
DPLR1\1061

Expanding the ex-situ propagation project for Cayman's Dendrophylax Ghost Orchid

Objective

Maintaining the impetus of a successful head-start to practical conservation of the Cayman Islands endemic ghost orchid, *Dendrophylax fawcettii*.

Propagation of long-lived, slowly-maturing plant species inevitably must extend over multiple years. "Out of Flask, Outcrossed, and Out of Danger" is a long-term project of the applicant that has been running since 2019. The outcome statement of that project is: a complete flask-to-wild reintroduction methodology for a sustainable source of genetically diverse plants for ex situ conservation and in situ ecological restoration (Rose-Smyth 2021a, 2021b).

This application seeks to ensure that the gains made to date are consolidated and that propagation initiated in 2021-2022 can reach the stage of outplanting to the ex situ holding site.

Background

The Cayman Islands are three small, low-lying, oceanic islands in the western Caribbean. Endemic to only Grand, Cayman *Dendrophylax fawcettii* Rolfe (Angraecinae) is Red Listed Critically Endangered. It is threatened by habitat loss, and the apparent senility of its remaining populations (Burton & Roberts 2014). Entirely leafless, *D. fawcettii* is highly pollination limited, though not necessarily pollinator-limited (Rose-Smyth et al 2022). Zero recruitment has been observed.

The most significant population is under intense pressure from development in the nation's capital, George Town. A proposed road corridor through the Ironwood Forest continues to be developed at either ends (Figure 1) and fire recently burned a portion of that forest (Anon 2021). Mastic Reserve populations may become threatened by a proposed six-lane highway (National Roads Authority 2023).

Queen Elizabeth II Botanic Park (QEIBP) holds a *Dendrophylax* population of Ironwood origin, following rescue operations in the 2000s. The project has succeeded in producing seedlings from a 2019 outcross of Ironwood and Mastic Reserve parents, which are currently growing on native trees within the QEIBP. Seedlings of Ironwood parents, made in 2021, are approaching deflasking for 6-12 months acclimatisation and on-growth on burlap (Rose-Smyth 2021b). Pods of hand pollinations made in April 2022 are nearing maturity.

Proposal

The project has been funded to date entirely by the applicant other than a small grant from the Dr. Cecilia Koo Botanic Conservation Center and the Taiwan Orchid Growers Association 23rd World Orchid Conference "Project Seeding". Darwin Plus Local will support purchases of flasking supplies, seed sowing and reflasking, field work for 2023 hand pollinations, outplant monitoring and preparation for implementing the next stages in the overall plan.

Specific actions (QEII BP ex situ population) and outcomes expected.

2023 Cohort: perform hand pollinations on individual plants not previously pollinated. Outcome: 6-10 maturing pods.

2022 Cohort: collection of seed pods at maturity, seed sowing, reflasking x 3 times.

2021 Cohort: deflasking larger seedlings to burlap and continuation of smaller seedlings in flask.

2019 Cohort: continuation of monitoring of seedlings outplanted in 2021-22.

Maximum number of flasks possible at any given time will be 180, which will be apportioned based on the total number of seed pods successfully sown from the 2022 Cohort and the number of 2021 Cohort flasks needing to be continued. Currently there are 80 flasks of the 2021 Cohort to be advanced.

It is anticipated that incorporating vented closures for the flasks could decrease reflasking intervals and/or speed up in flask maturation time. A prior attempt failed due to slight incompatibilities in the thread of flasks and closures used. The purchase of fully compatible vessels will enable the experiment to be repeated. Success will be measured by maturing flasks with no contamination.

Outreach

Article in Department of Environment (DOE) magazine "Flicker".

Public lecture for National Trust Cayman Islands (NTCI) and QEII BP.

Engage with partners for training and the plan and recommendations set out in 2021 report.

PRIMARY APPLICANT DETAILS

Name Christine
Surname Rose-Smyth

Tel (Work) [REDACTED]

Email (Work) [REDACTED]

Address [REDACTED]

DPLR1\1061

Expanding the ex-situ propagation project for Cayman’s Dendrophylax Ghost Orchid

Section 1 - Project Title & Contact Details

Q1. Project Title

Expanding the ex-situ propagation project for Cayman’s Dendrophylax Ghost Orchid

Q2. Please select whether you are applying as an organisation or as an individual (Guidance section 3 and Guidance Glossary)

Individual*

PRIMARY APPLICANT DETAILS

Name	Christine
Surname	Rose-Smyth
Tel (Work)	[REDACTED]
Email (Work)	[REDACTED]
Address	[REDACTED]

***If applying as an individual, you must open a separate project bank account used solely for your grant payment, if successful. This will be checked by the fund administrators. The maximum amount that can be requested during the first round of Darwin Plus Local applications is £20,000. Individual applicants will also be asked to provide: proof of identity, proof of solvency (e.g. bank statement), and a police check, if successful.**

Section 2 - Overseas Territory(ies)

Q3. Overseas Territory (Guidance section 1.3):

Which UK Overseas Territory(ies) will your project be working in? Please note that in case of a non-permanent resident population you need to demonstrate a clear, meaningful, long-term link to the territory.

Cayman Islands

*** if you have indicated a territory group with an asterisk, please give detail on which territories you are working on here:**

No Response

In addition to the UKOT(s) you have indicated, will your project directly benefit any other UK OT(s) or country(ies)?

No

Section 3 - Project Partners

Q4. Project partners (Guidance section 3.2)

In this section, please give details of all the partners involved (including the Lead Partner) and provide a summary of their roles.

Project Leader name (Guidance section 3.1):	Christine Rose-Smyth
Lead Partner name (if applying as an organisation; Guidance section 3.1):	Christine Rose-Smyth
Lead Partner Website (if applicable):	<i>No Response</i>
Is the Lead Partner based in a UKOT where the project is working (Guidance section 3.1)?	<input checked="" type="radio"/> Yes
List other partners involved and where are they based (Guidance section 3.2):	The following entities are partners/stakeholders in the project: Queen Elizabeth II Botanic Park (QEII BP), Grand Cayman, Cayman Islands National Trust for the Cayman Islands (NTCI), Grand Cayman, Cayman Islands Department of Environment (DOE), Grand Cayman

Queen Elizabeth II Botanic Park (QEIBP) is the location of the ex-situ population of *Dendrophylax fawcettii*, which is the subject of the propagation project. Pollinations occur within the population and outplanting of seedlings is also made within the approximately 55 acres of natural habitats of the Park.

National Trust for the Cayman Islands (NTCI) Grand Cayman, Cayman Islands is a joint owner of the QEIBP along side the Crown.

Summary of roles and responsibilities of each partner in the project:

Each partner will be able to send staff members to observe and participate in training opportunities occurring in the course of the Project Activities. Both entities have recently recruited new staff, to environmental and horticultural officer roles respectively.





DOE acts on behalf of the National Conservation Council for the issuance of permits to work with species protected under the National Conservation Act.

Partners will assist in facilities for outreach presentation and via social media.

I confirm that all listed partners are aware of this application and have indicated support:

Checked

Attach a Cover Letter for your application (Guidance section 4.2).

-  [R-S.2023 DPLR1 1061 Cover letter](#)
-  14/02/2023
-  20:41:52
-  pdf 240.5 KB

Section 4 - Project Summary & Description

Q5. Project Summary (Guidance section 3.8)

Please provide a brief summary of your project. This may be used in communication activities and/or published online, if your application is successful.

When extinction threatens, ex situ propagation offers a practical tool for conservation of species. Hand-pollinating flowers of Grand Cayman endemic ghost orchids (*Dendrophylax fawcettii*) and raising seedlings in sterile flasks of nutrient-rich media is a way to overcome the extreme pollination limitation and zero recruitment observed in dwindling natural populations. Working with orchids rescued from forest lost to development, project partners will expand the ex situ conservation population and prepare to augment the wild populations in the future.

Q6. Description (Guidance section 2.1)

Please provide a description of your project, including:

- the overall objective
- the current situation and the problem the project is trying to address
- what success will look like and how you will measure it

Please be as specific as possible when describing the project, using quantified data and evidence where available. You may wish to consider: what are the specific threats to the environment that the project will attempt to address, and what should we know about these threats? What does your successful project look like? And how will you demonstrate whether and how your project has been successful?

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Propagation of long-lived, slowly-maturing plant species inevitably must extend over multiple years. “Out of Flask, Outcrossed, and Out of Danger” is a long-term project of the applicant that has been running since 2019. The outcome statement of that project is: a complete flask-to-wild reintroduction methodology for a sustainable source of genetically diverse plants for ex situ conservation and in situ ecological restoration (Rose-Smyth 2021a, 2021b).

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Background

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The most significant population is under intense pressure from development in the nation’s capital, George Town. A proposed road corridor through the Ironwood Forest continues to be developed at either ends (Figure 1) and fire recently burned a portion of that forest (Anon 2021). Mastic Reserve populations may become threatened by a proposed six-lane highway (National Roads Authority 2023).

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Engage with partners for training and the plan and recommendations set out in 2021 report.

(Optional) Please upload any additional and supporting materials or files (such as maps of project sites, etc) below. Maximum of 5 pages:

 [R-S.2023 DPLR1 1061.Suppl materials](#)

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 pdf 1.04 MB

Section 5 - Project Outcome(s)

Q7. Project Outcome(s) (Guidance section 1.2)

Successful Darwin Plus Local projects must demonstrate measurable outcomes in at least one of the themes of Darwin Plus, either by the end of the project or soon after through a credible plan.

Please tick which theme(s) of Darwin Plus your project underpins:

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
Checked	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.

Please justify your selection.

(1) Biodiversity: Project provides measurable outcome to improve conservation of a Critically Endangered endemic orchid in face of habitat loss and apparent population senility.

(4) Capability and Capacity: supports capability that has been developed in territory, ensures gains made will not be lost and can be transferred to future adopters of the project.

Section 6 - Project Timeline


Q8. Project timeline (Guidance section 2.2)


Please provide anticipated dates for the start and end of your planned project here. Please use the Darwin Plus Local Project Implementation Timetable Template (which can be downloaded below) to provide a list of the individual activities you have planned for this project, a brief description of what each activity entails, and the months in which the activities will be carried out. If the project involves only one activity (e.g. a purchase), please still provide project start and end dates (noting estimated times for procurement). **Please note that your project will need to be completed by 31 March 2024.**

Start date:	End date:	Duration (e.g. 3 months):
03 April 2023	15 March 2024	11.5

Please upload the completed Darwin Plus Local Project Implementation Timetable template with your proposed project activities below.

 [R-S.2023 DPLR1 1061.Timetable](#)

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Section 7 - Costs

Q9. Costs (Guidance section 2.2 and please read the Finance Guidance)

Please provide a breakdown of costs to be funded through Darwin Plus Local (in GBP).

Are you seeking any matched funding for this project? (Please note that this is optional and there is no requirement to seek matched funding for Darwin Plus Local projects).

No

Budget line	Explanation	Cost in GBP
Staff costs:	1. Project Leader x 1	████████
	2. Field Assistant x1	
Overhead costs:	Overhead for laboratory facilities, power, seedling lighting, shadehouse watering, grant administration, accounts and customs clearance, banking fees.	████████
Travel & subsistence costs:	15 field days: petrol, water, ice, bug spray, etc.	████████
Operating costs:	Laboratory consumables: gloves, masks distilled water, bleach, aluminium foil). Seedling culture vessels, sowing and replate media, disposable pipettes, additional forceps, flask labelling tape.	████████
Capital equipment:	None.	£0.00
Consultancy costs:	None	£0.00
Total:		████████

This section provides more information on the budget to help evaluators understand how you will use the funds you are requesting. You do not need to list all costs, but please list and detail costs of more than £1,000 per item below, under the appropriate budget line.

Details of staff costs over £1,000 (if relevant)

Project leader: to manage project design, purchasing, record keeping and reporting, perform field and lab activities and outreach. 48 days, ██████████

Field Assistant: 11 days, ██████████

Details of overhead costs over £1,000 (if relevant):

No Response

Details of travel and subsistence costs over £1,000 (if relevant):

No Response

Details of operating costs over £1,000 (if relevant):

Laboratory consumables: gloves, masks distilled water, bleach, aluminium foil) to be purchased locally
[REDACTED]

Purchases from PhytoTechnology Products, Kansas USA (assuming no price increases next 3 months)

Seedling culture vessels and vented closures x 220 [REDACTED]

Sowing and replate media (2 x 10Litre units of each) [REDACTED]

Disposable pipettes, forceps x 8, flask labelling tape. [REDACTED]

Shipping to Florida freight forwarder by FedEx, estimate [REDACTED]

Florida to Cayman seafreight, estimate [REDACTED]

Subtotal [REDACTED]

Cayman Islands Customs 25% (incl. package taxes etc) [REDACTED]

TOTAL [REDACTED]

US\$ to CI\$ at 0.82 exchange rate [REDACTED]

Total CI converted to [REDACTED]

Details of capital equipment costs over £1,000 (if relevant):

No Response

Details of consultancy costs over £1,000 (if relevant):

No Response

Details of other costs over £1,000 (if relevant)

No Response

If your project budget was prepared in another currency and converted to GBP, please provide the exchange rate, its source, and the date it was accessed:

Other currency:	Exchange rate:	Source of this exchange rate:	Date exchange rate accessed:
Cayman Islands dollars	0.9781	Bank of Butterfield, Cayman	10 February 2023

Darwin Plus Local has been created to build capacity and contribute to local economies in-territory.

What % of the total will be spent in the OTs? [REDACTED]

If less than 80% of the total project spend is to be spent within the OT(s), please explain why.

No Response

Section 8 - Local and National Priorities

Q10. Local and national priorities

Please explain how this project aligns with local and national priorities? You may wish to consider the project in the context of national environmental laws, objectives, strategies, territory specific agreements, action plans or policies.

Meets elements of the National Biodiversity Action Plan (DaCosta-Cottam et al 2009) Species Action Plan for *Dendrophylax fawcettii*.

Objective 3. Develop an inter-situ cultivation and conservation programme.

Safeguard and Management, SM4. Develop a system for propagation of native orchids / Establish local propagation programme.

Communications & Publicity, CP4. Utilise native flora and associated preservation efforts in the international promotion of the Cayman Islands.

National Conservation Act 2013.

Dendrophylax fawcettii is a protected species under Part 1 of Schedule 1 to the National Conservation Act 2013. Project will contribute data and procedures for the development of a Species Management Plan to be drafted for the orchid under the Act.

Contributes to NTCI Natural Heritage Protection Strategy 2021-2030 for the understanding of the needs of endemic species


Will the project take place on Government owned land or water?


Yes


Please attach evidence that you have Government support i.e. Letter of Support.

 [CI DoE Darwin Support Ghost Orchids Feb 20](#)

[23](#)

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Section 9 - Project Risks

Q11. Project Risks

Please demonstrate your consideration of any risks involved in this project and how you intend to manage them. Depending on your project, you may wish to consider:

- Biosecurity risks – particularly for projects involving external equipment.
- Safeguarding risks – particularly for projects involving vulnerable groups such as children, older people or people with disabilities.

Risk	Mitigation
Hurricane season June - December.	<p>Grand Cayman infrastructure is good.</p> <p>Laboratory and shadehouse elements of project are carried out in a well-protected location; shadehouse seedlings can be moved indoors in emergency.</p> <p>Maturing seed pods at QEIBP will be protected, in part by density of woodland canopy. Additional methods of protection are under consideration.</p>
Delay in delivery of operating supplies.	Reflasking can be re-scheduled to a month later and/or some remaining plating media on hand can be utilised if reflasking cannot be delayed in the early part of the project.
Field safety	<p>Field work takes place within the QEIBP during normal working hours.</p> <p>We operate in accordance with the NTCI field safety manual.</p>

Do you require more fields?

Yes

Risk	Mitigation
Security risk to seedlings of a Critically Endangered plant.	<p>Whilst plant locations are shared with partners for verification purposes and continuity of the project, details are obscured in reporting that is made publicly available.</p> <p>It is an offence to take protected species.</p>
<i>No Response</i>	<i>No Response</i>
<i>No Response</i>	<i>No Response</i>
<i>No Response</i>	<i>No Response</i>
<i>No Response</i>	<i>No Response</i>

Section 10 - Terms & Conditions

Q12. Terms and conditions (Guidance section 3.10)

By applying for Darwin Plus Local you are adhering in full to the grant Terms and Conditions in full

(available at: <https://dplus.darwininitiative.org.uk/apply> and as referenced in the Guidance at section 3.10). For information, the Terms and Conditions include requirements for all applicants to (amongst other requirements as per the full Terms and Conditions):

- Uphold a zero tolerance for inaction approach to tackling sexual exploitation, abuse, and harassment.
- Where appropriate, make all reasonable and adequate efforts to address gender inequality and other power imbalances.
- Notify all cases of fraud and theft (whether proven or suspected) relating to the project to the Grant Administrator as soon as they identified.

Please indicate you have read, and understood, and will adhere to the Terms and Conditions.

Checked

If your application is successful: If your project application is successful, the Fund Administrator (NIRAS) will ask you to provide some financial evidence for due diligence checks before you receive your project grant. (Please see section 3.3 of the Darwin Plus Local Finance Guidance). Please be ready to provide this evidence promptly.

Financial evidence for organisations: Year-end financial statements, the latest management accounts or audited accounts (if you have these).

Financial evidence for individuals: Proof of identity such as a passport, ID card or driving licence and solvency (such as bank statements) and a police check.

Section 11 - Certification

Certification

I certify that, to the best of my knowledge and belief, the statements made in this application are true and the information provided is correct.





Checked

I have the authority to submit an application on behalf of my organisation.

Checked

Name: Christine Rose-Smyth

Position in the organisation: (if applicable) *No Response*

Signature (please upload e-signature)  [R-S.2023 DPLR1 1061.signature page](#)
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Date: 13 February 2023

Section 12 - Submission Checklist

Checklist for submission

	Check
I have read the Guidance documents, including the “Darwin Plus Local Guidance” and the “Darwin Plus Local Finance Guidance”.	Checked
If my proposed project takes place on public lands or water, I have uploaded a Letter of Support from Government.	Checked
I have uploaded a cover letter that details the information requested in the guidance (Guidance section 4.2 has information on what this cover letter should include).	Checked
I have read, and can meet, the current Terms and Conditions for this fund.	Checked
I have provided actual start and end dates for the project.	Checked
I have provided my summary budget based on UK government financial years i.e. 1 April – 31 March and in GBP in the application form.	Checked
I have uploaded my project implementation timetable using the specific template provided.	Checked
(If copying and pasting into Flexi-Grant) I have checked that all my responses have been successfully copied into the online application form.	Checked
The application has been signed by a suitably authorised individual (clear electronic or scanned signatures are acceptable).	Checked
I have checked the Darwin Plus website immediately prior to submission to ensure there are no late updates.	Checked
I have read and understood the Privacy Notice on the Darwin Plus website.	Checked

We would like to keep in touch!

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

Checked

Data protection and use of personal data

Information supplied in the application form, including personal data, will be used by Defra as set out in the **Privacy Notice**, available from the [Forms and Guidance Portal](#).

This **Privacy Notice must be provided to all individuals** whose personal data is supplied in the application form. Some information may be used when publicising Darwin Plus including project details (usually title, lead partner, project leader, location, and total grant value).

Project Title: **Expanding the ex-situ propagation project for Cayman’s endemic Ghost Orchid (DPLR1\1061)**

Darwin Plus Local

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. Projects are based on UK Financial Years (1 April – 31 March - therefore starts April 2023).

Activity #	Description (max 25 words)	No. of months	UK Financial Year 2023/24											
			Calendar Year 2023									Calendar Year 2024		
			Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
#1.1	Purchase orders	0.05												
#1.2	Field/lab preps / data management / reporting	0.30												
#2	2023 Cohort: perform pollinations and monitoring. NTCI and QEIBP training.	0.30												
#3	2022 Cohort: sowing and/or reflasking seed. NTCI and QEIBP training.	0.30												
#4.1	2021 Cohort: reflasking smaller seedlings.	0.15												
#4.2	2021 Cohort: deflasking larger seedlings to burlap panels. NTCI and QEIBP training.	0.30												
#5	2019 Cohort: monitoring of outplants in QEIBP since November 2021. NTCI and QEIBP training.	0.30												
#6	Outreach: Public presentation and Flicker article (Twitter throughout)	0.20												
#7	Continuous flask room and shadehouse maintenance.	0.3												