

# DPLR2\1038

Darwin Plus Local - Final Report (1)

Officer: Jessica Magnus

## Section 1 - Darwin Plus Local Project Information (Essential)

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### Project Reference Number

DPL00059

### Q1. Project Title

Permanent survey plots for baseline and long-term woodland ecological assessment

### Overseas Territory(ies)

Cayman Islands

### Lead Organisation or Individual

Queen Elizabeth II Botanic Park

### Partner Organisation(s)

Stuart Mailer, Nick Johnson, National Trust for the Cayman Islands, Cayman Islands Department of Environment, Royal Botanic Gardens, Kew

### Value of Darwin Plus Local Grant Award

£42,582.65

### Project Start Date

02 October 2023

### Project End Date

31 March 2024

### Project Leader Name

John Lawrus

### Project Website/Twitter/Blog etc.

*No Response*

### Report Author(s)

## Report Date

30 April 2024

## Project Summary

Habitat degradation, invasive species, and climate change are just a few of the threats to the natural world that supports our existence. Large-scale loss of biodiverse forest is easily measured from aerial images but we know a lot less about finer scale changes to forest health over time. The Woodland Preserve in the QEII Botanic Park is an ideal site to base permanent survey plots to allow for long-term comparative assessment of the native vegetation in the Cayman Islands.

## Project Outcomes

Checked	<b>Biodiversity: improving and conserving biodiversity, and slowing or reversing biodiversity loss and degradation;</b>
Unchecked	<b>Climate Change: responding to, mitigating and adapting to climate change and its effects on the natural environment and local communities;</b>
Unchecked	<b>Environmental quality: improving the condition and protection of the natural environment;</b>
Checked	<b>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.</b>

## 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?

2 - Outcome moderately exceeded

## Project outcomes and justification for rating above

OUTCOMES FOR BIODIVERSITY:

Quantitative baseline data from 10,000 square meters of plots that measure survival and adaptation by the native flora inform Cayman Islands conservation policy, management, and practice.

Identification and quantification of species composition and diversity in a candidate Tropical Important Plant Area site (known to harbour a high number of native species, including endemic, endangered species in the ex situ collection) spur Tropical Important Plant Area network adoption.

Outputs were substantially completed:

1. Permanent, trail-side survey beacons on 100 natural vegetation PSPs in the Woodland Preserve, plus secondary magnetic nails and discs marking interior corners of the plots.

A further eight plots were established in woodland along the Park's main walkway.

2. Permanent tags on each of the trees marked in 2021 and recording significant changes to that population.

636 trees were permanently tagged and re-measured, creating 557 records of survivorship and diameter DBH from both 2020/21 and 2024. With the assistance of the Department of Environment GIS team the QEIBP was photographed at high resolution and detailed maps of the tagged trees produced.

3. Complete databasing of the plots, upload in BRAHMS database.

The database of plot vegetation composition and 636 tagged trees compiled.

4. Report to the partners on the 2021 baseline vegetation survey.

A detailed technical report of the project is included in the supporting evidence (SUPPLEMENT 1). 136 plant taxa recorded, 117 native species. Distribution and relative abundance of the species plotted.

Species nationally Red-Listed: 72 (62%). Endemics: 11 (1/3 of all Cayman endemics), and a further 18 Near/Regional Endemics.

Accordingly, project supports QEIBP's potential as a strong candidate TIPA site according to the Darbyshire (2017) criteria, threatened species and species richness.

QEIBP accessions database of ex situ conservation species of concern was updated for three species: *Terminalia eriostachya* var *margaretiae*, *Dendrophylax fawcettii*, *Wittmackia caymanensis*. The project has, for the first time, created mapping of the locations.

#### OUTCOME FOR CAPABILITY AND CAPACITY BUILDING:

QEIBP is strengthened as a centre for conservation excellence and influence in the Cayman Islands and regionally.

5. A separate report of engagement with national TIPA constituency is provided (SUPPLEMENT 2).

6. Local and international awareness raised - public seminar at QEIBP, prepare updates for QEIBP and NTCI websites and press releases to local media. Install interpretive signage.

Partner and stakeholder staff, members and volunteers training is dealt with in the Challenges section. Although we were not able to adhere to the original plan as far as partner staff were concerned Corin Golding, QEIBP Horticulture Manager, contributed to the project beyond expectations and may be expected to be the Park's key person for future surveys.

Summary of additional over and above proposed:

A further eight plots were established in woodland along the Park's main walkway.

The entire original measured tree database was re-measured and GPS position of each determined.


DOE provided new mapping tools and now is a de facto additional repository of the data.


The accession updates assist with the Ghost Orchid Conservation project (DPL0005) to inform its cross-pollination programme.


## Supporting Evidence - file(s) upload

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 [DPL00059 TIPA Report April 2024](#)


 30/04/2024


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 pdf 1.38 MB

 [DPL00059 Technical Report April 2024](#)

 30/04/2024

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 pdf 4.85 MB

## Supporting Evidence - links to published document/online materials

A video of the presentation by Nick Johnson is available on the FIGSHARE repository Project created for the project. Access is made via an invitation to the Figshare project. If the BCFS or NIRAS already has an account please advise to [stuartrmailer@gmail.com](mailto:stuartrmailer@gmail.com) so that we may extend the invitation. If not, a free account can be created once the invitation has been received by the person you elect to receive the invitation. For more information please see [www.figshare.com](http://www.figshare.com). The file is too large to upload with the materials above.

Files uploaded:

SUPPLEMENT 1 - DPL00059\_Technical\_Report\_April\_2024.pdf

SUPPLEMENT 2 - DPL00059\_TIPA\_Report\_April\_2024.pdf

## Project Challenges

### SUPPLY CHAIN ISSUES

We anticipated delays by ordering survey beacons prior to start of project, which involved advancing payment prior to receiving funds.

We underestimated the amount of plastic coated wire needed to make spiral "spring" tag attachments for more than 600 trees. Luckily, we were able to source the wire from the U.S. when local sources were exhausted.

The special ordered Mag-nails were short-shipped, and Data-loggers, not available from manufacturer without a U.S. billing address, were re-ordered from Amazon.

### CONFLICTING PRIORITIES OF PARTNER STAFF AVAILABILITY – GREATER RELIANCE ON VOLUNTEERS

In response to criticism of the original application we broadened the targets for capacity building. We had agreement from NTCI that they would offer participation to six staff and also to Trust Council and Environmental Advisory Committee members and up to eight members of Department of Environment staff were slated to engage in the training, including members of both the Terrestrial Resources and the Environmental Management Units.

In the event, given the short time frame of the project, and conflicts with prior commitments it was difficult to schedule participation by staff members. However, 8 NTCI members, including 3 high-schoolers enthusiastically assisted in gathering field data. At DOE, two of the identified staff were able to attend training, and 3 members of the Geographical Information Systems unit performed aerial surveying and mapping. Two Botanic Park staff member and three Park volunteers assisted in the final fieldwork.

## Lessons Learned

The main project activities worked well (re-establishing rear plot boundaries, replacing missing temporary markers, installing permanent markers, completion of inputting data, meetings with partners and public meeting worked smoothly. This was largely in the direct control of Mailer and Johnson. Rear marker installation using

Mag-nails drilled and epoxied into bedrock wherever possible proved less time consuming than installing cement and PVC markers, and feasible as they are out of sight of the general public. Purchasing the correct equipment (portable hammer drill and supplies) was instrumental.

Replacing tree tags was delayed due to a shortage of suitable wire on-island. Once sourced, tagging went smoothly with volunteer assistance. Coordinating partner staff availability with project requirements was an issue. Local partner organisations are always operating at their maximum capacity with small staffs. A resurgence of Covid, end-of-year required vacations, and ongoing Sister Island projects impaired partner participation.

We would recommend that there be a longer lead-time between approval of grant applications and project commencement for the organizing of project supplies. With the Darwin Plus Local scheme now established in its fourth round applicants can count on more time in planning in advance of the grant application to assist in obtaining stronger commitments for partner staff contribution. These changes would improve likelihood of adherence to projections.

### Section 3 - Project Finance (Essential)

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#### 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)
<b>Staff Costs</b>				
<b>Consultancy Costs</b>				
<b>Overhead Costs</b>				
<b>Travel and Subsistence</b>				
<b>Operating Costs</b>				

<b>Capital Items</b>			
<b>Others</b>			
<b>Total</b>	42,582.65	41,096.61	-1486.03

## Please provide a short narrative summary on project finances.

Project financing went largely to plan. Main costs were fixed by contract.

Despite the difficulties in sourcing and delivery of some items that could not be purchased within the Cayman Islands (described at Section 2. Project Challenges) we improved on the expectation of 79% spend in territory, with savings in airfares and the elimination of the need to travel to Kew / send material for plant identifications.

Where costs were most likely to vary from budget estimates - Operating costs – the project benefitted from QEIIBP having a customs duty waiver for some items. The hammer drill was bought on sale at a 30% discount.

## 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)

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

## Group A Indicator Results

DPLUS-A01 A total of 8 NTCl members (including 3 high-schoolers) 3 DOE staff, 2 Botanic Park staff and 3 Botanic Park volunteers received training in tree identification, measuring and permanent tagging techniques. One Park staff member and three volunteers were also trained in general plant identification and species recording.

## 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.**

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

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

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

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

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

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## Group B Indicator Results

NA

## 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.**

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

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

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

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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.**

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## Group C Indicator Results

NA

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

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

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

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

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## Group D Indicator Results

DPLUS-D01: 16 hectares of native forest now monitored through the creation of a baseline survey of species occurrence and abundance, and tree DBH measurement.

## Section 5 - Project Partnerships, Wider Impacts and Contributions

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### Project Partnerships

i) Stuart Mailer was the Project Execution Leader. He brought together the other partners and wrote the Darwin Plus Local grant application, organised, scheduled and conducted most of the fieldwork, oversaw the work of the outside contractor, planned and ran the meetings with partners, stakeholders and the public.

QEIBP provided administration, overseas purchases customs clearance, local invoicing and bill payments, regular use of a golf cart for transporting personnel/equipment. They also provided publicity and facilities for the Walk and Learn. Staff participated in training.

Kew initially became involved when we consulted them on the feasibility of data recording and management to facilitate TIPA candidacy. Kew presented at the first TIPA constituency meeting, provided guidance on using BRAHMS, plant identification.

NTCI: publicity, recruited members for fieldwork.

The DOE provided the infrastructure for conducting three of the partner meetings, including use of Zoom. Their staff assisted in conducting fieldwork, including drone photography, and the production of detailed maps.

ii) Department of the Environment, Cayman Islands National Attractions Authority.

iii) The DOE produced a high resolution aerial map of the Park, to assist in future monitoring and development.

iv) Christine Rose-Smyth, though not a formal partner was instrumental in all aspects of the project, from conception, grant application, researching survey hardware, finances, fieldwork, and reporting.

Cayman Survey Associates contracted to install permanent beacons imbedded in a concrete post with a rebar stake, record accurate GPS position of the markers. They performed this work in a timely and efficient manner.



## Wider Impacts and Decision Making

The project infrastructure, of 100 permanent survey marks, trees bearing tags, and explanatory signage, along the Woodland Trail, will be seen by thousands of visitors to the Botanic Park each year, creating a greater awareness of the importance of long-term monitoring of plant communities subject to climate change, storms and invasive species.

This project has also created a renewed interest in the development of a TIPA network in the Cayman Islands among all stakeholders, including staff of the DOE, Botanic Park, NTCl and Sustainable Cayman.

## Sustainability and Legacy

QEIBP is no stranger to the role of partner in Darwin Plus and similarly funded projects, however this was the first Darwin Plus grant that the Botanic Park served as Lead Partner. The project stands as inspiration for other conservation organisations in the Cayman Islands.

The primary purpose of the project was to indelibly record the previous volunteer-lead baseline study, and to establish permanent survey plots, so that this work can be repeated in future years. The measuring of DBH, and the mapping and marking of over 600 individual trees with tags that can withstand the elements, was designed to permit long term monitoring of, mortality, growth rates and changes in community structure over many decades.

Stuart Maller (freelance naturalist) intends to continue the analysis of the project data and field work. Corin Golding, the secondary field researcher, continues his as Horticultural Manager, QEIBP, with a greatly increased knowledge and understanding of native woodlands. Nick Johnson continues work in developing his horticultural business in the UK while maintaining his strong links to Cayman conservation and native plant propagation.

The project interacted with the Darwin Plus Local DPL0005 grant. Each supported elements of the other.

We conclude that a 5 year interval between surveys will be optimal. It is not so long that the knowledge base of participants will be eroded; it is a meaningful length of time within which survival and mortality can be measured, and it acknowledges the rapid pace of development in the island.

## Section 6 - Communications & Publicity

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### Exceptional Outcomes and Achievements


NA


### 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.**

 [DPL00059 TIPA Walk+Learn](#)

 30/04/2024

 17:06:22

 jpg 5.17 MB

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

Stuart Mailer and Nick Johnson present the Tropical Important Plant Areas concept at a Walk and Learn at the Queen Elizabeth II Botanic Park, Grand Cayman, Cayman Islands, December 2023.

Credit: Christine Rose-Smyth

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.

NA



## Section 7 - Darwin Plus Contacts

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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.


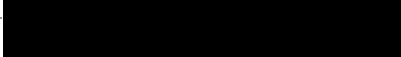
I confirm I have read the Privacy Notice and have consent to share the following contact details

### Project Contact Details

Project Contact Name	Stuart Mailer
Role within Darwin Plus Project	Lead Applicant
Email	
Phone	
Do you need further sections to provide additional contact details?	<input checked="" type="radio"/> Yes

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### Additional Project Contact Details

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

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