Darwin Plus Main & Strategic: Final Report

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

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

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

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

Darwin Plus Project Information

Project reference	DPLUS142
Project title	Bathymetry, and seafloor habitats within Ascension Island's nearshore waters
Territory(ies)	Ascension
Lead Organisation	British Geological Survey
Project partner(s)	Ascension Island Government (AIG), United Kingdom Hydrographic Office (UKHO)
Darwin Plus Grant value	£195 811 (lower than original value – see change requests)
Start/end date of project	April 22, End June 25 (extended – see change requests)
Project Leader name	Rhys Cooper
Project website/Twitter/blog etc.	www.bgs.ac.uk https://www.bgs.ac.uk/news/bgs-completes-first-mapping-expedition-to-ascension-island/ https://www.bgs.ac.uk/news/new-seabed-geology-maps-of-ascension-island/ https://www.bgs.ac.uk/news/in-photos-marine-surveying-a-remote-volcanic-island/
Report author(s) and date	Rhys Cooper (BGS), Catriona MacDonald (BGS), Tiff Simpson (AIG) 24/06/25

1 Project Summary

- The nearshore habitats of the Ascension Island Marine Protected Area (AI-MPA) comprise high biodiversity and are most at risk from anthropogenic development and climate change. This project will determine the character, distribution, and extent of these key habitats through an integrated programme of hydrographic and ground-truthing surveys.
- Resulting seafloor maps will provide urgently needed tools to better monitor and protect marine ecosystems and underpin the evidence-based management of the AI-MPA by the Department of Conservation, Ascension Island Government (AIG). Bathymetric data collected will also be used to update navigational charts used for Safety of Life at Sea (SOLAS) by UKHO. All data collected will be held by well-established Data Archive Centres enabling future use by all.

- Ascension Island is south of equator in the Atlantic Ocean, approximately 1500km from the coast of Africa. It is a governed British Overseas Territory of Saint Helena, Ascension and Tristan da Cunha. Ascension Island is a remote oceanic volcanic island characterised by its complex geological history and diverse ecosystems. This project is concerned with nearshore waters, collecting hydrographic data to a maximum of 300m water depth. The first detailed seabed geological maps were created to 1000m depth for Seabed Geomorphology and 300m depth for Seabed Substrate and Benthic Habitats.

2 Project Partnerships

- In October 23 and January 24 BGS were able to finally start executing fieldwork on Ascension after delays due to COVID and maintenance on the Ascension airport runway. The fieldwork involved extensive planning with the AIG Conservation Department to ensure we could successfully deploy equipment from their survey vessel, what equipment was available in country and possible areas of operation/prevailing weather conditions, etc. After these discussions, BGS were able to create a priority list of possible multibeam echosounder bathymetry survey areas and sample locations to create the required final geological maps.
- BGS involved the Department of Conservation in map production and report writing to ensure the final outputs are suitable for their ongoing use. This is especially true for the habitat maps, adapting a generic classification scheme (e.g., EUNIS, 2019) to be applicable locally.
- All key contributing members of the AIG conservation team are named as authors in all external outputs – conference talks, reporting and journals.
- In October 2021, a UK Navy survey ship, the HMS Protector surveyed the shelf around Ascension. The United Kingdom Hydrographic Office (UKHO) supplied all the raw and processed data from the HMS Prospector (received Dec/Jan 23).
- BGS reprocessed this data to higher resolutions and created backscatter maps making the data more suitable for the creation of substrate maps.
- The Royal Navy survey also helped determine the extent & type of fieldwork required to fulfil the deliverables stated in proposal. The data significantly reduced the extent of required bathymetric data collection reducing costs (see change requests) and allowed BGS to spend more time/money on focussed ‘ground-truthing’ and focused higher resolution surveys which will vastly improve the final mapping outputs (seabed substrates & habitats, marine geohazards etc.).
- The UKHO and AIG Harbour Master supplied survey priority areas to ensure any data gaps were filled and/or data density increased in areas of higher vessel traffic and known uncharted obstacles. All areas will improve and refine UKHO final chart outputs.
- BGS has supplied AIG with the final versions of merged, BGS & Navy bathymetry data that is proving vital for various other AIG and Defra/Darwin funded projects on Ascension. The best examples being a shark research team in deploying seafloor sensors and a mesophotic project analysing habitats and assemblages between 30-150m (DPLUS161, 213).
- Prior to undertaking bathymetric surveys, BGS contacted the National Oceanographic Centre (NOC) for information on using the recently installed tide gauge. We used real tide gauge data to reduce data to an established chart datum. This will be a significant improvement to HMS Protectors data, that used predicted tides, for charts and will allow UKHO to perform further data validation.
- The BGS field team undertook various outreach activities to inform the local community of project and expected outcomes. These activities included a talk at the local school (Jan 24) and presentations at both the Dept of Conservation offices for AIG staff (Nov 23) and at the local cinema open to all Ascension residents (Jan 24).

- Both AIG and BGS have very active outreach/comms teams and regular updates were provided via usual social media outlets – twitter, Instagram, Facebook etc.
- BGS provided training to local AIG staff whenever possible. This included initial office-based training on proposed data outputs, onboard the survey vessel collecting both bathymetry and ground-truth samples, final data delivery (formats, reporting etc.) and appropriate software to interrogate & update data in the future (e.g., QGIS).

3 Project Achievements

3.1 Outputs

- **Seafloor Surveys, Outputs 1.1-1.4 (*Activities 1.1 – 1.4 Marine Survey*)**

Assessment of HMS Protector data (both bathymetry and backscatter) enabled a targeted approach to multibeam survey operations and ground truth sample transects.

There was still significant uncertainty over certain factors that could affect survey operations, that included launch and recovery, frequency of suitable weather, effectiveness of equipment (the RIB has no cabin/shelter) and the performance of boat and crew etc. These risks were mitigated by undertaking two distinct periods of fieldwork: 31 Oct – 15 Nov 2023 and 17 Jan – 31 Jan 2024. This allowed sufficient time between each period to resolve any major issues, mobilise new equipment and conduct operations on Ascension during two separate weather windows.

The proposed multibeam survey solution was tested, prior to travel in Port Edgar, Edinburgh to confirm that it would work and was safe to operate in the challenging conditions of Ascension (https://www.youtube.com/watch?v=eOBy9bqnJ-w&t=3s).

The chosen multibeam survey solution proved extremely effective as it enabled rapid mobilisation on the AIG owned *Moray*. However, an 8m RIB with no cabin/shelter from the elements for personnel or equipment presented practical limitations. Ideal survey operations were limited to short duration surveys in enclosed water bodies/sheltered nearshore water without the big swells, wind, and heat typical of Ascension. Six (6) days of multibeam were collected during the first fieldwork period.

BGS successfully deployed two different drop camera systems to collect video transects – Drifto2000/GoPro11 and STR SeaSpyder Nano. We collected 50 samples around the island of Ascension using both systems -15 GoPro, 35 STR (Appendix 4 - Fig 7). The size of vessel, required manual handling of camera systems, sea state and wind conditions meant these were primarily all on the more sheltered west coast. These samples allowed us to validate and make assumptions over backscatter signatures for substrate and habitat mapping. Both drop camera systems performed well and their use proved complimentary.

The data density & accuracy collected meets the required IHO hydrographic standards for charting / safe navigation (CATZOC B). This was achieved in challenging environmental conditions (wind, swell, tide and current) and limited survey vessel (size, shelter, range). It was not feasible in the time available to wait for suitable weather windows required for the higher IHO standards of data collection in all areas. These standards are focused on data density for very precise object detection, and this does not fall within scope or remit of project.

We collected multibeam data over all the pre-planned features of interest, infilled data in extremely shallow water (<2m), collected water column data over areas of potential gas/freshwater seeps and added extra data density to all the areas requested by UKHO (Appendix 4 - Fig 7).

We used real tide gauge data so this will be a significant improvement to HMS Protectors data (predicted tides) for charting/Safety of Life At Sea (SOLAS) and will allow data validation.

It was a significant achievement of the project and survey team to collect data in the uncharted south coast. Weather conditions were far from ideal.

A full survey report – “Report of Survey: Ascension Island Multibeam & Video Transects” has been written and submitted to UKHO. See Appendix 4.

Report of survey: Ascension Island multibeam & video transects (attached with final report submission)

British Geological Survey. 2024 *Report of survey: Ascension Island multibeam & video transects.* British Geological Survey, 63pp. (OR/24/014)

https://nora.nerc.ac.uk/id/eprint/538774/

Note: BGS had a change request accepted, allowing any underspend to be transferred to this FY. This was to enable a further field season, attempting to 'add value' using an Autonomous Surface Vessel (ASV) to collect data in area inaccessible using a survey boat. Due to logistical difficulties, extreme weather/exposure and a cautious/experienced attitude towards operating in such a remote environment it was decided the benefits to project of such a survey didn't warrant the health & safety risk. The funds were reallocated to providing additional training to AIG staff in the best methods for interrogating and updating the final map products.

- **Seafloor Substrate and Habitat Maps delivered to AIG and applied to management. Outputs 2.1 - 2.4 (Activities 2.1 – 2.4 Seafloor Substrate and Habitat Mapping).**

The BGS ground truthing sample data were acquired using two different drop camera systems to collect video transects – Drifto 2000/GoPro11, and STR SeaSpyder Nano. A total of 50 samples around the island of Ascension were collected over the two campaigns using both systems. The size of the vessel, manual handling of the camera systems, sea state and wind conditions meant there were primarily collected to the west and north-west of the island which was more sheltered.

The samples were visually inspected to determine substrate type allowing general, qualitative observations on the composition of the seabed sediments. For the purposes of this project, observations have also been converted into EUNIS sediment classes depending on the water depth at that location.

The following sediment classes were identified: Sand (Mixed Sediment (Sand and Gravel – Sand dominant), Mixed Sediment (Sand and Gravel – Gravel dominant), Rhodolith (Gravel to Cobbles – minor sand), and Rock.

The dominant sediment class across the entire area is 'Mixed sediment', found with varying proportions of sand and gravel. This was split into two classes based on a visual inspection of grain size: 'Mixed sediment – Sand dominant with minor gravel', and 'Mixed sediment – Gravel dominant with minor sand'. Sand only areas were mapped primarily in the nearshore beach areas and was characterised by occurrence mobile bedforms and visible mobility of the sediments on the videos. Visual ground-truthing of the sand on the beach areas around the island showed the sand to be coarse-grained with shell fragments. Rhodolith is defined as "colourful unattached calcareous nodules composed of marine red algae" and was mapped only in areas where it was easily identifiable on the video transects. Rock (assumed to be mainly volcanic in origin) has dominantly mapped along the coastline, and where rock was mapped on the bathymetry data.

AIG have now received all the stated map outputs as agreed at project inception – the required baseline data for the management of a Marine Protected Area (MPA).

Preliminary maps were delivered and reviewed by AIG conservation department before finalising. They provided feedback for improvements.

AIG have received training in all data outputs (bathymetry and geological maps).

BGS delivered extensive training in the freely available QGIS mapping software. This will enable the Department of Conservation to use, modify and adapt data as appropriate.

AIG will use the data to inform and improve effectiveness of many additional proposed and ongoing projects around Ascension to allow for evidence-based management of the MPA. This includes numerous projects funded by Defra/Darwin.

The bathymetric, geological and habitat mapping are vital baseline data for any marine management organisation monitoring and controlling activity within a designated Marine Protected Area (MPA).

Published report and geological mapping:

- Report: “Mapping of geomorphology, seabed substrate and nearshore habitats within Ascension Island’s Marine Protected Area” Macdonald, C.; Cooper, R.; Bonde, C.E.; Stewart, H.A.; Baum, D.; Simpson, D.; Simpson, T.; Tieppo, M. 2025. *Mapping of geomorphology, seabed substrate and nearshore habitats within the Ascension Island Marine Protected Area*. Edinburgh, UK, British Geological Survey, 52pp. (OR/24/015), https://nora.nerc.ac.uk/id/eprint/539110/.
- Accepted paper submitted to Journal of Maps: Macdonald, C., Cooper., R, Bonde, C., Stewart, H.A., Simpson, T., Baum, D., Simpson, D., Muller, C., Tieppo, M. (2025) (Pending Review). Mapping the Seabed Geomorphology, Substrate and Benthic Habitats to support the long-term conservation of the Ascension Island Marine Protected Area. Journal of Maps

See Appendix 4 and attached evidence.

- **Knowledge Transfer and Project Dissemination. Outputs 3.1-3.4**

The Ascension Island Government Department of Conservation were involved in all aspects of the marine survey and helped create substrate, geomorphology and habitat maps. This has involved extensive training in use of survey equipment and the various data outputs.

BGS provided training in QGIS (mapping software) when the final data products were delivered to ensure full understanding of mapping outputs – how to interrogate and modify in future.

A communication plan was developed by AIG Conservation Department and BGS. Numerus Outreach events have been completed on Ascension. These included, talks at local cinema for community and at a local AIG office for staff. A workshop was run at local school.

The geological mapping outputs will also be published via Journal of Maps and BGS will investigate further publication options.

Data to be made available via BGS (geological maps) and UKHO (bathymetry). Both organisations are MEDIN Data Archive Centres (DACs). The bathymetric data & survey report were submitted to UKHO (March 2024) and validated to meet the International Hydrographic Organisations (IHO) Standards for charting – IHO CATZOC B. It will be used for charting and made available via the UKHO Admiralty portal. https://datahub.admiralty.co.uk/portal/apps/sites/#/marine-data-portal.

All geological maps submitted to EMODnet Geology and Habitats (June 2025) (https://emodnet.ec.europa.eu/en).

BGS presented at the following conferences:

- International Conference on Seafloor Landforms, Processes and Evolution https://icslpe.com/ (1-3 July 2024) (see Appendix 4)
- GEOHAB – Marine Geological and Biological Habitat Mapping https://geohab.org/ (12-16 May 2025) (see Appendix 4)
- Invited to speak and present results at the UK Civil Hydrography Annual Seminar (CHAS) 2025, which will take place on Tuesday 23rd September at Dynamic Earth, Edinburgh.

BGS were involved in various outreach events whilst on Ascension (see Appendix 4).

Various BGS News articles. Example below:

https://www.bgs.ac.uk/news/new-seabed-geology-maps-of-ascension-island/

BGS have been invited to speak at the Marine Coastguard Agency’s (MCA) UK Civil Hydrography Annual Seminar 2025 in September 2025. We will present the survey data and results to all UK government agencies involved in interaction with the seabed and the wider commercial survey community (i.e., https://www.gov.uk/guidance/uk-civil-hydrography-programme-chp).

3.2 Outcome

Ascension Island Government have significantly enhanced information on geodiversity and biodiversity to successfully support management and monitoring of the MPA. Geospatial data products will provide value long-after completion of the project.

BGS have delivered all stated and required outputs. Measuring outcomes will only be possible beyond the contractual dates of project. The full fruition of benefits will only be achieved over a longer period of time – contribution to the effective long term management of an MPA.

0.1 Complete

Before this project commenced there was no modern bathymetric data for Ascensions nearshore waters. A combination of the Royal Navy and BGS multibeam data have now covered over 95% of nearshore water.

This data will be also be useful for numerous DARWIN projects (oceanography, shark monitoring, fisheries and habitat monitoring etc.).

0.2 Complete

It is a little too early to assess how the projects outputs will be employed long term by the AIG Conservation Departments MPA managers for the long-term ecosystem assessment and monitoring. However, AIG now have all the required baseline data for the management of a Marine Protected Area (MPA). Prior to this project starting there was no bathymetry or geological/habitat assessment at the resolution/scale required to monitor and control access to a MPA. We have also provided training to enable AIG conservation staff to update and use data in the long term

0.3 Complete

AIG Harbour Masters provided input in the creation of priority areas for survey.

The bathymetric data collected was submitted to UKHO and validated to meet the International Hydrographic Organisations (IHO) Standards for charting – IHO CATZOC B. It will be used for charting and made available via the UKHO Admiralty portal. https://datahub.admiralty.co.uk/portal/apps/sites/#/marine-data-portal

3.3 Monitoring of assumptions

- Assumption 1 (Data quality - 1.1, 2.1)

The data collected by BGS and the Royal Navy were processed & validated by a qualified Hydrographic Surveyor (IHO Cat A). The data is excellent quality and suitable for use by BGS and AIG.

The analysis of data supplied by Royal Navy allowed us to plan our multibeam survey and ground-truthing campaign, identifying areas of interest prior to fieldwork. This survey data allowed us to significantly de-risk the project.

Over 95% of the AIG continental shelf is covered by bathymetric and backscatter data suitable for project outputs.

- Assumption 2 (suitable survey equipment & vessel)

Ascension Island Government had purchased a new RIB that was suitable for our marine survey.

The use of this RIB required a ‘rethink’ in how we deploy our survey equipment. A suitable, robust and safe solution was found & purchased. Lead Surveyor Rhys Cooper undertook training in its safe operation. We also had a framework/hire agreement with Kongsberg to have a standby multibeam system available if required.

The survey equipment was tested prior to travel on a similar boat in UK ensuring everything worked and was safe to operate.

The equipment worked well in Ascension, however, an 8m RIB with no cabin/shelter from the elements for personal or equipment presented practical limitations.

- Assumption 3 (Weather and Travel delays)

Previous delays and subsequent change request were fortuitous as it allowed more time for covid recovery and to allow for the unforeseen Royal Navy survey data to be processed and assimilated. It also allowed for more the more regular South Atlantic Air Bridge flights to resume after the Ascension runway was repaired.

Ascension Island is a remote and exposed location. The size of survey boat did limit the area of operation and available weather windows.

4 Contribution to Darwin Plus Programme Objectives

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

See responses above.

All the data detailed above are critical in the long term management and policy decisions regarding the Ascension Island Marine Protected Area.

The data has been vital for various other research projects, For example, this data has proved vital for a shark research team in deploying seafloor sensors. The research was also carried out under Darwin/Defra funding.

We have supplied the data to UKHO who will use it to update charting.

4.2 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	The BGS lead in creating all map outputs is a woman. AIG Director of Conservation and Fisheries is a woman, and the AIG Conservation marine team is currently over 50% female. 2 local interns from St Helena were part of local project team
Transformative	The project has all the characteristics of an 'empowering' approach whilst also addressing	

	unequal power relationships and seeking institutional and societal change	

5 Monitoring and evaluation

Royal Navy & BGS survey data assessed using industry standard marine survey processing software.

Project Lead is a Chartered Marine Scientist and Member of IMAREST. He holds an International Hydrographic Organization (IHO) Category A survey qualification which allows him to assess and sign-off data suitable for charting, validated against the various recognised IHO standards.

The bathymetric data collected was submitted to UKHO and validated to meet the International Hydrographic Organisations (IHO) Standards for charting – IHO CATZOC B. It will be used for charting and made available via the UKHO Admiralty portal. https://datahub.admiralty.co.uk/portal/apps/sites/#/marine-data-portal

The bathymetry data was used to create substrate, geomorphology and habitat maps that can be integrated into the various mapping applications BGS & AIG use (ArcPro, QGIS).

All map and report outputs have been published using BGS approved publication worksheets and data QA procedure.

The AIG Dept. of Conservation are the primary 'end of users' of mapping outputs and have been involved in every stage of their creation, from helping undertake the marine survey to providing vital feedback into the map interpretation.

There have been no changes to the M&E plan since the proposal was written and subsequent change requests.

We share all work and project planning information with AIG and UKHO.

6 Lessons learnt

Testing equipment in UK immediately before shipping to Ascension was vital. It meant we had confidence in its safe operation prior to using in a more remote and extreme location. We had very minimal equipment downtime.

The communication between BGS and AIG has been excellent. We had a well-formed idea of fieldwork plan and execution prior to arriving. We all worked extremely well as a team with no duplication of roles.

Travel is long and transporting equipment slightly tricky. BGS should have spent more time investigating air freight options. The south Atlantic bridge route to Ascension was only re-established at start of project.

Underestimated the issue of internet access. Wifi was severely limited and we had to rely on individuals (not organisational) starlink connections many times. This indicates a lack of proper research & planning.

BGS Project Manager overly cautious on the cost of some aspects of field work. Boat hire, fuel, food and accommodation were cheaper than expected.

The weather on Ascension for marine survey is not ideal and the level of exposure underestimated/beyond recent experience.

The BGS Project Manager should have investigated the launch and recovery of survey vessel in more detail.

For future work we would be more realistic about influence of weather and the knock-on effects of such a remote location.

BGS submitted a change request to attempt an ASV survey on Ascension FY24-25. We decided not to proceed as felt we couldn't launch and recover the equipment safely and effectively. It is a long way to go with an expensive bit of kit that is also very sensitive to weather conditions.

7 Actions taken in response to Annual Report reviews

All project outputs, reports & mapping files, are attached with this submission.

All documents and project reporting discussed and reviewed by AIG.

8 Risk Management

We submitted a change request to attempt an USV survey on Ascension FY24-25. We decided not to proceed as felt we couldn't launch and recover the equipment safely and effectively.

We have constantly adapted this project to allow for the new survey data, covid delays, runway maintenance, availability of accommodation and to utilise the new AIG survey vessel.

BGS has a well maintained and up-to-date Risk Register .

We followed the AIG Risk Assessment for small boat operation, expanded to include use of multibeam system and chosen seafloor sampling technique.

Significant risk factors to this project are the use of a new multibeam mounting system on a small nearshore, 8 m inflatable RIB and the impact of weather/sea state.

1) Survey vessel - multibeam mounting system

Research was undertaken to ensure we reduced delays, improved safety and minimised data errors that could have resulted from inadequate vessel mobilisation. We purchased a robust and repeatable mounting system from a known manufacturer (USB) who work closely with Kongsberg (manufacturers of our multibeam system).

We received training and saw it in operation. It is also used regularly by the US Navy. However, prior to shipping the equipment to Ascension, BGS undertook a warm-up survey on a similar sized RIB in the Firth of Forth, Scotland. We tested viability of the equipment and gained familiarity in use/developed risk assessments for safe operation in Ascension.

2) Weather conditions/sea state

Ascension Island is in a very remote and exposed location. Weather conditions played a part in the amount and quality of data collected. This is the same for any marine survey operation, however, more accentuated due to potential size of swell and limiting size of a small survey vessel. The increased frequency & reduced cost of flights allowed us to spread the risk by having two separate survey seasons at slightly different periods of the year (November & January).

3) Further mitigation.

- Regular communication with Ascension Island Government over vessel, flight and accommodation requests.
- Regular discussion with United Kingdom Hydrographic Office / NOC on tide gauge installation, their plans and future use of data.
- Project Manager in constant discussion over changes in survey platform and modifications required to enable its use.

9 Sustainability and Durability

- BGS has supplied AIG with a compiled versions of both the BGS and Royal Navy bathymetry. These are in a format suitable for use by a non-expert and in software that is readily and freely available. These data are vital for long term management of the MPA and are already providing useful for current & future research projects (including Darwin). For example, proving vital for a shark research team in deploying seafloor sensors.
- BGS have provided AIG with all seabed samples collected as part of marine works. They will undoubtably be re-used on future project work.
- BGS provided AIG with final version of all marine geological map outputs – substrate, geomorphology and habitat maps. AIG helped review and finalise these maps. This familiarity will help enable future use and any required updates.

- BGS staff provided an extensive training course and materials in use of the mapping software QGIS. This is freely available and widely supported. It was already AIGs preferred GIS software.
- Staff at the Department of Conservation AIG were involved in all aspects of the multibeam surveys. They received training in use of the equipment and the theory of data collection. This knowledge will be useful in how the data is used in future.
- AIG staff and equipment were heavily involved in ground truth survey – we used their new dropdown camera capabilities and hired a new one for comparison.
- BGS have presented the results of projects to our peers at various conferences (see Appendix 4).

10 Darwin Plus Identity

The Darwin Plus identity & logos used in all outreach/social media activity.

Logo used in all slides during presentations etc.

BGS have presented the work at the following conferences:

- International Conference on Seafloor Landforms, Processes and Evolution https://icslpe.com/ (1-3 July 2024) (see Appendix 4).
- GEOHAB – Marine Geological and Biological Habitat Mapping https://geohab.org/ (12-16 May 2025) (see Appendix 4).

BGS press release news articles:

- https://www.bgs.ac.uk/news/bgs-completes-first-mapping-expedition-to-ascension-island/
- https://www.bgs.ac.uk/news/in-photos-marine-surveying-a-remote-volcanic-island/
- https://www.bgs.ac.uk/news/new-seabed-geology-maps-of-ascension-island/

Ascension Island Government twitter feeds here:

First trip - https://x.com/AscensionMPA/status/1725102115360522557?s=20

Second trip - https://x.com/AscensionMPA/status/1750460817047204098?s=20

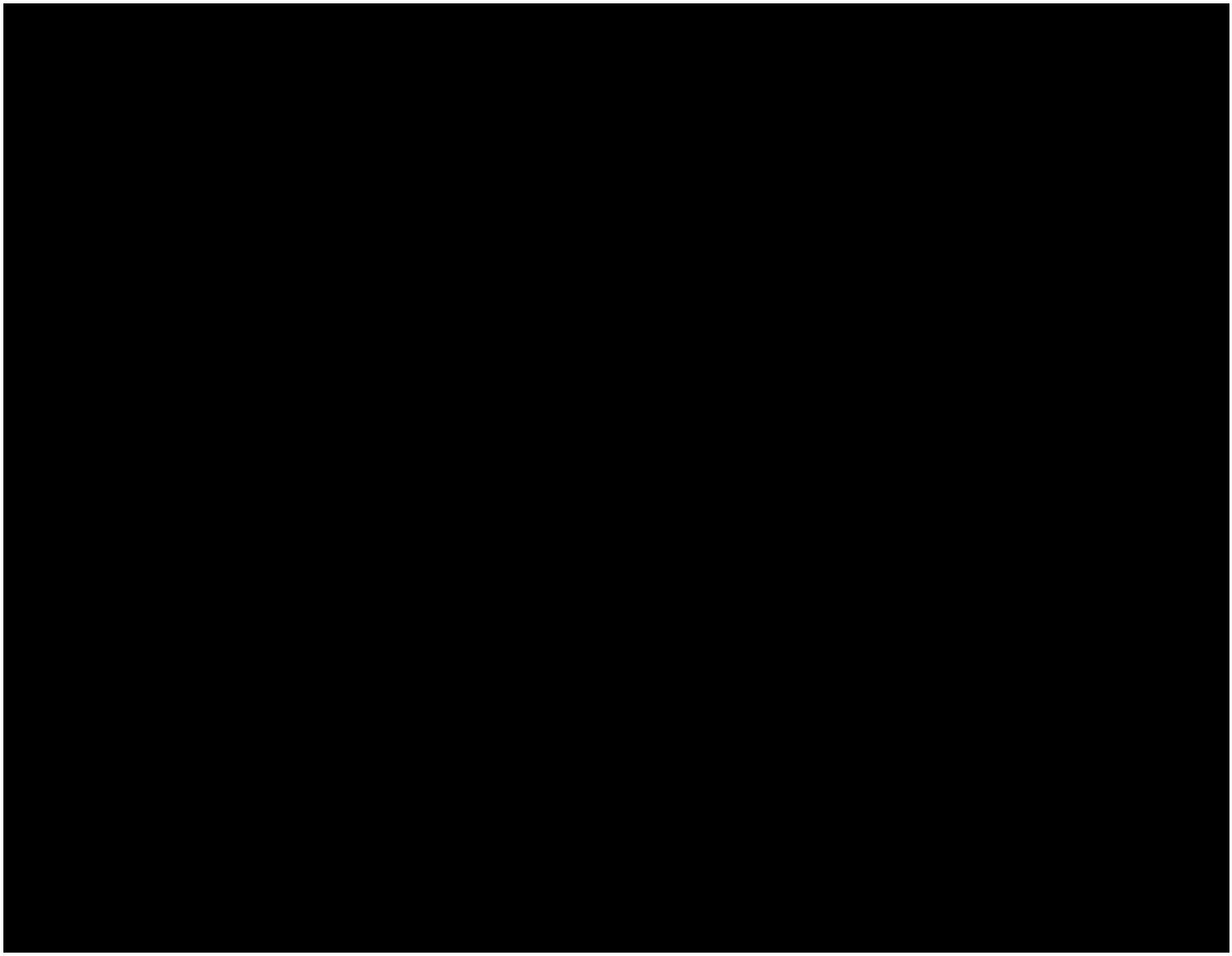
Various outreach

- https://x.com/AscensionMPA/status/1750818467383546270?s=20
- https://x.com/AscensionMPA/status/1750816535621390808?s=20

The Darwin logo was also used in local outreach including the presentation for the Ascension community at the local cinema.

11 Safeguarding

[redacted]



12 Finance and administration

12.1 Project expenditure

2024-25

Project spend (indicative) since last Annual Report	2024/25 Grant (£)	2024/25 Total actual Darwin Plus Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs	[redacted]			
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items				
Others				
TOTAL	£55,171.00	£29,569.25	[redacted]	

Staff employed (Name and position)	Cost (£)
Rhys Cooper, Project Manager, Senior Surveyor	[redacted]
Christian Bonde, Junior Geospatial Data Analyst	
Dayton Dove, Marine Geoscientist	
Catriona MacDonald, Marine Geoscientist	
TOTAL	

Consultancy – description and breakdown of costs	Other items – cost (£)
TOTAL	0

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

Other items – description	Other items – cost (£)
TOTAL	0

2025-26

Project spend (indicative) since last Annual Report	2025/26 Grant (£)	2025/26 Total actual Darwin Plus Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs	[redacted]			
Consultancy costs				
Overhead Costs				
Travel and subsistence				

Project spend (indicative) since last Annual Report	2025/26 Grant (£)	2025/26 Total actual Darwin Plus Costs (£)	Variance %	Comments (please explain significant variances)
	[redacted]			
Operating Costs				
Capital items				
Others				
TOTAL	10000	8146.01	**-19%**	

Staff employed (Name and position)	Cost (£)
Rhys Cooper, Challenge Programme Manager	[redacted]
Catriona MacDonald, Marine Geoscientist	
TOTAL	

Consultancy – description and breakdown of costs	Other items – cost (£)
External Audit	[redacted]
TOTAL	

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

Other items – description	Other items – cost (£)
TOTAL	0

12.2 Additional funds or in-kind contributions secured

Matched funding leveraged by the partners to deliver the project	Total (£)
The BGS and AIGCFD are providing the acoustic and ground-truthing equipment to the project 'in kind'	[redacted]
BGS In kind contribution to Full Economic Costs (FEC)	
TOTAL	

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

12.3 Value for Money

BGS in-kind project contributions

- BGS will contribute all hydrographic survey equipment required to undertake the marine survey from our own small vessel.
- The BGS and AIGCFD are providing the acoustic and ground-truthing equipment to the project 'in kind', providing savings of [redacted]

BGS In kind contribution to Full Economic Costs (FEC)

- Darwin grant only covers 40% of overheads. BGS covered the difference to usual FEC 130% charge out. Difference between the allowable cost and the staff FEC will be borne by the BGS - [redacted]

Proposed matched funding as % of total project cost ~ 35%

13 Other comments on progress not covered elsewhere

The design of the project significantly changed due to various factors:

1) Covid – delayed field work and created a backlog leading to reduced availability of flights & accommodation. Staf had to be flexible with field arrangements and the amount of time limited.

2) Ascension runway was being upgraded. This furthered delayed and reduced access to flights.

3) Royal Navy undertook significant survey work within our proposed survey area. This was a huge gain for the project considering points 1) & 2) above and allowed the project team to concentrate data collection on prioritised areas. The survey team were also able to concentrate on ground-truth sampling.

4) The original intention was to ship a small survey vessel out to Ascension. The AIG Conservation Department brought their own RIB just after the first lockdown. This fact combined with the increased availability of survey data (Royal Navy) allowed BGS to change proposed multibeam survey data acquisition system allowing a more robust, repeatable, safe and cost effective solution.

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

Project summary	Progress and achievements
Impact There is a step-change in our understanding of the biodiversity and geodiversity of the nearshore Ascension Marine Protected Area providing a baseline to underpin future ecosystem assessment, monitoring, and development.	1) Trial surveys undertaken in the Firth of Forth to ensure proposed novel survey methodology works (mounting multibeam on RIB) & and all equipment working and present before shipping to Ascension 2) All equipment shipped to Ascension for arrival prior to fieldwork commencing. 3) Two successful survey campaigns to Ascension undertaken in Oct 2023 and Jan 2024. All data finalised, submitted and validated by UKHO (IHO CATZOC B) for future use in navigational chart production and held in data repository (UK MEDIN Data Archive Centre) 4) Undertaken two successful seafloor ground-truth surveys – locations determined by 3). 5) Final seabed geological (substrate, geomorphology) and habitat maps completed and given to Ascension Island Government Department of Conservation. 6) BGS delivered training in future use of data and mapping software (QGIS) 7) Completed various outreach and knowledge exchange activities (conferences, school workshops, local presentations & social media)
Outcome Ascension Island Government have significantly enhanced information on geodiversity and biodiversity to successfully support management and monitoring of the MPA. Geospatial data products will provide value long-after completion of the project.	
Outcome indicator 0.1 At least 70% of the AI-MPA nearshore area (60 km²; 0-100m depth) is surveyed and mapped with particular emphasis on priority area along west coast, ensuring comprehensive characterisation of nearshore environment (Year 1 Q4);	0.1 Complete – the British Geological Survey and Royal Navy survey has provided extensive coverage of nearshore waters <100m, extending out to depths greater than 3000m. The two surveys enabling redundancy of data for improved vertical (depth accuracy) and comparison & validation of backscatter seafloor signatures. There were no survey vessels suitable for grab sampling equipment which made the backscatter

	data essential for characterising the seafloor. BGS then collected 59 video transects based on backscatter signature variability to create the substrate and habitat maps.
Outcome indicator 0.2 Project outputs regularly employed by MPA managers for ecosystem assessment and monitoring purposes (From Year 2, Q4);	BGS has supplied AIG with compiled versions of both the BGS and Royal Navy bathymetry & backscatter data. These are in a format suitable for use by a non-expert and in software that is readily and freely available. BGS have provided AIG with all seabed video transects/samples collected as part of marine works. They will undoubtably be re-used on future project work. BGS provided AIG with final version of all marine geological map outputs – substrate, geomorphology and habitat maps. AIG helped review and finalise these maps. This familiarity will help enable future use and any required updates. Staff at the Department of Conservation AIG were involved in all aspects of the marine surveys. They received training in use of the equipment and the theory of data collection. This knowledge will be useful in how the data is manipulated and used in future. BGS staff provided an extensive training course and materials in use of the mapping software QGIS. This is freely available and widely supported. It was already AIGs preferred GIS software All these finalised data types and software use will be vital for long term management of the Marine Protected Area (MPA)
Outcome indicator 0.3 Bathymetry data will be supplied to the UKHO as significant contribution towards navigational charting (Year 2 Q3)	0.3 Complete – full density, QIMERA (industry standard software) project files supplied to UKHO.
Output 1 - Seafloor Surveys	

1.1 Assess Royal Navy Prospector Survey data – reprocess into suitable backscatter and bathymetric products for marine geological mapping. Assess and indicate areas for resurvey/high-definition coverage.	1.1 Complete – great quality survey allowing us to expand mapping area and concentrate subsequent survey on areas of interest (higher resolution/water column data etc.) and fill gaps/data holidays/quality issues. Appendix 4.1
1.2 Acoustic (at least 70% of nearshore area) and ground-truthing (at least 30 sites) surveys conducted (completed by Year 1 Q4);	1.2 Complete – surveys successfully undertaken Oct 2023, January 2024 See attached survey report (OR_24_014_RoS_BGS_Ascension.pdf)
1.3 High-quality MBES hydrographic data processed and delivered to AIG (Year 2 Q 1)	1.3 Complete – Royal Navy data & BGS data delivered to AIG - Jan/Feb 2023 (UKHO) & Feb 2024 (BGS).
1.4 Ground-truthing data classified and delivered to AIGCFD (Year 2, Q2);	1.4 Complete – delivered to AIG January 2024.
1.5 Processed hydrographic data delivered to UKHO and data repository (Year 2 Q3);	1.5 Complete – The bathymetric data collected was submitted to UKHO and validated to meet the International Hydrographic Organisations (IHO) Standards for charting – IHO CATZOC B. It will be used for charting and made available via the UKHO Admiralty portal. https://datahub.admiralty.co.uk/portal/apps/sites/#/marine-data-portal 1.1 – 1.5 Report of survey: Ascension Island multibeam & video transects British Geological Survey. 2024 Report of survey: Ascension Island multibeam & video transects. British Geological Survey, 63pp. (OR/24/014) https://nora.nerc.ac.uk/id/eprint/538774/
Output 2. Seafloor Substrate and Habitat Maps delivered to AIG and applied to management	
2.1 Classified seafloor substrate maps completed, at least including Hard Substrates and Seafloor Sediment Composition. Further outputs include geomorphology and sediment mobility indicators (Year 2 Q2);	2.1 Complete – delivered to AIG Feb 25.

2.2 Seafloor habitat maps: classified with reference to seafloor morphology, hardness, composition, and biological cover (Year 2 Q3);	2.2 Complete – delivered to AIG Feb 25.
2.3 Map products delivered via GIS project and database (including processed acoustic data, ground-truthing locations and classification, interpreted substrate layers, and habitat map). Content and formats agreed with AIG (delivered Year 2 Q3)	2.3 Complete – delivered to AIG Feb 25.
2.4 Final Project Report: Describes survey, data acquired, analysis methods, observations and key findings, and recommendations on applicability of map products. Report to include high-quality figures of underlying data and habitat maps .(Year 2 Q4)	2.4 Complete – delivered to AIG Feb 25. *2.1 – 2.4* *Macdonald, C.; Cooper, R.; Bonde, C.E.; Stewart, H.A.; Baum, D.; Simpson, D.; Simpson, T.; Tieppo, M. 2025 Mapping of geomorphology, seabed substrate and nearshore habitats within the Ascension Island Marine Protected Area. Edinburgh, UK, British Geological Survey, 52pp. (OR/24/015)* *https://nora.nerc.ac.uk/id/eprint/539110/*
Output 3. Knowledge Transfer and Project Dissemination.	
3.1 Communication Plan created in consultation with AIG (Year 1 Q3);	3.1 Complete – communication plan developed in collaboration with AIG (see below events listings)
3.2 Science communication to public, including at least two educational outreach activities on AI, and at least one article published in gray literature (e.g. Darwin newsletter) (completed by Year 2, Q4);	3.2 Complete • Outreach events completed on Ascension. Talks at local cinema for community and at local AIG office for staff. A workshop was run at local school. • BGS have presented the work at the following conferences: International Conference on Seafloor Landforms, Processes and Evolution https://icslpe.com/ (1-3 July 2024) (see Appendix 4) GEOHAB – Marine Geological and Biological Habitat Mapping https://geohab.org/ (12-16 May 2025) (see Appendix 4) Invited to speak and present results at the UK Civil Hydrography Annual Seminar (CHAS) 2025, which will take place on Tuesday 23rd September at Dynamic Earth, Edinburgh.

	• BGS Annual Report https://www.bgs.ac.uk/download/bgs-annual-report-2023-to-2024/ • BGS news articles covering the two trips are available here: https://www.bgs.ac.uk/news/bgs-completes-first-mapping-expedition-to-ascension-island/ https://www.bgs.ac.uk/news/in-photos-marine-surveying-a-remote-volcanic-island/ • Ascension Island Government twitter feeds here: 1) BGS first trip - Oct-November 24. https://x.com/AscensionMPA/status/1725102115360522557?s=20 2) BGS second trip - Jan 24. https://x.com/AscensionMPA/status/1750460817047204098?s=20 3) Various outreach https://x.com/AscensionMPA/status/1750818467383546270?s=20 https://x.com/AscensionMPA/status/1750816535621390808?s=20
3.3 Minimum 1 peer-review paper submitted to scientific journal (Year 2 Q4);	3.3 Complete – publication of results via the Journal of Maps – August 2025 (final revisions accepted).
3.4 Geospatial products uploaded to accredited data archive centre. (Yr 2 Q4)	3.4 Complete - Data to be made available via BGS (geological maps) and UKHO (bathymetry)- UK Official MEDIN (https://medin.org.uk/) Data Archive Centres (DACs). https://www.bgs.ac.uk/ https://datahub.admiralty.co.uk/portal/apps/sites/#/marine-data-portal

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: There is a step-change in our understanding of the biodiversity and geodiversity of the nearshore Ascension Marine Protected Area providing a baseline to underpin future ecosystem assessment, monitoring, and development.			
Outcome: Ascension Island Government have significantly enhanced information on geodiversity and biodiversity to successfully support management and monitoring of the MPA. Geospatial data products will provide value long-after completion of the project.	0.1 At least 70% of the AI-MPA nearshore area (60 km²; 0-100m depth) is surveyed and mapped with particular emphasis on priority area along west coast, ensuring comprehensive characterisation of nearshore environment (Year 1 Q4); 0.2 Project outputs regularly employed by MPA managers for ecosystem assessment and monitoring purposes (From Year 2, Q4); 0.3 Bathymetry data will be supplied to the UKHO as significant contribution towards navigational charting (Year 2 Q3)	0.1 Survey Completion report produced and approved by AIGCFD; 0.2 Project outputs received and incorporated into the AI-MPA Monitoring and Research Strategy; Project outputs cited within MPA management reporting; 0.3 Data meet IHO standards and are made available to the UKHO.	Weather and sea conditions allow surveys to be undertaken successfully and in a timely manner. All travel for fieldwork is permitted as per FCO guidelines. Mitigation Sufficient time built into survey schedule to allow for delays. Flexible survey plan allows sheltered areas to be prioritised to reduce lost days. Project not due to start until September 2021 when travel restrictions predicted to have eased.
Outputs: 1. Seafloor Surveys	1.1 Assess Royal Navy Prospector Survey data – reprocess into suitable backscatter and bathymetric products for marine geological mappning. Assess and indicate areas for resurvey/high-definition coverage. 1.2 Acoustic (at least 70% of nearshore area) and ground-truthing (at least 30 sites) surveys conducted (completed by Year 1 Q4); 1.3 High-quality MBES hydrographic data processed and delivered to AIGCFD (Year 2 Q 1);	1.1 Completed and suitable bathymetric & backscatter data layers from Royal Navy data. 1.2 Brief 'Survey Completion' report issued including: areas mapped, description of data acquired and data quality, number of ground-truth samples, preliminary figures of data acquired); 1.2 Processed data meet IHO charting standards, and received by AIGCFD; 1.3 Classified data received by AIGCFD in usable formats, e.g.	1.1 Data is collected that is fit for purpose and can be processed into a suitable format 1.2 Local vessel secured (multiple options on island), workable weather conditions (survey in sheltered areas where possible), timely shipment of survey equipment and personnel; 1.2 Hydrographic survey equipment functioning properly (equipment tested in advance) ; surveyors have suitable hydrographic certification (BGS has qualified personnel);

	1.4 Ground-truthing data classified and delivered to AIGCFD (Year 2, Q2); 1.5 Processed hydrographic data delivered to UKHO and data repository (Year 2 Q3);	spreadsheets, and within GIS database; 1.4 Receipt of data by UKHO and data repository;	1.3 Drop frame camera and other ground-truthing equipment functioning properly (equipment tested in advance); survey personnel have suitable training and experience for data acquisition (BGS has qualified personnel); 1.4 UKHO want and require data (BGS and UKHO have active dialogue about project and deliverables).
2. Seafloor Substrate and Habitat Maps delivered to AIG and applied to management	2.1 Classified seafloor substrate maps completed, at least including Hard Substrates and Seafloor Sediment Composition. Further outputs include geomorphology and sediment mobility indicators (Year 2 Q2); 2.2 Seafloor habitat maps: classified with reference to seafloor morphology, hardness, composition, and biological cover (Year 2 Q3); 2.3 Map products delivered via GIS project and database (including processed acoustic data, ground-truthing locations and classification, interpreted substrate layers, and habitat map). Content and formats agreed with AIG (delivered Year 2 Q3) 2.4 Final Project Report: Describes survey, data acquired, analysis methods, observations and key findings, and recommendations on applicability of map products. Report to include high-quality	2.1 AIG in receipt of substrate maps; Maps included in final project report, and incorporated into GIS deliverables; 2.2 AIG in receipt of habitat maps; Maps included in final project report and incorporated into GIS deliverables. 2.3 Maps used in at least two MPA management decisions by Y2 Q3	2.1 & 2.2 Survey data are of suitable quality; Project staff have suitable training and expertise (BGS has numerous staff with suitable qualifications). AIGCFD are able to use project outputs for MPA management and monitoring, and potential future developments (Data formats specified/agreed early in project to ensure that AIG and local stakeholders can access all outputs);

	figures of underlying data and habitat maps (Year 2 Q4).		
3. Knowledge Transfer and Project Dissemination	3.1 Communication Plan created in consultation with AIG (Year 1 Q3); 3.2 Science communication to public, including at least two educational outreach activities on AI, and at least one article published in grey literature (e.g. Darwin newsletter) (completed by Year 2, Q4); 3.3 Minimum 1 peer-review paper submitted to scientific journal (Year 2 Q4); 3.4 Geospatial products uploaded to accredited data archive centre. (Yr 2 Q4)	3.1 Communication plan agreed between project partners. Knowledge exchange activities included as appendices in final project report; 3.2 Verification may include presentations, published articles, photographs, teacher feedback and examples of children's work; 3.3 Journal confirmation email(s); 3.4. Upload notification from data archive centre.	3.1 & 3.2 Ability to reach local stakeholders. (Project partners AIG are part of local government and have established network on island); 3.3 Project findings hold sufficient scientific interest to warrant peer-reviewed study (Proposed surveys will identify features offshore relevant to seafloor habitats and volcanic environments for the first time); 3.4 Suitable geospatial data archive identified (several candidate domestic and international data repositories, e.g., MEDIN).

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 **Marine Survey - Year one, Q1 onwards (2023/2025**)-

Activity contributing to outputs 1.1 – 1.4

Hydrographic acoustic survey and ground-truthing campaign.

1.1 Assess Royal Navy Prospector Survey data – reprocess into suitable backscatter and bathymetric products for marine geological mappning. Assess and indicate areas for resurvey/high-definition coverage.

1.2 Acquire continuous high-resolution (≤ 5m resolution) multibeam echosounder (MBES) bathymetry (water depth) and backscatter data (proxy for seafloor composition and hardness) within the nearshore waters around Ascension Island (< 100m depth)). Utilise BGS's portable MBES system (Kongsberg EM2040P) aboard a locally-contracted vessel. This system is very well suited to undertaking cost-effective survey in this remote environment. Acquisition conducted according to habitat priority areas;

1.3 Deploy drop-camera system from locally-contracted vessel to provide point-source ground-truth samples of seafloor habitat types;

1.4 Process MBES bathymetry and backscatter data to IHO charting standards;

2 Seafloor Substrate and Habitat Mapping – Year 1-2 (2023-2025): Activity contributing to outputs 2.1 - 2.3

2.1 Seafloor mapping

2.1.1 Substrates. Apply geospatial analysis to characterise seafloor morphology and composition using a range of quantitative and qualitative methodologies;

2.1.2 Use bathymetric derivatives, together with backscatter data and ground-truthing observations to model distribution of hard substrates (important predictor of benthic habitat character) and sediment composition;

2.1.3 Produce further classified maps indicative of seafloor processes (e.g. seafloor geomorphology, sediment thickness and mobility);

2.2 Seafloor Habitats:

2.2.1 Analyse and classify ground-truthing imagery;

2.2.2 Incorporate existing data within nearshore, and deeper, environments;

2.2.3 Produce final seafloor habitat maps (attributed according to morphology, hardness, composition, and biological cover);

2.3 Project delivery via GIS database, project reports and maps, and stakeholder engagement;

2.3.1 Supply seafloor data, and classified map products of seafloor substrate and habitats;

2.3.2 Prepare raw and processed data for project partners, stakeholders, and relevant data repositories to ensure long-term application of the data;

2.4 Final Report Prepare report(s) in collaboration with AIG detailing the survey campaign, acquired data, and methodologies employed. The project report will also describe key observations and potential discoveries, as well as emphasise the applicability and impact of the data and map outputs;

3 Knowledge Transfer and Project Dissemination: Activity contributing to outputs 3.1 - 3.4

3.1 Communication Plan developed early Y1 to include not only formal reporting but also social media engagement, academic outputs and grey literature. The Communications Plan will be a living document, updated regularly at Project Board meetings.

3.2 Project partners will actively communicate (e.g. public presentations) with AIG and local stakeholders to highlight the need, interest and value, and findings from the habitat mapping

3.3 Publish at least 1 peer reviewed paper

3.4 Ensure dissemination via appropriate data archive centres. MEDIN, EMODnet etc.

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?	Yes
Is the report less than 10MB? If so, please email to BCF-Reports@niras.com putting the project number in the Subject line.	Yes
Is your report more than 10MB? If so, please discuss with BCF-Reports@niras.com about the best way to deliver the report, putting the project number in the Subject line. All supporting material should be submitted in a way that can be accessed and downloaded as one complete package.	No
If you are submitting photos for publicity purposes, **do these meet the outlined requirements (see section 14)?**	Yes
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.	Yes
Have you involved your partners in preparation of the report and named the main contributors	Yes
Have you completed the Project Expenditure table fully?	Yes
Do not include claim forms or other communications with this report.	