Applicant: **Newton, Rosemary**
Organisation: **Royal Botanic Gardens, Kew**
Funding Sought: **£458,225.00**

# DPR12S2\1024

**Assessing BVI habitat recovery from soil seedbanks following invasives removal**

Great and Little Tobago National Parks (British Virgin Islands) are internationally recognised Key Biodiversity Areas. DPLUS196 is removing major threats to their native flora: feral goats and emergent invasive plants. The soil seedbank is an important source of plants during ecosystem recovery. This project will, using molecular methods, provide a baseline of native and non-native plants present in the soil seedbank, thereby enabling enhanced habitat recovery through continued management of non-native plant species and planning of native plant species reintroduction.

## PRIMARY APPLICANT DETAILS

| | |
|---|---|
| **Title** | Dr |
| **Name** | Rosemary |
| **Surname** | Newton |
| **Organisation** | Royal Botanic Gardens, Kew |
| **Tel (Work)** | [redacted] |
| **Email (Work)** | [redacted] |
| **Address** | [redacted] |

# DPR12S2\1024

Assessing BVI habitat recovery from soil seedbanks following invasives removal

## Section 1 - Contact Details

### PRIMARY APPLICANT DETAILS

| | |
|---|---|
| **Title** | Dr |
| **Name** | Rosemary |
| **Surname** | Newton |
| **Organisation** | Royal Botanic Gardens, Kew |
| **Tel (Work)** | [redacted] |
| **Email (Work)** | [redacted] |
| **Address** | [redacted] |

### GMS ORGANISATION

| **Type** | **General** |
|---|---|
| **Name** | Royal Botanic Gardens, Kew |
| **Phone (Work)** | [redacted] |
| **Email (Work)** | [redacted] |
| **Website (Work)** | [redacted] |
| **Address** | [redacted] |

## Section 2 - Title & Summary

### Q3. Title:

Assessing BVI habitat recovery from soil seedbanks following invasives removal

### What was your Stage 1 reference number? e.g. DPR12S1\1123

DPR12S1\1053

Please attach a cover letter as a PDF document.

Darwin cover letter final
02/10/2023
18:35:43
pdf 118.33 KB

## Q4. Summary of project

**Please provide a brief non-technical summary of your project: the problem/need it is trying to address, its aims, and the key activities you plan on undertaking.**

**Successful Darwin Plus Main projects must demonstrate substantial measurable outcomes in at least one of the themes of Darwin Plus either by the end of the project's implementation or via evidenced mechanisms for post-project delivery.**

**Preference will be given to discrete projects implementing existing identified environmental solutions on the ground.**

**The broad themes of Darwin Plus Main are:**

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

Great and Little Tobago National Parks (British Virgin Islands) are internationally recognised Key Biodiversity Areas. DPLUS196 is removing major threats to their native flora: feral goats and emergent invasive plants. The soil seedbank is an important source of plants during ecosystem recovery. This project will, using molecular methods, provide a baseline of native and non-native plants present in the soil seedbank, thereby enabling enhanced habitat recovery through continued management of non-native plant species and planning of native plant species reintroduction.

# Section 3 - UKOT(s), Dates & Budget Summary

## Q5. UKOT(s)

**Which UK Overseas Territory(ies) will your project be working in?**

☑ British Virgin Islands (BVI)

*** 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 UKOTs you have indicated, will your project directly benefit any other Territories or country(ies)?**

⦿ No

### Q6. Project dates

| Start date: | End date: | Duration (e.g. 2 years, 3 months): |
|---|---|---|
| 01 April 2024 | 31 March 2027 | 3 years |

### Q7. Budget summary

| Year: | 2024/25 | 2025/26 | 2026/27 | Total request |
|---|---|---|---|---|
| Amount: | [redacted] | [redacted] | [redacted] | £ [redacted] |

## Q8. Do you have matched funding arrangements?

⊙ Yes

Please ensure you clearly outline your matched funding arrangement in the budget.

## Q9. If you have a significant amount of unconfirmed matched funding, please clarify how you will fund the project if you don't manage to secure this?

N/A

## Q10. Have you received, applied for or plan to apply for any other UK Government funding for the proposed project or similar?

⊙ No

## Section 4 - Problem statement

### Q11. Problem the project is trying to address

**Please describe the problem your project is trying to address in the UKOTs, relating to at least one of the themes of Darwin Plus:**

**For example, what are the specific threats to the environment that the project will attempt to address? Why are they relevant, for whom? How did you identify the need for your project? Please cite the evidence you are using to support your assessment of the problem.**

Great Tobago and Little Tobago are designated national parks under the National Parks Trust Act, 2006. Great Tobago is an Important Bird Area because of its regionally significant Magnificent Frigatebird (Fregata magnificens) population and a Tropical Important Plant Area due to the abundance of plant species of conservation importance, including the globally threatened regional endemic Agave missionum. Neighbouring

Little Tobago also supports nesting seabirds including Brown Pelicans (Pelecanus occidentalis) and Brown Boobies (Sula leucogaster). Little data exists for flora and reptiles, due to the island's steep slopes which restrict access.

Feral goats have had devastating impacts on the native flora and fauna. Their effect on native seed production and seedling recruitment caused by overgrazing have also exacerbated erosion and led to increased landslides, destroying part of the habitat where the frigatebirds roost, as reported by the NPTVI over a 25-year period of visiting the Tobagos. In 2022, the Royal Society for the Protection of Birds (RSPB) received DPLUS196 funding to eradicate goats from these islands in collaboration with NPTVI and other partners. While removing goats would greatly reduce pressures on the local flora, it could also enable invasive plant species to proliferate. Thus, DPLUS196 also aims to eradicate the four known emergent plant invaders that pose the greatest current risk.

The soil seedbank is essential to the restoration of the native flora but is also a source of non-native plants. DPLUS080 identified, in soil seedbanks, persistent non-native plant species in South Georgia requiring longer-term monitoring and control. These data and results were used to inform the development of a 5-year stewardship framework called "Protect, Sustain, Inspire 2021-2025" by the Government of South Georgia and the South Sandwich Islands. Molecular methodologies were optimised in DPLUS080 and these will be applied in this proposed project.

This proposed project will complement the reference DNA library for native plant species in BVI that is being developed by DPLUS183 by producing a reference DNA library for the non-native plant species found in BVI. This reference for non-native plant species will be essential for the identification of invasives on the Tobagos and also other BVI islands. This expanded reference DNA library will support the activities of DPLUS196 aimed at eradicating non-native species by comprehensively assessing the soil seedbank following the removal of invasive species by applying techniques developed for DPLUS080.

The proposed project will enable the identification of the broader non-native flora that could be present in the soil seedbank, some of which may prove to be problematic invasives. The additional field surveys will also provide an early warning system for newly emerging non-native species and data for evaluating their likely threats to native communities. Finally, it will build on DPLUS196 activities by informing a longer-term NPTVI invasive plant species management strategy to enable the recovery and reintroduction of native plants and protect the forest for tree-nesting seabirds. Consequently, native habitats will be able to thrive free from competition, significantly restoring and improving the biodiversity value and environmental condition and quality of these two National Parks.

# Section 5 - Environmental Conventions, Treaties and Agreements

## Q12. Environmental Conventions, Treaties and Agreements

**Please detail how your project will contribute to the aims of the national and/or international agreement(s) your project is targeting. What key UKOT Government priorities and themes will it address and how? You should also consider local, territory specific agreements and action plans here. Letters of support from UKOT Government partners/stakeholders should also make clear reference to the agreements/action plans your project is contributing towards.**

This project will support the following international and national agreements:
UN Sustainable Development Goal 15, to "Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss".
The Kunming-Montreal Global Biodiversity Framework of the Convention on Biological Diversity (CBD), to which BVI is a signatory, specifically the following Action Targets:

Target 2: 30% of degraded areas are under effective restoration by 2030;
Target 3: 30% of areas are effectively conserved by 2030;
Target 6: Rates of introduction and establishment of invasive alien species reduced by 50% by 2030;
Target 20: Capacity-building and development, technological transfer, and technical and scientific cooperation for implementation is strengthened; and,
Target 21: Data, information and knowledge for decision-making is available.
Removal of invasive species is a listed priority on Defra's UKOTs Biodiversity Strategy (2014), with invasive non-native species declared a primary threat to biodiversity in the UKOTs.
At a local level, this project will support the objectives of the National Environmental Action Plan and Environmental Charter of BVI, to "Safeguard and restore native species, habitats and landscape features, and control or eradicate invasive species".
A knowledge and understanding of which native and non-native plant species are present in the soil seedbank at Great and Little Tobago National Parks will inform management policies to ensure successful elimination of non-native plant species and restoration of these degraded habitats following invasive species removal by DPLUS196. Capacity building and associated knowledge transfer will enable NPTVI to strengthen their invasive species monitoring and management plans.

# Section 6 - Method, Project Stakeholders, Gender, Change Expected, Pathway to Change & Exit Strategy

## Q13. Methodology

**Describe the methods and approach you will use to achieve your intended Outcome and contribute towards your Impact. Provide information on:**

- **how you reflected on and incorporated evidence and lessons learnt from past and present similar activities and projects in the design of this project.**
- **the specific approach you are using, supported by evidence that it will be effective, and justifying why you expect it will be successful in this context.**
- **how you will undertake the work (activities, materials and methods).**
- **how the main activities will be and where these will take place.**
- **how you will manage the work (governance, roles and responsibilities, project management tools, risks etc.).**

The biodiversity of many of the world's islands are threatened by introduced plant and animal species. The proposed project aims to improve our knowledge of how to restore and manage native floras in BVI after invasive species control, as exemplars of the Caribbean UKOTs.

Output 1 will, using the proven methodology of DPLUS183, construct a phylogenetic tree for all known native and non-native plant species in BVI with a combination of material from Kew's DNA and Tissue Bank, dried plant specimens from Kew's Herbarium, seedling material from seeds germinated at Kew's Millennium Seed Bank newly collected field material. We will use the same phylogenomic approach as DPLUS183 to reconstruct the tree for all plant species in BVI.

For Output 2 and 3, 200 soil samples of approximately 200 ml (70 comprising 5 replicates from 14 sites on Great Tobago and 30 comprising 5 replicates from 6 sites on Little Tobago, sampled during two field seasons) will be collected from areas where non-native plant species control has taken place and representing all habitat types (forests/woodland, coastal scrubland and sparce vegetation, Appendix 1). These quantities were deemed sufficient in DPLUS080. Soil samples will be sown in suitable conditions in the Kew Quarantine House, watered, and monitored regularly for seedling emergence. High-quality images will be taken of all seedlings prior to drying in silica-gel for DNA analysis. The same set of genes will be sequenced for all the emerging seedlings, and

molecular barcoding approaches (as optimized in DPLUS080) will be used to identify morphotypes in soil samples.

Images of seedlings originating from the soil seedbank will be examined to identify morphological traits that could allow species identification at the seedling stage, when possible. A protocol to identify emergent native and non-native plant seedlings from the soil seedbank will then be developed, following seedlings through to the flowering stage if necessary to secure an accurate identification.

These data will be used to inform which non-native species are likely to persist long-term in the soil seedbank, as well as the potential for recovery of native plant species from seeds in the soil, following invasive species control on Great and Little Tobago Islands. Resources developed here will be applicable to other National Parks and Caribbean UKOTs.

This will enable a degree of species prioritisation and will provide more refined information to NPTVI to enable the development of individual species action plans and the compilation of a target list of non-native plant species for in-depth control as part of the Invasive Plant Seedbank Control Strategy and Biosecurity Plan developed by DPLUS196.

Output 4 will support capacity building by providing training to two BVI colleagues at Kew in soil seedbank analyses and seedling identification through seedling morphology and molecular analyses. This will enable trained staff to monitor non-native plant species threats from the soil seedbank. Outreach activities will be undertaken to raise the awareness of non-native plant species threats in the community.

This project will directly benefit from lessons learnt in DPLUS080, one of the aims of which was to estimate the risk of non-native plant species to inform future management strategy. In DPLUS080, soil processing initially involved dry extraction of seeds; however, this proved too time-consuming. A different method of watering soil samples was then trialled, resulting in >1,400 seedlings emerging and enabling greater soil quantities to be processed and seed content analysed. Emerging seedlings generally lacked morphological traits to enable distinguishing between different species. Additional funding was obtained by Kew to allow identification of seedlings with similar morphology to species level, using molecular techniques.

DPLUS183 is sequencing the DNA of all native species in BVI, which will create a reference library to allow identification of any native BVI plant sample. This dataset, along with the development of a reference for all non-native BVI plants proposed in this project, will enable accurate and rapid identification of emerging seedlings using phylogenomics. Work will take place in Kew's Quarantine House to comply with Defra soil licence requirements.

Fieldwork activities, including soil collection, will be undertaken by NPTVI staff. Soil seedbank studies and molecular work and data analysis will be carried out at Kew, with training of NPTVI staff as outlined above, so that all collaborators are fully aware of the techniques and types of data generated and how these can be used to support on the ground conservation initiatives. Monitoring, evaluation, and reporting will be managed by the Kew. Regular steering group meetings, including both Kew and NPTVI staff, will be held to ensure the project remains on track.

## Q14. Project Stakeholders

**Who are the stakeholders for this project and how have they been consulted (include local or host government support/engagement where relevant)? Briefly describe what support they will provide and how the project will engage with them**

The main project partner (NPTVI) is also the primary stakeholder. NPTVI is the local authority responsible for managing designated national parks in BVI. NPTVI is a statutory body within the Ministry of Natural Resources

and Climate Change, Government of the Virgin Islands. The skills learned during this project will assist NPTVI in replicating this work at other national park sites to address invasive plant management. This project will complement the soil analysis training that NPTVI staff received under DPLUS160, led by Portsmouth University and the Department of Disaster Management to better understand BVI soil biodiversity and composition. NPTVI has a long-standing partnership with Kew having worked on numerous joint projects to deliver effective plant conservation over the past two decades, with existing partnerships in currently funded DPLUS183 and DPLUS196 projects.

## Q15. Gender equality and social inclusion

**All applicants must consider whether and how their project will contribute to promoting equality between persons of different gender and social characteristics. Explain your understanding of how individuals may be excluded from equal participation within the context of your project, and how you seek to address this. You should consider how your project will proactively contribute to ensuring individuals achieve equitable outcomes and how you will engage participants in a meaningful way.**

In 2018 Kew published its "People and Culture Strategy (2020/21)", recognising diversity and inclusion as one of its six corporate priorities. This means equal access to opportunities regardless of gender, including equal participation at all levels in the organisation, equality in decision-making positions (including recruitment) and equal pay. RBG Kew is signed up to the Athena Swan Charter (a framework used across the globe to support and transform gender equality within higher education and research) and the Science Directorate received the Athena Swan Bronze Award in 2021. Kew's Equality, Diversity and Inclusion Delivery Plan is available at: https://www.kew.org/about-us/equality-diversity-inclusion

As Great Tobago and Little Tobago National Parks are uninhabited, the issues of gender equality and inclusion apply to the wider project team and how the project is promoted locally within BVI and to a wider international audience. The project team will balance gender and gender roles in all project activities, decision making and communications.

The project will be led by a female scientist Rosemary Newton with horticultural guidance from a female horticulturalist (Marcella Corcoran). They will form the core of the team interacting with and training partners. The project steering committee will have an equal male/female split from RBG Kew and NPTVI.

NPTVI is an exemplar of gender inclusivity, with both the Director and Deputy Director of NPTVI being female. Our project partner lead will be Nancy Pascoe, NPTVI Deputy Director.

The use of pronouns will be encouraged in emails and meetings to promote gender inclusivity. We will measure attendance and participation in planned group activities to ensure that different age, culture and mobility groups are not excluded, and will, if necessary, make adjustments to ensure equal and fair inclusion.

## Q16. Change expected

**Detail the expected changes this work will deliver. You should identify what will change and who will benefit a) in the short-term (i.e. during the life of the project) and b) in the long-term (after the project has ended). Please describe the changes for the environment and, where relevant, for people in the OTs, and how they are linked.**

**When talking about how people will benefit, please remember to give details of who will benefit, differences in benefits by gender or other layers of diversity within stakeholders, and the number of beneficiaries expected. The number of communities is insufficient detail – number of households should be the largest unit used.**

In the short-term, the project will increase the knowledge of the native and non-native plant species present in the soil seedbank of Great and Little Tobago National Parks. Very little is known about the soil seedbank in BVI and this ground-breaking research will begin to shine a light on this under-explored realm. This will allow prediction of which native plant species are likely to emerge and which non-natives are likely to require additional control measures to ensure eradication following herbivore removal. This will enable NPTVI to manage invasive plants more effectively, ensuring a better outlook for the native plant community. Capacity building and skills improvement activities for NPTVI staff have been included to support these objectives. NPTVI have a team of five new Terrestrial Wardens who will benefit from training they will receive through this project.

In the long-term, NPTVI will benefit, as our project will provide baseline data on the species that form soil seedbanks in the Tobagos, and the natural recovery capacity that ecosystems will have after removal of threats driven by invasive species. As management and control of invasive species is a long-term objective, these data are vital to initiate and inform longer-term monitoring and conservation planning. The capacity to identify non-native plant species from seedling morphology will strengthen the ability of NPTVI to effectively manage invasive plant species and thus improve conservation actions on these islands. The recovery of the native plant community will restore ecosystem services to support wider biodiversity and restore optimal habitat for the Magnificent Frigatebird colony resident at Great Tobago National Park.

The expansion of the plant species DNA reference library to include non-natives will facilitate the development of plant management plans to similar islands in BVI. While the proposed project builds upon the findings and successes of DPLUS080, it will offer a valuable opportunity to investigate the potential to significantly scale such approaches and adapt them accordingly. Future monitoring and invasive species management projects and initiatives across the UK Overseas Territories and neighbouring countries could benefit from the tools developed by DPLUS183 and this proposed project, building on the reference datasets produced for native and non-native plant species authentication. This is particularly important as we envisage that the expansion of these methods to other islands would be extremely valuable for the control of invasives across other UKOTs and the Caribbean as a whole.

Other stakeholders that will benefit include those people that will be targeted by outreach activities, which will include landowners, nursery managers and the public. Outreach activities will be tailored to highlight the risks of introducing non-native species and how easily these can become invasive, particularly in natural areas. Outreach activities will promote the growth and use of native plant species, particularly in gardens. In planning these activities, we will ensure that any differences in gender and diversity of those benefitting from these outreach activities are carefully considered and outreach activities planned so that differences are kept to a minimum. These differences will be recorded for reporting purposes.

## Q17. Pathway to change

**Please outline your project's expected pathway to change. This should be an overview of the overall project logic and outline <u>why and how</u> you expect your Outputs to contribute towards your overall Outcome and, in the longer term, your expected Impact.**

First, the project will quantify the potential of the soil seedbank to accelerate or inhibit recovery of the flora after goats have been eradicated from the two islands. This will be done ex-situ under controlled conditions at Kew, developing protocols that can be applied at other sites in BVI and the Caribbean UKOTs.

Second, the project will develop tools for conservation and restoration professionals to identify native and non-native plant seedlings. This will involve both desktop and laboratory studies: to establish the baseline native and non-native flora, use cutting-edge DNA sequencing approaches to identify species and to produce a seedling identification guide.

Third, the project will disseminate project activities and progress via blogs and Twitter and educate BVI

communities about invasive species and their control, as well as publish scientific papers.

Finally, capacity will be developed in BVI through training both in-country and at Kew, to enable soil seedbank studies and thus non-native plant species emergence to continue to be monitored after the end of the project and a longer-term non-native plant species management strategy to be refined. The project partner will also have the skills in place to integrate this crucial activity into their routine monitoring work.

## Q18. Sustainable benefits

**How will the project reach a sustainable point and continue to deliver benefits post-funding? Will the activities require funding and support from other sources, or will they be mainstreamed in to "business as usual"? How will the required knowledge and skills remain available to sustain the benefits? If relevant, how will your approach be scaled? How will you ensure your data and evidence will be accessible to others?**

The project will generate a DNA reference library of the non-native plant species in BVI as well as baseline data on the native and non-native plant species present in the soil seedbank at Great and Little Tobago National Parks. This, along with a photographic record of the emergent seedlings from soil seedbank samples, will enable seedling recruitment of both native and non-native plant species at Great and Little Tobago National Parks to continue to be monitored by NPTVI after non-native species eradication (in DPLUS196). Ongoing monitoring will allow NPTVI to assess native plant recovery and the success of non-native plant species eradication efforts and will inform management plans for non-native plant species control and native plant species and habitats restoration.

Soil samples could be quickly and easily collected by NPTVI staff, or other nominated visiting researchers on behalf of NPTVI, when the islands are visited for invasive species monitoring, or for other conservation reasons (such as monitoring of the Magnificent Frigatebird population on Great Tobago). Collected soil samples could be processed at the JR O'Neal Botanical Garden, which is also a national park managed by NPTVI, and emergent seedlings identified using the seedling guide that will be produced. Any seedlings where identification is problematic could be dried for identification using molecular methods and the DNA reference libraries of native and non-native plants that will have been developed by DPLUS183 and this project.

Training NPTVI staff will ensure they have the required knowledge and skills for monitoring the soil seedbank, identifying emergent seedlings, and interpreting molecular data after the project has finished. The data from this project will be shared with NPTVI and published in peer-reviewed open access journals. In this way these novel techniques can be integrated into NPTVI's conservation toolkit for application in analogous circumstances.

**If necessary, please provide supporting documentation e.g. maps, diagrams, references etc., as a PDF using the File Upload below:**

Appendix 1
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pdf 84.35 KB

# Section 7 - Risk Management

## Q19. Risk Management

**Please outline the 6 key risks to achievement of your Project Outcome and how these risks will be managed and mitigated, referring to the Risk Guidance. This should include at least one Fiduciary, one Safeguarding, and one Delivery Chain Risk.**

| Risk Description | Impact | Prob. | Inherent Risk | Mitigation | Residual Risk |
|---|---|---|---|---|---|
| **Fiduciary (Financial)**<br>Variations in the exchange rate could significantly affect the costs of the activities in the British Virgin Islands if the Great British Pound declines against the United States Dollar during the project. | Major | Possible | Major | NPTVI have a GBP bank account into which funds could be deposited for conversion when the exchange rate is favourable. The number of Kew staff travelling to BVI could be reduced; the trip duration could be curtailed, and some training and engagement activities could be completed virtually. | Moderate |
| **Safeguarding**<br>Abuse, harassment, or discrimination occurs between project staff or with any participant in planned project activities, or by colleagues outside of the project. | Moderate | Rare | Minor | Kew's safeguarding policy and training ensures that all staff have the knowledge of how to handle any safeguarding concerns and report any safeguarding issues using the "Safeguarding Incident and Concern Form" This will be shared with our partners to ensure safeguarding practices are applied during all project activities. | Minor |
| **Delivery Chain**<br>Staff changes (affecting both Kew and NPTVI teams) and any subsequent loss of skills and experience could impact project delivery. | Moderate | Possible | Major | The inclusion of additional Steering Group project members will ensure project continuity should any staff turnover occur during the project. Planned capacity building and training will mitigate any negative effects of staff changes. Project files and methods will be stored online in a shared area available to all project staff. | Minor |
| **Risk 4**<br>Adverse weather, including tropical storms, hurricanes and rough seas could hamper or prevent fieldwork and capacity building (training, workshop, and outreach activities) from taking place as planned | Moderate | Possible | Major | Fieldwork is planned outside the peak hurricane season and fieldwork dates can be flexible as NPTVI is not reliant on Kew staff for this activity. The dates of capacity building activities could be changed, and travel insurance will protect against financial loss if bookings have to be altered. | Moderate |

| | | | | | |
|---|---|---|---|---|---|
| **Risk 5**<br>Seedlings are not obtained from soil samples collected from Great and Little Tobago National Parks due to lack of seed, poor seed viability or poor seed germination. | Moderate | Possible | Major | Soils will be dried and sent to Kew as quickly as possible to ensure seed viability is maintained. The large number of soil samples should ensure most soil samples will contain viable seed. BVI temperatures will be replicated in the Quarantine House facilities to maximise the chance of seed germination. | Moderate |
| **Risk 6**<br>Adequate plant material cannot be sourced for non-native plant species to complete the non-native plant species DNA reference library. | Minor | Unlikely | Minor | Several sources of plant material are available to the project (Kew's DNA and Tissue Bank, dried plant specimens from Kew's Herbarium, seedling material from seeds germinated at Kew's Millennium Seed Bank). Living material could also be collected in the field in BVI. | Minor |

## Q20. Project sensitivities

**Please indicate whether there are sensitivities associated with this project that need to be considered if details are published (detailed species location data that would increase threats, political sensitivities, prosecutions for illegal activities, security of staff etc.). Please note your response to this question won't influence the outcome of your application.**

⦿ No

# Section 8 - Workplan

## Q21. Workplan

**Provide a project workplan that shows the key milestones in project activities. Complete the Word template as appropriate to describe the intended workplan for your project.**

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17:52:17
pdf 165.15 KB

# Section 9 - Monitoring and Evaluation (M&E)

## Q21. Monitoring and evaluation (M&E) plan

**Describe how the progress of the project will be monitored and evaluated, making reference to who is responsible for the project's M&E.**

**Darwin Plus projects will need to be adaptive and you should detail how the monitoring and evaluation will feed into the delivery of the project including its management. M&E is expected to be built into the project and not an 'add' on. It is as important to measure for negative impacts as it is for positive impact. Additionally, please indicate an approximate budget and level of effort (person days) to be spent on M&E (see Finance Guidance).**

In line with our previous collaborations, this project will be delivered as an equal partnership between Kew and NPTVI. A Memorandum of Collaboration and grant agreement will be drawn up for this specific project for signing by both partners. A Steering Group will be formed at the start of the project with representation from both partner organisations. In addition to the project leader (Rosemary Newton), there will be two co-chairs of the Steering Group (NPTVI Director, Cassander Titley O'Neal and Stuart Cable from Kew), with Nancy Woodfield Pascoe (Deputy Director, NPTVI) and two Kew staff (Sara Barrios and Thomas Heller, both with extensive experience of working in BVI), as members of the Steering Group Committee.

The Steering Group will meet at a minimum twice a year. The project co-ordinator, Rosemary Newton, will review progress against the logical framework, implementation timetable and activities and ensure that reports for Darwin are prepared in good time. Meetings will evaluate progress against listed activities and will identify any obstacles to progress and successful delivery of the four outputs and project outcome. The biennial meetings will be minuted by the project co-ordinator and provide a means of verification for the monitoring and evaluation plan.

The project team will meet at the beginning of the project, and thereafter every two months (and more frequently if necessary), to discuss progress with the field and laboratory work and any issues arising. Meeting notes will be recorded and action points from these meetings will be tracked.

Reporting will enable the project co-ordinator to make informed decisions to maximise the impact of the project and ensure value for money. Kew will manage the project adaptively and collaboratively, working with partners to respond to circumstances strategically to ensure that the overall objectives of the project are achieved. Regular communication by email, telephone and video conferencing will be maintained between quarterly meetings.

At the end of the project, the final report will evaluate the success of the project and submitted to Darwin. Appropriate results will be published in scientific journals. Publishing the scientific results from the study in peer-reviewed scientific journals will be a means of external validation of the quality of the science. Some of the publication of results is likely to take place after the lifetime of the project and will be delivered by the project leader and co-researchers.

Monitoring and evaluation will comprise 10% of the project lead's time in arranging and attending meetings and preparing reports. Other steering group and project members will have 5% of their time utilised for monitoring and evaluation to ensure that the project remains on track. Most meetings will be held virtually, thus saving on costs for travel and subsistence.

| | |
|---|---|
| **Total project budget for M&E (£)**<br><br>**(this may include Staff and Travel and Subsistence Costs)** | [redacted] |
| **Total project budget for M&E (%)** | 3 |
| **Number of days planned for M&E** | 88 |

## Section 10 - Logical Framework

# Q23. Logical Framework (logframe)

**Darwin Plus projects will be required to monitor and report against their progress towards their Outputs and Outcome. This section sets out the expected Outputs and Outcome of your project, how you will measure progress against these and how we can verify this.**

BCF-St2-and-Single-Stage-Logical-Framework-Template-Apr23
02/10/2023
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pdf 91.95 KB

Impact:

The native habitats and plant species diversity of the British Virgin Islands conserved through the eradication of non-native species and recovery of native species

Outcome:

The long-term non-native plant biosecurity strategy and native plant species recovery for Great Tobago and Little Tobago informed by science-based management from soil seedbank studies

| Project Outputs |
| --- |
| **Output 1:** Non-native plant species DNA sequence data for BVI generated and accessioned in secure collections |
| **Output 2:** Database and reference document for all emergent native and non-native plant seedlings created to enable seedling identification |
| **Output 3:** The risk of non-native plant species persisting and the potential for native plant species recovering from the soil seedbank quantified |
| **Output 4:** Capacity built for soil seedbank monitoring to enable effective non-native plant species management; outreach activities undertaken to raise the awareness of invasive plant species |
| **Output 5:** *No Response* |

**Do you require more Output fields?**

**It is advised to have fewer than 6 Outputs since this level of detail can be provided at the Activity level.**

⦿ No

**Activities**

**Each activity is numbered according to the Output that it will contribute towards, for example, 1.1, 1.2, 1.3 are contributing to Output 1.**

1.1 Produce non-native species list and agree sampling methods and protocols
1.2 Source vegetative samples of all known non-native plant species in BVI
1.3 Generate DNA sequence data and complete the Tree of Life for all non-native BVI plant species
1.4 Produce non-native plant species library for use in Output 2 and 3

2.1 Produce and agree sampling methods and protocols, arrange permits
2.2 Collect soil samples from Great Tobago and Little Tobago National Parks
2.3 Transport soil samples to Quarantine House at Kew
2.4 Water soil and photograph emergent seedlings to capture morphological characteristics
2.5 Collect and dry emergent seedlings for DNA analysis
2.6 Produce a seedling guide for emergent native and non-native plant seedlings from the Tobagos soil seedbank

3.1 Accession and process seedlings for DNA extraction
3.2 Molecular analysis of seedlings from soil samples
3.3 Produce a list of the native and non-native plant species present in the Tobagos soil seedbank
3.4 Compare native and non-native plant species on both islands to estimate vegetation recovery on the Tobagos
3.5 Manuscript drafted and submitted for publication

4.1 First BVI colleague to Kew for soil seedbank, seedling morphology & molecular analyses training
4.2 Second BVI colleague to Kew for soil seedbank, seedling morphology & molecular analyses training
4.3 Two Kew colleagues visit BVI for outreach activities (landowners/plant nurseries)
4.4 Two Kew colleagues visit BVI for Soil Seedbank Management Workshop
4.5 Dissemination of project activities and progress via blogs and social media

# Section 11 - Budget and Funding

## Q24. Budget

**Please complete the appropriate Excel spreadsheet which provides the Budget for this application and ensure the Summary page is fully completed. Some of the questions earlier and below refer to the information in this spreadsheet.**

BCF-Budget-over-100k-MASTER-Aug23 Newton final
02/10/2023
18:21:12
xlsx 93.97 KB

## Q25. Alignment with other funding and activities

**This question aims to help us understand how familiar you are with other work in the geographic/thematic area, and how this proposed project will build on or align with this to avoid any risks of duplicating or conflicting activities.**

### Q25a. Is this new work or does it build on existing/past activities (delivered by anyone and funded through any source)?

⦿ Development of existing work

**Please provide details:**

Although soil seedbanks have been studied in different habitats and locations around the world, we could only find one reference to such a study in the Caribbean:
Ray GJ & Brown BJ (1994). Seed Ecology of Woody Species in a Caribbean Dry Forest. Restoration Ecology 2(3): 156-163.

This paper reports on a study undertaken on St John (US Virgin Islands); however, we are not aware of any soil seedbank studies in BVI. St John and Great and Little Tobago islands are geographically close, yet despite this, island floras can be surprisingly distinct due to different biogeographical histories and anthropogenic influences. This study also focussed on woody species rather than the whole island flora. Finally, this study was published almost three decades ago. Our proposed project is therefore novel in several aspects.

Methods and results from this published study will nevertheless inform our project methodology and the results generated from our proposed project will be compared and placed into context with their findings.

In addition to this completed project, our proposed project will build on three key Darwin-funded projects currently running in BVI: DPLUS160 (BVI soil mapping), DPLUS183 (BVI plant genetics) and DPLUS196 (Great and Little Tobago National Park invasives removal).

### Q25b. Are you aware of any current or future plans for work in the geographic/thematic area to the proposed project?

⦿ Yes

**If yes, please give details explaining similarities and differences, and explaining how your work will be additional, avoiding duplicating and conflicting activities and what attempts have been/will be made to co-operate with and share lessons learnt for mutual benefit.**

NPTVI are partners on all current Darwin-funded projects in Q25a. Kew are partners on DPLUS183 and DPLUS196. This project team overlap will prevent duplication and conflicting activities.

DPLUS160 aims to understand the soil biodiversity in BVI National Parks and to train NPTVI staff to collect and assess soil samples. Soil microbiology and soil composition will be examined in DPLUS160 soil samples. The proposed project is primarily interested in the soil seedbank.

DPLUS196 will be removing feral goats and non-native plant species from Great and Little Tobago National Parks to enable their ecosystems to recover, and training NPTVI staff in invasive plants removal. The proposed project will complement DPLUS196 by establishing a baseline for the native and non-native plant species in the soil seedbank to inform a longer-term NPTVI non-native plant species management and native species restoration strategy.

DPLUS183 will create a reference library for all native BVI plant species. The proposed project will use and build upon this by adding molecular data for non-native BVI plant species to make a comprehensive library for all plant species present in BVI. This will be essential to identify both native and non-native angiosperms present in the soil seedbank, crucial for future conservation activities.

## Q26. Balance of budget spend

**Defra are keen to see as much Darwin Plus funding as possible directly benefiting UKOT communities and economies. While it is appreciated that this is not always possible every effort should be made for funds to remain in-Territory.**

**Explain the thinking behind your budget in terms of where Darwin Plus funds will be spent. What benefits will the Territory/ies see from your budget? What level of the award do you expect will be spent locally? Please explain the decisions behind any Darwin Plus funding that will not be spent locally and how those costs are important for the project.**

The project will benefit the people of BVI by helping NPTVI to restore Great and Little Tobago National Parks to a healthier ecological state and in this way will leave a positive legacy for nature and the environment.

Although most expenditure will occur at Kew, due to limited capacity in NPTVI to lead the proposed project, the outputs will be of direct benefit to BVI. Kew steering group staff have extensive experience in BVI and will be directly supporting the project leader and staff working in the field and laboratory and with training, to ensure smooth running of activities. Most activities, out of necessity, will take place at Kew, where there are appropriate facilities and skilled scientists to do the work (molecular labs in the Jodrell Laboratory, controlled nursery facilities in the Quarantine House).

Budget (comprising travel, accommodation, and subsistence) for two NPTVI staff to visit Kew to develop skills and knowledge to be used in-territory are included in the financial spreadsheet with one visit planned for Y1 and the second for Y2. Additional training for NPTVI colleagues will take place at the end of the project when two Kew staff members will visit BVI to deliver the final workshop.

## Q27. Value for Money

**Please describe why you consider your application to be good value for money including justification of why the measures you will adopt will secure value for money.**

The budget was developed through a consultative process with partners and is based on experience of similar project work undertaken in the past. The project staff and partners have all the existing skills required within the team to successfully deliver the project.

Fieldwork will be undertaken by NPTVI staff who will already be visiting Great and Little Tobago National Parks for other project work during DPLUS196 and DPLUS183, thus saving on extra travel and subsistence costs for both NPTVI and Kew staff. This project will also make use of the native plant species reference library that is being created in DPLUS183 to identify emergent seedlings of native plants. The estimated monetary value of these substantial in-kind contributions from these projects are detailed in the financial spreadsheet and in Q8.

The project will enable the monitoring of the threat of invasive plant species re-establishing on these islands post non-native species removal, which will enable continued control to ensure that they are eradicated before they have a chance to spread further, which would make control and eradication more difficult. Prevention of invasive species introduction by strict biosecurity measures and monitoring is far more cost-effective than trying to eradicate non-native species once they have established.

Communication and meetings will be mainly held online, with a modest travel budget requested to enable two NPTVI staff to visit Kew for training and for two Kew staff to visit BVI at the end of the project to deliver the final workshop.

## Q28. Capital items

**If you plan to purchase capital items with Darwin Plus funding, please indicate what you anticipate will happen to the items following project end. If you are requesting more than 10% capital costs, please provide your justification here.**

Kew has access to state-of-the-art molecular laboratory and nursery facilities and thus there is no need for the purchase of many or expensive capital items to successfully deliver the project. We have requested a small budget of [redacted] to enable the purchase of a high spec digital camera to be able to take quality images of emergent seedlings in the nursery at Kew. This equipment will be available at the end of the project for any additional monitoring work required by NPTVI. This capital item represents less than 1% of the overall project budget.

## Section 12 - Safeguarding and Ethics

# Q29. Safeguarding

**All projects funded under the Biodiversity Challenge Funds must ensure proactive action is taken to promote the welfare and protect all individuals involved in the project (staff, implementing partners, the public and beneficiaries) involved in the project from harm. In order to provide assurance of this, projects are required to have specific procedures and policies in place.**

**Please upload the following required policies:**

- **Safeguarding Policy:** including a statement of commitment to safeguarding and a zero tolerance statement on bullying, harassment and sexual exploitation and abuse.
- **Whistleblowing Policy:** which details a clear process for dealing with concerns raised and protects whistle blowers from reprisals.
- **Code of Conduct:** which sets out clear expectations of behaviours – inside and outside the workplace – for all involved in the project and makes clear what will happen in the event of non-compliance or breach of these standards.

**If any of these policies are integrated into a broader policy document or handbook, please upload just the relevant or equivalent sub-sections to the above policies, with (unofficial) English translations where needed.**

**Please outline how (a) beneficiaries, the public, implementing partners, and staff are made aware of your safeguarding commitment and how to confidentially raise a concern, (b) safeguarding issues are investigated, recorded and what disciplinary procedures are in place when allegations and complaints are upheld, (c) you will ensure project partners uphold these policies.**

**If your approach is currently limited or in the early stages of development, please clearly set out your plans address this.**

Kew has clear safeguarding policies and procedures, and all staff are required to complete regular training to ensure that the welfare of all people that they interact with are protected. All Kew staff working on the project will have successfully completed safeguarding training. This training is mandatory for all staff and staff are required to complete a refresher course every two years.

Kew's Safeguarding Policy, Whistleblowing Policy, and Code of Conduct as well as our safeguarding risk assessment will be shared with our partners, so they are aware of the risks and the control measures that we will put in place to mitigate these. Although NPTVI do not yet have a Safeguarding Policy in place, Kew is working with them to develop their own Safeguarding policy.

Any safeguarding incidents will be reported to and investigated by Kew, and if necessary, will be referred for external investigation.

## Q30. Ethics

**Outline your approach to meeting the key principles of good ethical practice, as outlined in the guidance.**

This project will adhere to the key principles of good ethical practice as set out in Darwin Plus guidance for projects and will operate within both the UK and BVI legal system, including access and benefit sharing legislation pertaining to the use of genetic resources and associated traditional knowledge.

The project will work within Kew and NPTVI Health and Safety Guidelines. As both Great Tobago and Little Tobago National Parks are uninhabited islands, risks to human rights are low. The rights, privacy and safety of people who may be directly or indirectly impacted by project activities will be respected.

Kew and NPTVI will be equal partners and the project will be managed to ensure that all partners are equally involved in planning, meetings, and training.

# Section 13 - Project Staff

## Q31. Project staff

**Please identify the core staff (identified in the budget), their role and what % of their time they will be working on the project.**

| Name (First name, Surname) | Role | % time on project | 1 page CV or job description attached? |
|---|---|---|---|
| Rosemary Newton | **Project Leader** | 63 | Checked |
| Marcella Corcoran | Research Horticulturalist | 33 | Checked |
| Juan Viruel | Molecular Analyses Co-ordinator | 10 | Checked |
| Freya Cornell-Davison | Molecular Analyses Research Assistant | 50 | Checked |

**Do you require more fields?**

⦿ Yes

| Name (First name, Surname) | Role | % time on project | 1 page CV or job description attached? |
|---|---|---|---|
| Stuart Cable | Steering Group Co-Chair and Advisor | 5 | Checked |
| Thomas Heller | Steering Group Committee Member | 5 | Checked |
| Sara Barrios | Steering Group Committee Member | 5 | Checked |
| Nancy Woodfield-Pascoe | BVI Co-ordinator | 10 | Checked |
| Cassander Titley O'Neal | Steering Group Co-Chair and Advisor | 5 | Checked |

| | | | |
|---|---|---|---|
| *No Response* | *No Response* | 0 | Unchecked |
| *No Response* | *No Response* | 0 | Unchecked |
| *No Response* | *No Response* | 0 | Unchecked |

**Please provide 1 page CVs (or job description if yet to be recruited) for the project staff listed above as a combined PDF.**

CVs combined
02/10/2023
11:17:43
pdf 1.79 MB

**Have you attached all project staff CVs and job descriptions?**

⦿ Yes

# Section 14 - Project Partners

## Q32. Project partners

**Please list all the Project Partners (including the Lead Partner who will administer the grant and coordinate delivery of the project), clearly setting out their roles and responsibilities in the project including the extent of their engagement so far.**

**This section should demonstrate the capability and capacity of the Project Partners to successfully deliver the project. Please provide Letters of Support for all project partners or explain why this has not been included.**

| | |
|---|---|
| **Lead partner name:** | Royal Botanic Gardens, Kew |
| **Is the Lead Partner based in a UKOT where the project is working?** | ⦿ No |
| **Please explain why this project is led from outside the UKOT** | NPTVI is a small organisation currently leading two and partnering on three Darwin Plus projects and has limited capacity to lead additional projects. They requested Kew lead because of this and specialised facilities (Jodrell Laboratory and Quarantine House), equipment (e.g., for DNA extraction and analysis) and staff expertise at Kew. |

| | |
|---|---|
| **Why is this organisation the Lead Partner, and what value to they bring to the project? (including roles, responsibilities and capabilities and capacity):** | Kew has a successful history in delivering Darwin Plus projects on time and within budget and actively supporting UKOTs conservation initiatives for more than two decades. Kew will provide overall project management and financial control.<br><br>The PI, Rosemary Newton, has previous experience on Darwin Projects as the project leader for DPLUS080 and the Kew lead on the current DPLUS144 project. She has more than 20 years' experience working with seeds and experience with working with soil seedbanks from the DPLUS080 project on South Georgia.<br><br>The named Kew team all have extensive experience in working in the Caribbean UKOTs, especially BVI, and will be able to support the PI with their botanical knowledge and project management expertise.<br><br>Marcella Corcoran, an expert in horticultural science and who also worked on the South Georgia DPLUS080 project, will be supporting the PI with the soil seedbank work in the Quarantine House and in training visiting NPTVI colleagues in nursery and horticultural skills and techniques. |
| **Allocated budget (proportion or value):** | [redacted] |
| **Representation on the Project Board (or other management structure)** | ⊙ Yes |
| **Have you included a Letter of Support from the Lead Partner?** | ⊙ Yes |

**Do you have partners involved in the Project?**

⊙ Yes

| | |
|---|---|
| **1. Partner Name:** | National Parks Trust of the Virgin Islands (NPTVI) |
| **Website address:** | https://www.bvinpt.org/ |

| | |
|---|---|
| **What value does this Partner bring to the project? (including roles, responsibilities and capabilities and capacity):** | NPTVI are the most appropriate organisation in BVI to be involved in this project as an equal partner because of their current statutory role to conserve the National Parks of BVI, their experienced staff and their long-standing collaborative relationship with Kew.<br><br>Their involvement as project partners on the two other closely related Darwin-funded projects (DPLUS183 and DPLUS196) will enable strong synergies between these current projects and this proposed project.<br><br>NPTVI partners have the knowledge, capability, and capacity to ensure necessary and appropriate permits are obtained to collect and export soil samples from BVI to Kew in the UK. They have funding secured for boat transport for fieldwork on current DPLUS projects and will use this opportunity to collect soil samples for the proposed project. They have appropriate facilities to dry soil samples to ensure seed viability is maintained while in transit and to then arrange transport of these to Kew in the UK.<br><br>NPTVI have confirmed the support of the Government of the Virgin Islands for this proposed project. |
| **UKOT-based/other Partner** | ⦿ UKOT-based |
| **Allocated budget (proportion or value):** | [redacted] |
| **Representation on the Project Board (or other management structure)** | ⦿ Yes |
| **Have you included a Letter of Support from this organisation?** | ⦿ Yes |

| | |
|---|---|
| **2. Partner Name:** | *No Response* |
| **Website address:** | *No Response* |
| **What value does this Partner bring to the project? (including roles, responsibilities and capabilities and capacity):** | *No Response* |
| **UKOT-based/other Partner** | ○ UKOT-based<br>○ Other |
| **Allocated budget (proportion or value):** | £0.00 |
| **Representation on the Project Board (or other management structure)** | ○ Yes<br>○ No |

| | |
|---|---|
| **Have you included a Letter of Support from this organisation?** | ◯ Yes<br>◯ No |

| | |
|---|---|
| **3. Partner Name:** | *No Response* |
| **Website address:** | *No Response* |
| **What value does this Partner bring to the project? (including roles, responsibilities and capabilities and capacity):** | *No Response* |
| **UKOT-based/other Partner** | £0.00 |
| **Allocated budget (proportion or value):** | ◯ UKOT-based<br>◯ Other |
| **Representation on the Project Board (or other management structure)** | ◯ Yes<br>◯ No |
| **Have you included a Letter of Support from this organisation?** | ◯ Yes<br>◯ No |

| | |
|---|---|
| **4. Partner Name:** | *No Response* |
| **Website address:** | *No Response* |
| **What value does this Partner bring to the project? (including roles, responsibilities and capabilities and capacity):** | *No Response* |
| **UKOT-based/other Partner** | ◯ UKOT-based<br>◯ Other |
| **Allocated budget (proportion or value):** | £0.00 |
| **Representation on the Project Board (or other management structure)** | ◯ Yes<br>◯ No |
| **Have you included a Letter of Support from this organisation?** | ◯ Yes<br>◯ No |

| | |
|---|---|
| **5. Partner Name:** | *No Response* |
| **Website address:** | *No Response* |

| | |
|---|---|
| **What value does this Partner bring to the project? (including roles, responsibilities and capabilities and capacity):** | *No Response* |
| **UKOT-based/other Partner** | ◯ UKOT-based<br>◯ Other |
| **Allocated budget (proportion or value):** | £0.00 |
| **Representation on the Project Board (or other management structure)** | ◯ Yes<br>◯ No |
| **Have you included a Letter of Support from this organisation?** | ◯ Yes<br>◯ No |

| | |
|---|---|
| **6. Partner Name:** | *No Response* |
| **Website address:** | *No Response* |
| **What value does this Partner bring to the project? (including roles, responsibilities and capabilities and capacity):** | *No Response* |
| **UKOT-based/other Partner** | ◯ UKOT-based<br>◯ Other |
| **Allocated budget (proportion or value):** | £0.00 |
| **Representation on the Project Board (or other management structure)** | ◯ Yes<br>◯ No |
| **Have you included a Letter of Support from this organisation?** | ◯ Yes<br>◯ No |

**Please provide a combined PDF of all letters of support.**

Letters of Support
02/10/2023
12:20:23
pdf 834.42 KB

# Section 15 - Lead Partner Capability and Capacity

## Q33. Lead Partner Capability and Capacity

**Has your organisation been awarded Biodiversity Challenge Funds (Darwin Plus, Darwin Initiative or Illegal Wildlife Trade Challenge Fund) funding before?**

⦿ Yes

**If yes, please provide details of the most recent awards (up to 6 examples).**

| Reference No | Project Leader | Title |
|---|---|---|
| DPLUS183 | Juan Viruel | Biodiversity metrics for conservation management in the British Virgin Islands |
| DPLUS114 | Stuart Cable | Tropical Important Plant Areas and Important Plant Species in TCI |
| DPLUS084 | Thomas Heller | Identifying and conserving resilient habitats in the British Virgin Islands |
| IWT114 | David Whitehead (originally Carly Cowell) | Harnessing technology to end the illegal trade in succulent plants |
| 28-012 | Maria Vorontsova | Native grass forage management to feed people and protect forests |
| 27-14 | Aaron Davis | Coffee natural capital for environmental and livelihood sustainability in Uganda |

**Have you provided the requested signed audited/independently examined accounts?**

⦿ Yes

# Section 16 - Certification

## Certification

**On behalf of the**

Trustees

**of**

Royal Botanic Gardens, Kew

**I apply for a grant of**

£458,225.00

**I certify that, to the best of our knowledge and belief, the statements made by us in this application are true and the information provided is correct. I am aware that this application form will form the basis of the project schedule should this application be successful.**

**(This form should be signed by an individual authorised by the applicant institution to submit applications and sign contracts on their behalf.)**

- **I enclose CVs for key project personnel, a cover letter, letters of support, a budget, logframe, Safeguarding and associated policies, and project workplan.**

- **Our last two sets of signed audited/independently verified accounts and annual report (covering three years) are also enclosed.**

Checked

| | |
|---|---|
| **Name** | Rosemary Newton |
| **Position in the organisation** | Postdoctoral Researcher |
| **Signature (please upload e-signature)** | Signature<br>02/10/2023<br>12:35:29<br>jpg 58.85 KB |
| **Date** | 02 October 2023 |

**Please attach the requested signed audited/independently examined accounts.**

RBG-Kew-Annual-Report-and-Accounts-2022-2023
02/10/2023
12:32:54
pdf 799.07 KB

RBG-Kew-Annual-Report-and-Accounts-2021-2022
02/10/2023
12:32:49
pdf 761.3 KB

RBG-Kew-Annual-Report-and-Accounts-2020-2021
02/10/2023
12:32:44
pdf 822.21 KB

**Please upload the Lead Partner's Safeguarding Policy as a PDF**

Code-of-Conduct
02/10/2023
12:36:23
pdf 241.17 KB

Whistleblowing-policy
02/10/2023
12:36:17
pdf 424.08 KB

Safeguarding-Policy-January-2022
02/10/2023
12:33:07
pdf 389.28 KB

# Section 17 - Submission Checklist

## Checklist for submission

| | Check |
|---|---|

| | |
|---|---|
| **I have** read the Guidance**, including the "Guidance Notes for Applicants", "Monitoring Evaluation and Learning Guidance", "Standard Indicator Guidance", "Risk Guidance", and "Finance Guidance".** | 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** budget based on UK government financial years **i.e. 1 April – 31 March and in GBP.** | Checked |
| **I have checked that our** budget is complete, **correctly adds up and I have included the correct final total at the start of the application.** | Checked |
| **The application been** signed by a suitably authorised individual **(clear electronic or scanned signatures are acceptable).** | Checked |
| **I have attached the below documents to my application:**<br>• **a** cover letter from the Lead Partner**, outlining how any feedback received at Stage 1 has been addressed where relevant and referencing any potential conflicts of interest, as a single PDF.** | Checked |
| • **my** completed logframe **as a PDF using the template provided and using "Monitoring Evaluation and Learning Guidance" and "Standard Indicator Guidance".** | Checked |
| • **my budget (which meets the requirements above) using the template provided.** | Checked |
| • **a signed copy of the last 2 annual report and accounts for the Lead Partner, or provided an explanation if not.** | Checked |
| • **my completed workplan as a PDF using the template provided** | Checked |
| • **a copy of the Lead Partner's Safeguarding Policy, Whistleblowing Policy and Code of Conduct (Question 28).** | Checked |
| • **1 page CV or job description for each of the Project Staff identified at Question 30, including the Project Leader, or provided an explanation of why not, combined into a single PDF.** | Checked |
| • **a letter of support from the Lead Partner and partner(s) identified at Question 31 and relevant OT Governments, or an explanation of why not, combined into a single PDF.** | Checked |
| **My additional supporting evidence is in line with the requested evidence, amounts to a maximum of 5 sides of A4, and is combined as a single PDF.** | 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 |
| **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 the Darwin Initiative and our sister grant scheme, the IWT Challenge**

**Fund. We also provide occasional updates on other UK Government activities related to biodiversity conservation and share our quarterly project newsletter. 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 the Darwin Initiative including project details (usually title, lead partner, project leader, location, and total grant value).

Project Title: Assessing BVI habitat recovery from soil seedbanks following invasives removal

| | Activity | No. of months | Year 1 (24/25) | | | | Year 2 (25/26) | | | | Year 3 (26/27) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| **Output 1** | **Non-native plant species DNA sequence data for BVI generated and accessioned in secure collections** | | | | | | | | | | | | | |
| 1.1 | Produce non-native species list and agree sampling methods and protocols | 6 | | | | | | | | | | | | |
| 1.2 | Source vegetative samples of all known non-native plant species in BVI | 12 | | | | | | | | | | | | |
| 1.3 | Generate DNA sequence data and complete the Tree of Life for all non-native BVI plant species | 12 | | | | | | | | | | | | |
| 1.4 | Produce non-native plant species library for use in Output 2 and 3 | 6 | | | | | | | | | | | | |
| **Output 2** | **Database and reference document for all emergent native and non-native plant seedlings created to enable seedling identification** | | | | | | | | | | | | | |
| 2.1 | Produce and agree sampling methods and protocols, arrange permits | 3 | | | | | | | | | | | | |
| 2.2 | Collect soil samples from Great Tobago and Little Tobago National Parks | 12 | | | | | | | | | | | | |
| 2.3 | Transport soil samples to Quarantine House at Kew | 18 | | | | | | | | | | | | |
| 2.4 | Water soil and photograph emergent seedlings to capture morphological characteristics | 27 | | | | | | | | | | | | |
| 2.5 | Collect and dry emergent seedlings for DNA analysis | 27 | | | | | | | | | | | | |
| 2.6 | Produce a seedling guide for emergent native and non-native plant seedlings from the Tobagos soil seedbank | 9 | | | | | | | | | | | | |
| **Output 3** | **The risk of non-native plant species persisting and the potential for native plant species recovering from the soil seedbank quantified** | | | | | | | | | | | | | |
| 3.1 | Accession and process seedlings for DNA extraction | 27 | | | | | | | | | | | | |
| 3.2 | Molecular analysis of seedlings from soil samples | 15 | | | | | | | | | | | | |
| 3.3 | Produce a list of the native and non-native plant species present in the Tobagos soil seedbank | 9 | | | | | | | | | | | | |
| 3.4 | Compare native and non-native plant species on both islands to estimate vegetation recovery on the Tobagos | 6 | | | | | | | | | | | | |

Project Title: Assessing BVI habitat recovery from soil seedbanks following invasives removal

| | Activity | No. of months | Year 1 (24/25) | | | | Year 2 (25/26) | | | | Year 3 (26/27) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 3.5 | Manuscript drafted and submitted for publication | 3 | | | | | | | | | | | | |
| **Output 4** | **Capacity built for soil seedbank monitoring to enable effective non-native plant species management; outreach activities undertaken to raise the awareness of invasive plant species** | | | | | | | | | | | | | |
| 4.1 | First BVI colleague to Kew for soil seedbank, seedling morphology & molecular analyses training | 6 | | | | | | | | | | | | |
| 4.2 | Second BVI colleague to Kew for soil seedbank, seedling morphology & molecular analyses training | 6 | | | | | | | | | | | | |
| 4.3 | Two Kew colleagues visit BVI for outreach activities (landowners/plant nurseries) | 6 | | | | | | | | | | | | |
| 4.4 | Two Kew colleagues visit BVI for Soil Seedbank Management Workshop | 6 | | | | | | | | | | | | |
| 4.5 | Dissemination of project activities and progress via blogs and social media | 36 | | | | | | | | | | | | |

Project Title: Assessing BVI habitat recovery from soil seedbanks following invasives removal

| Project Summary | SMART Indicators | Means of Verification | Important Assumptions |
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| **Impact:**<br>(Max 30 words)<br>The native habitats and plant species diversity of the British Virgin Islands conserved through the eradication of non-native species and recovery of native species | | | |
| **Outcome:**<br>(Max 30 words)<br>The long-term non-native plant biosecurity strategy and native plant species recovery for Great Tobago and Little Tobago informed by science-based management from soil seedbank studies | 0.1 Number of non-native plant species persisting in the soil seedbank following invasives eradication for Great and Little Tobago determined by Q4, Y3 **[DPLUS-B01]**<br><br>0.2 Number of native plant species present in the soil to aid native habitat recovery for Great and Little Tobago determined by Q4, Y3 **[DPLUS-B01]** | 0.1 List of the non-native plant species identified from soil seedbank studies published in the final Darwin report<br><br>0.2 List of the native plant species identified from soil seedbank studies published in the final Darwin report<br><br>0.3 Updated management plan for Great and Little Tobago developed by NPTVI following incorporation of relevant soil seedbank study results | 0.1 Weather conditions allow boat access to Great Tobago and helicopter access to Little Tobago as planned to allow soil sample collection (external factor)<br><br>0.2 Soil samples contain sufficient viable seeds to accurately assess the soil seedbank for both islands |
| **Outputs:**<br>**1**. Non-native plant species DNA sequence data for BVI generated and accessioned in secure collections | 1.1 Updated list of all non-native plant species occurring in BVI (estimated at 263 species in "Retaining Nature's Little Secrets: A Guide to the Important Plants and Tropical Important Plant Areas of the British Virgin Islands" by Kew in 2019) produced from Kew and NPTVI | 1.1 Updated non-native plant species list for BVI produced from literature survey shared with partners and included as an annex to the first Darwin annual report<br><br>1.2 List of tissue samples for all the non-native plant species in | 1.1 Vegetative material is available for all non-native BVI species in the updated list under indicator 1.1 (external factor)<br><br>1.2 DNA is successfully extracted from any problematic species (e.g., species containing |

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| | data and published literature by Q3, Y1 **[DPLUS-B01]**<br><br>1.2 Tissue samples for all non-native plant species in BVI (from 1.1) sourced from DNA and Tissue Bank, Herbarium, MSB and the field by Q2, Y2<br><br>1.3 DNA and tissue collections for all non-native plant species in BVI (from 1.1) completed with DNA material available for sequencing by Q2, Y3<br><br>1.4 Sequence data generated, a DNA library produced, and the Tree of Life completed for all native and non-native plant species in BVI (from 1.1) by Q4, Y3 **[DPLUS-C16]** | BVI produced and these data made available to partners and included as an annex to the second annual Darwin report<br><br>1.3 Accession numbers for all non-native plant species in BVI created in the DNA and Tissue Bank at Kew and the results of DNA extractions made available to partners and included as an annex to the final Darwin report<br><br>1.4 DNA sequence data publicly available in the Sequence Read Archive (SRA: https://www.ncbi.nlm.nih.gov/sra) and data shared with Kew's Tree of Life Explorer for incorporation into their database (https://treeoflife.kew.org/) | polysaccharides, secondary metabolites, etc.) (external factor)<br><br>1.3 Molecular techniques can adequately authenticate all non-native plant species<br><br>1.4 The incorporation of new data and maintenance of the Kew Tree of Life Explorer continues at current levels of core support (external factor) |
| **2**. Database and reference document for all emergent native and non-native plant seedlings created to enable seedling identification | 2.1 Minimum of 200 soil samples collected over two field seasons (70 from Great Tobago and 30 from Little Tobago per field season) and sent to Kew for processing by Q4, Y1 and Q4, Y2, respectively<br><br>2.2 All soil samples (from 2.1) processed and all emergent native and non-native seedlings photographed for soil seedbank | 2.1 Customs clearance and Air Waybill paperwork for soil samples completed<br><br>2.2 Database detailing soil samples processed and photographs saved in project directory and attached as annex to Steering Group meeting minutes and final Darwin report<br><br>2.3 Database of native and non-native seedling accession | 2.1 DPLUS196 field trips proceed as planned and soil can be collected during these trips unhampered by inclement weather and sea conditions (external factors)<br><br>2.2 Soil samples stored in suitable conditions (dry and cool) during storage and transport, so that seeds remain viable (partly external factors) |

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| | seedling identification guide by Q2, Y3 **[DPLUS-C01]**<br><br>2.3 All emergent native and non-native seedlings collected for DNA analysis by Q1, Y3<br><br>2.4 Seedling images (from 2.2) compiled into a reference document for partner use in seedling identification by Q3, Y3 | numbers saved in project directory and attached as annex to Steering Group meeting minutes and final Darwin report<br><br>2.4 Reference document for use in seedling identification shared with partners and attached as an annex to the final Darwin report | 2.3 Soil samples contain sufficient seeds and seeds germinate under Quarantine House growth conditions (external factors) |
| **3**. The risk of non-native plant species persisting and the potential for native plant species recovering from the soil seedbank quantified | 3.1 All seedling DNA analysed, and species identified, by Q3, Y3<br><br>3.2 Lists of native and non-native plant species likely to persist in the soil seedbank on both Great and Little Tobago National Parks produced by Q3, Y3<br><br>3.3 Comparison of native and non-native plant species lists to estimate vegetative recovery on both islands completed by Q4, Y3<br><br>3.4 Draft manuscript submitted for publication by Q4, Y3 **[DPLUS-B02, DPLUS-C17]** | 3.1 List of species identified on each island attached as an annex to the final Darwin report<br><br>3.2 Database of native and non-native seeds found in soil seedbank produced for Great and Little Tobago National Parks and a summary of the findings published in final Darwin report<br><br>3.3 A comparison of the native and non-native plant species in the soil seedbank on Great and Little Tobago shared with partners and published in the final Darwin report<br><br>3.4 Draft manuscript quantifying the risk of non-native plant species persisting in the soil seedbank and estimating the | 3.1 Sufficient seedling material can be collected from germinated seeds to enable DNA analysis<br><br>3.2 DNA sequences for all native plant species are obtained in DPLUS183 and for all non-native plant species in Output 1 to enable successful seedling identification (external factor) |

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| | | recovery of native plant species from the soil seedbank | |
| **4.** Capacity built for soil seedbank monitoring to enable effective non-native plant species management; outreach activities undertaken to raise the awareness of invasive plant species | 4.1 Two NPTVI staff (with at least one female) trained at Kew in soil seedbank, seedling morphology and interpretation of molecular results by Q1, Y2 and Q1, Y3, respectively **[DPLUS-A02, DPLUS-A04]**<br><br>4.2 Two Kew staff to run a Soil Seedbank Management Workshop in BVI to enable NPTVI staff to refine their non-native plant species management plan by Q4, Y3 **[DPLUS-A03, DPLUS-A07]**<br><br>4.3 Outreach activities with landowners and nurseries on non-native and invasive plant species by Kew and NPTVI staff in BVI by Q4, Y3 **[DPLUS-A01]**<br><br>4.4 The profile of Darwin Plus and the project raised throughout the life of the project using social media and blogs **[DPLUS-C12]** | 4.1 Report on each training visit to Kew produced, shared with partners and included as an annex to the Steering Group minutes and annual Darwin reports<br><br>4.2 Report detailing the Soil Seedbank Management Workshop delivery to NPTVI staff included as an annex to the final Darwin report<br><br>4.3 Report of outreach activities in BVI by two Kew staff (with at least one female) and NPTVI staff delivered to at least five landowners and nurseries included as an annex to the final Darwin report<br><br>4.4. At least one blog and twenty Twitter posts per year promoting project activities, included as an annex to the annual and final Darwin reports | 4.1 Selected NPTVI staff can travel to Kew for training<br><br>4.2 Selected Kew staff can travel to the BVI for training and outreach activities<br><br>4.3 Suitable venues can be found to host the training activities and workshop and people are able and willing to attend |

Project Title: Assessing BVI habitat recovery from soil seedbanks following invasives removal

**Activities** (each activity is numbered according to the output that it will contribute towards, for example 1.1, 1.2 and 1.3 are contributing to Output 1. Each activity should start on a new line and be no more than approximately 25 words.)

1.1 Produce non-native species list and agree sampling methods and protocols
1.2 Source vegetative samples of all known non-native plant species in BVI
1.3 Generate DNA sequence data and complete the Tree of Life for all non-native BVI plant species
1.4 Produce non-native plant species library for use in Output 2 and 3

2.1 Produce and agree sampling methods and protocols, arrange permits
2.2 Collect soil samples from Great Tobago and Little Tobago National Parks
2.3 Transport soil samples to Quarantine House at Kew
2.4 Water soil and photograph emergent seedlings to capture morphological characteristics
2.5 Collect and dry emergent seedlings for DNA analysis
2.6 Produce a seedling guide for emergent native and non-native plant seedlings from the Tobagos soil seedbank

3.1 Accession and process seedlings for DNA extraction
3.2 Molecular analysis of seedlings from soil samples
3.3 Produce a list of the native and non-native plant species present in the Tobagos soil seedbank
3.4 Compare native and non-native plant species on both islands to estimate vegetation recovery on the Tobagos
3.5 Manuscript drafted and submitted for publication

4.1 First BVI colleague to Kew for soil seedbank, seedling morphology & molecular analyses training
4.2 Second BVI colleague to Kew for soil seedbank, seedling morphology & molecular analyses training
4.3 Two Kew colleagues visit BVI for outreach activities (landowners/plant nurseries)
4.4 Two Kew colleagues visit BVI for Soil Seedbank Management Workshop
4.5 Dissemination of project activities and progress via blogs and social media