Biodiversity Challenge Funds Projects
Darwin Initiative, Illegal Wildlife Trade Challenge Fund, and Darwin Plus
Half Year Report

Note: If there is any confidential information within the report that you do not wish to be shared on our website, please ensure you clearly highlight this.

Submission Deadline: 31st October 2023

Project reference	DPLUS 147
Project title	Collaborative approach to managing coral disease in UK Overseas Territories
Country(ies)/territory(ies)	British Virgin Islands, Cayman Islands, Turks and Caicos Islands (TCI)
Lead partner	JNCC
Partner(s)	Turks and Caicos Islands - Department of Environment and Coastal Resources, British Virgin Islands - Ministry of Natural Resources, Labour and Immigration, Cayman Islands' Government Department of Environment, Nature2, Dr Greta Aeby
Project leader	*Bryony Meakins, JNCC*
Report date and number (e.g. HYR1)	*HYR3*
Project website/blog/social media	*https://jncc.gov.uk/our-work/collaborative-coral-reef-working-group*

Outline progress over the last 6 months (April – Sept) against the agreed project implementation timetable (if your project has started less than 6 months ago, please report on the period since start up to end September).

Although we are not looking for specific reporting against your indicators, please use this opportunity to consider the appropriateness of your M&E systems (are your indicators still relevant, can you report against any Standard Indicators, do your assumptions still hold true?). The guidance can be found on the resources page of the relevant fund website.

DPLUS147 is a 2.75-year project which commenced in July 2022. This half-yearly report therefore outlines progress made to date on activities that were scheduled for Y3 Q1 & Q2 (April-October 2023). Progress against delivery for each project output can be summarised as follows:

Output 1. Collaborative partnership to optimise the treatment and management of Stony Coral Tissue Loss Disease (SCTLD) established.

C-COT Membership

The Coral Conservation in the UK OTs (C-COT) working group (formerly known as the Collaborative Coral Reef Working Group) was established at the start of the project. It is made up of representatives from each of the six Caribbean and Western Atlantic Overseas Territories (OTs). Three of these OTs are partners in this project (The Cayman Islands, British Virgin Islands, Turks and Caicos Islands); they are joined by representatives from Anguilla, Bermuda and Montserrat to support wider knowledge sharing and project benefits. This is a collaborative working group which includes government and Non-Governmental Organisation (NGO) representatives, all of whom share a common goal of addressing SCTLD and wider coral reef

conservation. Members signed a Partnership Agreement in early 2022, which provides the framework for this collaborative working relationship, and includes commitments to a wide range of activities to deliver coral reef conservation.

C-COT Online Meetings

C-COT has met online seven times in Y3, Q1 & Q2. JNCC staff time provides the secretariat function for C-COT, including organising meetings, writing and sharing minutes, preparing a frequent newsletter, liaising and networking with the group but also maintaining and managing information via an online Teams platform which is accessible to the group and NIRAS. JNCC, along with C-COT chair Kalli De Meyer (Nature2), organise the meeting schedule and the theme of each meeting is determined by C-COT members. The secretariat responds to these themes, sourcing external speakers and science experts. The JNCC Team Leader Dr Jane Hawkridge and our scientific lead partner Dr Greta Aeby are kept fully informed, providing expert input and feedback through video recordings and email exchanges whenever they can't attend meetings in person. Participants praised the C-COT newsletter as a useful tool for keeping up-to-date with the project and latest scientific developments when their time is too limited to attend meetings. All expert presenters are recorded and posted onto the Teams platform and links are shared in the newsletter – this allows those unable to attend to catch-up on their own schedule. We also have data on newsletter engagement which we will present in the final report.

Reflecting on the indicator for measuring attendance of partners at meetings highlighted in the Y2 Review, we want to revise how we measure success. We consider attendance by at least one of each OT project partner being present at each meeting as a measure of success. On this basis, 75% of the meetings this year have had all partner OTs represented. The Project Officer in BVI has specifically notified us in advance when they have not been able to attend due to conflicting obligations and we have provided recordings for them to review at their convenience.

Meeting minutes are shared within two weeks and recordings shared on the Teams platform to ensure that all members are fully informed; recordings are archived unless requested for deletion by members. The attendance in meetings varies seasonally with some conflicting priorities and commitments such as fieldwork but overall has been good. Two of the NGO's highlighted this year that they would only be able to attend intermittently over the summer due to increased student workload. Since the arrival of the Blue Belt Programme in Anguilla and TCI (and pending in Cayman and Montserrat), we have seen some reduction in attendance with C-COT members from Anguilla and sometimes TCI, indicating challenges with capacity. When the project was designed the Blue Belt Programme was not in the Caribbean and thus not included in the assumptions. To address this, we are increasing efforts to liaise and link up with key elements of the Blue Belt Programme which are of mutual benefit e.g. Sustainable finance hub activities. Further work will be undertaken in the rest of the project. A new working assumption for Q3 & 4 is that Blue Belt Programme activities, and the new Darwin Plus Local grant projects, will on occasion impact attendance by core members. Both the Blue Belt Programme and Darwin Plus Local are seen as very positive by the group but it is recognised that the group may need to adapt over the next 6 months to accommodate these new developments.

C-COT Workshop in Miami

C-COT met in person at a 'Coral Conservation in the UK Overseas Territories (C-COT)' workshop on 5-9 June in Miami with 20 attendees. JNCC organised and facilitated the workshop in a location to minimise travel time and costs for all participants and that also allowed for a site visit to a prestigious coral reef University for networking opportunities. The workshop was attended by 8 representatives from the three OT government partner members, along with NGO representatives from TCI and Montserrat. Non-partner OT members from Anguilla and Montserrat were also able to attend this workshop, using some additional Defra funding to support wider knowledge sharing. Bermuda wished to attend but unfortunately had a clash with another workshop. JNCC enabled remote attendance by one participant from Cayman who could not travel.

The workshop also included a key-note speech by Professor Andrew Baker on using engineering and biological solutions to project vulnerable coastal sites from the effects of global climate change. Workshop attendees participated in a fieldtrip to Rosenstiel School of Marine, Atmospheric and Earth Science, University of Miami where they were able to learn about reef restoration techniques, including research into cutting-edge assisted evolution approaches.

The objectives of the workshop were to:

- Review and discuss the next steps in the management of Stony Coral Tissue Loss Disease (SCTLD) in the region including the potential need for an Adaptive Management Plan
- Develop a framework and provide the content for a Coral Reef Resilience Model to support the long-term management of coral reefs in the UK Caribbean Overseas Territories.
- Finalise discussions regarding the future of C-COT and the development of a Road Map for the future of the working group.

The key outputs of the workshop were:

- Agreement on the format and content for the project output SCTLD Adaptive Management Tool.
- Development of the content for a Coral Reef Resilience model by C-COT members and agreement on it's use as a decision-making tool, rather than a computer model (as originally planned).
- A clear and detailed vision for the continued C-COT partnership to be used to form the basis of indicator, '*An action plan for longer-term, broader, partnership*'.
- A consensus on the urgent need for continuing 3-5 years of funding to support a C-COT secretariat, regional networking, annual meetings and support for science and technical support C-COT members and coral reef conservation in the UKOTs.

Links to Regional Networks

C-COT continues to link into regional and global groups, such as the NOAA Caribbean Cooperation group, MPA Connect, AGRRA and the UKOT Conservation Forum Wider Caribbean Working Group.

C-COT members provided detailed input into the Global Coral Reef Monitoring Network (GCRMN)'s Caribbean priorities ahead of the International Coral Reef Initiative meeting in September. These priorities informed the work programme agreed by the Steering Committee at their General Meeting. C-COT members Jane Hawkridge (JNCC) and Argel Horton (British Virgin Islands) attended the GCRMN Steering Committee meeting and strengthened relationship with the Secretariat of the Caribbean hub of the GCRMN.

Output 2. Optimised treatment and management of SCTLD using best available scientific evidence and expertise

Status of SCTLD

C-COT meetings include a review of SCTLD status and treatment in each OT at each meeting. Much of the focus at this stage of the project has shifted to coral rescue, gene banking, and restoration activities due to the stage of disease progression, which varies across each OT. Taking on board feedback from the Year 2 Review, we are collating status updates of SCTLD from each meeting into a project document, along with retrospective status updates from meeting minutes in the interim. Recognising the starting point for some of the OTs included a lack of any formal monitoring programmes, this necessarily is a semi-qualitative approach.

C-COT SCTLD Treatment Strategy

The SCTLD Treatment strategy is currently being updated for this year, incorporating the latest science and publications, led by project partner Dr Greta Aeby. This updated report provides an overview of the success rates and different treatment options for SCTLD across the region. Current treatment options include the direct application of antibiotics, chlorine, probiotics and

other experimental approaches such as the use of honey. The report will also highlight new opportunities to sample and monitor spread following this year's bleaching event. Other management options, including (i) mobilising responses from the wider dive community, (ii) biosecurity measures to stop the spread of the disease, and (iii) reducing overall pressures on the reef, all remain crucial to the overall response to SCTLD.

We note the comment in the Year 2 Review that each OT is implementing an individual approach rather than adhering to the project vision of delivering a regional SCTLD treatment approach. In our opinion, this is due to limited capacity as noted above. Despite this, it is clear that the OTs are sharing information and learning from each other and this project will continue to work towards implementing a regional approach.

Fieldwork in TCI

The DECR has completed Coral Reef Monitoring on a select number of its baseline monitoring sites - pending completion of the analysis of that data will give some indication as to the impact TCI has experienced as a result of SCTLD and other phenomena. Previous monitoring was conducted 2019, same year as TCI coral reefs first received SCTLD infections. Monitoring targeted sights with higher recorded live coral cover (2019) and therefore most likely to produce results indicating SCTLD impact. Analysis of GCRMN photo-quadrants is on-going.

DECR collected SCTLD probiotic samples of a *Montastrea cavernosa* colony that was identified in the field as likely SCTLD resistant. These samples were exported to Dr. Blake Ushijima's lab for initial analysis and isolation. The DECR prepares for ex-situ testing based upon recommendations from Dr. Ushijima.

During the summer of 2023 the TCI, like much of the Caribbean, has experienced a mass coral bleaching event. Because SCTLD is thermally sensitive, there have been very few active SCTLD lesions for field research or treatments. With this in consideration, the DECR has collected some coral histology samples of some suspected SCTLD lesions that could be located on the bleached corals - the aim is to investigate histopathological differences of SCTLD lesions with and without heat stress. In addition, during the coral bleaching event, the DECR has conducted some coral bleaching surveys, quantitatively highlighting the low SCTLD prevalence during this time.

Once sea temperatures reduce sufficiently and the coral bleaching event ceases, we anticipate that SCTLD prevalence to increase. With that the DECR will resume its SCTLD research and treatments. Preparing for more in-water work, the DECR seeks Enriched Air (Nitrox) training for its SCUBA staff to permit safer diving during prolonged in-water field days conducting SCTLD treatments.

Fieldwork in the Cayman Islands

Throughout this reporting period SCTLD was active on Grand Cayman. Utilising all available sources of funding (not limited to this Darwin+ project) the DOE had previously established a designated SCTLD Response Team consisting of 5 trained responders and two boat captains. The team has remained active throughout this reporting period with a shift in coral treatment and management focus to perceived high value sites on the South, West and North of Grand Cayman. A DOE trained and equipped SCTLD 'Strike Team', operated by a local dive operator, continues to assist with antibiotic treatment in the eastern reefs of Grand Cayman. Good response to the antibiotic treatment remains observable and the DOE reported that SCTLD took longer to progress to the endemic stage of the disease at sites where antibiotic treatment was being used.

Coral spawning was observed in large coral colonies despite infection. Antibiotic treatment continues weekly at priority sites. Treated corals show slightly lower rates of reinfection.

As in other places throughout the Caribbean extensive warmer than average sea water temperatures and the resulting coral bleaching from July 2023 onwards has slowed the progression of SCTLD on Grand Cayman.

Surveys have shown that Cayman Brac and Little Cayman remain SCTLD disease free. There has been a strong management emphasis on safeguarding these reefs, including a social media campaign 'Disinfect to Protect'. This ongoing campaign includes involving the local

airline, local boat traffic and live-aboard dive vessels to ensure arriving passengers are aware of the need to disinfect dive and snorkel gear. DOE is additionally working with local live aboard dive charter staff and dive companies and provided custom made training to involve them in SCTLD treatment and monitoring.

Preparation for probiotic treatment included sampling in June 2023 where mucus samples were taken from stony corals considered to be disease resistant and included sampling from Little Cayman. DOE is looking for alternative treatments for pillar coral (Dendrogyra) which does not respond well to antibiotic treatment and experimenting with Ocean Alchemist product which is anti-septic based.

Building on contacts made during the Miami workshop, in late August, DOE sent a total of 12 corals considered to be SCTLD free to Professor Andrew Baker at the Rosenstiel School of Marine and Atmospheric Science. They will be used in experiments with cross-breeding and investigating the role of coral zooxanthellae in disease resistance.

DOE staff and SCTLD Responders completed the Long-Term Coral Reef Monitoring survey consisting of 50-meter photo transects around all three islands. Additionally, the survey was repeated in October to document the extensive coral bleaching occurring on all nearshore and deep reefs. A post bleaching assessment survey is planned for February 2024. C-COT collaborator Will Green from the Perry Institute conducted an online training session with the Team in September 2023 in the use of Photogrammetry of coral reefs along with the acquisition of equipment has helped to track and monitor the impact of the SCTLD on Grand Cayman. All photogrammetry sites established in November 2022 were re-photographed in September 2023 and the sister islands of Cayman Brac and Little Cayman are scheduled for late October 2023.

Fieldwork in BVI

The work in BVI this FY began focussing on analysis of the fieldwork completed in the previous financial year. SCTLD prevalence is still active within reef system which was first treated back during year 1 of DPLUS 147 but in low cases. Although chlorine applications appear to slow the disease, antibiotic treatment was shown to be most effective. *Meandrina meandrities* (Maze Coral) which was one of the most highly susceptible species to SCTLD, didn't respond positively to the antibiotic treatment. Treatment efforts using antibiotics continues to be administered by dive operators and available volunteers (in a separate project), with guidance from the Ministry. Positively, juvenile colonies have been found within the southern cays of the Territory, potentially with larvae sources from deeper water regions or from neighbouring USVI species, previously assumed to be wiped out by SCTLD.

In the Summer of 2023, the Caribbean region experienced an El Nino event starting as early as June 2023 and is ongoing. During this time, NOAA reported an extensive coral bleaching event in the Caribbean. Dive assessments were conducted at some of the southern island cays, namely, the Wreck of the Rhone (the Territory's only marine park), fisheries protected areas (Dead Chest) and some tourist sites (The Indians, Ginger Islands etc) noting which corals were impacted and at what depth. Visual observations suggest corals were impacted in shallow waters in less than 3m to as deep as 30m. Corals impacted and fully bleached were *Orbicella* spp. and *Agracia* spp. Closer investigations suggest the colonies are still alive, as there is pigmentation within the polyps. Minimal observations of SCTLD were noted and treatment efforts were halted.

Following the hurricane season, efforts in BVI will commence in November and will contract external assistance to complete an assessment of reefs in BVI to determine the updated condition assessment, including presence of SCTLD.

Links to the wider Scientific Community

The C-COT workshop in Miami in June included a fieldtrip to the Coral Futures Lab in the University of Miami, which has led to collaborations and potential collaborations in Cayman, TCI and BVI.

C-COT meetings have had two invited speakers, including project partner Dr Greta Aeby. This is a lower number than some periods, but a lot of the meetings were focussed on the Miami workshop in the lead-up to the event and since have been focussed on project outputs such as the reef resilience model, C-COT Action Plan for future partnership and adaptive management

plan. We expect the number of invited speakers to increase in the final six months of the project; the upcoming October meeting (31st October 2023) includes presentations from Island Solutions on related Darwin Plus Local projects, and the Marine Management Organisation on the Blue Belt Programme sustainable financing hub and how C-COT may be able to benefit from their outputs.

Discussions are also underway with an existing regional connection (The Reef World Foundation (TRWF)) to re-examine how C-COT members can engage with their Green Fins initiative. These discussions are in the early stages but may look towards regional training and a future project proposal, led by the OT partners and TRWF.

DOE (Cayman Islands) have also recently begun an independent coral laboratory and spawning project with Dr Mike Sweet from the University of Derby. This connection was initially made when Dr Sweet presented to C-COT in 2022. Similarly, the initial connection between the Ushijima Lab at the University of North Carolina Wilmington has been progressed into a stand-alone Darwin Plus Local funded project in Montserrat with Island Solutions and the Government of Montserrat. This project is focussed on building the capacity to roll-out probiotics SCTLD treatments in Montserrat and potential neighbouring islands.

Output 3. Creation of Reef Resilience Model Framework to support the long-term management of coral reefs

Reef Resilience Model Framework

The Reef Resilience Model Framework was produced and refined through participatory sessions at the C-COT workshop held in Miami in June. This was further refined, presented back to CCOT and the PMG in July. It was formally signed off by CCOT on 5 September.

The original bid has an indicator for success against the project outcome to develop '*At least 1 funding proposal developed to pilot use of the Conceptual Reef Resilience Model to inform management decisions, by February 2024*'. At the workshop held in Miami in June 2023 with projects partners and the wider CCOT working group, work was undertaken to develop the Conceptual Reef Resilience Model framework and to agree a pilot. During discussions, CCOT members explored how best to take forward the framework and unanimously agreed that this framework was best used as a communication and management tool, rather than developed into a computer-based model and thus a pilot, as previously envisioned at the project design and bid stage. A change to the indicator and the agreed output is therefore required (please refer to change request sent in separately).

Output 4. Project management, monitoring and evaluation

Project organisation and roles
JNCC has continued to project manage the project, including managing finances, project governance and monitoring and evaluation.

Project Management Group (PMG)
The PMG, consisting of project partners and non-partner OTs, has met two times between April-October 2023 to address project progress against the outcomes and indicators, sign off project documents and address project risks. The new format Darwin project risk audit has been introduced to consider new and emerging risks relating to the project and to discuss mitigation options.

2. Give details of any notable problems or unexpected developments/lessons learnt that the project has encountered over the last 6 months. Explain what impact these could have on the project and whether the changes will affect the budget and timetable of project activities.

JNCC has recently experienced turnover of staff working on this project, with key skills lost from the project. Recruitment is underway and resources are being reallocated from other areas of the organisation. The original project manager has returned to the project following maternity leave with strong handover from the cover provided in her absence, bringing some resilience back into the project. Whilst JNCC is managing this risk, this has resulted in some continuity issues between years which we are actively addressing.

Lack of capacity (and some turnover in staff, thus maintenance of skills) remains a challenge in the UKOTs, which is not unexpected and has been identified all through the project as a risk. We do note that this challenge has increased in relation to the expansion of the FCDO's Blue Belt Programme in two of our three partner OTs. Darwin Plus Local coming online has been both beneficial in realise some areas of related project activity but is also impacting NGO and Government capacity to participate in C-COT on a regular basis. This is a constant challenge in the UKOTs but strategies to help address these challenges are constantly being considered. For example, in delivering the fieldwork elements, the most likely option will before the OTs to contract professionals (dive operators and volunteers) to help deliver dive surveys and disease treatment. Attendance at C-COT is under constant review with bi-laterals as needed.

As mentioned under Section 1, the Caribbean has experienced a mass bleaching event. While this has resulted in lower SCTLD prevalence, this event is a harsh reminder of the risk that Climate Change poses to the coral reef ecosystems in the Caribbean. The lower disease prevalence has meant that disease treatment has not been required in most instances, but expectations are that the disease will re-emerge following seawater cooling in November/December and thus will likely be carried out in late Q3 and Q4; this is a new risk to project spend. Discussions with project partners has included exploration of this risk and identified options to mitigate this risk, including bringing external assistance in if difficulties in completing project activities arise.

Feedback from C-COT and the PMG have emphasised the value of C-COT as a working group in its own right, rather than purely a mechanism for receiving project funds. This is an important consideration for our next steps as a group.

3. Have any of these issues been discussed with NIRAS and if so, have changes been made to the original agreement?

Discussed with NIRAS:	Yes/**No**
Formal Change Request submitted:	Yes/**No**
Received confirmation of change acceptance	Yes/**No**
Change request reference if known:	

4a. Please confirm your actual spend in this financial year to date (i.e. from 1 April 2023 – 30 September 2023)

Actual spend: [redacted]

4b. Do you currently expect to have any significant (e.g. more than £5,000) underspend in your budget for this financial year (ending 31 March 2024)?

Yes ☐ **No** ☐ Estimated underspend: £

4c. If yes, then you need to consider your project budget needs carefully. Please remember that any funds agreed for this financial year are only available to the project in this financial year.

If you anticipate a significant underspend because of justifiable changes within the project, please submit a re-budget Change Request as soon as possible. There is no guarantee that Defra will agree a re-budget so please ensure you have enough time to make appropriate changes if necessary. Please DO NOT send these in the same email as your report. **NB: if you expect an underspend, do not claim anything more than you expect to spend this financial year.**
5. Are there any other issues you wish to raise relating to the project or to BCF management, monitoring, or financial procedures?

If you are a new project and you received feedback comments that requested a response, or if your Annual Report Review asked you to provide a response with your next half year report, please attach your response to this document.

All new projects (excluding Darwin Plus Fellowships and IWT Challenge Fund Evidence projects) should submit their Risk Register with this report if they have not already done so.

Please note: Any planned modifications to your project schedule/workplan can be discussed in this report but should also be raised with NIRAS through a Change Request. Please DO NOT send these in the same email.

Please send your **completed report by email** to BCF-Reports@niras.com. The report should be between 2-3 pages maximum. **Please state your project reference number, followed by the specific fund in the header of your email message e.g. Subject: 29-001 Darwin Initiative Half Year Report**