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

Darwin Plus Project Information

Project reference	DPLUS120
Project title	Spatial segregation of seabirds at South Georgia
Territory(ies)	South Georgia
Lead Partner	British Antarctic Survey
Project partner(s)	Birdlife international
Darwin Plus grant value	£269,233
Start/end dates of project	1 March 2021-31 October 2024
Reporting period (e.g. Apr 2022-Mar 2023) and number (e.g. Annual Report 1, 2)	April 2021-March 2022
Project Leader name	Victoria Warwick-Evans[1]
Project website/blog/social media	Project website: https://www.bas.ac.uk/project/spatial-segregation-of-seabirds-at-south-georgia/ News stories: https://www.bas.ac.uk/media-post/tracking-of-vulnerable-seabirds-reveals-difference-in-foraging-patterns/ https://www.acap.aq/latest-news/british-antarctic-survey-study-shows-significant-differences-in-feeding-patterns-across-white-chinned-petrel-colonies-in-south-atlantic
Report author(s) and date	Richard Phillips

[1]On maternity leave since Nov. 2022. Project paused since then except for fieldwork undertaken by the Co-I.

1. Project summary

Despite measures to minimise bycatch of South Georgia's globally important populations of seabirds, albatross and petrel populations are still declining, and at different rates across the archipelago. We are using biologging devices to track albatrosses and petrels from different colonies. We aim to characterise variation among colonies in overlap of birds with fishing fleets during the breeding and non-breeding seasons, identify high-risk areas, and provide a more focussed approach for engaging with fisheries managers to better understand and address impacts of bycatch on these threatened species.

2. Project stakeholders/partners

Since the start of the project in March 2021, we have engaged with the project partners primarily via email. We also discussed the project at the Government of South Georgia and South Sandwich Islands (GSGSSI) stakeholder meeting. The project partners are aware of the amended timescale of the project and the pause in the analyses while the project leader is on maternity leave. We had frequent dialogue with GSGSSI on logistics, ship time and other aspects of planning for the recent field season (which went smoothly). The level of engagement with stakeholders and partners will increase once the project leader is back from maternity leave, particularly as there will be more results to discuss and disseminate.

3. Project progress

3.1 Progress in carrying out project Activities

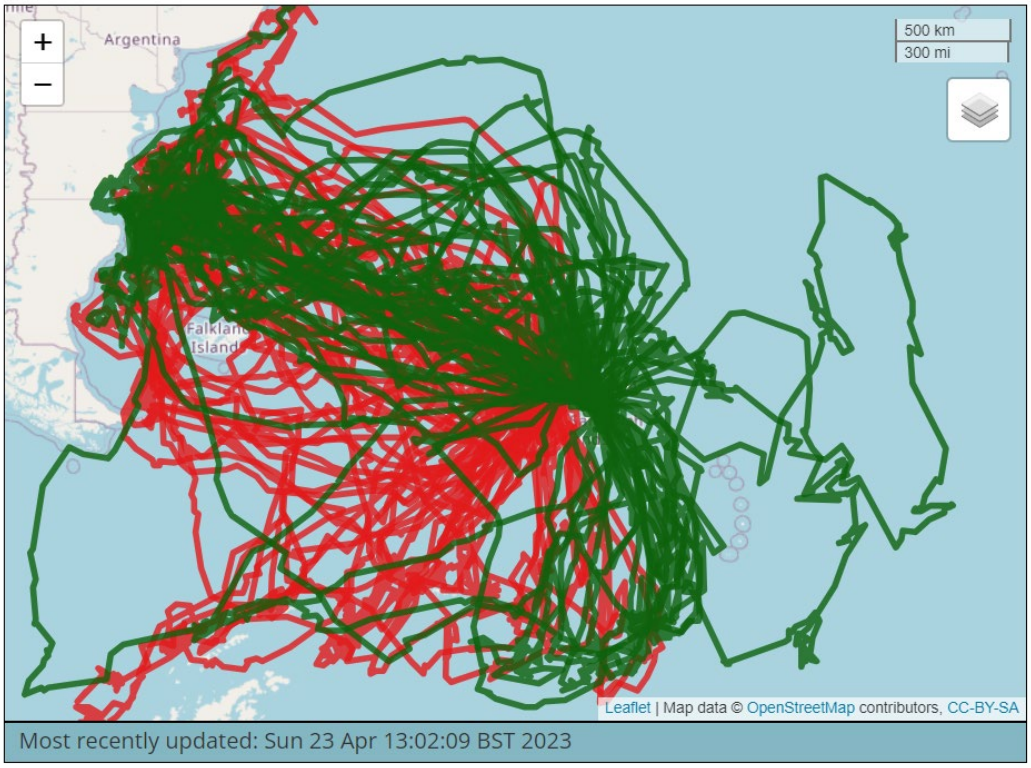
We had a very successful 2nd field season in 2022/23, deploying devices on northern and southern giant petrels, and white-chinned petrels at Bird Island and sites in the Cumberland Bay area (Maiviken, Harpon and King Edward Point) on mainland South Georgia, and retrieving archival, leg-mounted geolocator-immersion (Global Location Sensor or GLS) device deployed last season at Bird Island, Prion Island and Cooper Island. Details as follows.

Back-mounted satellite transmitters (Platform Terminal Transmitters) were deployed on white-chinned petrels at King Edward Point (n = 13) and Bird Island (n = 12) during the late incubation period. These transmit in near real-time and we set up an updating map on the project website as part of the public outreach (Fig. 1). Remote-download GPS loggers were deployed during the incubation/brood-guard period on 14 northern giant petrels and 14 southern giant petrels at Harpon/Maiviken. To enable the between-site comparison, archival/remote-download GPS were deployed on 70 northern giant petrels and 73 southern giant petrels and provided tracking data during the incubation, brood-guard and post-guard chick rearing periods at Bird Island. Remote-download GPS loggers were used at Harpon and Maiviken to avoid the need to recapture birds which was not practical at those sites, and at Bird Island during chick-rearing when nest attendance is very low and recapture is also challenging. The satellite transmitters and remote-download GPS loggers provided data on movements of breeding birds for a mean of 45 days (northern and southern giant petrels) and 60 days (white-chinned petrels).

All tracked giant petrels and white-chinned petrels were also fitted with a leg-mounted geolocator-immersion (Global Location Sensor or GLS) device to record at-sea activity patterns (timing of flights and landings). These devices were left on all birds tracked in the Cumberland Bay area and 30+ white-chinned petrels, southern giant petrels and northern giant petrels at Bird Island. They will be retrieved in the 2023/24 summer and enable a comparison of distribution, activity patterns and overlap with fisheries during the nonbreeding season.

In total, 14 out of 20 GLS loggers deployed last season were retrieved from nonbreeding wandering albatrosses at Prion Island, and 30+ GLS loggers were retrieved from wandering albatrosses at Bird Island. The retrieval rate at Prion Island is higher than we expected, and the sample sizes are sufficient for a robust comparison of distribution, habitat use and fisheries overlap during the nonbreeding season.

Fig. 1. Map showing the routes of white-chinned petrels tracked with satellite transmitters from Dec. 2022 to April 2023 from (a) King Edward Point (green), and (b) Bird Island (red).



Twenty GLS loggers were retrieved from white-chinned petrels at Bird Island, but only one of 11 GLS loggers deployed last season on white -chinned petrels at Cooper Island was retrieved on the single ship call by the MV Pharos SG. The ten other burrows at Cooper Island marked in the 2021/22 season were relocated, but had either collapsed, were empty, or the other partner was present, hence the low GLS retrieval rate. However, retrieval rates should be much higher at KEP next season as burrows can be visited on multiple occasions. Hence there should still be sufficient data to compare distribution, fisheries overlap etc. of white-chinned petrels from two sites at South Georgia (Bird Island and KEP) before the end of the project.

Good progress was made on analyses until the project was paused in mid-November 2022. We completed the habitat models for breeding wandering albatrosses tracked from Bird Island and Prion Island, and showed there to be marked inter-colony variation in at-sea distributions (Output 1). We also mapped and quantified the overlap between wandering albatrosses and different fisheries during the breeding season and identified high-risk areas where bycatch may be of particular concern (Output 2). These results were presented at the 15th International Seabird Group conference in August, and a manuscript is well-advanced. The project leader plans to complete the manuscript shortly after her return from maternity leave. The manuscript will be provided to stakeholders, including GSGSSI, for comment, and submitted to a high-impact peer-reviewed journal as well as working groups at the next meeting of the Advisory Committee of the Agreement on the Conservation of Albatrosses and Petrels.

3.2 Progress towards project Outputs

Outputs 1 and 2. Habitat preferences of white-chinned petrels and wandering albatrosses from different colonies during the breeding and non-breeding seasons are identified, and inter-colony variation in their at-sea distributions is characterised. We have made good progress towards this output, with the successful collection to date of breeding-season tracking data from wandering albatrosses at Bird Island and Prion Island, white-chinned petrels at Bird Island, King Edward Point and Cooper Island, and northern giant petrels and southern giant petrels at Bird Island and Cumberland Bay. Non-breeding season

tracking data have already been collected, or will be collected, from all these species-site combinations except for white-chinned petrels at Cooper Island.

Output 4. Dissemination and application. The satellite-tracking data from white-chinned petrels at Bird Island and Cooper Island were featured on the project website in a map and animation (see Data tab) which both updated in near real-time. The tracking study was promoted in BAS and ACAP news stories.

BAS NEWS STORY: Vulnerable seabirds tracking reveals foraging patterns

ACAP NEWS: British Antarctic Survey study shows significant differences in feeding patterns across white-chinned petrel colonies in South Atlantic

We gave a presentation on the project results at the International Seabird Group Conference, Cork in August 2022.

Slides outlining the project goals and tracking results, and showing the Darwin Plus logo, were included in four other presentations by the project Co-I: Marine Predators group, Institute for Marine and Antarctic Studies (IMAS), Hobart - 18 Oct. 2022; King Edward Point Science Talk – 5 Jan. 2023; Gropius Lecture, Impington Village College 22 Feb. 2023; University of the Third Age, Cambridge (U3AC) – 7 Mar. 2023.

3.3 Progress towards the project Outcome

We are still on target to achieve the project outcome by the end of the funding. We now have all the required tracking data from the breeding season - two sites for wandering albatross, northern giant petrel and southern giant petrel, and three sites for white-chinned petrel. The analyses for wandering albatrosses during breeding are complete and the associated manuscript is in progress. By Jan. 2024, we should also have the required tracking data for the nonbreeding season from two sites for all species. The project leader will re-start analyses on her return from maternity leave.

3.4 Monitoring of assumptions

Assumption 1.1 White-chinned petrels and grey-headed albatrosses breeding at our target colonies will be catchable. These species breed in large numbers and are tractable for tracking studies.

Comments: Although white-chinned petrels were catchable and we were able to successfully deploy devices at Cooper Island, King Edward Point and Bird Island (two seasons), adverse weather conditions prevented landing at the target colony for grey headed albatrosses in our first fieldwork season (2021/22). For that reason, we substituted wandering albatross as our 2nd core study species.

All other assumptions still hold true, and we will continue to monitor these as the project develops.

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

The project will directly benefit the GSGSSI as it will achieve several objectives stated in their Marine Protected Area Research and Monitoring Plan, and their Albatross Conservation Action Plans. These objectives include understanding the at sea-distribution of white-chinned petrels, and tracking albatrosses from locations other than Bird Island. In the long-term, the project will benefit GSGSSI and other stakeholders who will be able to use this information to maintain healthy populations of seabirds around the island group, and promote seabird and marine conservation in general. The project will benefit the UK government as it will contribute to the Blue Belt initiative for protection of the marine environment, supporting vital conservation objectives whilst demonstrating the commitment of the UK to protecting the global marine environment, including as a signatory to the Agreement on the Conservation of Albatrosses and Petrels. The project will benefit various NGOs as it will provide scientific results to present to

fisheries managers to promote the adoption of mitigation measures in areas of high seabird bycatch.

5. Gender equality and social inclusion

Our project is supportive of gender equality issues. The PI on the project is female and is now on maternity leave. The Co-I is male, and carried out the fieldwork this season. Project partners are 1 male and 1 female. Seven of the 10 field assistants who helped with the deployment of tracking devices in the last two field seasons were female.

6. Monitoring and evaluation

The PL and Co-I continued to work together for M&E until the PL went on maternity leave. Meeting were generally weekly, as necessary to discuss the day-to-day running of the project (such as fieldwork logistics, analysis, interpretation, and communication with stakeholders). Additionally, monthly meetings were organised where progress was evaluated, any challenges discussed, and modifications to the project were considered. Once the PL returns from maternity leave, we will have biannual meetings with the project partners that will be written up and reported. Papers to be presented at stakeholder meetings such as regional fisheries management meetings, GSGSSI stakeholder meetings, ACAP and the International Commission for the Conservation of Atlantic Tunas (ICCAT), will be developed and discussed in advance of the relevant meeting. Additionally, we will hold post-meeting debriefs with project partners to discuss how our project was received by stakeholders, and if there are any improvements we can make in terms of engagement. Additionally, in the final year of the project, we will have meetings with the project partners to discuss the progress in terms of implementing changes to management in order to mitigate seabird bycatch in fisheries.

7. Lessons learnt

We have learned that it was optimistic to expect to retrieve many GLS loggers from white-chinned petrels with a single visit to the breeding site.

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

There were some comments on the logframe in the review of the 1st year report, including to combine the outputs from the breeding and non-breeding seasons. We have now done this, and also changed the 2nd core study species from grey-headed albatross to wandering albatross. Further updates to the logframe, including revised timings of delivery that take account of the current project pause will be made after the PL returns from maternity leave.

9. Risk Management

No new risks have been identified but the timing of delivery will require adjustment for the project pause.

10. Other comments on progress not covered elsewhere

The project has been enhanced by the addition of two new species (northern and southern giant petrels) and new sites in Cumberland Bay. The project benefits a great deal from logistical support, additional devices (archival GPS loggers and some GLS loggers) and fieldworkers time for the tracking at Bird Island, which is provided *gratis* by British Antarctic Survey. The project also benefited from generous support of ship calls at Prion Island and Cooper Island, which were provided by GSGSSI.

11. Sustainability and legacy

We have engaged with various members of GSGSSI and the NGO, Friends of South Georgia, to discuss the project. As a result of these discussions we were offered additional funding to purchase more tracking devices. This provides evidence of increased interest and capacity as a result of our work so far. Additionally, we were fortunate in the 2021/22 season to be on the ship to South Georgia with the CEO of GSGSSI with whom we discussed the project in depth, ensuring that she understood the details and purpose, and was invested in a successful outcome. Our project website (https://www.bas.ac.uk/project/spatial-segregation-of-seabirds-at-south-georgia/) featured in news stories on the BAS and ACAP websites, and has been shared widely on these and other social media networks.

12. Darwin Plus identity

We make sure that funding for the project by Darwin Plus is acknowledged in the text on the project website and news stories. During presentations, we both mention this when speaking and ensure the Darwin Plus logo is displayed on the slides.

13. Safeguarding

Has your Safeguarding Policy been updated in the past 12 months?	Yes
Have any concerns been investigated in the past 12 months	No
Does your project have a Safeguarding focal point?	Yes we have a safeguarding lead at BAS
Has the focal point attended any formal training in the last 12 months?	?
What proportion (and number) of project staff have received formal training on Safeguarding?	25% of BAS staff have been trained. They are primarily staff living and working on a research vessel. More training is planned this year.
Has there been any lessons learnt or challenges on Safeguarding in the past 12 months? Please ensure no sensitive data is included within responses. The most challenging issue for BAS was to engage staff who had an inaccurate idea of what safeguarding was and who it affected. We do not employ staff working with children; however many of our staff live and work in isolated environments and under challenging conditions, which may make them more vulnerable than others.	
Does the project have any developments or activities planned around Safeguarding in the coming 12 months? If so please specify. More training for BAS personnel is planned this year.	

14. Project expenditure

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

Project spend (indicative) in this financial year	2022/23 D+ Grant (£)	2022/23 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)				
TOTAL	57,608.61	54,272.37		

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.	[redacted]	
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

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

Project summary	SMART Indicators	Progress and Achievements April 2022 - March 2023	Actions required/planned for next period
Impact Population declines of white-chinned petrels and wandering albatrosses breeding on South Georgia will reverse, and their conservation status will improve as a result of improved management practices.		We have successfully collected data and carried out analyses with which to better understand the threats that these populations encounter at sea.	
Output 1: Habitat preferences of white-chinned petrels and wandering albatrosses from different colonies during the breeding and non-breeding seasons are identified, and inter-colony variation in their at-sea distributions is characterised.	1.1 Relationships between seabird habitats and oceanographic variables are identified (May 2022). 1.2 Maps highlighting seabird distributions and high-density hotspots during the breeding season and non-breeding seasons are produced (June 2022). 1.3 Spatial overlap in high-use areas of birds from different colonies are quantified (July 2022).	We have collated the data collected to date from breeding white-chinned petrels at Bird Island and Cooper Island, and breeding wandering albatrosses at Bird Island and Prion Island. We downloaded all the relevant environmental data and developed habitat models during the breeding season for wandering albatrosses, created kernel density plots indicating areas of high use and quantified spatial overlap of birds from the two colonies.	We will continue with these data analyses and complete one or two manuscripts in the year following the return of the project leader from maternity leave.
Output 2: Identify overlap with fisheries during the breeding and non-breeding seasons, and identify specific high-risk areas from different fishing fleets.	2.1 A suite of detailed maps and tables describing the overlap between predicted habitat use and different fishing fleets are produced for the breeding and non-breeding seasons (December 2022).	We downloaded vessel Automatic Identification System (AIS) data from Global Fishing Watch, and have compared overlap of wandering albatrosses from Bird Island and Prion Island with fisheries during the breeding season.	We will continue with these data analyses and complete one or two manuscripts in the year following the return of the project leader from maternity leave.

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

Project summary	SMART Indicators	Means of verification	Important Assumptions
Impact: Population declines of white-chinned petrels and wandering albatrosses breeding on South Georgia will reverse, and their conservation status will improve as a result of improved management practices.			
Outcome: Colony-specific, areas of high bycatch-risk, during breeding and non-breeding seasons, are identified for white-chinned petrels and wandering albatrosses. Initial steps towards modification of mitigation policy incorporating these results.	0.1 Maps indicating spatially and temporally explicit high-risk areas are produced. 0.2 Engagement with Stakeholders (including relevant Fisheries managements, government stakeholders and NGOs). 0.3 Commitment to change policy mitigation measures. 0.4 Steps towards adoption of results into relevant fisheries management frameworks.	0.1 Independent meeting report text discussing the results of the project in a positive light. 0.2 Report text to include the next steps for incorporation into management frameworks.	0.1 Tracked birds will interact with fishing vessels, or overlap with areas used by pelagic or demersal fisheries. Previous tracking studies from Bird Island indicate that the both of these species overlap with fisheries during the non-breeding season. Bycatch records from South Georgia show that white-chinned petrels overlap with the South Georgia toothfish fishery if the season starts early.
Output 1: Habitat preferences of white-chinned petrels and wandering albatrosses from different colonies, during the breeding and non-breeding seasons, are identified, and inter-colony variation in their at-sea distributions is characterised.	1.1 Relationships between seabird habitats and oceanographic variables are identified (May 2022). 1.2 Maps highlighting seabird distributions and high-density hotspots during the breeding and non-breeding seasons are produced (June 2022).	1.1 Models will be validated to test their predictive power using recognised statistical techniques. 1.2 Results will be discussed with project partners at bi-annual meetings which will be written up.	1.1 White-chinned petrels and wandering albatrosses will be breeding at Cooper Island, King Edward Point and Bird Island and will be catchable. These species breed in large numbers and are tractable for tracking studies. 1.2 Environmental predictors will have sufficient predictive power to predict the distribution of seabirds. There is abundant evidence that seabirds select habitats based on oceanographic cues.

Project summary	SMART Indicators	Means of verification	Important Assumptions
	1.3 Spatial overlap in high-use areas of birds from different colonies are quantified (July 2022).		Furthermore, extensive experience in this type of modelling, large sample sizes and abundant environmental information will optimise model performance.
Output 2: Identify overlap with fisheries during the breeding and non-breeding seasons, and identify specific high-risk areas from different fishing fleets.	2.1 A suite of detailed maps and tables describing the overlap between predicted habitat use and different fishing fleets are produced for the breeding and non-breeding seasons (December 2022).	2.1 Submission of manuscripts for peer-reviewed papers, after quality assessment from co-authors.	2.1 Tracked birds will overlap with fisheries. Tracking studies from birds breeding at Bird Island have shown overlap of both wandering albatrosses and white-chinned petrels with both local and international fisheries.
Output 3: Dissemination and application	3.1 Results and recommendations shared with stakeholders to inform their conservation and management frameworks (May to October 2023). 3.2 Data deposited in global databases (October 2023). 3.3 Communication of results at national and international conferences (May to October 2023).	3.1 Text from independent meeting reports, and meeting minutes will discuss the results and the plans to implement changes to management frameworks. 3.2 Datasets available online. 3.3 Abstracts presented in conference programmes.	3.1 Outputs will be discussed at relevant stakeholder meetings. The decline in populations of white-chinned petrels and wandering albatrosses is a recognised conservation issue for all stakeholders. As such any measures to mitigate further declines in these populations are a priority for many stakeholders, and a consideration for fisheries management bodies.
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 Track wandering albatrosses from Prion Island and Bird Island, and track white-chinned petrels from Bird Island, Cooper Island and King Edward Point using GPS and GLS devices (January 2024). 1.2 Use statistical analyses to create habitat models which link distribution of tracked individuals with environmental variables during the breeding season. Use these models to predict at-sea distribution for all individuals from these colonies. 1.3 Calculate core foraging areas for each species for each colony and measure overlap between colonies. 2.1 Collect satellite-AIS data on all fishing vessels operating in the core foraging areas of wandering albatrosses and white-chinned petrels. 2.2 Collate fishing effort in these regions from existing datasets, including pelagic longline, demersal longline and trawl fisheries.			

Project summary	SMART Indicators	Means of verification	Important Assumptions
2.3 Calculate spatial overlap between fishing effort and at-sea distribution for both species during the breeding season. Identify which fleets present the highest risk to each species at this time of year. 2.4 Produce a series of maps and tables describing the overlap with different fishing fleets. 2.5 Prepare manuscripts for publication in peer-reviewed journals. 3.1 Prepare reports for meetings and working groups. 3.2 Share results with all stakeholders via email, conferences, and attendance at meetings (e.g. ACAP, ICCAT and GSGSSI annual stakeholder/ working group meeting). 3.3 BirdLife will engage directly with fishing fleets and fishing management organisations, to engender change in fisheries management practices in areas of high bird-fishery overlap. 3.3 Deposit data into the Birdlife Tracking Database 3.4 Attend national and international conferences to present results.			

Annex 3: Standard Indicators

This section will be completed by the PL for the next Annual Report after her return from maternity leave.

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
E.g. DPLUS-A01	E.g. People who attended training on CBD Reporting Standards	E.g. Number of officials from national Department of Environment who attended training on CBD Reporting Standards	People	Men	20			20	60
E.g. DPLUS-C17	E.g. Articles published by members of the project team	E.g. Number of unique papers published in peer reviewed journals	Number	None	1			1	4

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)

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?	
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 discuss with BCF-Reports@niras.com about the best way to deliver the report, putting the project number in the Subject line.	
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.	
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.	
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	
Have you completed the Project Expenditure table fully?	
Do not include claim forms or other communications with this report.	