DPLUS061

Darwin Plus: Overseas Territories Environment and Climate Fund
Project Application Form

Submit by **2359 GMT Monday 29 August 2016**

Please read the Guidance before completing this form.
Information to be extracted to the database is highlighted blue. Blank cells may render your application ineligible

Basic Data

1. Project Title (max 10 words)	Protecting herbivorous fish to conserve Cayman Island coral reef biodiversity		
2. UK OT(s) involved	Cayman Islands	**Letter of support from OT government attached?**	YES
3. Start Date:	April 5 2017		
4. End Date:	December 2019		
5. Duration of project (no longer than 36 months)	36 months		

Summary of Costs	**2017/18**	**2018/19**	**2019/20**	**Total**
6. Budget requested from Darwin	£92,261	£81,454	£75,381	£249,096
7. Total value of matched funding	£52,833	£45,508	£47,871	£146,212
8. Total Project Budget (all funders)	£145,094	£126,962	£123,252	£395,308
9. Names of Co-funders	Central Caribbean Marine Institute, Smithsonian Institution, Cayman Islands Department of Environment			

10. Name, address and contact details of lead applicant organisation (responsible for delivering outputs, reporting and managing funds)*	Central Caribbean Marine Institute PO Box 37, Little Cayman, KY3-2501 Cayman Islands

* Notification of results will be by email to the Project Leader named in Question 12

11. Type of organisation of Lead applicant. Place an x in the relevant box.

OT GOVT		UK GOVT		UK NGO		Local NGO	**X**	International NGO		Commercial Company		Other (e.g. Academic – Marine Research institute)	X

12. Partners in project. Please provide details of the partners in this project and provide a CV for the individuals listed. You may copy and paste this table if necessary

Details	Project Leader	Project Partner 1	Project Partner 2
Surname	**Manfrino**	**Bothwell**	**Cox**
Forename(s)	**Carrie**	**John**	**Courtney**
Post held	**President**	**Sr Scientist**	**Research Fellow**
Institution (if different to above)		**Cayman Islands Government**	**Smithsonian Institution**
Department	**Research & Conservation**	**Department of Environment**	**Marine Conservation Programme**
Telephone/Skype			
Email			

Details	Project Partner 3	Project Partner 4
Surname	**Dell**	**Candelmo**
Forename(s)	**Claire**	**Allison**
Post held	**CCMI Scientist**	**CCMI Scientist**
Institution (if different to above)		
Department	**Little Cayman Research Centre**	**Little Cayman Research Centre**
Telephone/Skype		
Email		

13. Has your organisation been awarded Darwin Initiative funding before (for the purposes of this question, being a partner does not count**)? If yes, please provide details of the most recent awards (up to 6 examples).**

Reference No	Project Leader	Title
DPLUS010	**Carrie Manfrino**	Coral Nursery Project in Little Cayman: Enhancing Resilience and Natural Capacity of Coral Reefs in the UKOTs (2013-2015)

14. If your answer to Q13 was No, provide details of 3 contracts previously held by your institution that demonstrate your credibility as an implementing organisation. These contracts should have been held in the last 5 years and be of a similar size to the grant requested in this application. (If your answer to Q13 was Yes, you may delete these boxes, but please leave Q14)

15. Key Project personnel

Please identify the key project personnel on this project, their role and what % of their time they will be working on the project. Please provide 1 page CVs for these staff, or a 1 page job description or Terms of Reference for roles yet to be filled. Please include more rows where necessary.

Name (First name, surname)	Role	Organisation	% time on project	1 page CV or job description attached?

Carrie Manfrino	**Project Leader**	**Central Caribbean Marine Institute**	**20**	**Yes**
John Bothwell	**Project Partner**	**Cayman Islands Government**	**20**	**Yes**
Courtney Cox	**Project Partner**	**Smithsonian Institute**	**25**	**Yes**
Claire Dell	**Project Partner**	**Central Caribbean Marine Institute**	**50**	**Yes**
Allison Candelmo	**Project Partner**	**Central Caribbean Marine Institute**	**10**	**Yes**

Project Details

16. Project Outcome Statement: Describe what the project aims to achieve and what will change as a result. (30 words max). You can copy and paste from Q26.
Herbivorous fish that are key to maintaining coral reef health are incorporated into a biodiversity action plan that empowers government to establish policies to manage and sustain ecologically functional fish.

17. Background: (What is the current situation and the problem that the project will address? How will it address this problem? What key OT Government priorities and themes will it address? (200 words max)

Coral reef health relies on dynamic interactions among key functional groups of organisms. Disruptions to the roles these taxa play (e.g. fish, coral and algae) can lead to changes in community structure with negative implications for coral reef biodiversity. Algae plays important ecological roles in reef systems, but as excellent competitors for space certain species can compromise coral growth and/or larval recruitment. A critical process in regulating the balance between coral and algae is herbivory. A loss of herbivorous fishes due to overfishing has resulted in shifts is community structure from coral to algal dominated systems, thereby eroding overall coral biodiversity.

Currently, there is limited management, or protection, of herbivorous fishes under the Cayman Islands National Conservation Law; a draft fish conservation plan is proposing to improve protection of all fish. The work proposed in this project will identify and assess movement patterns of functionally important herbivores that maintain coral reef community structure as well as estimate current fishing pressure. This project will ensure that effective protection measures are implemented and biological diversity and coral reef health are conserved; thereby addressing OT Government priorities of promoting sustainable fisheries and improving the protection and management of the marine environment.

18. Methodology: Describe the methods and approach you will use to achieve your intended outcomes and impact. Provide information on how you will undertake the work (materials and methods) and how you will manage the work (roles and responsibilities, project management tools etc.). Give details of any innovative techniques or methods. (500 words max)

The primary objective is to promote the sustainable use of coral reefs and provide support for targeted management of herbivorous fish species Three broad approaches will be used: 1) assess the role of key herbivorous fish species, 2) elucidate population genetic connectivity of key herbivorous fishes across the coral reef ecosystem and 3) quantify the herbivore fishery in the Cayman Islands.

Approach 1 Assess the role key herbivorous fish species

a) Characterize herbivorous fish and benthic community structure across the Cayman Islands
We will use an established long-term (12+ years) fish and benthic survey database, collected by CCMI and the DOE, to quantify herbivorous fish biomass and algal coverage across the three islands. We will add to this database by conducting visual census surveys ($50m^2$ belt transects; n=6) at five sites within Little Cayman, Cayman Brac and Grand Cayman (Y1, Y2 and Y3).

b) *Quantify species and size specific diet preference of herbivorous fishes*.
Roving surveys throughout Little Cayman on SCUBA will characterize diet preference and grazing capacity of 20 herbivorous fish species. We will observe individuals in both small and large size classes for 5 minutes and identify the food source and substrate targeted for each bite taken. The data will be used to identify key herbivorous fish species for a range of benthic communities.

Approach 2 –Elucidating movement patterns and connectivity of key herbivores (species determined through approach 1)

a) Establish the movement patterns key herbivores
Up to 40 fish will be trapped using hand nets and acoustic tags surgically implanted in the intraperitoneal cavity. Fish movements will be recorded through acoustic receivers placed around Little Cayman (LC). There are currently 16 receivers used by DOE in fish conservation projects. These will be used along with 4 hydrophones between protection zones on LC.

b) *Elucidate population connectivity within the Caymans and wider western Caribbean*
We will use genetic population structure to assess population connectivity and larval dispersal of key herbivorous fishes. We will collect tissue from adult fishes on reefs in Little Cayman, Cayman Brac, and Grand Cayman. Using SCUBA, we will capture approximately 100 adult fishes in a hand net between the hours of 9:00 pm and 12:00 am and clip a small portion (5 mm^2) of the anal fin or upper lobe of the caudal fin with scissors *in situ*. This is a non-lethal method of collecting genetic material.

We will use restricted site associated DNA (RAD) genotyping to assess genetic population structure and kinship.

Approach 3 – quantifying the impact of fishing effort on herbivores

Interviews of fishers (18) at the three islands will be undertaken. Surveys will include questions on number of shore fishers, fishing gear, time spent fishing and number of times fished in the last month. The common name, and number, of all species retained, or released, by the fisher will be recorded along with total lengths of the retained catch.

19. How does this project:

a) Deliver against the priority issues identified in the assessment criteria
b) Demonstrate technical excellence in its delivery
c) Demonstrate a clear pathway to impact in the OT(s)

500 words max)

a) Assessment criteria: The proposed outputs link to three of the Darwin Plus funding priorities:

1) "improving conservation, protection and management of the marine environment of UK OT's with a focus on underpinning the initiative for a United Kingdom's blue belt manifesto,

2) "promoting sustainable fisheries in the UK OT's", and

3) "developing ecosystem-based initiatives for the conservation and sustainable use of the terrestrial and marine environments".

The outputs of this project will deliver a robust scientific basis for a focused fisheries management template that will prioritize the conservation of herbivorous fish and coral reefs in the Cayman Islands.

The proposed project benefits from a strongly partnered and collaborative team between CCMI (the local marine research institute), the Smithsonian Marine Conservation Program (experts in coral reef science) and the Cayman Islands Department of Environment (experts in directing management and policy for the protection of biodiversity). The partnership, especially with the DoE which coordinates the local conservation and protection of biodiversity, will be instrumental in implementing what is learned from the proposed work into policy.

b) ***Technical excellence***: The proposed project provides excellence due to an interdisciplinary approach that links the importance of broader coral reef health by demonstrating herbivore control of algae. Identifying this first step is critical in managing coral reef health, biodiversity and conservation value. Defining which herbivores are important will drive targeted fishery regulations. Importantly, this approach will identify which fishes are routinely targeted by fishers; this information will also dovetail into other aspects of the project elucidating movement patterns, and population replenishment/connectivity of functional herbivorous fishes, both within the Caymans and wider Caribbean (including other UK OT's).

c) ***Clear pathways***: Coral reefs are a significant reservoir of UKOT biodiversity that fall under the broader and co-contributing stewardship of the UK. Herbivorous fish are vital to protecting the biological diversity of coral reefs which support the Caribbean OT economics through dive tourism, enhance local lifestyles through fishing, and offer a physical barrier that protects 100% of the Cayman Islands coastal community. Evidence-based management is vital for effective conservation. This project delivers pivotal information on the dynamic between species-specific herbivory and coral reef health and provides evidence for prioritizing fishery directed policy. The results from this work will lead to a Herbivorous Fish Biodiversity Action Plan that can be used as a model for all Caribbean UKOT's Environmental Departments.

Added pathways to improve the protection of key fish species include the CCMI Science to Society programs that communicate results of our work to non-scientific audiences and that offers informal science learning to hundreds of local K-12 children each year. Partnership with the Cayman DOE, association with international scientists who use the research institute, the UKOT

Conservation Forum, and presentations at regional meetings and conferences are all pathways to disseminate the results from this work.

Overall, this project will establish an ecosystem-based initiative prioritizing the sustainable use of coral reefs by reducing overfishing of key herbivorous fish.

20. 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. (250 words max)

Key stakeholders include:

1) Cayman Islands Department of Environment (DoE)
2) Cayman Island residents

The DoE will be the central stakeholder in this project. The DoE has a "mission to facilitate responsible management and sustainable use of the natural environment and the natural resources of the Cayman Islands…". CCMI and DoE have collaborated on a previous Darwin Plus project that led to a new policy for coral restoration. We will work together on all aspects of this project from conception through to experimental approaches, coordination of field work and in the delivery of results to a platform that best informs fishery and conservation directed management, policy and coral reef conservation.

The DoE will provide boat, expert field support, and guidance for a new herbivorous fish biodiversity action plan that will feed into the overall national biodiversity action plan.

The community level stakeholders for this project include the residents of Cayman including students, businesses, environmental groups and tourism associations (National Trust, CITA, Save Cayman). There are clear advantages to having a well-informed community in relation to the importance of herbivores to coral reefs and the implications for overfishing key herbivores.

The CCMI campaign to improve the ocean literacy across the islands is a key area where we engage the local community (children and families). Recognising the community of the artisanal fisherman is therefore important. CCMI will use consistent public forums to inform the community on the outcomes and outputs that stem from the proposed work. The Department of Environment regularly communicates important findings to the local fishing community.

21. Institutional Capacity: Describe the implementing organisation's capacity (and that of partner organisations where relevant) to deliver the project.
(500 words max)

Implementing organisation

CCMI has 18 years of experience and is the only non-governmental marine research and education institution based in the Cayman Islands. CCMI's field station, the Little Cayman Research Centre, has the facilities required for this project to be successful. Dr. Carrie Manfrino, is the Director of Research and two expert coral reef scientists are based in the Cayman Islands year round. In addition to scientists Dr. Claire Dell and Dr. Allison Candelmo, CCMI has 8 support staff including 2 education staff, 2 research interns, a financial administrator, a field operations manager, and 2 operational staff members. Dr. Carrie Manfrino has overseen the growth and development of the CCMI and the Little Cayman Research Centre from inception. This capacity, along with strong partnerships (DoE and Smithsonian Institution) and matching funding provides evidence of CCMI's ability to deliver the project.

CCMI's highest priority is to increase the sustainability and conservation of coral reef ecosystems. The organization has maintained a long term assessment and monitoring program (LAMP) on Little Cayman since 1999 which provides an important foundation for the current study. With a small human population (<200) and low fishing pressure, the location is an ideal control site for understanding the regional variability in fish populations today. CCMI has developed several successful initiatives on topics that help to bridge some of the challenges of managing coral reef health, adding value to current concerns including:

- Identifying and describing critical habitats that need protection for juvenile Nassau grouper (Little Cayman has the territory's last identified 'grouper spawning aggregation').
- Developing a regional coral bleaching threshold model using the Little Cayman Coral Reef Early Warning System (CREWS) instrumentation.
- Coordinating community lionfish culling efforts with goals to manage the impacts of this invasive species.
- "Campaigning for Ocean Literacy" across the region, providing educational tools (Our Ocean Planet) for children so they are ocean literate by the time they are 12 years old, (including training for teachers).
- Hosting workshops with local marine park managers and the scientific community to improve the relationship between research, education and conservation methodology and techniques.

Partners:

The Cayman Islands DoE is the main Government agency responsible for the management and conservation of the environment and natural resources. Our partners include John Bothwell and Timothy Austin who have decades of experience establishing policy, expanding marine protected area management and with instituting a new conservation law in the Cayman Islands.

Dr. Courtney Cox, of the **Smithsonian Marine Conservation Program**, is a key collaborator. Her expertise is in reef fish ecology and population dynamics. She uses molecular tools to enhance marine conservation and fisheries management and has an ongoing collaboration with Manfrino and the DoE. Dr. Cox's targeted research explores how overfishing may be leading to the decline in coral reef health. She uses molecular methods to identify fish being sold at markets around the Caribbean in order to evaluate fishing pressure on sharks, parrotfish, and grouper. She is managing a regional study to understand parrotfish larval dispersal and population connectivity.

APPLICANTS SEEKING £100,000 OR OVER CAN PROCEED TO QUESTION 26

22. Expected Outputs

Output (*what will be achieved e.g. capacity building, action plan produced, alien species controlled)*	Indicators of success *(how we will know if its been achieved e.g. number of people trained/ trees planted)*	Status before project/baseline data *(what is the situation before the project starts?)*	Source of information *(where will you obtain the information to demonstrate if the indicator has been achieved?)*
	.		

23. Expected change: How will each of the outputs contribute to the overall outcome of the project? (100 words max)

24. Main Activities Activities or tasks to be done to deliver the outputs. Include activities on open access information sharing and collaboration with other OTs

25. Risks

It is important that you and your partners consider all potential risks to the project and how these risks could be mitigated. Please identify risks you have considered, the potential impact on the project and explain how you can mitigate against them. Risks may include working in a volatile region, staff retention, lack of engagement with local communities or Governments. You should always consider the

risk of fraud, error or bribery.			
Description of the risk	Likelihood the event will happen (H/M/L)	Impact of the event on the project (H/M/L)	Steps the project will take to reduce or manage the risk

26. LOGICAL FRAMEWORK

Darwin Plus projects will be required to report against their progress towards their expected outputs and outcome if funded. 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.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Impact: Targeted management of functionally important herbivorous fish and direct fisheries policies that improve coral reef biodiversity.			
Outcome: Herbivorous fish species that are key to maintaining reef health are incorporated into a draft biodiversity action empowering government to establish policies to sustanably manage herbivores. (Max 30 words)	0.1 Field survey data to indicate key herbivorous fish that is compile and used in a spatial map to inform plans which are endorsed by the Department of Environment managers during a meeting by the end of the second year.; 0.2 Creation of a public- private partnership as an expert fish focus group including members from National Trust, environmental, business, and tourism to empower new policy and protection; 0.3 Draft Biodiversity Action Plan (BAP) agreed internally and draft of management plan for key herbivores by the end of the project.	0.1 By the end of Year 1, minutes from 2 partner meetings and report describes and quantifies the role of herbivorous fish in reducing competitive algae and improving reef health, and that elucidates species trends over the last 2 decades; 0.2 Meeting minutes that record the establishment and meetings of such group; 0.3 Final report with meeting minutes and attendee lists from 3 partner meetings (initial, review, final) discussing draft BAP and management plan;	0.1 Herbivorous fish are key to maintaining coral reef health; 0.2 Unknown trends for herbivorous fish on all three islands over the last 20 years of data collection will inform the paln and effectively impact decision making; Fisherman will support this effort and provide accurate data; Fish may be overfished in areas unknown to us; MPA has led to long term increases in herbivorous fish. Draft fish species protection plan which has parrotfish included has never progressed so we are starting from 0.
1. Output: Draft biodiversity action plan to protect key herbivores is approved internally by the Dept. of Environment.	1.1 Partners assess fish from 15 reefs across the three Cayman Islands; Historic reef trends quantified and key species reducing algae growth are identified by the end of year 2; 1.2 Number of members in an expert Herbivorous Fish Focus group by end of year 2; 1.3 Empower 300 local students through new educational modules about herbivory,	1.1. Report on herbivorous fish; 1.2. Final Report on knowledge gained over duration of project by focus group; 1.3. Pre and post surveys indicating students empowered with knowledge and utilising CCMI resource;	1.1 Hierarchy of herbivores, with some species playing larger roles in reducing algae; Populations of herbivorous fish species richness and fish biomass has changed over the last 20 years;

	(specifically taught to students in grades 5 and 6) by the end of year 2.		
2. Spatial map establishes the levels of herbivory and regional connectivity of key herbivorous fish and supports regional benefit of protecting herbivores.	2.1 Project data and map is posted and partner media pages and newsletters raise awareness (from 0 to 2000) via partner networks including DoE, CCMI, school groups by end of project; 2.2 Regional connectivity (tagging and genetics) of herbivore fish determined by end project;	2.1 Web analytics and newsletter opens with project views; 2.2. Fish connectivity report with data and photographs;	2.1 Movement patterns can be generalised for a range of herbivorous fishes with similar life history traits to facilitate broad management and conservation plans/action.
3. Herbivorous fish impact assessment based on levels of fishing	3.1 Fishing effort surveyed (data on catch and effort at 6 landing sites across the Cayman Islands by end of year 2. 3.2 Historical effort and catch data compiled by end of year 2 (interviews with (6) local Little Cayman fishermen.	3.1 Report of interviews quantify current levels of fishing pressure by end of year 3.2 Report documenting oral history with photographs;	3.1 Fishing effort measured at landing sites reflect overall fishing efforts; Illegal fishing does not occur in protected zones; Fishers provide accurate data through face to face interviews. Fishers are reluctant to report fishing effort due to a potential perception of restricted access to certain herbivorous fish species.
4. Dissemination and application of results	4.1 Results incorporated into the BAP. 4.2 Scientific papers (2 submitted for publication, 2 meetings attended by end of project; 4.3 Completion of public education curriculum with herbivory modules for all K-12 CCMI programs;	4.1 Draft of Biodiversity Action Plan. 4.2 Peer reviewed publications; 4.3 Teaching modules and curriculum developed and posted to the CCMI website.	None

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)

Output 1: Draft biodiversity action plan to protect key herbivores

1.1 Survey reefs at 15 sites on the north sides of all three islands to determine fish biodiversity and benthic (algae and coral) community structure, abundance, and health, and identify key fish for protection.

1.2 Herbivorous Fish Focus stakeholder group meet with partners and expand their knowledge and grow support for a BAP.

1.3 Create and deliver new educational modules about herbivory that empowers 300 grade 5 and 6 students.

Output 2: Spatial map of key herbivorous fish.

2.1 Manipulation experiments determine dietary patterns and key herbivores are identified also using surveys (from Output 1.1).

2.2 Tag fish to determine range and impact on reducing algae on the reefs; genetics (fin clips) of selected species expand our knowledge on connectivity across the region.

Output 3: Herbivorous fish impact assessment.

3.1 12 Fisherman are surveyed for catch and effort data;

3.2 Historical fishing effort and catch is documented through oral history interviews which are available online.

Output 4: Dissemination and application of results.

4.1 Develop draft Biodiversity Action Plan with partners

2 Write and submit 2 scientific papers to peer reviewed journals and attend 2 international meetings to present research results.

4.2 K-12 Educational curriculum is developed and used for residential programmes; 200 additional students participate by end of project.

27. Sustainability: How will the project ensure benefits are sustained after the project has come to a close? If the project requires ongoing maintenance or monitoring, who will do this? (200 words max)

We will work closely with the DoE. Our findings will provide a platform to aid decision making, and policy, for targeted fishery priorities, and broader aspects of the management and conservation of coral reef biodiversity within the Cayman's, and by extension the UKOT's.

CCMI has dedicated research programs that monitor coral reef health. These are undertaken through annual surveys which monitor 10 sites around Little Cayman. These surveys provide data on the benthic health of corals and algae, along with measures of fish abundances and diversity; the fish data includes detailed records of herbivores.

Our commitment to long term monitoring, evidenced by surveys conducted since 1999, will ensure that data on herbivorous fish abundances/distributions will continue to build on what is learned from the proposed Darwin project. Moreover, important information gained from movement studies and population genetics, may provide insights into how we conduct our monitoring programs in the future. For example, the information from the proposed study may provide rationale to include additional monitoring sites, based on movement and connectivity, into our independently funded annual monitoring program.

A Herbivorous Fish Biodiversity Action Plan will be a key tool for new policy that protects coral reef biodiversity.

28. 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. (200 words max)

We will have a three-fold approach to ensure delivery of the project outcomes to wide, open access, audiences:

1. Translating research in open management platforms that benefit society

   This project will have integral links to providing information that the DoE will be able to translate into actionable policy. This ensures key functional groups of herbivories are afforded protection in addition to the wider protection of coral reef health. As such, there will be an important and open platform of results to the public through the actions of the DoE via their website.

2. Communicating to the general public:

   CCMI has a broad mandate to communicate science to the public. Free and online delivery of the broader outputs will be facilitated through our website. Further, CCMI has extensive engagement with marine conservation and education. The outcomes of this work will be delivered through our educational programs.

3. Peer reviewed publication strategy

   It is our intention to publish the work in scientific reviewed articles using open access journals so this information is widely disseminated to the scientific and resource management agencies globally.

29. Monitoring & Evaluation:
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.

(Max 500 words)

Integrated and robust quantitative and qualitative monitoring led the project organization including Dr. Carrie Manfrino, Kate Holden, and Dr. Claire Dell and project partners (Bothwell - DoE & Cox – Smithsonian) will take place throughout the project to assure progress is evaluated against the objectives and that milestones are achieved. The monitoring is designed as an adaptive measure to assure potential problems are addressed early; so that change can be incorporated if needed, and to assure the highest quality results are delivered on time and on budget. Routine monitoring and reporting by the project leader (to the government, Darwin, and stakeholders) and administration of the project by the operations and financial team at CCMI (to the project leader) provides important data on progress and information vital to reporting the achievements and scale of the project's impact.

The following steps (linked to each study milestone and with individuals responsible for the reporting in bold and responsible for the activities listed) outlines the logical evaluation process of this project's methodology and results. Evaluations with all project partners will take place during quarterly meetings and stakeholders will provide input during annual meetings, again to assure adaptive measures are taken as needed. Interaction with the fishing community will require special consideration to include their concerns and assure their participation.

1) Fish distribution and abundance surveys **(Cox)**
   a) Survey design: Cox, Manfrino, Bothwell
   b) Fish visual census data: Cox/Canty, Dell, Bothwell, CCMI Tech
   c) Observational surveys: Cox/Canty, Dell, Bothwell CCMI Tech
   d) Data analysis: Cox, Dell
   e) Interpretation and reporting (inc. herbivore inventory and algal diet preferences to inform management action): Cox, Dell, Bothwell

2) Movement ecology **(Dell/Cox)**
   a) Survey design: Dell, Cox, Candelmo, Manfrino, Bothwell
   b) Field work – deploying acoustic tags and receivers: Dell, Candelmo, CCMI Tech
   c) Monitoring of experiment: Dell and CCMI Tech
   d) Data analysis, evaluation and interpretation, and reporting (inc. the provision of spatial maps to inform management and conservation priorities): Dell, Cox, Manfrino, Bothwell

3) Population genetics **(Cox)**
   a) Survey design and sample collection: Cox, Dell, CCMI Tech
   b) Molecular work: Cox/Dell
   c) Analysis:Cox, Dell
   d) Evaluation and reporting (reports to guide management decisions of effective spatial scales for population level protection of fishery exploited and non-exploited herbivores) : Cox, Dell, Bothwell

4) Fishery impacts **(Dell)**
   a) Surveys design: Bothwell, Cox, Dell
   b) Surveys: Dell, CCMI Tech
   c) Analysis: Bothwell, Cox, Dell
   d) Reporting and Evaluation: Bothwell, Cox, Dell, Manfrino

5) Conservation management template and biodiversity action plan for herbivorous fishes **(Cox/Dell)**
   a) Spatial Scale connectivity map: Cox
   b) Synthesis Report (from 1-4 Results): Cox, Dell, Bothwell
   c) Biodiversity Action Plan: Cox, Dell, Bothwelll
   d) Final Review and Planning meetings with DoE: Cox, Dell, Manfrino

Number of days planned for M&E	30
Total project budget for M&E	14,380
Percentage of total project budget set aside for M&E	6%

30. 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?)
The financial control of the organization is managed according to financial policies and best practices governed by the board of directors. Internal controls separate accounting responsibilities (book keeping and reconciliations, purchasing and approvals, etc), require project activity accounting (field team records field activities which are entered into the project accounting), and time and effort accounting (reviewed and approve by HR manager). In 2015, CCMI advanced the quick books system to include provisions to account for grant funding individually which increases transparency and accountability. Grant funded expenditures and project activities are under the oversight of the Director of Research and Conservation. CCMI's Director of Operations manages the day to day business and he produces quarterly financial reports and monthly bank reconciliations. Quarterly reports are reviewed by the treasurer who reports to the President and board of Directors. CCMI undergoes an annual external audit by a major accountancy firm (KPMG) which provides audited financial statements and oversight for the board and management team. Audits are made available to all granting agencies and individuals upon request. Over the past 16 years CCMI has successfully secured and managed over $10M in research and development funding. The research team has extensive experience managing multi-year coral reef research projects.

Please complete the separate Excel spreadsheet which provides the Budget for this application. Some of the questions earlier and below refer to the information in this spreadsheet. If you are requesting over £100,000 from Darwin Plus, you must complete the full spreadsheet.

31. Value for Money

Please explain how you worked out your budget and how you will provide value for money through managing a cost effective and efficient project. You should also discuss any significant assumptions you have made when working out your budget. (200 words max)

The budget is based on current operational costs of the research institute at Little Cayman and assumes a 3% increase per annum. Value for money stems from the operational and personnel costs met by partners and investments already in place.

1. The project team (Cox and DoE) provide their expertise at no cost as they are subsidized by their agency (DoE and SI). Results will inform fishery policy, reinforcing the value for money as minimal investment is required for two major personnel.
2. The DOE already has16 receivers (cost £1200each) installed so this project requires only 4 additional receivers.
3. The CCMI technician (50%) assures project logistics, data collection/ management.
4. CCMI year round on-site staff time is apportioned and allocated based on project needs.
5. The CCMI and DoE long-term (17+yr) data sets are an invaluable resource that offers critical baseline data to the project deliverables.
6. Project transportation costs will be kept to a minimum due to easy access to field sites and the use of Institution boats (CCMI and DoE) for field work.
7. The focused conservation effort on key fish species will have a longer-term value and offers an economically leveraged conservation strategy.

32. Provide a project implementation timetable that shows the key milestones in project activities. Complete the following table as appropriate to describe the intended workplan for your project

Please add/remove columns to reflect the length of your project. For each activity (add/remove rows as appropriate) indicate the number of quarters it will last, and shade only the quarters in which an activity will be carried out. The workplan can span multiple pages if necessary.

	Activity	No. of months	Year 1				Year 2				Year 3			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Output 1	**Key herbivores identified for biodiversity action plan to protect fish implicated in moderating algae**													
1.1	Visual census surveys of herbivores across 3 islands (15 sites);	5												
1.2	Stakeholder fish focus group -develop expertise and build support	7												
1.3	Link data to new educational modules that empowers 300 local students with new knowledge by the end of year 2.	7												
Output 2	**Map that highlights movement patterns, levels of of herbivory, and regional connectivity**													
2.1	Manipulation experiments determine dietary patterns and key herbivores are identified also using surveys (from Output 1.1).	12												
2.2	Tag fish to determine range and impact on reducing algae on the reefs; genetics (fin clips) of selected species expand our knowledge on connectivity across the regio by end of project.	15		Tag						Tag				
Output 3	**Fishery assessment of herbivorous fish**													
3.1	Conduct interviews of herbivore fishing effort	6												
3.2	Historical effort and catch data compiled and reported	6												
Output 4	**Dissemination and Application of Results**													
4.1	Draft Biodiversity Action Plan for herbivores	24												
4.2	Summarizing, reporting, and quarterly meetings with DOE (yellow); Annual meetings with stakeholders (gray)	36												
4.3	Completion of K-12 Public school curriculum incorporating results and empowering an additional 200 local students by end of project.	6												

CERTIFICATION

On behalf of the trustees of The Central Caribbean Marine Institute

I apply for a grant of £249,096 in respect of **all expenditure** to be incurred during the lifetime of this project based on the activities and dates specified in the above application.

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 lead institution to submit applications and sign contracts on their behalf.)*

- I enclose CVs for key project personnel and letters of support.
- I enclose the most recent 2 years of signed and audited/independently verified accounts.

Name (block capitals)	CARRIE MANFRINO
Position in the organisation	President

Signed		**Date:**	2016-08-25

If this section is incomplete the entire application will be rejected. You must provide a real (not typed) signature. You may include a pdf of the signature page for security reasons if you wish. Please write PDF in the signature section above if you do so.

Application Checklist for submission

	Check
Have you **read the Guidance?**	X
Have you read the current **Terms and Conditions** for this fund?	X
Have you **checked the Darwin Plus website** immediately prior to submission to ensure there are no late updates?	**X**
Have you provided **actual start and end dates** for your project?	X
Have you provided your **budget based on UK government financial years** i.e. 1 April – 31 March and in GBP?	X
Have you checked that your **budget is complete**, correctly adds up and that you have included the correct final total on the top page of the application?	X
Has your application been **signed by a suitably authorised individual**? (clear electronic or scanned signatures are acceptable in the email)	**X**
Have you included a **1 page CV for all the key project personnel**?	x
Have you included a **letter of support from the applicant organisation, main partner(s) organisations and the relevant OT Government**?	X
Have you included a **copy of the last 2 years' annual report and accounts** for the lead organisation?	X

Once you have answered the questions above, please submit the application, not later than midnight **2359 GMT Monday 29 August 2016** to Darwin-Applications@ltsi.co.uk using the first few words of the project title **as the subject of your email**. If you are e-mailing supporting documentation separately please include in the subject line an indication of the number of e-mails you are sending (e.g. whether the e-mail is 1 of 2, 2 of 3 etc). You are not required to send a hard copy.

DATA PROTECTION ACT 1998: Applicants for grant funding must agree to any disclosure or exchange of information supplied on the application form (including the content of a declaration or undertaking) which the Department considers necessary for the administration, evaluation, monitoring and publicising of Darwin Plus. Application form data will also be held by contractors dealing with Darwin Plus monitoring and evaluation. It is the responsibility of applicants to ensure that personal data can be supplied to the Department for the uses described in this paragraph. A completed application form will be taken as an agreement by the applicant and the grant/award recipient also to the following:- putting certain details (i.e. name, contact details and location of project work) on the Darwin Initiative and Defra/FCO/DFID websites (details relating to financial awards will not be put on the websites if requested in writing by the grant/award recipient); using personal data for the Darwin Initiative postal circulation list; and sending data to Governor's Offices outside the UK, including posts outside the European Economic Area. Confidential information relating to the project or its results and any personal data may be released on request, including under the Environmental Information Regulations, the code of Practice on Access to Government Information and the Freedom of Information Act 2000.