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

Scheme (Main or Strategic)	Main
Project reference	DPLUS162
Project title	Characterising the biodiversity of selected offshore seamounts to improve management
Territory(ies)	Cayman Islands
Lead Organisation	Central Caribbean Marine Institute (CCMI)
Project partner(s)	Cayman Islands Department of Environment, Guy Harvey Ocean Foundation, Smithsonian Tropical Research Institute
Darwin Plus Grant value	£492,904
Start/end date of project	May 1, 2022 / March 31, 2025
Project Leader name	Gretchen Goodbody-Gringley
Project website/Twitter/blog etc.	www.reefresearch.org
Report author(s) and date	Dr. Gretchen Goodbody-Gringley & Abbie Dosel, 23.06.25

1 Project Summary

Coral reefs have global ecological, structural, social, and economic importance that is disproportionately large relative to their areal extent. They are a fundamental component of marine ecosystems and a major locus of global biodiversity, providing an ecological reserve of genetic complexity. Coral reef systems are increasingly threatened by local and global impacts, including overfishing and climate change. Nearshore ecosystems are particularly vulnerable due to their proximity to humans and longer residence times of water, resulting in higher frequency of thermal anomalies. Offshore seamounts, however, are increasingly targeted for commercial and recreational fishing and thus may suffer from greater impacts of overfishing. In the archipelago of the Galapagos Islands, for example, international commercial fishing fleets line the border of the marine protected area to take advantage of these highly productive seamounts. Yet, seamounts often serve as critical stepping-stones, connecting oceanic islands and shaping community composition and distribution across broad geographic scales. In the Cayman Islands, two seamounts (12-Mile Bank and Pickle Bank) rise above the 30m depth contour and likely serve as important stepping-stone communities. Both seamounts are frequently visited by recreational and commercial fisherman as prime locations for catching large pelagic species, yet characterization of the biological communities and physical environments remains limited. This study aimed to use advanced technologies and the proven strength of project partners to create precise, high-resolution characterization of these understudied ecosystems as well as generate outreach and educational content to be distributed globally, highlighting the importance of

protecting these valuable resources through sustainable management. Coupled with data generated for fish communities in deeper regions of the main platform around Grand Cayman and Little Cayman, this project will increase understanding of how these unique ecosystems function and maintain biodiversity, and the importance of connectivity among and between seamounts and nearshore communities. As such, this project will help guide future management of offshore seamounts and assist with marine spatial planning for offshore zones and the Blue Belt.

2 Project Partnerships

The main stakeholder for this project was the Cayman Islands Department of Environment (DOE). This project was developed in direct collaboration with the DOE following several consultations to identify key outcomes that would benefit local marine spatial planning, while capitalizing on the key strengths of all partners. During expeditions based out of Grand Cayman, the DOE provided housing to visiting researchers. They also assisted with construction of weighted buoys that were used as descent lines and drop point markers for divers on the seamounts. The DOE also made introductions with collaborators on DPLUS140 to ensure data were shared among groups. In the final quarter of the project, project results were presented to the DOE who then guided development of the CIBAP chapter (See attached Chapter).

The second main stakeholder is the local commercial and recreational fishing community. To include this stakeholder group, we collaborated with the Guy Harvey Ocean Foundation (GHOF). The GHOF met continuously with the project team and provided support by disseminating our project intent, activities, and results directly to the fishing community. An initial press release was launched in the local newspaper to inform the public of the upcoming work. In the final year of the project, the postdoctoral researcher on the project held a series of workshops on each of the three islands (Grand Cayman, Cayman Brac, and Little Cayman).

Another main stakeholder group is the local public. This group was initially engaged with the project through our press release at the project start and postings on social media throughout the project. Likewise, the scientific community has been included with the project through presentation of project results at multiple international scientific symposia each year, including the Mesophotic Coral Ecosystem Gordon Research Conference, the Benthic Ecology Meeting, the Gulf Caribbean Fisheries Institute Symposium, the European Coral Reef Symposium, and the Boston Sea Rovers. Three scientific manuscripts have been published from the project, one describing the benthic and pelagic biodiversity of mesophotic coral ecosystems in Grand Cayman, and another describing the fish communities on Pickle Bank Seamount, and a third describing the role of deep reefs as a thermal refuge (LeGall et al. 2024; Johnson et al. 2025; Goodbody-Gringley and Chequer, 2025), with two additional publications expected post-project (Annex 5, Fig. 1, Fig. 6, Fig. 7).

3 Project Achievements

3.1 Outputs

Output 1: *Baseline assessment of benthic and pelagic biodiversity at 12-Mile and Pickle Banks*

The bulk of the workload for the project was focused on achieving Output 1, which fed into all other project outputs. In project year 1 the team focused on project planning and development, such as finding a suitable vessel for the Pickle Bank surveys and recruiting a qualified postdoctoral researcher, as well as purchasing all necessary supplies. We established an MOU with project partner M. Leray from STRI and made travel arrangements for his participation in field work. In addition, two research technicians completed their technical dive training with the CCMI Dive Safety Officer to participate in surveys at the seamounts.

The first set of surveys at 12-Mile Bank were delayed due to weather, and as such we decided to focus our efforts for the week on nearshore mesophotic reefs in Grand Cayman. This allowed the opportunity to test our sampling design while also obtaining comparative data that will ultimately strengthen the project results. Data collection included photomosaics of the

benthos, visual fish community surveys, and water and sediment samples for eDNA. These efforts resulted in presentations at international scientific symposia and a published scientific paper (Output 1.3 & 1.4; Le Gall et al. 2024; Annex 5, Fig. 1). Still imagery captured during these nearshore surveys also contributing to an episode of CCMIs Reefs Go Live Series in 2023 (Outputs 2.1 & 2.2).

In year 2, we were able to complete the proposed activities at 12-Mile Bank seamounts (Output 1.2). This included two separate missions to the seamount to complete the proposed fish surveys, capture benthic imagery, collect samples for eDNA, collect light and temperature data and complete production for a series of short videos (Outputs 2.1 & 2.4; Annex 5, Fig. 2; [redacted]n addition, we leveraged matching funds to also collect samples for genetic connectivity assessments and generate a bathymetric map of the seamount (Annex 5, Fig. 3).

In year 3, we were able to make it to the furthest seamount, Pickle Bank (Output 1.2). During this expedition we completed the visual fish surveys, eDNA sampling, coral population genetic sampling, and created a preliminary bathymetric map (Annex 5, Figs. 4 & 5). These data have already contributed to a published peer-reviewed paper describing the fish communities (Output 1.4; Johnson et al. 2025; Annex 5, Fig. 6) and will be presented at the upcoming Association of Marine Laboratories of the Caribbean scientific meeting (Output 1.3). Remaining data are still be analysed by our team with at least two additional scientific publications expected after project completion. Consolidated results have been presented at multiple international scientific symposia, including the Mesophotic Coral Ecosystem Gordon Research Conference, the Benthic Ecology Meeting, the Gulf Caribbean Fisheries Institute Symposium, the European Coral Reef Symposium, and the Boston Sea Rovers (Outputs 1.3 & 1.4).

Output 2: *Project specific educational and outreach programmes*

CCMI delivered 12 live educational broadcasts throughout the project highlighting the importance of biodiversity and conservation management and highlighting seamounts (Output 2.1). Information about seamounts was incorporated into standard educational modules and a seamount specific education module was created (Output 2.3; see attached module). The project was also presented to the public via a press release in the local paper, multiple social media posts, and through the CCMI newsletter. In year 2 we collaborated with a television producer to create a short docuseries following our expedition to 12-Mile Bank (Output 2.3). These videos are publicly available on the CCMI youtube channel (https://www.youtube.com/@reefresearch). In year 3 we presented project results in a series of public lectures (https://youtu.be/4pLrfmeVwU8?si=zO8BIUykAwZtd9qk) and local workshops at each of the three islands (Grand Cayman, Cayman Brac, and Little Cayman; Outputs 2.4 & 2.5).

Output 3: *New section for offshore seamounts included in the Cayman Islands Biodiversity Action Plan.*

A new chapter to the Cayman Islands Biodiversity Action Plan specific to seamounts was written based on consolidated data from the project and submitted to the Cayman Islands Department of Environment (Output 3.1; see attached document). The chapter contains recommendations for improved management of seamounts to be proposed and enacted at the discretion of the CIG (Output 3.2).

3.2 Outcome

Expected Outcome: Detailed baseline data on benthic and pelagic biodiversity at offshore seamounts coupled with targeted education and outreach activities will foster and guide future management strategies.

We feel confident that we have met our proposed project outcome. Prior to this project, out initial baseline knowledge of these offshore seamounts was completely lacking. We have now completed all the proposed activities and outputs required to meet this outcome. With the data collected throughout the project, we achieved our first indicator of *completing data collection*

and analysis by project end. Our indicators that provide evidence of achieving this outcome include presentations are multiple scientific symposia, recorded webinars and lectures, published papers, and online archived datasets (Sharepoint and Zenodo). We completed the second indicator of *Improved management of biodiversity via incorporation of data into the Cayman Islands Biodiversity Action Plan by end of project* through incorporation of data into the newly drafted Seamount chapter to the Cayman Islands Biodiversity Action Plan submitted to the Cayman Islands Department of Environment. We have also created extensive outreach materials, including a docuseries, and developed a new education module that achieve our third indicator of *Heightened public awareness via dissemination of workshops, webinars, multi-media products and education modules by end of project*. We are certain, therefore, that we have achieved the proposed project outcome.

3.3 Monitoring of assumptions

Assumption 0.1: Delays related to recruitment, travel, weather, etc, do not hinder data collection/analysis.

Comments: This assumption was monitored closely throughout the project as weather caused a delay in data collection in years 1 and 2. However, the team was still able to collect useful data and complete the final field work in year 3.

Assumption 0.2: Suggested modifications to protection of offshore seamounts are well received; New chapter is approved by CIG

Comments: This assumption remains unchanged. The chapter has been submitted to the DOE without any reservations. We therefore do not expect this assumption to affect the final outcome of the project.

Assumption 0.3: Technical difficulties and COVID restrictions to not impact outreach

Comments: As COVID becomes less of a global issue this assumption became much lower risk and did not impact the project.

Assumption 1.1 &1.2:

- Weather is conducive to executing dives
- Liveaboard vessel is available to support technical diving
- Instruments do not flood

Comments: Weather is always an issue; the team has developed alternative strategies to ensure quality data was still obtained even if we couldn't access the seamounts. The liveaboard vessel was sourced and secured for the final trip to support technical diving, however, due to circumstances beyond our control was not available at the last minute. The team was able to pivot and find a fast local boat that could access the distant seamount in day trips to complete the final data collections for output 1. Instruments were purchased and tested with no failures, making this risk extremely low for the project.

Assumptions 1.3

- Resulting images are high enough quality to generate photomosaics
- DNA is high enough quality to successfully sequence

Comments: Mosaics were generated without issues. A failure rate of 20% is considered standard for molecular analyses, and thus some failure is always a risk, however, eDNA analysis was completed with quality results exceeding expectations.

Assumptions 1.4

- Publications are completed and accepted by end of project

Comments: Although acceptance is never guaranteed, we have already published 2 peer-reviewed papers from this project, making this a low-risk assumption for future projects.

Assumptions 2.1 – 2.5:

- Technological capabilities enable underwater video + audio recording at offshore sites
- Weather is conducive to completing expeditions
- Ample content is generated to create 2 modules

- Videography is available to join expeditions and film
- Local venue is available for hosting webinar and workshops

Comments: We completed all indicators for Output 2, however these assumptions remain unchanged for future projects.

Assumptions 3.1 – 3.2:

- Data collection and analysis is complete in time to develop chapter by end of project
- DOE approve the chapter

Comments: Data collection and consolidation was completed, and the chapter was written and submitted to the DOE. Formal acceptance is outstanding and thus the final assumption remains at a low risk.

4 Contribution to Darwin Plus Programme Objectives

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

The Cayman Islands and UK governments have been engaged in delimiting the Cayman Islands Exclusive Economic Zone and other areas of offshore control (possibly part of the Blue Belt Program), which would include these seamounts. The detailed biodiversity profiling will inform management to preserve the biodiversity, and economic and social utility, of these locally important but vulnerable marine ecosystems. One seamount, '12-Mile Bank', was identified as a key site in the 2009 Cayman Islands National Biodiversity Action Plan (part funded by DEFRA) however Pickle Bank was not included in that project due to practical limitations. These seamounts meet the FAO Vulnerable Marine Ecosystem criteria, except for being in state waters, rather than high seas. This work also supports the Specially Protected Areas and Wildlife (SPAW) Protocol of the Cartagena Convention to protect biodiversity through preservation and sustainable management of areas of ecological value. This project has generated detailed data on benthic and pelagic biodiversity on both 12-Mile bank and Pickle Bank, created bathymetric maps of each seamount, that were used to write the new seamount chapter to CI BDAP, directly contributing to these objectives.

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

Our project was intentionally structured to align with GESI principles through inclusive and equitable practices across all levels of engagement:

Rights: Legal and Customary
All participants operated under the legal framework of the Cayman Islands, including compliance with labour laws and employment standards. We ensured all contracts and participation agreements respected individual rights and upheld equal opportunity regardless of gender, age, or career status.

Practice: Attitudes, Customs & Beliefs
The project promoted a culture of mutual respect and collaboration, actively fostering inclusive attitudes across diverse cultural and professional backgrounds. By engaging individuals from academia, government, and industry, and ensuring open community involvement, we demonstrated respect for diverse perspectives and knowledge systems.

Environment: Stressors & Vulnerability
We minimized participant vulnerability by fully funding fieldwork—including housing, food, and salaries—and by ensuring a capped 45-hour workweek in accordance with local standards. This supported work-life balance and reduced the risk of overwork-related stress, particularly for early-career and marginalized participants.

Roles and Responsibilities: Division of Time, Space & Labour
Project roles were distributed equitably, involving undergraduate interns, graduate students, postdoctoral researchers, early-career and senior scientists, along with government and industry professionals. Tasks were assigned based on expertise and interest, not hierarchy, ensuring equitable contributions across genders and career levels.

Representation: Participation, Inclusion & Power
We prioritized diverse representation, ensuring that participants ranged across age, career stages, and sectors. All voices were valued in planning and decision-making. Local stakeholders and the public were engaged throughout the project, including through free public events and outreach, ensuring community perspectives were included and respected.

Resources: Access & Control of Assets and Services
Equitable access was a core principle. All participants had equal access to research funding, training, equipment, and data. Research outputs were published in open-access journals with no paywalls, ensuring that knowledge generated was freely available to local communities and the global scientific community alike.

Why Transformative:
This project promotes women's empowerment, as outreach initiatives will showcase a female lead scientist, and gender equality, as key decisions for conservation policies are led by the female Director of the DOE and outreach activities were led by the female CEO of the GHOF (Jessica Harvey). Moreover, in recruiting project participants, gender equality was at the forefront. Prior to project start we had recruited a female postdoctoral researcher to participate with the project; however, she decided to take an alternative position. Following a lengthy recruitment period, we hired a male researcher, however, an early career female intern and a female research assistant were brought onto the project creating a gender balanced team. Moreover, we trained both male and female early career scientists as technical divers, ensuring gender equality in our approach. In addition, the graduate student recruited through the Smithsonian to analyse eDNA data was also female.

This is an offshore expedition-based project that involves physically and mentally demanding technical diving to conduct science at depths of 30-70m, and it is led by a woman. She is one of only a few women doing research at these depths on SCUBA in the world. She was awarded the Explorer's Club Flag to carry as a Fellow of the club for this mission bringing awareness to the lack of female leaders in underwater exploration. We have made a docuseries highlighting her role as the lead scientist and expedition leader that has the potential to encourage more young women to pursue technical diving, exploration, and science. We therefore consider this project transformative.

5 Monitoring and evaluation

This project has been managed to CCMI's established monitoring and evaluation (M&E) protocols, in addition to the M&E practice as outlined in the grant application. Internal activities that provide the structure and scope to facilitate the project M&E:

- The project team met monthly to update the outputs and Activities, with increased frequency when preparing for field work or data analysis;
- Project partners are involved in each stage of the monthly M&E that is relevant to them.
- Project deliverables and updates were shared monthly with the CCMI Board of Directors, as well as project finances, as part of our overall financial governance protocols.
- CCMI holds a quarterly grants M&E meeting across the company, to discuss, assess and confirm the status of each project.
- A separate financial meeting was also held each quarter following the grants quarterly meeting, with the executive team, to discuss, assess and confirm the status of each project.
- A project summary is provided to our Board of Directors following the quarterly grant and financial meetings.

Both the Outputs and Activities, and the indicators of achievement were driven by the approved project logframe. As outlined in this report, there were minor changes to the timing of the Outputs and Activities due to weather issues and the delay in personnel recruitment, but the Outcomes were still achieved on target for the project. The logframe identified clear indicators of achievements which have also been outlined in this report and were achieved. The risk assessment and viability of the study was communicated via the M&E protocols outlined above.

There were no changes to the M&E plan over the project. In addition to the internal project M&E updates, project updates were released via our social media and outreach activities, including a quarterly newsletter and ongoing website updates.

6 Lessons learnt

During our planned expedition to Pickle Bank, it was determined by the liveaboard vessel that the weather was not conducive to offshore travel to the seamount. While the vessel provided excellent dive support, it was not equipped to handle high seas and thus the weather would need to be nearly perfect for an offshore trip on this boat. As we planned for another attempt to Pickle Bank, we decided to opt for a more sea-worthy vessel and incorporate support vessels to provide diving assistance. In the end, we were reliant on just the support vessels, highlighting the importance of flexibility when planning field work and having multiple options available as a contingency plan.

During the expedition in Year 2, there was conflict among the teams for when activities needed to be conducted, i.e. diving vs. mapping. As we planned our next expedition, we decided to enlist additional support so that activities could be conducted in tandem.

7 Actions taken in response to Annual Report reviews

The first annual report received a score of 2, indicating strong probability of achieving the proposed outcome. Three issues were raised in the review. The first was lack of supportive materials to substantiate claims. To address this, we have included the submitted manuscript, data figures from 12-Mile bank surveys, and provided links to the docuseries produced from the year 2 expedition. The second comment was related to an underspend due to delay in hiring the postdoc, which was discussed. The third issue raised was continued weather delays. Despite still not reaching Pickle Bank in year 2, we completed extensive assessment of 12-Mile that exceed the deliverables initially proposed and were able to complete the proposed activities at Pickle Bank in year 3.

The second annual report received a score of 1, indicating the project results would likely be completely achieved, and we feel have done this. There were minimal comments, the first was to add an example of the education module, which has been included in this report. The second was to more clearly outline the relationship with the DOE, which has been addressed throughout this report.

8 Risk Management

The major risk occurred in year 2 and was inclement weather prohibiting field work. We mitigated this risk by shifting surveys from offshore to nearshore sites, and by focussing extensively on 12-Mile Bank in year 2, with Pickle Bank completed in year 3. Had weather prohibited the expedition to Pickle Bank, an alternative trip was planned and comparable nearshore data from Little Cayman and or Cayman Brac would have been collected while we have access to the vessel.

The second major risk is that associated with technical diving. This risk was mitigated by the team adhering to strict diving protocols outlined in the CCMI diving safety manual which align with the American Academy of Underwater Sciences regulations. Moreover, the team regularly participated in updated training to ensure the highest level of training.

No new risks have arisen since the previous report.

9 Scalability and Durability

The most enduring achievements of the project include the publication of open-access papers, the availability of associated data online, the incorporation of findings into local youth education, and the development of a new chapter for the Cayman Islands Biodiversity Action Plan (BDAP), which will serve as a long-term governance tool. The project's intended sustainable benefits remain fully valid and have even gained strength, as all proposed outcomes were successfully completed. With the conclusion of Darwin Plus funding, the Principal Investigator and Research Manager/DSO will remain at the Central Caribbean Marine Institute (CCMI), continuing to contribute to ongoing and upcoming research initiatives, including future Darwin Plus projects. The postdoctoral researcher is progressing to the next stage of their academic career by applying for Fellowship positions at UK universities. As part of the project's open access plan, all published papers are freely accessible, with supporting data hosted on platforms such as Zenodo and/or available upon request. Additionally, results were widely disseminated through webinars, lectures, symposia, and workshops targeting a broad range of stakeholders. The project has also had a tangible impact on local policy by contributing a new BDAP chapter that offers specific recommendations for the conservation and management of seamount ecosystems explored during the study.

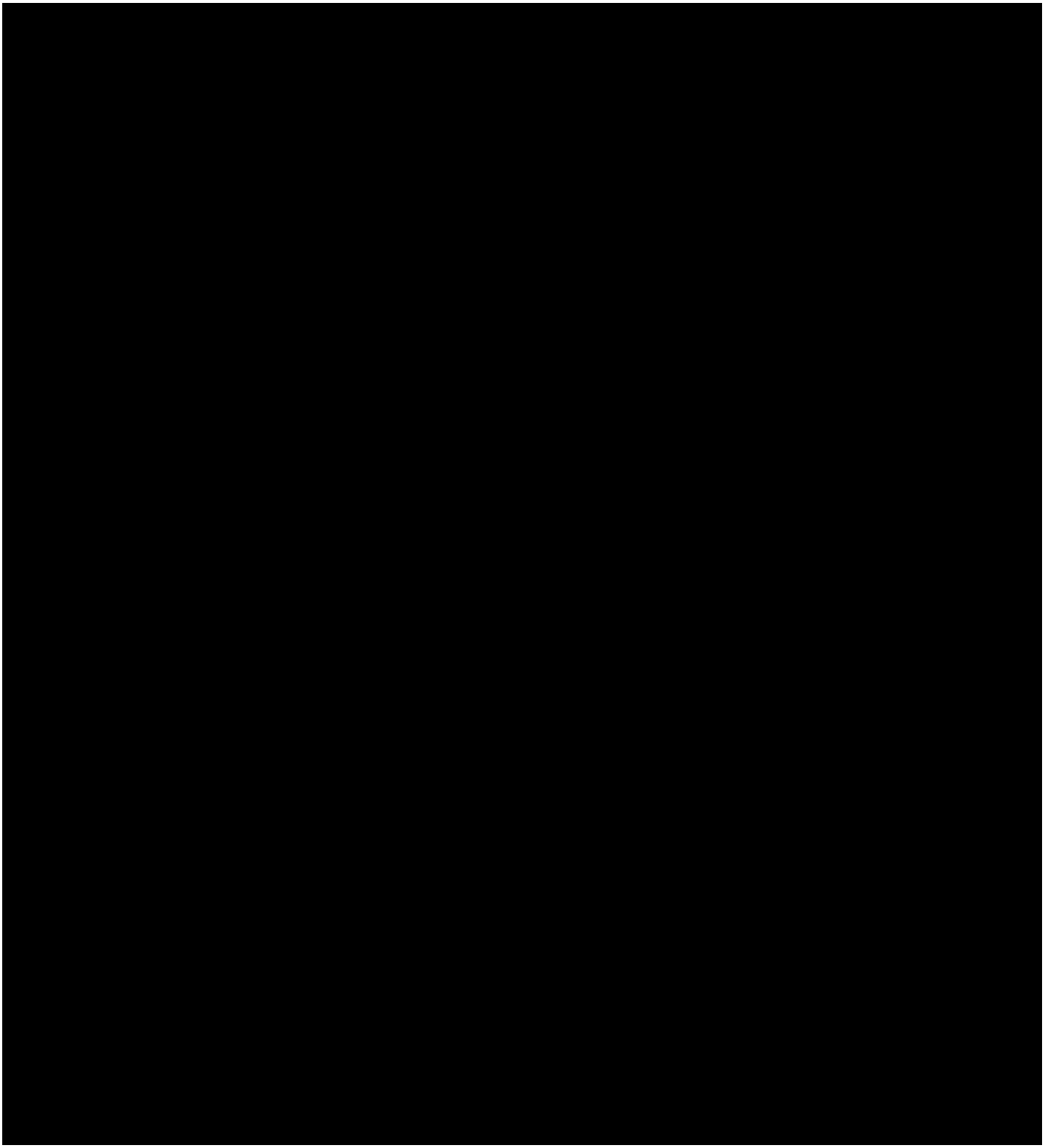
10 Darwin Plus Identity

Darwin Plus's identity was supported heavily in the Cayman Islands via CCMI and our project partners, the Cayman Islands Department of Environment. This project is stand alone for CCMI, ensuring that the Darwin Plus logo has clear stand out and links to project success.

The Darwin Plus logo was used in all CCMI collateral. There was a specific webpage, plus 4 newsletters per year that include the logo (reach od 8,000 people per newsletter). The Darwin Plus logo was used on the scientific poster presented at the Gordon Research Conference (February 2023), the Benthic Ecology Meeting (April 2023), which in addition to reaching 700 attendees, was also shared by CCMI's social media accounts. The logo was also included in the oral presentation given at the Gulf Caribbean Fisheries Institute meeting (November 2023) and at the Boston Sea Rovers Symposium (February 2024 & March 2025), and at an invited seminar at the Smithsonian Tropical Research Institute (November 2024). CCMI also included the logo in the Reefs Go Live broadcast (https://www.youtube.com/live/T2fs4I-M9rs?si=t_LXBGhxw7cNDu6K March 2025) which reached over 25,000 people and the mini documentary featured within the broadcast (https://youtu.be/z5p0Tk5z0O0?si=Wsz6C16PUwnLFJyd).

CCMI also has an active social media programme, that reaches thousands of people per day. In addition to logo usage, CCMI tags both the Darwin Plus programme and DEFRA when project information is shared. CCMI stakeholders are continually briefed on who Darwin Plus is, and the funding support for the project. Therefore, Darwin Plus identity was positively reinforced via CCMI's outreach and engagement for this project.

11 Safeguarding



12 Finance and administration

12.1 Project expenditure

Project spend (indicative) since last Annual Report	2024/25 Grant (£)	2024/25 Total actual Darwin Plus Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs	[redacted]			
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items				
Others				
TOTAL	180,195	180,234		

Staff employed (Name and position)	Cost (£)
Jack Johnson - Post Doc Researcher	[redacted]
Alex D Chequer - Research Manager	
Gretchen Goodbody - Director of Research	
Abbie Dosell - Grant management and Project support	
TOTAL	

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

Capital items – description	Capital items – cost (£)

NA	
TOTAL	

Other items – description	Other items – cost (£)
Smithsonian Institution Subaward Public Lectures costs on Grand Cayman Membership to ICRS Publication fees for Frontiers in Marine Science Publication fees for PloS ONE Outreach Costs	[redacted]
TOTAL	

12.2 Additional funds or in-kind contributions secured

Matched funding leveraged by the partners to deliver the project	Total (£)
Private Foundation 2024	[redacted]
Private Foundation 2025	
TOTAL	

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

12.3 Value for Money

The project represented excellent value for money, having not only completed all proposed activities and outcomes within the allocated budget, but also significantly exceeding expectations. In addition to the original objectives, the team conducted comprehensive biodiversity assessments of mesophotic coral ecosystems (MCEs) in Grand Cayman, completed bathymetric mapping of both seamounts, and collected samples for coral genetic connectivity analysis. The project expanded its collaborative network beyond initial plans to include Florida Atlantic University, Harbor Branch Oceanographic Institute, and the University of Delaware, enhancing research capacity and knowledge exchange. Despite these additional activities, the team remained within budget while attending more international conferences than anticipated, allowing for broader dissemination of findings. Two open access scientific papers were published before project completion, supporting long-term impact and accessibility of

results. Furthermore, two early-career researchers were trained as technical divers, strengthening local capacity at CCMI. Delivering these outcomes efficiently and effectively, despite the logistical and operational challenges of conducting marine research on offshore seamounts, demonstrates the project's strong value for money.

13 Other comments on progress not covered elsewhere

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

I agree for the Biodiversity Challenge Funds 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).

This project represents a strong example of the pathway to change from scientific research to conservation action for the safeguarding of biodiversity. Through Expedition Hope, CCMI has successfully increased the evidence-base of seamount communities in the Cayman Islands. An ecological baseline has been established through scientific exploration which will be essential for future management. Similarly, this project has also demonstrated an efficient and successful methodology protocol for seamount exploration that can be applied globally.

Expedition Hope has not only confirmed the presence of, but has also mapped in detail, the high levels of biodiversity on 12-mile Bank and Pickle Bank seamounts. This information has been developed into a seamounts chapter for the Cayman Islands Biodiversity Action Plan.

In addition to informing policy, the project has engaged with a wide range of stakeholders in the Cayman Islands and internationally and disseminated findings to key audiences. As a result, stakeholders that are essential to ensuring the legacy of this project now have a greater understanding of the biodiversity on these seamounts, the conservation requirements and why these ecosystems are vital to the health of the marine environment in the Cayman Islands and the communities that rely upon them.

This is an outstanding achievement in undertaking essential research that is robust enough to inform policy and translating that research into audience-appropriate forms to ensue maximum impact through management, increased stakeholder awareness and behaviour change.

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

Project summary	Progress and achievements
Impact Increase protection and public awareness of unique offshore seamount ecosystems in the Cayman Islands.	Complete: All proposed deliverables were achieved and the data obtained was shared broadly across stakeholders including the scientific community through conference presentations and peer-reviewed publications, the local youth through incorporation into educational materials, the general public through local seminars and workshop, and the government through development of the *Seamount* chapter of the Biodiversity Action Plan.
Outcome Detailed baseline data on benthic and pelagic biodiversity at offshore seamounts coupled with targeted educational and outreach activities will foster and guide future management strategies.	
Outcome indicator 0.1 Increased understanding of seamount biodiversity via data collection and analysis	Complete: Data was collected from the 12-Mile Bank and Pickle Bank Seamounts; New bathymetric map of the seamount was created; Manuscript describing biodiversity of nearshore mesophotic reefs in Grand Cayman was published; Manuscript describing fish communities on Pickle Bank was published. Evidence in provided in Section 3.2 and Annex 5.
Outcome indicator 0.2 Improved management of biodiversity via incorporation of data into the Cayman Islands Biodiversity Action Plan	Complete: New Chapter on Seamounts was written and submitted to the Cayman Islands Department of Environment. Evidence in provided in Section 3.2 and Annex 5.
Outcome indicator 0.3 Heightened public awareness and local knowledge via dissemination of workshops, webinars, multi-media products and education modules	Complete: Dissemination occurred via press releases, social media posts, presentations at scientific conferences, and publication of peer-reviewed scientific papers. Evidence is provided in Section 3.2 and Annex 5.
Output 1 Baseline assessment of benthic and pelagic biodiversity at 12-Mile and Pickle Banks	
Output indicator 1.1 Knowledge gained on 12-Mile bank seamount biodiversity via data collection by end of Year 1	Complete: All data were collected and available on Sharepoint and/or Zenodo. Evidence is provided in Section 3.1 and Annex 5.
Output indicator 1.2	Complete: All data were collected and available on Sharepoint and/or Zenodo. Evidence is provided in Section 3.1 and Annex 5.

Knowledge gained on Pickle Bank seamount biodiversity via data collection by end of Year 2	
Output indicator 1.3 Improved understanding of seamount ecosystem function via data consolidation and analysis completed by Jan. 2025	Complete: Data collection completed for nearshore mesophotic reefs in Grand Cayman was published. Data describing fish community composition on Pickle Bank seamount was published. Consolidated paper comparing seamounts to nearshore environments in preparation. Evidence is provided in Section 3.1 and Annex 5.
Output indicator 1.4 Increased stakeholder knowledge via publication of results by end of project	Complete: Two scientific publications available open access; Multiple presentations at international scientific conferences; Several local seminars and workshops; new chapter submitted for BDAP. Evidence is provided in Section 3.1 and Annex 5
Output 2. Project specific educational and outreach programmes	
Output indicator 2.1. Increased global stakeholder engagement via 1 interactive educational broadcast delivered each project year, each reaching 250-450 via direct views In the Cayman Islands with up to 25,000 recording views per episode from 28 countries (this includes data on class sizes watching - i.e. 1 'view' included 25 students).	Completed via the Reefs Go Live programme. Disseminated via CCMI Reefs Go Live webpage (https://reefresearch.org/what-we-do/education/reefs-go-live/) and YouTube channel (https://www.youtube.com/@reefresearch/videos). Evidence is provided in Section 3.1
Output indicator 2.2. Increased local education via 1 education module related to the project delivered each project year reaching roughly 100 local primary students each year	Completed via CCMI's residential programmes to local primary school children, which included over 200 students in 2023. The docuseries was released in December 2023 and has been showed widely to CCMI residential students, we well as across our social media channels and at the Sea Rovers Conference. Evidence is provided in Section 3.1 and Annex 5
Output indicator 2.3. Broaden educational reach via 1 short educational video available online by end of Year 2 provided to local schools and available online reaching upwards of 1,000 students	Complete. Education video was completed and shared with local school networks. Evidence is provided in Section 3.1 and Annex 5
Output indicator 2.4. Increased stakeholder knowledge via one webinar delivered locally each project year reaching roughly 50 people via in person attendance and 100 via online stream.	Complete. Two Reef Lectures included the mesophotic reef/project content, delivered by Dr Gretchen Goodbody-Gringley (50 people) and intern Lucas De Gall (60 people). Evidence is provided in Section 3.1 and Annex 5

Output Indicator 2.5 Improved fisherman understanding of seamount biodiversity and importance via consultation through 1 in-person workshop given at each of the 3 Cayman Islands by the end of Year 3, reaching approximately 50-200 local fisherman and anglers.	Complete. Postdoctoral Researcher J. Johnson presented project results at a series of public workshops on each of the three islands. Evidence is provided in Section 3.1 and Annex 5
Output 3. New section for offshore seamounts included in the Cayman Islands Biodiversity Action Plan	
3.1 Improved documentation of seamount biodiversity and sustainability via new seamount chapter written by Jan 2025	Complete. Evidence is provided in Section 3.1 and Annex 5
3.2. Better management of seamounts via chapter approval by DOE and incorporation in CI BAP by end of project.	Complete. Evidence is provided in Section 3.1 and Annex 5

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: Increase protection and public awareness of unique offshore seamount ecosystems in the Cayman Islands.			
Outcome: Detailed baseline data on benthic and pelagic biodiversity at offshore seamounts coupled with targeted educational and outreach activities will foster and guide future management strategies.	0.1 Increased understanding of seamount biodiversity via data collection and analysis 0.2 Improved management of biodiversity via incorporation of data into the Cayman Islands Biodiversity Action Plan 0.3 Heightened public awareness and local knowledge via dissemination of workshops, webinars, multi-media products and education modules	0.1 Biodiversity data available on public repositories 0.2 Updated Cayman Islands Biodiversity Action Plan; Final project report. 0.3 Documentation of outreach events; media files available online; education modules published online	1. Delays related to recruitment, travel, weather, etc, do not hinder data collection/analysis 2. Suggested modifications to protection of offshore seamounts are well received; New chapter is approved by CIG Technical difficulties and COVID restrictions to not impact outreach
Outputs: **1**. Baseline assessment of benthic and pelagic biodiversity at 12-Mile and Pickle Banks	1.1 Knowledge gained on 12-Mile bank seamount biodiversity via data collection by end of Year 1 1.2 Knowledge gained on Pickle Bank seamount biodiversity via data collection by end of Year 2 1.3 Improved understanding of seamount ecosystem function via data consolidation and analysis completed by Jan. 2025 1.4 Increased stakeholder knowledge via publication of results by end of project	1.1 Project notebooks; internal online database; interim project report 1.2 Project notebooks; internal online database; interim project report 1.3 Documented presentations of results with interpretation; interim project report 1.4 Documented presentations of results with interpretation; final project report; publications	1.1 & 1.2 Weather is conducive to executing dives 1.1 & 1.2 Liveaboard vessel is available to support technical diving 1.1 & 1.2 Instruments do not flood 1.3 Resulting images are high enough quality to generate photomosaics 1.3 DNA is high enough quality to successful sequence 1.4 Publications are completed and accepted by end of project
2. Project specific educational and outreach programmes	2.1 Increased global stakeholder engagement via 1 interactive educational broadcast delivered	2.1 Recorded Reefs Go Live broadcast online via CCMI	2.1 Technological capabilities enable underwater video + audio recording at offshore sites

	each project year, each reaching 250-450 via direct views with up to 10,000 recording views from 28 countries. 2.2 Increased local education via 1 education module related to the project delivered each project year reaching roughly 100 local primary students each year 2.3 Broaden educational reach via 1 short educational video available online by end of Year 2 provided to local schools and available online reaching upwards of 1,000 students 2.4 Increased stakeholder knowledge via one webinar delivered locally each project year reaching roughly 50 people via in person attendance and 100 via online stream. 2.5 Improved fisherman understanding of seamount biodiversity and importance via consultation through 1 in-person workshop given at each of the 3 Cayman Islands by the end of Year 3, reaching approximately 50-200 local fisherman and anglers.	2.2 Education modules available on CCMI and GHOF websites 2.3 Video (s) available online via CCMI and GHOF 2.4 Recorded webinar available on CCMI YouTube page and via CCMi website/social media 2.5 Recorded workshop available online via CCMI and GHOF 2.1 – 2.4 Final project report	2.1 Weather is conducive to completing expeditions 2.2 Ample content is generated to create 2 modules 2.3 Videographer is available to join expeditions to film 2.4 local venue is available for hosting webinar
3. New section for offshore seamounts included in the Cayman Islands Biodiversity Action Plan	3.1 Improved documentation of seamount biodiversity and sustainability via new seamount chapter written by Jan 2025 3.2. Better management of seamounts via chapter approval by	3.1 Digital copy archived and publicly available on CCMI website 3.2 Updated version of the Biodiversity Action Plan publicly available.	3.1 Data collection and analysis is complete in time to develop chapter by end of project 3.2 DOE approve the chapter

	DOE and incorporation in CI BAP by end of project.		

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

1.1 12 in-situ fish surveys completed at each seamount (July – December 2022 & 2023)
1.2 5 benthic photomosaics generated from each seamount (July – December 2022 & 2023)
1.3 Fish and benthic data analyzed (January – July 2023 & 2024)
1.4 Water and sediment samples collected from each seamount (July – December 2022 & 2023)
1.5 Water samples analyzed for eDNA (January – July 2023-2024)
1.6 3 replicate light and temperature loggers deployed at each seamount for 1 month (July – December 2022 & 2023)
1.7 Data consolidated and results published (June 2024 – March 2025)
2.1 Interactive video with scientist filmed while diving on each seamount (July – December 2022 & 2023)
2.1 Video incorporated into a live broadcasted Q&A session with scientists (June each year)
2.2 Education modules created related to the project and delivered locally and regionally (1 per year)
2.3 Short educational video developed and broadcast only by December 2024
2.4 One webinar delivered locally each project year
2.5 One workshop delivered on each island (Grand, Little, Brac) (Year 3)
3.1 Consultations with DOE regarding interpretation of results and development of CIBAP chapter (Year 3)
3.2. Recommendations and data consolidated into new CIBAP chapter on seamounts (Year 3)
3.3. Chapter approved and consultations held with relevant government agencies to discuss implications and potential changes to legislation (Year 3).

Table 1 Project Standard Indicators

Please see the Standard Indicator Guidance for more information on how to report in this section, including appropriate disaggregation. N.B. The annual total is not cumulative. For each year, only include the results achieved in that year. The total achieved should be the sum of the annual totals.

DPLUS Indicator number	Name of indicator	If this links directly to a project indicator(s), please note the indicator number here	Units	Disaggregation	Year 1 Total	Year 2 Total	Year 3 Total	Total achieved	Total planned
DPLUS-A01	Number of people from key national and local stakeholders completing structured and relevant training	People	People	5	2	1	8	6	DPLUS-A01
DPLUS-A03	Number of local/national organization with improved capacity as a result of the project	Number of Organizations	Number of Organizations	1	1	1	1	1	DPLUS-A03
DPLUS-A04	Number of people reporting that they are applying new capabilities	People	People	5	2	1	8	5	DPLUS-A04
DPLUS-C04	Number of new conservation or species stock assessments published	Number	Taxa (fish, corals, algae, sponges, etc); regional; visual and photographic surveys	1	1	1	3	2	DPLUS-C04
DPLUS-C15	Number of Media related activities	Number	Print; national	1	1	1	3	3	DPLUS-C15
DPLUS-C12	Social Media Presence	Number	By year; Instagram and Facebook; reach	180,000	180,00	180,000	360000	540000	DPLUS-C12
DPLUS-A07	Number of government institutions/departments with enhanced awareness and understanding of biodiversity and associated local community issues	Number	Planning; environmental; tourism	0	0	1	1	1	DPLUS-A07
DPLUS-B01	Number of new/improved habitat management plans available and endorsed	Number	Local; habitat; Chapter	0	0	1	1	1	DPLUS-B01

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)
Benthic and fish community composition on mesophotic reefs in Grand Cayman	Journal article	Le Gall L, Johnson JV, Chequer AD, Doherty M, Goodbody-Gringley G. (In Review)	Male	French	PeerJ, London UK	DOI 10.7717/peerj.17763
Depth partitioning of mesophotic reef fish communities on Pickle Bank seamount	Journal article	Johnson JV, Chequer AD, Goodbody-Gringley G	Male	English	Frontiers in Marine Science, Lausanne, Switzerland	https://doi.org/10.3389/fmars.2025.1539066
Mesophotic reef offer thermal refuge to the 2023 Caribbean mass bleaching event in the Cayman Islands	Journal article	Goodbody-Gringley G and Chequer AD	Female	Bermudian	Nature: Scientific Reports, London UK	https://doi.org/10.1038/s41598-025-01813-6

Checklist for submission

	Check
Different reporting templates have different questions, and it is important you use the correct one. Have you checked you have used the **correct template** (checking fund, 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.	x
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
If you are submitting photos for publicity purposes, **do these meet the outlined requirements (see section 14)?**	x
Have you included means of verification? You should not submit every project document, but the main outputs and a selection of the others would strengthen the report.	
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 encouraged to develop a risk register.	x
Have you involved your partners in preparation of the report and named the main contributors	x
Have you completed the Project Expenditure table fully?	x
Do not include claim forms or other communications with this report.	