plans with tiered maintenance options.<br><br>Commitments include specific budget lines or staff allocations for ongoing operations.<br><br>Secure initial commitments by Q3 Y2, finalize all agreements by project end (May 2027).<br><br>■ **0.3 Data Analysis Completion**<br><br>Process and analyse a complete 12-month cycle of monitoring data from all camera sites across all 6 UKOTs.<br><br>Full dataset covering breeding and non-breeding seasons with population metrics for targeted species.<br><br>Deploy phased analysis approach with quarterly processing milestones.<br><br>Analysis covers priority species identified in baseline conservation assessments.<br><br>Complete full dataset analysis by Q4 Y2, with final report delivery by project end (May 2027). | | |

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| **Output 1**<br><br>Marine species health index guidelines established to support the development of partners conservation priorities and UKOTs conservation policy | ■ **1.1 Monitoring Network Establishment**<br><br>Install and maintain 3-5 camera stations per UKOT (18-30 total) that continuously monitor seabird colonies.<br><br>>90% uptime for camera network with daily data transmission to central servers.<br><br>Deploy in phases with technical support from the project team.<br><br>Camera locations selected based on colony importance and species diversity.<br><br>First installations by Q2 Y1, all sites operational by Q2 Y2, complete year of data collection by Q4 Y2.<br><br>■ **1.2 Population Trend Analysis**<br><br>Generate statistically robust population trends for minimum 2 priority seabird species per UKOT.<br><br>Trend reports with confidence intervals and power analysis to detect 10% population change.<br><br>Integrate historical records with new monitoring data using standardized methods. | 1.1 a) Baseline and at least one breeding season worth of monitoring data collected (i.e., colony distribution maps counts and raw) processed and data freely available on project evidence portal and known repositories like MAPPPD, UK Polar Data Centre, Montserrat Data Centre and IMS-GIS Data Centre.<br><br>1.1 b) Health index methodology made available online.<br><br>1.2 a) Peer reviewed publications (minimum 2) produced alongside local authors made available online.<br><br>1.2 b) Research briefs summarising the methodology and evidence sent to the relevant UKOT Governments staff.<br><br>1.3 a) Guidelines on training workshops for the trained trainer made available by Y3 to all territories.<br><br>1.3 b) Post-training skill self-assessment by partners by the end of Y3. | Sufficient data collected for the aggregated evidence to be representative of the key project species populations health.<br><br>Partners able to provide access to historical records. |

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| | Focus on IUCN Red-Listed species and/or those of economic/cultural importance.<br><br>Preliminary trends by Q3 Y2, final trend analysis completed by Q2 Y3.<br><br>■ **1.3 Local Capacity Development**<br><br>Train 1-2 local staff per UKOT in camera maintenance, data collection and processing protocols.<br><br>Staff demonstrate competency through skills assessment and independent operation.<br><br>Conduct structured training programs with ongoing remote support.<br><br>Training tailored to local infrastructure and technical capacity.<br><br>Initial training completed by Q3 Y1, refresher training in Q1 Y2, final assessment by Q1 Y3. | | |
| **Output 2**<br><br>Artificial Intelligence (AI) tool modified, re-development and tested for new taxa for data processing to speed up access to evidence made accessible in the time frame of the project | ■ **2.1 Algorithm Development**<br><br>Adapt and optimize computer vision algorithms for 5 target seabird taxa (sooty terns, macaroni/rockhopper penguins, shags/cormorants, and boobies). | 2.1 AI data processing tool made available to OT Governments and practitioners to speed up use of evidence from the field and challenging data processed through this tool.<br><br>Progress report to steering committee. | Sufficient data collected to train the computer vision tool for the project species.<br><br>Existing algorithm works on morphologically similar species with no significant training. |

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| | The algorithm achieves >85% accuracy in species identification and >90% in counting individuals.<br><br>Build on existing Seabird Watch algorithm with additional training data.<br><br>Algorithms calibrated for region-specific conditions and species.<br><br>Initial algorithms by Q3 Y1, refined versions by Q2 Y2, final optimized algorithms by Q4 Y2. | | |
| **Output 3**<br><br>Online open access web portal to fill critical knowledge gaps in UKOT and improve policymakers access to marine health research evidence | ■ **3.1 Data Access Package**<br><br>Develop and release R functions enabling standardized access to monitoring data.<br><br>10+ functions for data retrieval, visualization, and basic analysis.<br><br>Build on existing statistical frameworks with project-specific extensions.<br><br>Functions aligned with analytical needs identified in baseline assessment.<br><br>Alpha version within 4 months of project start, beta release by month 6, final package with documentation by month 8.<br><br>■ **3.2 Online Portal Development** | 3.1 Open access publication of R package in The Comprehensive R Archive Network (CRAN).<br><br>3.2 a) Partner workshop feedback.<br><br>3.2 b) Link to functional open access web portal promoted to relevant stakeholders on partner websites.<br><br>3.3 a) Portal visitation statistics and number of downloads of research briefs.<br><br>3.3 b) Data collected during the lifespan of the project uploaded on the portal. | Continued support from local management agencies and industry stakeholders.<br><br>No technical challenges delay the development of the database.<br><br>Partners and key stakeholders perceive the value of using the database and agree to support the development and testing of the platform.<br><br>Partners and users are aligned in terms of portal requirements. |

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| | Create user-friendly web portal for data visualization and reports.<br><br>Portal passes QA testing with <3 critical bugs and achieves >80% satisfaction in partner feedback.<br><br>Use agile development with regular stakeholder input.<br><br>Interface design based on stakeholder needs assessment.<br><br>Developer testing by Q3 Y2, partner beta testing by Q4 Y2, final release by Q1 Y3.<br><br>■ **3.3 Database Completion**<br><br>Establish a comprehensive database with analyzed data from all monitoring sites.<br><br>The database contains complete processed data from at least one breeding season per site, including aerial survey imagery.<br><br>Implement phased data migration strategy with quality controls.<br><br>Data structure optimized for policy-relevant queries.<br><br>Database architecture complete by Q3 Y1, migration by Q2 Y2, complete with one breeding season by Q4 Y2. | | |

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| **Output 4**<br><br>Establish a cross-UKOTs network aimed at facilitating knowledge exchange, cross-training and lowering barriers to marine predator conservation | ■ **4.1 Field Skills Transfer**<br><br>Train at least one field staff per UKOT in drone operation and camera maintenance.<br><br>Staff achieve certification in drone operation and demonstrate camera troubleshooting skills.<br><br>Conduct hands-on training followed by supervised practice.<br><br>Training adapted to specific equipment deployed in each territory.<br><br>Initial training in Q3-Q4 Y1, follow-up sessions in Q1-Q2 Y2, final certification by Q4 Y2.<br><br>■ **4.2 Knowledge Exchange Network**<br><br>Establish a formal network with representatives from each UKOT government and field team.<br><br>The network includes a minimum 12 active members (2 per UKOT) who participate in quarterly exchanges.<br><br>Build on existing regional relationships with formalized structure.<br><br>Membership based on direct involvement in monitoring and policy application. | 4.1 Workshop materials including partner letters and training resources.<br><br>4.2 Network terms of references and strategy, including list of members and coordinator position filled (local partner secondment).<br>4.3 Strategy made available online and promoted on the data portal.<br><br>4.4 End of project workshop report.<br><br>4.5 Draft strategy sent to key stakeholders at each UKOT government and abstract for a workshop at the UKOTCF international environmental conference. | Selection and retention of qualified staff (i.e., trainer) among member organisations.<br><br>Practitioners see value in attending and willing to connect and share experience with other territories on seabird monitoring and marine conservation.<br><br>More UKOT governments are willing to explore the monitoring method and join the network to develop a UKOT-wide Marine Monitoring Strategy and Network (supported by successful project results). |

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| | Network structure defined by Q2 Y2, members selected by Q3 Y2, fully operational by Q1 Y3.<br><br>■ **4.3 Regional Monitoring Strategy**<br><br>Develop comprehensive UKOT-wide Marine Monitoring Strategy incorporating project methodologies.<br><br>The strategy document includes an implementation roadmap with resource requirements for each UKOT.<br><br>Draft collaboratively with input from all partners.<br><br>Strategy addresses specific monitoring challenges identified during the project.<br><br>Initial outline by Q2 Y2, draft for review by Q4 Y2, final document presented at UKOTCF by Q2 Y3. | | |

**Activities**

**1. Marine species health index guidelines established to support the development of partners conservation priorities and UKOTs conservation policy**

1.1 Sign a memorandum of understanding with all the OTs involved.
1.2 Train field staff to maintain camera networks and fly drones safely and legally.
1.3 Run time-lapse cameras over selected species and sites for at least 2 consecutive years.
1.4 Conduct a drone survey over each species colony for at least 2 consecutive years.
1.5 Historical records collected and processed.
1.6 Project data processed via citizen science platforms (i.e., Penguin Watch, Seabird Watch).
1.7 Raw and processed data (including distribution maps) uploaded on repositories.
1.8 Health index guidelines agreed among UKOT partners.
1.9 Peer reviewed publications submitted for review (minimum of two publications during the lifespan of the project).

1.10 Research brief shared with key stakeholders for each significant project findings.

**2. Artificial Intelligence (AI) tool development for data processing to speed up access to evidence made accessible in the time frame of the project**

2.1 Finalise the coding and testing of the AI recognition algorithm on Seabird Watch existing data for macaroni and rockhopper penguins as well as shags, cormorants, and boobies.

2.2 Code and start testing a new recognition algorithm for Sooty tern using data collected from Ascension and Least tern for Montserrat during the first two years of the project.

2.3 Challenging project data processed using the algorithm to refine its training.

2.4 Produce progress reports to interested UKOT partners.

**3. Online open access web portal to fill critical knowledge gaps in UKOT and improve policymakers access to marine health research evidence**

3.1 Discuss UKOT gaps and evidence needed to agree on portal requirements.

3.2 Write and publish a R code for data access.

3.3 Design a front-end and application mapping tools back-end for data entry tools (i.e., portal).

3.4 Publish and promote an online database for UKOT marine monitoring data to key stakeholders (i.e., governments, conservation NGOs, researchers, and relevant fishing and tourism industry stakeholders).

**4. Establish a cross-UKOTs network aimed at facilitating knowledge exchange, cross-training and lowering barriers to marine predator conservation**

4.1 Host a series of training workshops (yearly) to identify needs, train the trainers locally (e.g., drone use, set up and maintenance of camera network) and, for year 3, define the mechanisms for knowledge exchange between participating partners and project continuation beyond the Darwin Plus grant.

4.2 Make training resources freely available on the project portal.

4.3 Host regular partner meetings and publish progress reports.

4.4 Draft network marine monitoring strategy with project partners and present at the UKOTCF conference.

## ■ Table 2 Publications

| Title | Type<br>(e.g. journals, best practice manual, blog post, online videos, podcasts, CDs) | Detail<br>(authors, year) | Gender of Lead Author | Nationality of Lead Author | Publishers<br>(name, city) | Available from<br>(e.g. weblink or publisher if not available online) |
|---|---|---|---|---|---|---|
| Demographic rates of Adélie penguins from Approximate Bayesian Computation and time-lapse cameras | Journal | Flynn, C. M., Juarez Martinez, I., Hart, T. & Lynch, H. J.<br>2025 | Female | USA | Ecography | In revision |
| Different phenological responses to climate change in three sympatric penguin species | Journal | Martinez, I. J., Kacelnik, A., Jones, F., Hinke, J., Dunn, M., Raya Rey, A. & Hart, T.<br>2025 | Male | Spain | Journal of Animal Ecology | In revision |
| The Biodiversity of Peter I Island—The Most Remote Island in the World | Journal | Jackson, M., Clarkin, E., Ryan, C., Santangelo, M., Stephenson, B., Blakesee, M., Forbes, S., Kirchner, R., Searle Pineda, A., Wolff, A. & Hart, T.<br>2025 | Female | UK | Nature Notes | https://doi.org/10.10012/ece3.7163 |
| Using citizen science image analysis to measure seabird phenology | Journal | Edney, A. J., Danielsen, J., Descamps, S., Jónsson, J. E., Owen, E. Merkel, F., Stefánsson, R. A., Wood, M. J., Jessopp, M. J., & Hart, T.<br>2024 | Female | UK | Ibis | https://doi.org/10.1111/ibi.13317 |
| Best practice for using drones in seabird monitoring and research | Journal | Edney, A. J., Hart, T., Jessopp, M. J., Banks, A., Clarke, L. E., Cugniere, L., Elliot, K. H., Juarez-Martinez, I., Kilcoyne, A., Murphy, M., Nager, R. G., Ratcliffe, N., Thompson, D. | Female | UK | Marine Ornithology | http://marineornithology.org/article?rn=1544 |

| Title | Type<br>(e.g. journals, best practice manual, blog post, online videos, podcasts, CDs) | Detail<br>(authors, year) | Gender of Lead Author | Nationality of Lead Author | Publishers<br>(name, city) | Available from<br>(e.g. weblink or publisher if not available online) |
|---|---|---|---|---|---|---|
| | | L., Ward, R. M. & Wood, M. J.<br>2023 | | | | |
| Penguins in the anthropause: COVID-19 closures drive gentoo penguin movement among breeding colonies | Journal | Flynn, C., Hart, T., Clucas, C. & Lynch, H.<br>2023 | Female | USA | Biological Conservation | https://doi.org/10.1016/j.biocon.2023.110318 |
| Penguindex: a Living Planet Index for Pygoscelis species penguins identifies key eras of population change | Journal | Talis, E.J., Che-Castaldo, C., Hart, T., McRae, L. & Lynch, H. J.<br>2023 | Female | USA | Polar Biology | https://doi.org/10.1007/s00300-023-03148-2 |
| | | | | | | |

## 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, scheme, 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. | - |
| **Is your report more than 10MB?** If so, please consider the best way to submit. One zipped file, or a download option, is recommended. We can work with most online options and will be in touch if we have a problem accessing material. If unsure, please discuss with BCF-Reports@niras.com about the best way to deliver the report, putting the project number in the Subject line. | 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 provided an updated risk register?** If you have an existing risk register you should provide an updated version alongside your report. If your project was funded prior to this being a requirement, you are encourage to develop a risk register. | - |
| If you are submitting photos for publicity purposes, do these meet the outlined requirements (see section 15)? | - |
| 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. | |