Applicant: Gore, Mauvis
Organisation: Heriot-Watt University
Funding Sought: £207,681.00

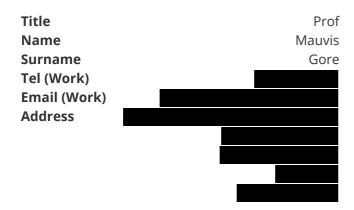
DPR9S2\1022

Assessment and conservation of Cayman Islands' deep-water reefs and fishes

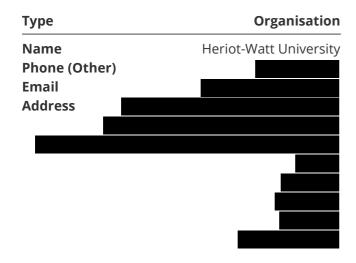
The Cayman Islands lie adjacent to deep ocean trenches, yet little is known of its marine life below 50m, or whether its deep reefs offer a refuge from climate change. The project will undertake surveys of Cayman seabed habitats down to 2000m and evaluate connectivity between shallow-water and deep-reef communities. The work will focus on threatened and commercial fish species, including sharks, and map the distribution of deep-water coral and other biotopes with a view to designating additional protected areas.

Section 1 - Contact Details

PRIMARY APPLICANT DETAILS



GMS ORGANISATION



Section 2 - Title, Dates & Budget Summary

Q3a. Project title

Assessment and conservation of Cayman Islands' deep-water reefs and fishes

Q3b. What was your Stage 1 reference number? e.g. DPR9S1\10008

DPR9S!/1048

Q4. UKOT(s)

Which eligible UK Overseas Territory(ies) will your project be working in?

☑ Cayman Islands

^{*} if you have indicated a territory group with an asterisk, please give detail on which territories you are

working on here:

Grand Cayman & Little Cayman

Q4b. In addition to the UKOTs you have indicated, will your project directly benefit any other Territories or country(ies)?

No

Q5. Project dates

Start date: End date: Duration (e.g. 2 years, 3

01 October 2021 30 September 2023 **months):**

2 years

Q6. Budget summary

Year:	2021/22	2022/23	2023/24	2024/25	Total request
Darwin funding request (Apr - Mar)	£53,621.00	£103,869.00	£50,191.00	£0.00	£ 207,681.00

Q6a. Do you have proposed matched funding arrangements?

Yes

What matched funding arrangements are proposed?

- 1. Cayman Islands Department of Environment
- 2. CayBrew Whitetip Shark Conservation Fund
- 3. Wanderlust Fund

Q6b. Proposed matched funding as % of total project cost (total cost is the Darwin request <u>plus</u> other funding required to run the project).



Section 3 - Project Summary and Conventions

Q7. Summary of Project

Please provide a brief summary of your project, its aims, and the key activities you plan to undertake. Please note that if you are successful, this working may be used by Defra in communications e.g. as a

short description of the project on GOV.UK.

Please write this summary for a non-technical audience.

The Cayman Islands lie adjacent to deep ocean trenches, yet little is known of its marine life below 50m, or whether its deep reefs offer a refuge from climate change. The project will undertake surveys of Cayman seabed habitats down to 2000m and evaluate connectivity between shallow-water and deep-reef communities. The work will focus on threatened and commercial fish species, including sharks, and map the distribution of deep-water coral and other biotopes with a view to designating additional protected areas.

Q8. Biodiversity Conventions, Treaties and Agreements

Please detail how your project will contribute to the aims of the agreement(s) your project is targeting. What key OT Government priorities and themes will it address? You should refer to Articles or Programmes of Work here. You should also consider local, territory specific agreements and action plans here.

The work proposed here is now a priority for the Cayman Department of Environment since, while being tasked with promoting the biological diversity and sustainable use of natural resources throughout the Islands and their surrounding waters, almost no information is available from the Cayman Islands on the character of the deep reef and sea-bed below 50m, nor on the principal species present. Although a well-managed network of Marine Protected Areas (MPAs) effectively protects shallow-water coastal reefs and associated habitats such as mangrove forest and seagrass beds, as yet no planning is possible to protect or manage the greater part of Cayman's territorial waters, let alone the huge extent of Cayman Islands' EEZ.

Protection of marine habitats and species throughout national waters is a requirement of both the Convention on Biological Diversity (CBD), which was extended to the Cayman Islands in 1992, and the Cayman Islands Environment Charter (2001), which includes a commitment (item 2) to "Ensure the protection and restoration of key habitats and speciesthrough legislation and appropriate management structures and mechanisms...". Subsequently, the National Strategic Plan (Vision_2008) stated an objective "to protect the coral reefs of the Cayman Islands from further adverse impacts," while the Cayman National Biodiversity Action Plan (2009) had the goal of "no net loss of biodiversity", to be achieved through a two-pronged approach, including the preservation of key species, through Species Action Plans, and of critical habitats through the establishment of Protected Areas.

In 2013, a further National Conservation Law (2013/24) was enacted inter alia: to promote and secure biological diversity and the sustainable use of natural resources in the Cayman Islands; to protect and conserve endangered, threatened and endemic wildlife and their habitats; and to provide for protected terrestrial, wetland and marine areas. The legislation established the National Conservation Council and gives protection (in Schedule_1) to all species of marine mammal (cetaceans), sharks and rays (elasmobranchs), sea-urchins and starfish (echinoderm) and hard and soft corals (Anthozoa), even though their occurrence outside near shore water is poorly known.

The law was also established to give effect within the Cayman Islands to the provisions of a series of international agreements, including not only the CBD, the Convention on the Migratory Species (CMS) and the United Nations Framework Convention on Climate Change, but also several regional agreements including a) the Protocol Concerning Specially Protected Areas and Wildlife (SPAW) and b) the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region.

However, although the National Conservation Council may designate any area of Cayman waters as a protected area, those established to date include only shallow-water environments, usually to a depth of 24m. The present project will assess biodiversity to a depth of 2000m, and is likely to record species, especially of elasmobranchs, included in the CMS Appendices (such as the hammerhead sharks Sphyrna lewini and S. mokarran).

Section 4 - Lead Organisation Summary

Q9. Lead organisation summary

Has your organisation been awarded a Darwin Initiative award before (for the purposes of this question, being a partner does not count)?

Yes

If yes, please provide details of the most recent awards (up to 6 examples).

Reference No	Project Leader	Title
11-015	Dr Mark Baine	Sustainable Management of the black land crab in Colombia
12-021	Dr James (Hamish) Mair	Marine biodiversity assessment and development in Perlas Archipelago, Panama
6-029	Dr James (Hamish) Mair	Marine Benthic Invertebrate Study in Coastal Waters of Ecuador
7-147	Dr James (Hamish) Mair	Marine habitat mapping development in San Andres Archipelago, Colombia
EIDPO017	Dr James (Hamish) Mair	Conservation Management Zoning Implementation and Facilitation in Perlas Archipelago, Panama
8-085	Professor Brian Austin	Bacterial diversity in coastal seawater in Shandong Province, China

Have you provided the requested signed audited/independently examined accounts? If you select "yes" you will be able to upload these. Note that this is not required from Government Agencies.

Yes

Please attach the requested signed audited/independently examined accounts.

& HWU annual-report-accounts-2019	
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Section 5 - Project Partners

Q10. Project Partners

Please list all the partners involved (including the Lead Organisation) and explain their roles and responsibilities in the project. Describe the extent of their involvement at all stages, including project development.

This section should illustrate the capacity of partners to be involved in the project. Please provide Letters of Support for the Lead Organisation and each partner or explain why this has not been included.

N.B: There is a file upload button at the bottom of this page for the upload of a cover letter (if applicable) and all letters of support.

Lead Organisation name:	Prof. Teresa Fernandes, School of Energy, Institute of Life and Earth Sciences, Heriot Watt University		
Website address:	https://www.hw.ac.uk/uk/schools/energy- geoscience-infrastructure-society/iles.htm and https://cmbb.hw.ac.uk/		

Details (including roles and responsibilities and capacity to engage with the project):

Heriot-Watt University is a leading UK University that also has campuses in Malaysia and Dubai. It receives more than £ year in research funding. It ranked 9th among UK Universities in the most recent Research Excellence Framework (REF) review. The Institute of Life and Earth Sciences (ILES), of which Professor Fernandes is Director and Professors Gore and Ormond are associate member of staff, is part of the University's School of Energy, Geoscience, Infrastructure and Society. The Institute includes the University's Environment Department, within which expertise on marine and coastal environments is brought together within the Centre for Marine Biodiversity & Biotechnology (CMBB). The Department has at its main campus well equipped laboratories, which will be available to project personnel. In addition, the school's experienced administrative staff will fulfil the necessary purchasing and accounting requirements.

Have you provided a cover letter to address your Stage 1 feedback?

Yes

Do you have partners involved in the Project?

Yes

1. Partner Name: Prof. Mauvis Gore, Marine Conservation International (MCI) /

Heriot-Watt University

Website address: https://marineconservationinternational.org/index.html

Details (including roles and responsibilities and capacity to engage with the project):

MCI is an independent conservation-oriented marine research group run by staff affiliated with Heriot-Watt University. Its senior staff (Profs. Mauvis Gore and Rupert Ormond) have over more than 40 years directed marine research projects in more than 20 countries, including Cayman Islands, Jamaica, Egypt, Saudi Arabia, Seychelles, Pakistan, Australia and U.K. They have between them generated more than 200 publications including over 20 papers in international journals over the last 10 years. The latter include papers on reef ecology, survey methodologies, deep-sea biota, cetacean conservation, and shark abundance and migration patterns. MCI will contribute its detailed local knowledge of the Cayman Islands, its expertise in use of camera traps (BRUVS), its knowledge of Caribbean fauna and its experience of substrate and biota analysis from video transects (e.g. at 5000m in the Eastern Pacific – Tilot, Ormond et_al._2018).

Prof. Gore will direct the project, lead the fieldwork in the Cayman Islands, and undertake the greater part of the data analysis and reporting. As well as making numerous previous research trips to the Cayman Islands, she completed her undergraduate studies and PhD at the University of West Indies in neighbouring Jamaica. She coordinated the writing and submission of the present application.

Have you included a Letter of Support from this organisation?

Yes

Do you have more than one partner involved in the Project?

Yes

2. Partner Name:

Dr. Austin Gallagher, Beneath the Waves (BTW)

Website address:

https://beneaththewaves.org/

Details (including roles and responsibilities and capacity to engage with the project):

BTW is a Florida-based non-profit organization dedicated to promoting ocean health. They employ advanced technology, including drop down camera rigs / seabed landers and small submersibles, to achieve research findings and secure conservation policies that otherwise would not be possible without the use of heavy ocean-going vessels and gear. They specifically focus on threatened species and marine protected areas, with an emphasis on sharks and other deep-sea fishes. BTW will provide experience in the use of deep-sea imaging technology and video surveys down to 2000m, as well as the required skills and gear for sampling and performing environmental DNA analyses. They have extensive experience of undertaking similar work across the wider Caribbean. Dr. Gallagher first recognised the need for surveying Cayman waters for deep-water elasmobranchs.

Have you included a Letter of	
Support from this organisation	?

Yes

3. Partner Name:	Mr. Timothy Austin, Deputy Director, Cayman Islands Department of		
	Environment (DOE)		
Website address:	www.doe.ky/ and https://conservation.ky/ also https://www.facebook.com/DOECayman/		
Details (including roles and responsibilities and capacity to engage with the project):	The DOE is the government agency responsible for management of natural resources in the Cayman Islands. Deputy Director Tim Austin has over 30 years of marine environmental work in the Cayman Islands and oversaw the establishment and development of the islands' much admired Marine Protected Areas (MPAs) network. He is also a board member of the Cayman Islands National Conservation Council. He will be responsible (under DOE Director Gina Ebanks-Petrie) for overseeing the project in the Cayman Islands and managing the provision of the required facilities, including accommodation, vehicles, vessels and diving facilities. The DOE operates three inshore vessels as well as a larger offshore live-aboard, one of which will be made available as required. At least one of four other DOE staff will assist in fieldwork on a daily basis (skippering vessels, diving, surveying) and others in providing administrative services (GIS, gear maintenance). The DOE also employ ranger staff who patrol and manage the MPAs on a regular basis. Ms. Johanna Kohler, the DoE's shark officer under the supervision of Prof. Gore, will also participate in all fieldwork. DOE staff Mr. Jeremy Olynik will lead the GIS mapping work on the		
Have you included a Letter of Support from this organisation?	⊙ Yes		
4. Partner Name:	No Response		
Website address:	No Response		
Details (including roles and responsibilities and capacity to engage with the project):	No Response		
Have you included a Letter of Support from this organisation?	○ Yes ○ No		

Website address:	No Response
Details (including roles and responsibilities and capacity to engage with the project):	No Response
Have you included a Letter of Support from this organisation?	○ Yes ○ No
6. Partner Name:	No Response
Website address:	No Response
Details (including roles and responsibilities and capacity to engage with the project):	No Response
Have you included a Letter of Support from this organisation?	O Yes O No
f you require more space to ente ield below. No Response	r details regarding Partners involved in the Project, please use the t
Please provide a cover letter resp PDF of all Letters of Support.	onding to feedback received at Stage 1 if applicable and a combined
△ DPR9S1-1048 Cover Support Approximation Ap	ort Letters & DPR9S1-1048 HWU Cover Letter

No Response

Section 6 - Project Staff

Q11. Project Staff

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5. Partner Name:

Please identify the core staff on this project, their role and what % of their time they will be working on the project. Further information on who should be classified as core staff can be found in the guidance.

■ 30/01/2021

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Please provide 1 page CVs for these staff, or a 1 page job description or Terms of Reference for roles yet to be filled. These should match the names and roles in the budget spreadsheet. If your team is larger than 12 people please review if they are core staff, or whether you can merge roles (e.g. 'admin and

finance support') below, but provide a full table based on this template in the PDF of CVs you provide.

Name (First name, Surname)	Role	% time on project	1 page CV or job description attached?
Prof. Mauvis Gore	Project Leader	33	Checked
Dr. Austin Gallagher	Co-Project Leader	17	Checked
Prof. Teresa Fernandes	Research Advisor	5	Checked
Timothy Austin	Research Manager	10	Checked

Do you require more fields?

Yes

Name (First name, Surname)	Role	% time on project	1 page CV or job description attached?
Prof. Rupert Ormond	Research Advisor & Reporting	15	Checked
Johanna Kohler	Research Assistant	50	Checked
Christine de Silva	Research Assistant	50	Checked
No Response	No Response	0	Unchecked
No Response	No Response	0	Unchecked
No Response	No Response	0	Unchecked
No Response	No Response	0	Unchecked
No Response	No Response	0	Unchecked

Please provide 1 page CVs (or job description if yet to be recruited) for the Project staff listed above as a combined PDF.

Ensure the file is named clearly, consistent with the named individual and role above.

- 凸 DPR9S1-1048 CVs
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Yes

Section 7 - Background & Methodology

Q12. Problems the project is trying to address

Please describe the problem your project is trying to address in terms of environment and climate issues in the UKOTs.

For example, what are the specific threats to the environment that the project will attempt to address? Why are they relevant, for whom? How did you identify these problems? How will your proposed project help?

Please cite the evidence you are using to support your assessment of the problem (references can be listed in your additional attached PDF document which can be uploaded at the bottom of the page).

In the last decade there has been a dramatic increase in awareness of the importance of mesophotic coral ecosystems (MCEs) and deeper reef and sea-bed zones (Lesser et_al._2018), with new evidence of exceptional fish biomass in the mesopelagic zone (Irigoien et_al._2014). Surveys conducted in parts of the Caribbean and elsewhere have revealed that mesophotic and sub-mesophotic zones harbour a partially-distinct fauna (Smith et_al._2010; Baldwin et_al._2018) and that many shallow-water species make extensive use of deep reefs.

Globally, MCEs are inadequately protected by fishery regulations or Marine Protected Areas (MPAs) (Soares et_al._2020) and in many regions under immediate threat of pollution from sea-bed mining for metalliferous nodules adjacent to ocean trenches (Churchyard et_al._2016; Tilot et_al._2018). As traditional fish stocks become exhausted, deep-water species are threatened by unregulated, unsustainable fishing (Baker et_al._2016; Rocha et_al._2018). Commercial and recreational interests are targeting newly discovered deep reefs that are the spawning grounds or migration corridors of deep-water snapper and grouper (Heileman_2011; Sadovy-de-Mitcheson et_al._2013).

Furthermore, the extent to which deep-reef habitats interact ecologically with shallow-reef areas or serve as a cooler refuge from ocean warming for shallow-water species has become a critical environmental issue (Semmler et_al._2016; Laverick et_al._2018; Muir et_al._2018).

The Cayman Islands has designated 17.8% of its shallow coastal shelf as MPAs to protect its well-developed, economically important fringing coral reefs, mangrove stands and seagrass beds (Dromard et_al._2011). These MPAs have been effectively managed over >25 years, but only extend 0.5-1km offshore/25-45m deep.

Little is known in the Cayman Islands of the habitats or biota associated with deeper seabeds (Wind_2015) extending to 2000m within territorial waters (12nm from shore) and >6000m within Cayman's extensive (119,137km2) Exclusive Economic Zone (EEZ). The Cayman Islands DOE is thus concerned to inform itself about its renewable deep-sea resources, and initiate measures to secure their sustainable use.

Q13. Methodology

Describe the methods and approach you will use to achieve your intended Outcome and Impact. Provide information on:

- How you have analysed historical and existing initatives and are building on or taking work already done into account in project design. Please cite evidence where appropriate.
- The rationale for carrying out this work and a justification of your proposed methodology.
- How you will undertake the work (materials and methods).
- How you will manage the work (role and responsibilities, project management tools etc.)

Please make sure you read the **Guidance Notes** before answering this question.

(This may be a repeat from Stage 1 but you may update or refine as necessary)

The project will collect data on the occurrence and distribution of macrofauna (fish, corals and other invertebrates >10cm in diameter) and biotopes (hard coral, soft coral and sponge communities, encrusted hard substrate and soft-bottom seabed) at depths of 50–2000m within the territorial waters of the Cayman Island. The project will focus on mesophotic and sub-mesophotic coral and rock ecosystems, and on predatory and commercial fish species such as sharks, grouper and snapper. It will use deep-water baited remote underwater video stations (BRUVS), baited drop camera rigs/seabed landers and a DOE-owned ROV (Remote Observation Vehicle) to a) establish the character of the seabed at sample locations, b) assess the relative abundance of both scarce and commercial fish species, including sharks, and c) record the density and variety of corals and other sessile macro-invertebrates.

Manually lowered sampling bottles and Niskin bottles attached to the seabed landers will be used to collect sea-water for a) analysis of environmental DNA (e-DNA) to detect the presence of deep-water elasmobranchs (Johri et_al._2019; Truelove et_al._2019), and b) determining levels of key water quality parameters. In addition, where practicable, technical diving will be employed to inspect sites of particular interest in the 30-80m depth range.

Fieldwork will be undertaken during four campaigns twice a year during different seasons. The BRUVS, tethered to surface buoys, will each carry two cameras with one directed at the bait and the other at the substrate. A total of 160 BRUVS deployments will be undertaken, each lasting 2 hours, with half at 5 –100m, half at about 200m. The baited drop camera rigs, in contrast to the BRUVS, are released untethered to sink to the seabed at 500 to 2000m, where they will record 7 hours of video before being retrieved by acoustic release (inflation of floats triggered by an acoustic signal), a total of 80 deployments being envisaged. Replicate deployments will be completed off different faces of the islands, over the ridges that run east and west, and over the offshore "Cayman Bank". DOE's tethered ROV will be employed to undertake 60 video transects adjacent to the same locations at 30-50m. Deployments will generate 1000 hours of video recording requiring subsequent viewing and interpretation. Deep-dive surveys will be carried out voluntarily by DiveTech to 100m at 10 sites over 2 years to ground-truth BRUVS survey data and add additional insight into data collected.

Data obtained will inform the development of Species/Habitat Action Plans. The 10+ year MCI–DOE (part Darwin-plus funded) Cayman Islands Shark Conservation Project resulted in a good understanding of the abundance and biology of sharks, rays, and other predatory fish in coastal waters, but no sampling was conducted at depths greater than 30m. Thus, none of the deep-water elasmobranch species likely to be present were detected. Three very deep-water sharks have been recorded in the Cayman Trench during oceanographic work (Ethier_2008; Messing et_al._2013), but no other information is available, and the protection and management of these species is not specifically addressed within the Cayman Islands.

If necessary, please provide supporting documentation e.g. maps, diagrams, and references etc., as a PDF using the File Upload below.

No Response

Section 8 - Stakeholders and Beneficiaries

Q14. Project Stakeholders

Who are the stakeholders for this project and how have they been consulted (include local or host government support/engagement where relevant)? Briefly describe what support they will provide and how the project will engage with them.

Among proximal stakeholders, the principal one is the Cayman Islands Department of Environment, while others of particular importance are the National Conservation Council and the local fishing community. There are few full-time fishermen in Cayman, but a small number of skippers support themselves through a mix of taking visitors sport fishing while also fishing on their own account when no clients are forthcoming. A larger number of Caymanians and residents fish recreationally, sometimes selling surplus catch. Among the latter, fishing for deep-sea snapper and other deep-water species is popular. Local professional/artisanal and recreational fishers with whom links were established during the previous project will be consulted, while links will also be sustained with the local Angling Association, in response to whose request earlier work on grey snapper was conducted. It is anticipated that some fishers can provide advice on specific sites that should be included in survey work, though a minority of fishers remain to be persuaded of the need for conservation measures.

Project staff also have close links with the economically important local SCUBA diving community, especially through the on-going MCI-DOE Shark-Logger programme. There are over 40 dive centres of whom a few centres (such as DiveTech with whom project staff have previously collaborated) undertake technical diving to depths of 30–100m. The project will extend its links with these centres with a view to a) exploring their views on those deeper reef areas of which they have experience and b) involving them in volunteer survey work.

Q15. Institutional Capacity

Describe the lead organisation's capacity (and that of partner organisations where relevant) to deliver the project.

Heriot-Watt University's Institute for Life and Environmental Sciences (ILES) brings together more than 20 marine scientists within its Centre for Marine Biology & Biotechnology (https://cmbb.hw.ac.uk/people/). These staff have extensive experience of research, especially in relation to the oil industry, pollution, fisheries, and marine protected areas, both in the UK and overseas.

Marine Conservation International (MCI) www.marineconservationinternational.org) is a partnership of marine scientists focusing on high priority marine conservation objectives. Rupert Ormond is past director of marine laboratories at the University of York and at Millport. Mauvis Gore completed her education to PhD level at the University of the West Indies before working at a series of European Institutions. MCI have extensive experience in the Cayman Islands and the use of underwater camera traps.

The Cayman Islands' Department of Environment (DoE) (www.doe.ky) is the Government agency responsible for management and conservation of environment and natural resources. It has 10 marine research staff and 10 Marine Enforcement Officers, as well as boats, laboratories and diving facilities. It has

the capacity to undertake much of the planned fieldwork, but lacks the resources and expertise.

Beneath the Waves (BTW) (www.beneaththewaves.org) is focussed on employing advanced technology, including drop down camera rigs / seabed landers and environmental DNA analysis, to achieve research findings and secure conservation policies that otherwise would not be possible without great expense. BTW leads and maintains collaborative projects in 5 countries throughout the Greater Caribbean region, working with government officials and departments, as well as local NGOs and communities.

Q16. Project beneficiaries

Who will your project benefit? You should consider the direct benefits as a result of your project as well as the broader indirect benefits which may come about as a result of your project achieving its Outputs and Outcome. The measurement of any benefits should be included in your project logframe.

The ultimate beneficiaries will be present and future generations of Caymanians, pre-eminent among whom will be those involved in the tourism and fisheries sectors. At the end of a previous project in Cayman, we conducted a public consultation exercise which revealed overwhelming support for marine conservation measures, with for example 92% of respondents favouring protection of sharks.

Immediate direct benefits of increased knowledge and protection of deep-water areas will likely be limited to supporting the sustainability of deep-water fish species such as snapper and grouper.

In the medium-term wider benefits will include:

Maintaining the health of the mesotrophic zone as a potential refuge for shallower coral reef species enabling them to repopulate Cayman's economically important coral reefs following anticipated periods of coral bleaching and mortality.

Enabling the Cayman Islands' Government to fulfil its obligations under the CBD, CMS and other international and regional conventions, including increasing its overall percentage of Marine Protected Area towards the widely agreed target of 30% of national waters.

Monitoring and safe-guarding the quality of the environment throughout Cayman waters, as a protective buffer to that of coastal waters on whose health a significant proportion of Caymanians depend for both their income and recreation.

Section 9 - Gender and Change Expected

Q17. Gender (optional)

How is your project working to reduce inequality between persons of different gender? At the very least, you should be able to provide reassurance that your proposed work is not increasing inequality. Have you analysed the context in which you are working to see how gender and other aspects of social inclusion might interact with the work you are proposing?

The project will support the local community with highly progressive attitudes to racial, sexual and cultural equality with benefit accruing to all. The project will strongly support the involvement of men and women of different cultural backgrounds and ages in marine science without regard to gender. A majority of the project staff, including the lead applicant and one of the two project leaders are women and the Director of the DoE, for example, is a Caribbean woman, with both project assistants being women. At least 50% of dive industry staff in the Cayman Islands, including dive guides, are women. Caymanian fishers, as elsewhere in the Caribbean, are almost entirely male, but women often play key roles in fish processing

and marketing. We will follow Heriot-Watt University's policy on gender (www.hw.ac.uk/uk/services/docs/hr/policies/GenderIdentityPolicy.pdf).

Q18. Change expected

Detail the expected changed this work will deliver. You should identify what will change and who will benefit a) in short-term (i.e. during the life of the project) and b) in the long-term (after the project has ended). Please describe the changes for the environment and, where relevant, for people in the OTs, and how they are linked.

In the short-term, key data from the project will be delivered on the species and biotopes characteristic of Cayman Islands' deep reefs and seabed to a depth of 2000m. While the habitats and species likely to be present can be anticipated as a result of recent studies in some other western Atlantic areas, little information exists for Cayman waters below 50m (please see Cover Letter). This deficit handicaps the DOE from taking steps to address the relevant NBAP targets or in responding effectively to the threats of deep-sea fishing or deep ocean mining.

The project results should be sufficient, combined with knowledge of other regions, to develop interim proposals for a territorial waters biodiversity action plan(s) that will include regulations for conservation of scarce or threatened species of fish and other fauna, requirements for controls in relation to any use of the seabed (e.g. for dumping or mining), and consider the case for one or more new MPAs or seawards extensions of some existing MPAs. Existing Species Action Plans (e.g. for sharks) may also require modification in the light of new information. At the same time consultation within government and the DOE's public awareness programme will increase willingness to address sustainable management of the offshore environment.

The present proposal will achieve a cost-effective, preliminary survey of deep reefs within Cayman territorial waters, but it can only achieve site sampling of 300 stations within a much larger area. It is anticipated that subsequently the survey work can be extended, either by local staff using similar cost-effective methods, or through securing the use of larger fully-equipped oceanographic vessels. Meanwhile, the project will help ensure that the health and productivity of offshore areas are sustained and that un-impacted seabed habitats and populations of rare or endangered species remain unthreatened.

Q19. Pathway to change

Please outline your project's expected pathway to change. This should be an overview of the overall project logic and outline how you expect your Outputs to contribute towards you overall Outcome, and, longer term, your expected Impact.

- 1. Data generated by the project will be analysed together with relevant reports/papers from other parts of the Caribbean and western Atlantic, to provide key knowledge of Cayman's deep reef and seabed habitat including a) biodiversity of demersal fish species, b) presence of rare or endangered species of elasmobranch and other fish, c) characteristics of the seabed within territorial waters, d) presence at depth of corals and other sessile invertebrates and e) any significant signs of impact to seabed habitat.
- 2. This information will be discussed with senior DOE staff on a quarterly basis and with the Cayman National Conservation Council through its half-yearly meetings. Proposals will be drafted for a territorial waters Biodiversity Action Plan and Species Action Plan(s), for possible new MPAs or seawards extension of some existing MPAs, and for regulation of other potential impacts to the deeper seabed.
- 3. Firm recommendations will then be submitted to the Cayman Government regarding the Action Plans,

extensions to the MPA network, and regulation of offshore activities. It is presumed these proposals will go out to public consultation prior to being adopted.

4. Sustained monitoring will be managed by the DOE and local partners, to ensure data collection will continue.

Q20. Exit strategy

State how the project will reach a stable and sustainable end point, and explain how the outcomes will be sustained, either through a continuation of activities, funding and support from other sources or because the activities will be mainstreamed in to "business as usual". Where individuals receive advanced training, for example, what will happen should that individual leave?

- 1. Results would inform deskwork by DOE staff on environmental and conservation policies, and whether mesophotic reefs may serve as climate change refugia. Training, tools, and analytical frameworks will be provided to DOE to continue work as technology is relatively cheap.
- 2. A DOE officer will assume responsibility for the deep-reef and deep-water environment and support the implementation of new action plans and regulations, just as capable DOE staff have assumed responsibility for the Action Plans and ongoing monitoring programmes arising from previous MCI Cayman Island projects.
- 3. Recommendations will be developed by the project for the DOE to establish a long-term territorial waters monitoring programme, appropriate to the department's resources. This will likely rely on similar methods to maintain sub-annual or annual monitoring of deep-water sites of particular interest and to conduct initial surveys of moderate numbers of new ones.
- 4. In addition, project staff will assist the DOE in looking for support (e.g. from major foundations or international programmes) to conduct more extensive surveys using larger vessels and more sophisticated equipment. Use of larger research vessels (e.g. UK or USA oceanographic vessels) will enable surveys to be extended to deeper water (>2000m) and other parts of the EEZ.

Section 10 - Funding and Budget

Q21. Budget

Please complete the appropriate Excel spreadsheet, which provides the Budget for this application. Some of the questions earlier and below refer to the information in this spreadsheet. Note that there are different templates for projects requesting over and under £100,000 from the Darwin Plus budget.

- R9 D+ Budget form for projects under £100,000
- R9 D+ Budget form for projects over £100,000

Please refer to the Finance Guidance for Darwin/IWT for more information.

N.B: Please state all costs by financial year (1 April to 31 March) and in GBP. Darwin Plus cannot agree any increase in grants once awarded.

Budgets submitted in other currencies will not be accepted. Use current prices – and include anticipated inflation, as appropriate, up to 3% per annum. The Darwin Initiative cannot agree any increase in grants once awarded.

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Q22. Funding

Q22a. Is this a new initiative or a development of existing work (funded through any source)?

New initiative

Please provide details:

The project is a new initiative that is a logical next step following previous work on shallow water sharks, fish predators and substrates by a MCI-DOE collaboration in the Cayman Islands.

Q22b. Are you aware of any other individuals/organisations/projects carrying out or applying for funding for similar work?

Yes

If yes, please give details explaining similarities and differences, and explaining how your work will be additional and what attempts have been/will be made to co-operate with and learn lessons from such work for mutual benefits.

We are not aware of similar planned work for the Cayman Islands (Please see cover Letter). There is an initiative for a UKOT deep-sea pelagic BRUVS network that we are in contact with through our DOE partner.

The project will provide a substantial contribution to the aim of the UK Blue Belt Initiative to increase UKOT MPA protection with key scientific data for negotiating Cayman's marine EEZ with Cuba and Jamaica.

MCI continues to lead work on sharks for the DOE, which has focused on depths to 30m to date. BTW maintains work in five Greater Caribbean countries, including in two other UKOT (BVI, Turks & Caicos). Data from Cayman will add to this growing database. Dr. Gallagher recently co-founded the Caribbean Shark Coalition to increase knowledge transfer on shark conservation in the region and to place synthesized findings into relevant inter-nation contexts.

Q23. Co-financing

Are you proposing co-financing?

Yes

Q23a. Secured

Provide details of all funding successfully levered (and identified in the Budget) towards the costs of the

project, including any income from other public bodies, private sponsorship, donations, trusts, fees or trading activity, as well as any your own organisation(s) will be committing.

(See Finance for Darwin/IWT and Guidance Notes)

Donor organisation	Amount	Currency code	Comments
CayBrew		£	This is from an MCI-DOE conservation beer initiative with CayBrew
Wanderlust Fund		No Response	Box will not accept £ for Currency Code This is an allocation from a Donor Advised Fund supporting BTW's general programs Caribbean
Cayman Islands Department of Environment		£	This includes 6 staff salaries, 2 boats and accommodation
No Response	0	No Response	No Response

Q23b. Unsecured

Provide details of any matched funding where an application has been submitted, or that you intend applying for during the course of the project. This could include matched funding from the private sector, charitable organisations or other public sector schemes. This should also include any additional funds required where a donor has not yet been identified.

Date applied for	Donor organisation	Amount	Currency code	Comments
No Response	No Response	0	No Response	No Response
No Response	No Response	0	No Response	No Response
No Response	No Response	0	No Response	No Response
No Response	No Response	0	No Response	No Response

Do you require more fields?

No

Q24. Financial Controls

Please demonstrate your capacity to manage the level of funds you are requesting. Who is responsible for managing the funds? What experience do they have? What arrangements are in place for auditing expenditure?

Prof. Fernandes will be responsible for regular summary accounts which, as for other recent projects, will be audited by Heriot-Watt University accountants.

Prof. Gore and Dr. Galagher (Co-PLs) will be responsible for the day to day management of funds, both of whom have previously managed several projects of similar size and greater.

As with previous projects all project funds will be processed through a dedicated bank account, and wherever possible payment will be by debit or credit card or bank transfer, to ensure transparency.

Sufficient funds to cover the cost of auditing have been included within the budget.

Q25. Financial Management Risk

This question considers the financial risks to the project. Explain how you have considered the risks and threats that may be relevant to the successful financial delivery of this project. This includes risks such as fraud or bribery, but may also include the risk of fluctuating foreign exchange and internal financial processes such as storage of financial data.

Heriot-Watt University (HWU) is a major UK university with overseas campuses and experience in operating overseas; HWU will oversee the finances.

The Cayman Islands have a mature economy with minimal corruption and none has been experienced by senior project staff during previous projects in Cayman.

There is the risk of the value of the pound sterling fluctuating with the US dollar and the Caymanian dollar. However, payments to the DOE and to BTW are to be determined in pounds sterling and not affected by fluctuations.

Q26. Balance of budget spend

Explain the thinking behind your budget in terms of where funds will be spent. What benefits will the Territory see from your budget? What level of the award to you expect will be spent locally? Please explain the decisions behind any funding that will not be spent locally and how those costs are important for the project.

Minimal funds have been requested for travel and part of time salary for non-DOE team members. A large proportion of project staff time will be spent in the Cayman Islands with consequent input to the local economy and to an understanding of the project's aims and results. Gear needed to carry out surveys for the project have been designed to be robust and effective, but also low cost. The gear does have to be sourced outside of the Cayman Islands.

The project will provide training for the UKOT team members and an exchange of knowledge and

experience. Gear to carry out the deeper surveys will be left with the DOE to allow further surveying to be carried out readily.

The co-financing for MCI from a local business will be largely spent locally in the Cayman Islands.

Q27. Capital Items

If you plan to purchase capital items with Darwin Plus funding, please indicate what you anticipate will happen to the items following project end. If you are requesting more than 10% capital costs, please provide your justification here.

Deep-sea drop cameras and gear winch will remain in Cayman throughout and after the project's completion for long-term use for further surveys.

Q28. Value for Money

Please describe why you consider your application to be good value for money including justification of why the measures you will adopt will secure value for money.

- 1) very experienced project officers (Gore & Gallagher) will be employed on a 33% and 17% basis, respectively.
- 2) UKOT-based MSc level Research Assistant (RA) will assist with project in fieldwork, data handling, analyses and writing 50% of time.
- 3) BTW RA will spend 50% of her time on the project, focusing mainly on fieldwork, data analysis, and training.
- 4) 6 Cayman DOE staff will contribute 5-15% of their time to fieldwork, data analysis and policy development, without cost to the project.
- 5) Boats, vehicles, fuel, diving and office facilities will be provided by Cayman DOE, without charge to the project.
- 6) highly experienced professorial staff (Prof. Fernandes Heriot-Watt University, Prof. Ormond MCI, Heriot-Watt University) will input time with minimal expense to the project.
- 7) local angling group and fishers providing time and expertise voluntarily in selecting survey sites and discussing results and interpretation of data collected.
- 8) technical dive centre team providing time and expertise voluntarily to collect data to ground truth BRUVS data.
- 9) Caybrew (local brewery) is sponsoring the project through a 5% levy on the MCI-DOE conservation beer "White Tip" lager.
- 10) the project will employ novel and cutting edge techniques that will be shared with the DOE.
- 11) the project provides a unique opportunity to obtain information related to Cayman's biodiversity and to combat the threats of climate change on the low-lying islands.

Q29. Outputs of the project and Open Access

All outputs from Darwin Plus projects should be made available on-line and free to users whenever possible. Please outline how you will achieve this and detail any specific costs you are seeking from Darwin Plus to fund this.

Data provided to and Biodiversity/Species Action Plans and recommendations proposed to the DOE and National Conservation Council by the project leaders would be made available to the DOE and through

them to the wider public and data through an online databank free of cost.

At least two peer-reviewed scientific papers will be published using open-access journals. We would seek the cost of part of these publications from Darwin Plus.

Section 12 - Safeguarding

Q30. Safeguarding

Projects funded through Darwin Plus must fully protect vulnerable people all of the time, wherever they work. In order to provide assurance of this, projects are required to have appropriate safeguarding polices in place. Please confirm the lead organisation has the following policies in place and that these are available on request:

We have a safeguarding policy, which includes a statement of our commitment to safeguarding and a zero tolerance statement on bullying, harassment and sexual exploitation and abuse	Checked
We have attached a copy of our safeguarding policy to this application	Checked
We keep a detailed register of safeguarding issues raised and how they were dealt with	Checked
We have clear investigation and disciplinary procedures to use when allegations and complaints are made, and have clear processes in place for when a disclosure is made	Checked
We share our safeguarding policy with downstream partners	Checked
We have a whistle-blowing policy which protects whistle-blowers from reprisals and includes clear processes for dealing with concerns raised	Checked
We have a Code of Conduct in place for staff and volunteers that sets out clear expectations of behaviors - inside and outside of the work place - and make clear what will happen in the event of non-compliance or breach of these standards	Checked

Please outline how you will implement your policies in practice and ensure that downstream partners apply the same standards as the lead organisation.

The project's safeguarding policy (https://heriotwatt.sharepoint.com/sites/red-policystrategyandimpact /SitePages/Research-Integrity-and-Ethics.aspx) will be communicated and copies made available to each organization's core and adjunct staff during regularly scheduled virtual/in-person meetings.

A detailed register of safeguarding issues raised and how they were dealt with will be kept. Clear investigation and disciplinary procedures will be in place to be used should allegations or complaints be made with clear processes in place when a disclosure is made.

The safeguarding policy incorporates a whistle-blowing policy to protect from reprisal and to deal with concerns raised.

A code of conduct for the project team will be in place to provide clear expectations of behaviour during and outside of project worktime. Clear consequences for non-compliance will be communicated.

Please upload the Lead Organisation's Safeguarding Policy as a PDF

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Section 13 - Logical Framework

Q31. Logical Framework

Darwin Plus projects will be required to monitor (and report against) their progress towards their expected Outputs and Outcome. This section sets out the expected Outputs and Outcome of your project, how you expect to measure progress against these and how we can verify this.

• Stage 2 Logframe Template

Please complete your full logframe in the separate Word template and upload as a PDF using the file upload below. Copy your Impact, Outcome and Output statements and your activities below - these should be the same as in your uploaded logframe.

Please upload your logframe as a PDF document.

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Impact:

Enhanced MPA protection of Cayman's deep reefs and seabed to 2000m, of fishes that are threatened (e.g. sharks) or of commercial interest (deep-water snappers), and of hard and soft corals

Outcome:

Species and habitat action plans for mesophotic and sub-mesophotic environments including recommendations for management of exploited fish stocks and for new offshore MPAs or offshore extensions of existing MPAs

Project Outputs

Output 1:

Database of observations showing diversity and abundance of significant species of deep-reef fish, sharks, hard and soft corals, and of major biotopes

Output 2:

Maps showing distribution of species and biotopes including deep-water areas of conservation significance including coral rich biotopes, and fish feeding and spawning areas

Output 3:

Scientific report and / or paper on survey and / research findings

Output 4:

Habitat Action Plan for mesophotic and sub-mesophotic habitats areas and Species Action Plan(s) for deep-water groupers, snappers and elasmobranchs

Output 5:

Press / social media releases and talks on project aims and progress directed at strengthening stakeholder support for Action Plans and MPA recommendations

Do you require more Output fields?

It is advised to have less than 6 Outputs since this level of detail can be provided at the Activity level.

No

Activities

Each activity is numbered according to the Output that it will contribute towards, for example 1.1, 1.2 and 1.3 are contributing to Output 1.

- 1.1 Deployment of BRUVS at 50-200m around the islands and on offshore "Cayman Bank" on twice yearly basis
- 1.2 Deployment of drop down camera rigs to 500–2000m around the islands and on offshore "Cayman Bank"
- 1.3 Video surveys by DoE RoV of 30-50m zones around the islands and on offshore "Cayman Bank" on twice yearly basis
- 1.4 Technical dives to 100m at focal areas around Grand Cayman
- 1.5 Angling groups and fishers discussion of results and interpretation of data collected
- 1.6 Viewing and analysis of video footage and annotating records of species and habitats observed
- 1.7 Entry of observations into digital database
- 2.1 Entry of significant records and observations into pre-existing DoE GIS system
- 2.2 GIS work to generate appropriate outputs
- 3.1 Collation and statistical analysis of data
- 3.2 Preparation of figures (graphs and images) to be used in scientific report or paper
- 3.3. Writing of scientific report within 3 months of end of project
- 3.4 Publication of scientific paper within 1 year of end of project
- 4.1 Development of policy and recommendations for Habitat Action Plan, including for establishment or new MPA(s) or extensions into deep water of existing ones
- 4.2 Development of policy and recommendations for Species Action Plan(s) including for management of deep-water fish stocks
- 4.3 Discussions of proposed recommendations with DoE administrative and policy staff
- 4.4 Preparation of Habitat Action Plan for consideration by National Conservation Council (by end of project)
- 4.5 Preparation of Species Action Plan for consideration by National Conservation Council (by end of project)
- 4.6 Review of Habitat Action Plan(s) for consideration by National Conservation Council (by end of project)
- 4.7 Review of Species Action Plan(s) for consideration by National Conservation Council (by end of project)
- 5.1 Preparation of press / media releases
- 5.2 Distribution of media / press releases and posting on DoE and other websites
- 5.3 Preparation of talk describing purposes, progress and findings of project
- 5.4 Arranging and giving of talks to relevant stakeholders (DoE, National Conservation Council, local communities and particularly fishers, dive centres)

Section 14 - Implementation Timetable

Q32. Provide a project implementation timetable that shows the key milestones in project activities

Provide a project implementation timetable that shows the key milestones in project activities. Complete the Excel spreadsheet template as appropriate to describe the intended workplan for your project.

Implementation Timetable Template

Please add/remove columns to reflect the length of your project. For each activity (add/remove rows as appropriate) indicate the number of months it will last, and fill/shade only the quarters in which an activity will be carried out.

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Section 15 - Monitoring and Evaluation

Q33. Monitoring and evaluation (M&E)

Describe, referring to the Indicators above, how the progress of the project will be monitored and evaluated, making reference to who is responsible for the project's M&E.

Darwin Initiative projects are expected to be adaptive and you should detail how the monitoring and evaluation will feed into the delivery of the project including its management. M&E is expected to be built into the project and not an 'add' on. It is as important to measure for negative impacts as it is for positive impact. Additionally, please indicate an approximate budget and level of effort (person days) to be spent on M&E (see Finance Guidance for Darwin/IWT).

Prof. Fernandes will be responsible for project strategy and quality and spend 5% of her time on M&E. Prof. Ormond will also be responsible for overall M&E with Prof. Fernandes and spend 15% of his time on this.

Project progress will be reviewed every approximately two months at formal meeting with the Cayman DOE Director (Ebanks-Petrie) and Deputy-Director (Austin).

Prof. Gore & Dr. Gallagher (Co-Pls) will provide overall management of the project and prepare half-yearly and annual reports in consultation with project partners. In Cayman, the Co-Pls will be based in the DOE offices and liaise informally with Deputy-Director Austin on an almost daily basis and be out in the field to lead and participate in fieldwork.

Project team members will also communicate with the wider body of stakeholders through talks and use of the media. Prof. Gore and Dr. Gallagher will use their time on the project to monitor and evaluate the work and team.

Monitoring the project's progress by the DoE's National Conservation Board (consisting of 6 appointed and elected members) will be made twice yearly at their meetings.

Total project budget for M&E in GBP (this may include Staff, Travel and Subsistence costs)	£
Number of days planned for M&E	106.00
Percentage of total project budget set aside for M&E (%)	

Section 16 - Certification

Certification

On behalf of the

trustees

of

Heriot-Watt University

I apply for a grant of

£207,680.00

I certify that, to the best of our knowledge and belief, the statements made by us in this application are true and the information provided is correct. I am aware that this application form will form the basis of the project schedule should this application be successful.

(This form should be signed by an individual authorised by the applicant institution to submit applications and sign contracts on their behalf.)

- I have enclosed CVs for project key project personnel, letters of support, budget and project implementation timetable (uploaded at appropriate points in application).
- Our last two sets of signed audited/independently verified accounts and annual report are also enclosed.

Checked

Name	TERESA FERNANDES
Position in the organisation	Director of the Institute of Life and Earth Sciences

Signature (please
upload e-signature)

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Date

30 January 2021

Section 17 - Submission Checklist

Checklist for submission

	Check
I have read the Guidance documents, including the "Guidance Notes for Applicants" and "Finance Guidance".	Checked
I have read, and can meet, the current Terms and Conditions for this fund.	Checked
I have provided actual start and end dates for this proposed project.	Checked
I have provided a budget based on UK government financial years i.e. 1 April – 31 March and in GBP.	Checked
I have checked that the budget is complete, correctly adds up and I have included the correct final total at the start of the application.	Checked
The application has been signed by a suitably authorised individual (clear electronic or scanned signatures are acceptable).	Checked
I have attached my completed logframe and timeline as a PDF using the templates provided.	Checked
I have included a 1 page CV or job description for all the Project staff identified at Question 11, including the Project Leader, or provided an explanation of why not.	Checked
I have included a letter of support from the Lead Organisation and main partner organisation(s) identified at Question 10, or an explanation of why not.	
I have included a cover letter from the Lead Organisation, outlining how any feedback at Stage 1 has been addressed where relevant.	
I have included a signed copy of the last 2 years annual report and accounts for the Lead Organisation, or provided an explanation if not.	Checked
I have checked the Darwin Plus website immediately prior to submission to ensure there are no late updates.	Checked
I have read and understood the Privacy Notice on GOV.UK.	Checked

We would like to keep in touch!

Please check this box if you would be happy for the lead applicant (Flexi-Grant Account Holder) and project leader (if different) to be added to our mailing list. Through our mailing list we share updates on upcoming and current application rounds under the Darwin Initiative, Darwin Plus and our sister grant scheme, the IWT Challenge Fund. We also provide occasional updates on other UK Government activities related to biodiversity conservation and share our quarterly project newsletter. You are free to unsubscribe at any time.

Checked

Data protection and use of personal data

Information supplied in this application form, including personal data, will be used by Defra as set out in the latest copy of the Privacy Notice for Darwin, Darwin Plus and the Illegal Wildlife Trade Challenge Fund available here. This Privacy Notice must be provided to all individuals whose personal data is supplied in the application form. Some information, but not personal data, may be used when publicising the Darwin Initiative including project details (usually title, lead organisation, location, and total grant value) on the GOV.UK and other websites.

Information relating to the project or its results may also be released on request, including under the 2004 Environmental Information Regulations and the Freedom of Information Act 2000. However, Defra will not permit any unwarranted breach of confidentiality nor will we act in contravention of our obligations under the General Data Protection Regulation (Regulation (EU) 2016/679).