

DPLR1\1088

Darwin Plus Local - Final Report (1)

Officer: Jessica Magnus

Section 1 - Darwin Plus Local Project Information (Essential)

Project Reference Number

DPL00042

Q1. Project Title

No Response

Overseas Territory(ies)

Turks and Caicos Islands (TCI)

Lead Organisation or Individual

Turks and Caicos Reef Fund

Partner Organisation(s)

n/a

Value of Darwin Plus Local Grant Award

██████████

Project Start Date

01 May 2023

Project End Date

31 March 2024

Project Leader Name

Michelle Taylor

Project Website/Twitter/Blog etc.

No Response

Report Author(s)

Report Date

24 March 2024

Project Summary

No Response

Project Outcomes

Checked	Biodiversity: improving and conserving biodiversity, and slowing or reversing biodiversity loss and degradation;
Unchecked	Climate Change: responding to, mitigating and adapting to climate change and its effects on the natural environment and local communities;
Unchecked	Environmental quality: improving the condition and protection of the natural environment;
Unchecked	Capability and capacity building: enhancing the capacity within OTs, including through community engagement and awareness, to support the environment in the short- and long-term.

Section 2 - Project Outcomes (Essential)

On a scale of 1 (high – outcome substantially exceeded) to 5 (low – outcome substantially did not meet expectation), how successful do you think your project has been?

1 - Outcome substantially exceeded

Project outcomes and justification for rating above

As a result of our project Turks and Caicos Islands now have a fully functional DNA extraction and quantification laboratory on island, accessible to all future visiting ecology and biology researchers. Turks and Caicos Reef Fund staff were trained on the equipment to ensure ongoing autonomy and can provide technical support to visiting researchers. Local high school and college students were invited to the laboratory and conducted DNA extractions using all the equipment. Whilst they are not fully trained to use the equipment, they were exposed to the potential of the laboratory set up and hopefully inspired to continue in science as they choose a future career.


Children and students on Providenciales, Grand Turk, and South Caicos were introduced to the habitat of coral rubble beds and its importance to the wider marine environment as well as the concept of environmental DNA monitoring. We ran multiple outreach events with children from primary school to college age.


A key goal of the project was to create an inventory of coral rubble bed biodiversity found in the Turks and Caicos Islands, that can then be extrapolated to estimate diversity in all Caribbean coral rubble beds. All major marine phyla were found in the habitat and over 400 DNA barcodes have been added to the global database,


further increasing our scientific knowledge of the region. All collected specimens have been curated into the permanent collection at the Natural History Museum of Los Angeles County, where they are available to experts and students alike.


An unanticipated positive result of this project was additional collaborations made with researchers from multiple countries. We had specimen identification help from experts in the United States, Mexico, Malaysia and Germany. We were able to collaborate with 3 other Darwin projects based in Turks and Caicos to extend our sampling out to East Caicos (the largest uninhabited island in the Caribbean). This cooperation brought together a dozen researchers where information could be exchanged, and vast amounts of data was generated for both marine and terrestrial projects.

Supporting Evidence - file(s) upload


 [Preliminary results poster](#)


 30/04/2024


 03:38:56


 pdf 1.99 MB


 [East Caicos Research Team](#)


 30/04/2024


 03:30:49


 jpg 303.21 KB


 [Michelle working at a quadrat](#)


 30/04/2024


 03:26:56

 jpg 10.56 MB


 [Selection of coral rubble bed organisms 2023](#)


 30/04/2024


 03:23:19


 png 493.86 KB


 [Michelle and Adara with TCRF flag](#)


 30/04/2024


 03:23:17

 jpg 2.12 MB

 [Caribbean coral rubble survey site example](#)

 30/04/2024

 03:23:15

 jpg 1.26 MB

Supporting Evidence - links to published document/online materials

Photo credits for above images

Caribbean coral rubble survey site example - Michelle Taylor

East Caicos Research Team - Charlie Todd

Michelle and Adara with TCRF flag - Charlie Todd

Michelle working at quadrat - Charlie Todd

Selection of coral rubble bed organisms 2023 - Michelle Taylor and Adara Jaggernauth

Preliminary results poster as presented at the Mexican Coral Reef Society Congress in April 2024.

Project Challenges

We anticipated there may be shipping issues with the equipment as we were ordering a large number of items and the logistics involved to ship to an island are more complex than shipping overland. We were also shipping chemicals which need to be sent by sea instead of by air, which takes longer. We did account for a small delay, but some of the items were out of stock and that delay was not anticipated.

When planning the data collection days we considered bad weather and were lucky that only one island (South Caicos) was affected whilst we were trying to sample. We lost a day and a half of sampling (5 dives), which we were unable to make up due to transportation already being booked.

Some planned outreach had to be cancelled due to sickness of our liaisons and unfortunately could not be rescheduled in the remaining time we had.

Lessons Learned

- i) We feel that several things went well in this project. The set up of and training on the laboratory equipment went very well. Two local researchers were trained successfully on the lab equipment and are now capable of training others. We were also able to bring in six high school and college students to the lab area who were given the opportunity to contribute to the research by conducting DNA extractions. They had never seen or used equipment like this and whilst not trained on it, they were given the opportunity to use it and hopefully encourage them into future STEM careers. We produced some specific outreach materials to explain environmental DNA and the coral rubble bed habitat which are now available for future outreach events.
- ii) We were lucky to not have any major issues with the project. More time on the island for our visiting researchers would have benefitted the project as a whole however.
- iii) If we were to do the project again, we would allocate more time for training. We were able to dedicate five full days to training and outreach involving the DNA work, however with an additional week we would have been able to bring over some researchers from other islands and train them on the equipment too.
- iv) If we were to advise other researchers doing similar projects our main recommendation would be to build in more time than you expect for deliveries to reach small islands.

Section 3 - Project Finance (Essential)

Project Expenditure

Project Spend (indicative) since last Annual Report	2023/24 Grant (£)	2023/24 Total actual Darwin Plus Costs (£)	Variance %	Comments (please explain significant variances)
Staff Costs	£0.00	£0.00	0	<i>No Response</i>
Consultancy Costs	£0.00	£0.00	0	<i>No Response</i>
Overhead Costs	██████	██████	0	<i>No Response</i>
Travel and Subsistence	██████	██████	████	We were extremely fortunate to have in kind donations from the hotel in South Caicos, reducing our accommodation costs. Dr. Layton did not travel to Turks and Caicos Islands as she left her position in Aberdeen, U.K. to return to Canada.
Operating Costs	██████	██████	████	<i>No Response</i>

				Some items that we used in our proposal budget were out of stock, and due to the time constraints of shipping we were forced to purchase more expensive options to ensure they arrived in time for the researchers arriving on island. Additionally, when we began processing the data we discovered that the computer we had was not capable of processing it. We reallocated some of the travel funding to purchase a new desktop computer with greater computing power. We also underestimated shipping costs of the large items (£█████ instead of the █████ anticipated)
Capital Items	█████	█████	█████	
Others	£0.00	£0.00	0	<i>No Response</i>
Total	█████	█████	█████	

Please provide a short narrative summary on project finances.

Due to some laboratory equipment being out of stock we were forced to purchase more expensive items due to time constraints. Our existing computer was not capable of processing the large genetic data set, so we reallocated some funds to purchase a large desktop computer capable of running large data sets and complex software. The largest unexpected cost was shipping of the laboratory equipment. We budgeted █████ and it was almost █████

As a donation to the Turks and Caicos Reef Fund we were provided with in-kind financing in the form of room and board for 3 researchers in South Caicos. Dr. Layton left her position at the University of Aberdeen and so did not travel to the Turks and Caicos Islands. Both of these reduced the travel and subsistence costs of the project.

Section 4 - Contribution of Project to Darwin Plus Programme Objectives

Please select up to **one** indicator that applies within **each group/indicator list (A, B, C, D)** and report your results for that indicator in the text box underneath. If you do not have relevant results to report for any of the indicators in a particular group, you can leave them blank.

Please also submit some form of evidence (above) to demonstrate any results you list below, where possible.

Group A: Capability and Capacity - Core Darwin Plus Standard Indicators (select one)

- | | |
|-----------|--|
| Unchecked | DPLUS-A01: Number of people from key national and local stakeholder groups completing structured and relevant training. |
| Unchecked | DPLUS-A02: Number of secondments or placements completed by individuals of key local and national stakeholders. |
| Checked | DPLUS-A03: Number of local/national organisations with improved capability and capacity as a result of project. |
| Checked | DPLUS-A04: Number of people reporting that they are applying new capabilities (skills and knowledge) 6 (or more) months after training. |
| Unchecked | DPLUS-A05: Number of trainers trained reporting to have delivered further training by the end of the project. |

Group A Indicator Results

The establishment of the on island genetics laboratory now allows all biology and ecology researchers to perform DNA extraction and quantification in situ. Multiple Turks and Caicos Reef Fund researchers are now trained on the equipment and can now share that knowledge with other researchers and staff.

Group B: Policies, Practices and Management- Core Darwin Plus Standard Indicators (select one)

- | | |
|-----------|---|
| Unchecked | DPLUS-B01: Number of new/improved habitat management plans available and endorsed. |
| Unchecked | DPLUS-B02: Number of new/improved species management plans available and endorsed. |

Unchecked **DPLUS-B03: Number of new/improved community management plans available and endorsed.**

Unchecked **DPLUS-B04: Number of new/improved sustainable enterprises/ community benefits management plans available and endorsed.**

Unchecked **DPLUS-B05: Number of people with increased participation in local communities / local management organisations (i.e., participation in Governance/citizen engagement).**

Unchecked **DPLUS-B06: Number of Local Stakeholders and Local Communities (people) with strengthened (recognised/clarified) tenure and/or rights.**

Group B Indicator Results

No new/improved management plans have yet to be made as we are waiting for the results of the further data analysis before making recommendations.

Group C: Evidence and Best Practices - Core Darwin Plus Standard Indicators (select one)

Unchecked **DPLUS-C01: Number of best practice guides and knowledge products published and endorsed.**

Unchecked **DPLUS-C02: Number of new conservation or species stock assessments published.**

Unchecked **DPLUS-C03: New assessments of habitat conservation action needs published.**

Unchecked **DPLUS-C04: New assessments of community use of biodiversity resources published.**

Unchecked **DPLUS-C05: Number of projects contributing data, insights, and case studies to national Multilateral Environmental Agreements (MEAs) related reporting processes and calls for evidence.**

Group C Indicator Results

No new assessments or best practice guides have been produced as yet as we are waiting for the results of the further data analysis before making recommendations.

Group D: Sustainable Benefits to People, Biodiversity and Climate - Core Darwin Plus Standard Indicators (select one)

Unchecked **DPLUS-D01 Hectares of habitat under sustainable management practices.**

Unchecked **DPLUS-D02: Number of people whose disaster/climate resilience has been improved.**

Unchecked **DPLUS-D03: Number of policies with biodiversity provisions that have been enacted or amended.**

Group D Indicator Results

n/a

Section 5 - Project Partnerships, Wider Impacts and Contributions

Project Partnerships

The role of each partner was as described in the application, except Dr. Layton who moved university (and country) and was not involved in the data collection or ongoing analysis. The on-ground decisions regarding dive sites and diving safety were made by Michelle Taylor. The equipment purchase organisation was organised by Ms. Taylor, in lieu of Dr. Layton's participation. Turks and Caicos Reef Fund was responsible for all shipping and laboratory set up logistics with assistance in the technical calibration once Ms. Taylor arrived on island. The partnership between Turks and Caicos Reef Fund and Michelle Taylor is ongoing and she will be assisting in additional research this summer.

The local government was involved in multiple ways. The project was approved and supported by the Department of Environment and Coastal Resources (DECR) of the Turks and Caicos Islands government. As part of our research permit all data has been provided to the DECR and the final findings report with the analysis will be shared once it is completed.

We were able to collaborate with three other Darwin projects to charter a liveaboard boat and expand our data collection to East Caicos. The opportunity for this was not identified prior to the application so was not included. Some of the outreach materials produced for the project have been shared with the School of Field Studies in South Caicos to use with their students. They are also continuing to be used by the Turks and Caicos Reef Fund at local outreach events.

Wider Impacts and Decision Making

Not as yet. We are still awaiting further analysis on the genetic data. It is likely that protection discussions will occur when these results are established.

Sustainability and Legacy

The main ongoing benefit resulting from this project is the existence of the genetic laboratory on Providenciales which can be used by all local and visiting researchers. All equipment purchased remains at the Turks and Caicos Reef Fund headquarters and has already been used by the Department of Environment and Coastal Resources. Local researchers and Turks and Caicos Reef Fund staff have the training to both use the equipment and train fellow researchers to use the equipment. The trained staff remain with the organisation and the equipment is already being used for other Turks and Caicos Reef Fund projects, including the very important coral bio-bank project.

Turks and Caicos Reef Fund is in the process of establishing a larger permanent research base which will provide accommodation and laboratory space for visiting researchers. The DNA extraction and quantification equipment purchased as part of this project will be housed there and can be used by any researchers who wish to utilise the resources, including training on the equipment.

Section 6 - Communications & Publicity


Exceptional Outcomes and Achievements


We are still awaiting the final results of the DNA barcoding from a third-party, so we do not currently have any results. Preliminary results are very promising with regards to the diversity found in the coral rubble beds that we surveyed.


Photo, video or graphic to be used for publicity and communications.


Please upload at least one relevant and engaging image, video or graphic that you consent to be used alongside the above text in Defra, JNCC or NIRAS communications material.


 [DPLR11088_Caribbean coral rubble survey site example - TCI - Michelle Taylor](#)


 30/04/2024


 17:55:34


 jpg 1.26 MB


 [DPLR11088_Underwater group photo - TCI - Charlie Todd](#)


 30/04/2024


 17:48:10

 png 2.35 MB

 [DPLR11088_organisms collected - TCI - Michelle Taylor and Adara Jaggernauth](#)

 30/04/2024

 03:50:37

 png 493.86 KB

Photo, video, and/or graphic captions and credits.

DPLR11088_organisms collected - TCI - Michelle Taylor and Adara Jaggernauth.png: A selection of the organisms collected from the coral rubble beds in Turks and Caicos Islands, July & August 2023. Image credits: Michelle Taylor & Adara Jaggernauth.

DPLR11088_Underwater group photo - TCI - Charlie Todd: A photograph of some of the researchers working on the project whilst in East Caicos. Image credit: Charlie Todd.

DPLR11088_Caribbean coral rubble survey site example - TCI - Michelle Taylor: An example of the coral rubble beds surveyed in this project. Photo credit: Michelle Taylor

When the final results are received additional infographics/graphs/tables/etc will be produced.

I agree for the Biodiversity Challenge Funds Secretariat, Administrator, and/or JNCC to publish the content of this section.

Yes, I agree for the BCFs Secretariat and/or JNCC to publish the content of this section.

Please list any accounts that you would like tagged in online posts here. This can include project pages, partners' pages or individuals' accounts for any of the following platforms: LinkedIn, Facebook, Twitter, or Instagram.

Instagram: @tcreef_fund, @seebeneaththesea, @tciseabirds @tcnationaltrust_@decrctci, @charliedivebum

Twitter: @seebeneathesea

LinkedIn: <https://www.linkedin.com/in/michelle-taylor-65a51017a/>, <https://www.linkedin.com/in/alizee-zimmermann-8777a3221/>

Facebook: Turks & Caicos Reef Fund

Section 7 - Darwin Plus Contacts

Please tick here to confirm that you have read and acknowledge the BCF's Privacy Notice on how contact details will be used and stored and that you have sought agreement from anyone that you are sharing personal details with us on their behalf.

I confirm I have read the Privacy Notice and have consent to share the following contact details

Project Contact Details

Project Contact Name	Michelle Taylor
Role within Darwin Plus Project	Project Leader
Email	████████████████████
Phone	██████████
Do you need further sections to provide additional contact details?	<input checked="" type="radio"/> No
