



Department
for Environment
Food & Rural Affairs



Foreign &
Commonwealth
Office



Department
for International
Development



Darwin Plus: Overseas Territories Environment and Climate Fund

Final Report

Important note To be completed with reference to the Reporting Guidance Notes for Project Leaders:
it is expected that this report will be a maximum of 20 pages in length, excluding annexes

Darwin Project Information

Project Ref Number	DPLUS012	
Project Title	Conserving plant diversity and establishing ecosystem based approaches to the management of forest ecosystems in the British Virgin Islands	
Territory(ies)	British Virgin Islands	
Contract Holder Institution	National Parks Trust of the Virgin Islands (NPTVI)	
Partner Institutions	Royal Botanic Gardens, Kew (Kew)	
Grant Value	£83,915.00	
Start/end date of project	1 st July 2013 – 31 st March 2015	
Project Leader	Lynda Varlack, Director (Ag.)	
Project website	http://bvinpt.org	
Report author and date	Nancy Pascoe, NPTVI Martin Hamilton, Kew	22 nd June 2015

1 Project Overview

This project was implemented across the Territory of the British Virgin Islands (BVI), which is located in the Eastern Caribbean. The project team visited over 90% of the islands in the BVI in order to groundtruth the vegetation habitat and to search for threatened species of interest.



Figure 1. Location map of Darwin Plus 012 project within the Caribbean region

There were major gaps in botanical information across the BVI, as previous Darwin funded projects had focused on specific sites on Virgin Gorda and Anegada, with little modern information known about the status of threatened plant species across the BVI as a whole. Historic records derived from herbarium vouchers at Kew Gardens assisted in guiding the project team to likely areas where threatened species were previously reported. These gaps in botanical information also meant that the last version of the British Virgin Islands Protected Areas System Plan 2007-2017 did not take into consideration or include areas with plant species of interest, and instead was more focused on the expansion of the marine protected area network. This project has since identified additional areas that could be proposed as new protected areas.

The National Parks Trust of the Virgin Islands (NPTVI) manages twenty terrestrial sites and there was very limited information on plant diversity within these areas. One of the goals of this project was to create plant lists for select national park sites, in order to guide better conservation management and provide more information for interpretation of national park sites.



Figure 2. Location map of the British Virgin Islands and existing national parks

The NPTVI is a member of the BVI Government National GIS (Geographic Information Systems) and is responsible for maintaining data layers relevant to the environment. There was not an existing digital vegetation base map available for use, other than a satellite based GIS vegetation layer of the BVI completed by the University of Colorado in 2000, which was never groundtruthed. This project sought to groundtruth this existing map to evaluate its level of accuracy so that it could be used with confidence as a base map in the National GIS, which is a major source of information in the development planning process, of which NPTVI participates as a committee member of the Pre-Planning committee under the Town and Country Planning Department.

This project sought to address the theme ‘Habitat or species conservation, management and sustainable use for terrestrial and marine environments’, in addition to ‘Projects that help to take forward work in priority areas identified through environmental mainstreaming’.

These challenges are very important to address as the British Virgin Islands are a small island developing state with great development pressure and limited land area on steep slopes that are relatively undisturbed at present. The timing of this project is critical as there are increasing numbers of large scale development applications being submitted to the Town and Country Planning Department in areas that have been previously undisturbed and before the landscape of these sites is altered it is essential to know what plant species exist and the quality of the vegetation habitat, so that recommendations can be put in place to reduce the amount of biodiversity loss and habitat destruction. These challenges are relevant to all stakeholders, from the conservation managers such as NPTVI and Kew who conduct the research and document the biodiversity, to private landowners whose land might contain plant species of interest, some of which might be critically endangered, and to Government Departments who must manage land use and who require more information on the natural habitats and their relative value ecologically in order to make informed decisions on whether development applications should be approved.

2 Project Achievements

2.1 Outcome

This project did achieve its expected outcome, as there is now improved baseline data for the future creation of a decision support tool using GIS as the main platform. Extensive field work was conducted with the project team of NPTVI and Kew visiting almost every island in the BVI in order to acquire GPS data that could be incorporated into the National GIS and update the vegetation base map, whilst creating a new threatened plant species GIS layer and making collections at all of these sites visited. The island of Anegada was not included in this vegetation mapping survey as a previous Darwin funded project 162/12/023 (2003 – 2006) previously focused on creating a vegetation map of Anegada using GIS.

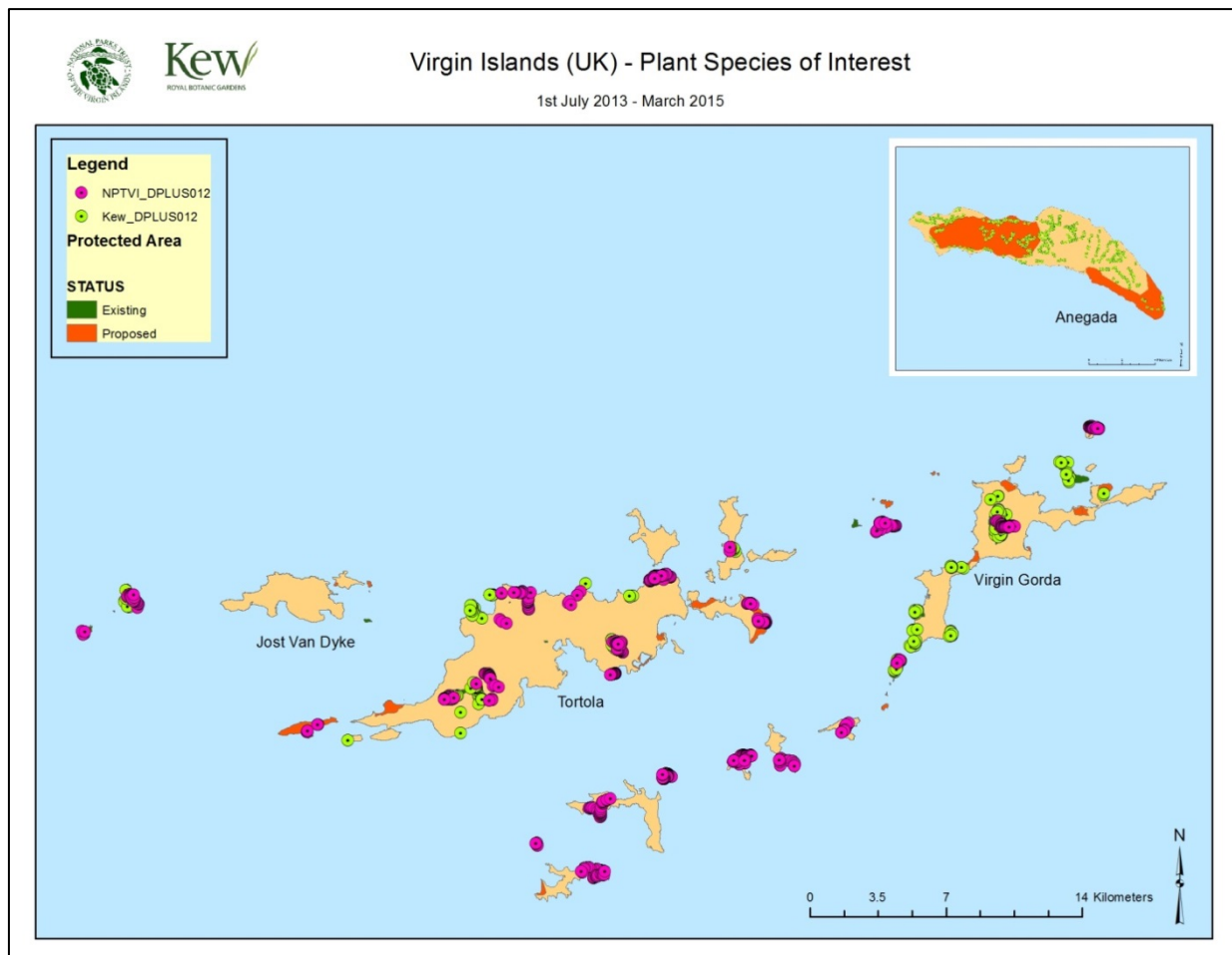


Figure 3. GIS map displaying the location of all GPS points collected of plant species of interest during the project by NPTVI and Kew

The revision of the Protected Areas System Plan is still ongoing as there were so many new botanical findings realized through this project across the Territory that more research on key areas is required to narrow down the sites that should be proposed protected areas and which could remain privately owned, but with recommendations for development restrictions. NPTVI and Kew will continue to survey the likely habitats where threatened plant species may be found and then develop a GIS map with proposed boundaries of new sites for protection that can then be discussed with stakeholders within the Government, private landowners and the wider community.

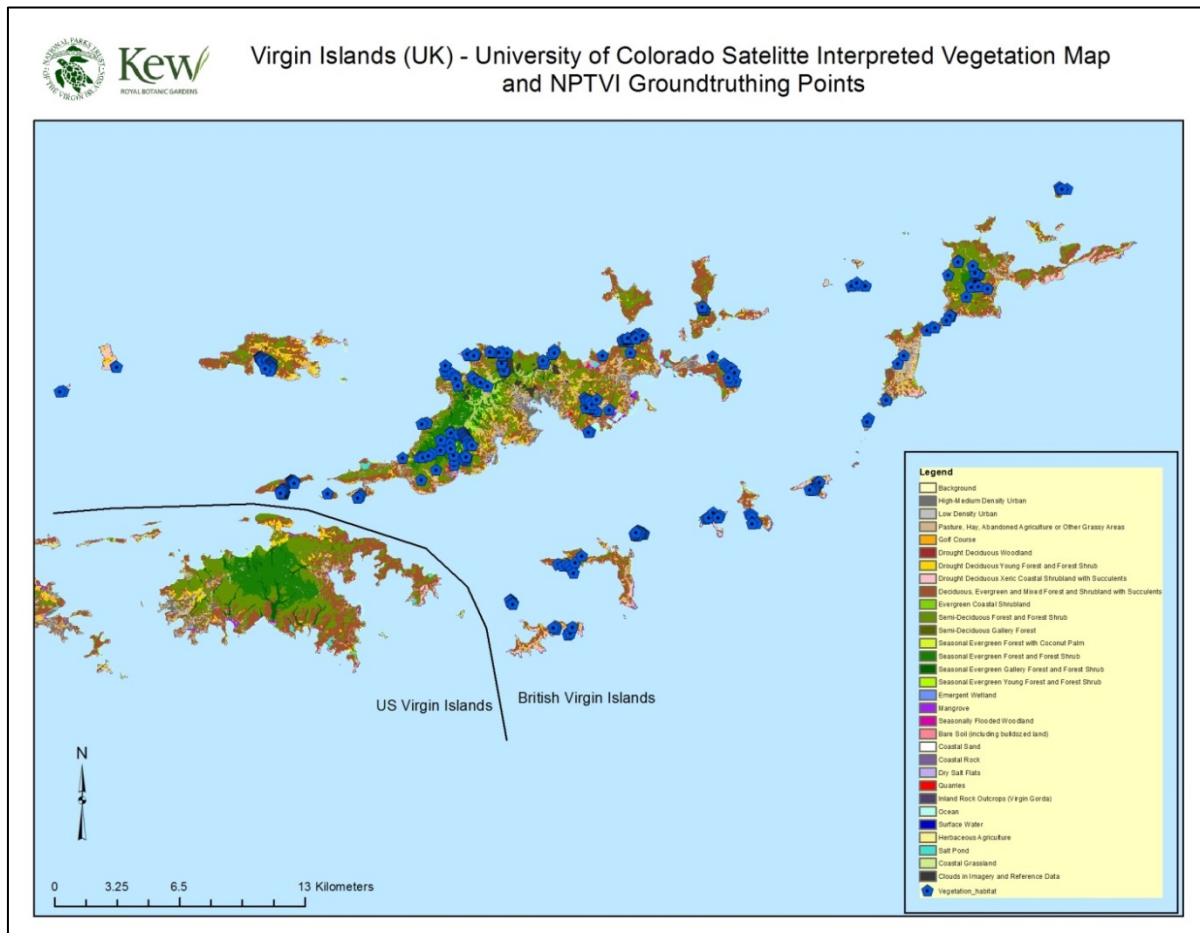


Figure 4. GIS map displaying the vegetation habitat groundtruthing points

There was great interest from the wider community and within the Government on the botanical findings, which raised the public profile of this Darwin Plus project and stressed the need for ongoing research and collaboration with private landowners on land management, as some of the areas with the highest amount of threatened species were on private lands. The NPTVI engaged the Ministry of Natural Resources and Labour (MNRL), Conservation and Fisheries Department (CFD), Town and Country Planning Department (TCP), Agriculture Department and Disaster Management Department (DDM) in order to identify the best approach to protect these sites under the various legislations available at present.

MNRL is in the process of updating the Draft Natural Resources and Climate Change Bill, which is a revision of the Draft Environmental Management and Conservation of Biodiversity Bill 2008. NPTVI has been able to participate in this process in order to ensure that the protection of plant species on public and private lands is included, using case studies of lands visited during this Darwin Plus project. This higher level legislative review will definitely assist with and deliver long term strategic outcomes for the natural environment of the BVI as the importance of integrated land management has been high on the agenda throughout the meetings and these important botanical findings were able to receive the level of recognition required to spur action.

This Darwin Plus project has delivered value for money as there is now a GIS layer of vegetation habitats and threatened species that will be shared with the entire BVI Government National GIS, which is comprised of 15 Government Departments, as a tool for integrated land management. Field work was scheduled to coincide with the schedules of the NPTVI Marine Programme in order to gain access to the offshore islands and cays using the NPTVI vessels and not incur addition transportation costs. Three Trimble Juno GPS units were purchased under this project and these have been utilized on every field visit and 4 staff members have been trained in using ArcPad software to input the GPS data. These GPS units will continue to play a critical role in capturing and storing field data beyond the project's lifetime.

2.2 Outputs

The field research was successful in producing a report on the phenology of 21 key threatened plant species, which exceeded the proposed project target of 15 threatened species. This information was previously unknown so a major change is that the NPTVI staff can now target seed collection activities to the correct time of year, saving valuable time and staff resources and result in more seed collections of threatened plant species. Further monitoring of these key species is required as more observations are needed to ensure that the phenological report is an accurate portrayal of the flowering and fruiting behavior and was not the result of climatic conditions in specific time periods. (See Appendix I - Phenology report)

Collections were made of herbarium voucher specimens and live collections. The proposed project target of 200 herbarium voucher specimens was exceeded as a total of 435 were collected, of which 225 are still pending assessment at Kew with the remaining 210 vouchers being processed and incorporated into the Kew collections. This activity represents a change as many of these species had not been collected as herbarium specimens from the BVI previously and are currently being stored at Kew until such time in the near future when a small herbarium can be established at the JR O'Neal Botanic Gardens, and duplicates can be repatriated to the BVI for NPTVI staff and the wider public to use as a reference collection.

The proposed project target of 100 living collections was exceeded with 110 new accessions into the Joseph Reynold O'Neal Botanic Gardens, which also resulted in the further development of a new threatened plant species collection created at the Botanic Gardens, featuring Virgin Island and Puerto Rico Bank endemics such as *Croton fishlockii*, *Malpighia woodburyana*, *Eugenia sessiliflora*, *Bastardiopsis eggersii* and *Varronia rupicola*.

(See Appendix II - Collections report)



Figure 5. Martin Hamilton, Kew presents the new conservation collection at the JR O'Neal Botanic gardens to Governor Boyd McCleary and members of the press and public at Arbour Day 2014

Flora inventories were conducted at eleven national parks, including Great Tobago, Gorda Peak, Copper Mine, Fallen Jerusalem, The Baths, Devil's Bay, Spring Bay, Little Fort, Prickly Pear, Shark Bay, Tortola and Cam Bay, Great Camanoe. This represents new information for NPTVI which will inform conservation management at these sites, in terms of the positioning of visitor trails, content for interpretation materials and long term park planning. No comprehensive flora inventories had been conducted within these specific national park sites prior to this Darwin plus project. (See Appendix III - Flora inventories)

Kew's species and specimens database was updated using the information collected during field activities, representing new botanical information that will be made freely available to a global audience as a direct result of this Darwin Plus project. Students, researchers and interested members of the public will now have access to herbarium voucher specimens specifically of BVI species.

The complete development of a draft management plan for forest ecosystems was not possible, but key actions in the management planning process were taken, such as an analysis of stresses and threats to forest habitats based upon stakeholder input. Stakeholders were engaged in ecosystem-based management planning exercises for forest ecosystems, but the project team realized through this process that there is much more information needed to inform a forestry management plan and that expertise did not reside within the NPTVI or Kew partners and will require engagement with new partners in the adjacent US Virgin Islands and Puerto Rico, who have recently undergone a similar forest inventory and monitoring system through the International Institute of Tropical Forestry, which has a satellite office in Puerto Rico. Contact was made with the foresters responsible for this work and future collaboration is anticipated as the forest resources in the BVI are an important part of the entire Puerto Rico Bank ecosystem and are currently an unknown entity to our US partners. During this Darwin Plus project NPTVI staff visited botanist Gary Ray in the US Virgin Islands in February 2015 to begin this cross territory engagement. Whilst the new Darwin Plus project DPLUS 030, "Building systems and capacity to monitor and conserve BVI's flora" creates partnerships with Puerto Rico colleagues who are skilled in botany and forestry.

See the following appendices:

Appendix IV – Minutes of project meeting

Appendix V – Minutes of management planning meeting

Appendix VI – Forest ecosystems threats and stresses ranking

2.3 Sustainability and Legacy

All of the project achievements will endure and continue to be developed, either as part of the NPTVI recurrent work activities or as outputs of the new Darwin Plus project (DPLUS 030). This project will further strengthen the NPTVI's capacity to monitor and conserve threatened plant species as regional and international partnerships are developed between the NPTVI, Kew and new project partners in Puerto Rico. This represents a greater focus on understanding more about the global significance of Puerto Rico Bank threatened species within the BVI in the context of species recovery planning.

NPTVI hired a new member of staff in 2014, Ms. Natasha Harrigan who is a BVI islander and she is being trained at the JR O'Neal Botanic Gardens, in the field, at Kew and in Puerto Rico to undertake conservation activities such as collecting herbarium vouchers, live collections, propagating new material and managing a herbarium collection. The phenology studies will also continue as reported above in # 2.2.

A threatened species conservation strategy will be developed during the new Darwin Plus project (DPLUS 030) for local implementation through dedicated guidelines detailing the data collection protocol, propagation material collection protocol, nursery production protocol and monitoring protocol for health of wild plants and *ex-situ* collections. The protocols will be developed jointly between Kew and NPTVI staff to ensure successful implementation.

The Trimble GPS units that were purchased through this Darwin Plus project will continue to be an integral part of data collection in the field, in order to further enhance the GIS layer that can be used within NPTVI and shared with the BVI Government National GIS committee.

3 Project Stakeholders

This Darwin Plus project received full support from Government partners who were engaged in the activities, as described in #2.1. There was great interest in the botanical findings, particularly with the parallel process to update the national environmental legislation within the BVI Government. The NPTVI was able to update Government and public stakeholders as the project progressed on the key locations of threatened species and the relevant issues of access to species on private property when monitoring and the proposed conservation strategy for these species.

Private landowners were engaged by NPTVI and Kew wherever possible in the field when conducting vegetation surveys, this led to access granted to private lands, shared information on potential species of interest and greater understanding of the project and its goals.

4 Lessons learned

The project design was well thought out and could be implemented in phases as planned, with the expected outputs clearly understood by NPTVI and Kew. As NPTVI and Kew have had a long standing relationship, there was a familiarity amongst project partners and with the BVI landscape which enabled easy communication of findings, and recommendations for potential new sites for threatened species as Kew has been coming to the BVI for over 15 years.

NPTVI realised at the onset that a time commitment of weekly field visits would be required throughout the project duration to ensure that the entire Territory could be surveyed, with focused site visits to specific sites when the Kew team were in country. This resulted in over 90% of islands in the BVI being groundtruthed, revealing new species distribution information and botanical findings.

Online social media was a great resource for identification of species in the field as almost real time assistance was being received by NPTVI from partners at Kew and other botanists regionally as photos of unknown species were uploaded to Facebook. In addition to this NPTVI would upload photos of plants gathered during field visits to Dropbox and share these albums with Kew partners to aid in species identification. These methods worked very well and assisted the NPTVI team enormously in pursuing more field visits and confirming threatened species in new locations.

NPTVI used these digital images to create a photo album of threatened species in a simple pdf file that could be printed in-house at the NPTVI office and used in the field by the NPTVI staff. This was a much more practical way of enabling NPTVI staff to identify plant species, in comparison to trying to key out species using heavy botanical books.

The project timeframe was realistic, but the onset of management planning was delayed to enable more field work to continue as so many new discoveries were being made.

The transfer of project funds from NPTVI as the lead partner to Kew as the project partner did have its own set of issues as sending wire transfers internationally are costly and sometimes resulted in the wires being returned to NPTVI, due to strict bank regulations. Whilst this did not lead to any change in scheduling of field visits, this meant that Kew had to bear the brunt of travel costs upfront and then be reimbursed when the project funds finally came through. It took a long time to finally get the Year 1 project funds sent to Kew due to these banking issues and resulted in delays in NPTVI submitting the Year 2 claim also.

Purchasing the GPS units was also a lengthy process as payment to the Trimble dealer in Jamaica was by wire transfer and this took several months to complete due to banking regulations, resulting in the NPTVI being unable to collect any GPS data in the first few months of the project and a reliance on Kew's GPS point collection.

The exchange rate between US dollars and UK sterling could have resulted in a significant loss of project funds, in order to prevent this NPTVI established a UK sterling account to facilitate payments to Kew.

4.1 Monitoring and evaluation

There were no major changes in project design. There was no internal or external evaluation conducted and this is not planned to take place.

4.2 Actions taken in response to annual report reviews

The NPTVI received good reviews from its 2014 annual report, which was shared with partners at Kew and reinforced the field team's enthusiasm to continue its weekly field visits and further expand our botanical knowledge of the BVI.

No response was required from the annual report but evidence of the Darwin logo was requested in the next annual report. This has been addressed and is reported in # 5 and in the supplemental project documents in the appendix.

5 Darwin Identity

The Darwin identity of the project was well publicized with all media and online posts referring to the project as the 'Darwin funded project'. Published media included newspaper articles, and an article in the BVI Welcome tourist magazine. Online publicity included regular photo albums of field visits posted onto the NPTVI's social media Facebook site. Kew maintained a regular Twitter feed, which has been summarized in Storify.

NPTVI gave a presentation of the project findings at its annual Arbour Day celebration in November 2014. Martin Hamilton, Kew gave a presentation on this Darwin Plus project at Kew's Brown Bag Series on 23rd March 2015.

In July 2015 NPTVI and Kew will be presenting a poster on this Darwin plus project at the UK Overseas Territories Conservation Forum (UKOTCF) meeting in Gibraltar.

See the following appendices:

Appendix VII – Kew Twitter posts in Storify

Appendix VIII – NPTVI Facebook posts in Storify

Appendix IX – Kew's Brown Bag Science Seminar presentation

Appendix X – NPTVI Arbour day presentation

Appendix XI – BVI Welcome magazine article

Appendix XII – BVI Beacon newspaper articles

6 Finance and administration

6.1 Project expenditure

Project spend (indicative) since last annual report	2014/15 Grant (£)	2014/15 Total actual Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs				
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items				
Others				
TOTAL				

Staff employed (Name and position)-Please write their position; last time we included everyone's name	Cost (£)
Natasha Harrigan	
Keith Grant	
Denville Hodge	
Ronald Massicott	
Marcus Maturine	
Ganshoun Harry	
Ronnie Thomas	
Bienvenido Friday	
Nancy Pascoe	
TOTAL	

Consultancy – description of breakdown of costs	Other items – cost (£)
Kew staff costs – Martin Hamilton, Sara Barrios	
TOTAL	

Capital items – description	Capital items – cost (£)
TOTAL	

Other items – description	Other items – cost (£)

NPTVI boat time with NPTVI marine staff to facilitate offshore island visits – NPTVI provided match funding for this in-kind.	
TOTAL	

6.2 Additional funds or in-kind contributions secured

Source of funding for project lifetime	Total (£)
NPTVI match funding for staffing	
RBG Kew match funding for staffing	
Bentham-Moxon (supporting field work) – Kew (secure and unsecure funding)	
NPTVI match funding for boat costs with marine staff	
TOTAL	

Source of funding for additional work after project lifetime	Total (£)
TOTAL	

6.3 Value for Money

This Darwin Plus project realized value for money as Kew field visits were long (on average 2.5 weeks long) and focused on field work, rather than more frequent and brief visits. This saved on international travel costs. In the interim period NPTVI conducted weekly field visits and accessed Kew's expertise remotely, as described in # 4.

Kew negotiated reduced rate accommodation at Nanny Cay Resort in the BVI due to the long duration of stay and the frequency of repeat visits. These were also self-catering units which enabled the Kew team to purchase food at a grocery store and cook themselves, rather than dining out, which is very expensive in the BVI.

The NPTVI marine programme vessel was utilized to access the offshore islands and cays, as described in # 2.1. This reduced the use of ferry travel costs, and in cases where the island had no ferry access this prevented the rental of a vessel to gain access.

Annex 1 Standard Measures

Code	Description	Totals (plus additional detail as required)
Training Measures		
1	Number of (i) students from the UKOTs; and (ii) other students to receive training (including PhD, masters and other training and receiving a qualification or certificate)	
2	Number of (i) people in UKOTs; and (ii) other people receiving other forms of long-term (>1yr) training not leading to formal qualification	7 people – NPTVI staff
3a	Number of (i) people in UKOTs; and (ii) other people receiving other forms of short-term education/training (i.e. not categories 1-5 above)	
3b	Number of training weeks (i) in UKOTs; (ii) outside UKOTs not leading to formal qualification	7.5 weeks
4	Number of types of training materials produced. Were these materials made available for use by UKOTs?	
5	Number of UKOT citizens who have increased capacity to manage natural resources as a result of the project	
Research Measures		
6	Number of species/habitat management plans/strategies (or action plans) produced for/by Governments, public authorities or other implementing agencies in the UKOTs	
7	Number of formal documents produced to assist work in UKOTs related to species identification, classification and recording.	3 reports: phenology, collections and threatened plants
8a	Number of papers published or accepted for publication in peer reviewed journals written by (i) UKOT authors; and (ii) other authors	
8b	Number of papers published or accepted for publication elsewhere written by (i) UKOT authors; and (ii) other authors	
9b	Number of computer-based databases enhanced (containing species/genetic information). Were these databases made available for use by UKOTs?	1 – Kew's Brahm's database 1 – BVI National GIS database The Kew database will be available for use by UKOTs online
9a	Number of species reference collections established. Were these collections handed over to UKOTs?	
9b	Number of species reference collections enhanced. Were these collections handed over	200 herbarium specimen vouchers 110 living collections accessioned

Code	Description	Totals (plus additional detail as required)
	to UKOTs?	into the JR O'Neal Botanic Gardens
Dissemination Measures		
14a	Number of conferences/seminars/workshops/stakeholder meetings organised to present/disseminate findings from UKOT's Darwin project work	
14b	Number of conferences/seminars/workshops/stakeholder meetings attended at which findings from the Darwin Plus project work will be presented/ disseminated	2 – NPVI Arbour Day ceremony and Kew Brown Bag Series 1 – poster will be shared at the UKOTCF conference in Gibraltar, July 2015
Physical Measures		
20	Estimated value (£s) of physical assets handed over to UKOT(s)	3 – Trimble GPS units and ArcPad software £4,102
21	Number of permanent educational/training/research facilities or organisation established in UKOTs	1 – Botanical centre was created at the JR O'Neal Botanic Gardens by NPTVI to enable the project activities to have a dedicated space.
22	Number of permanent field plots established in UKOTs	
23	Value of resources raised from other sources (e.g., in addition to Darwin funding) for project work	

Annex 2 Publications

Type * (e.g. journals, manual, CDs)	Detail (title, author, year)	Nationality of lead author	Nationality of institution of lead author	Gender of lead author	Publishers (name, city)	Available from (e.g. contact address, website)
n/a						

Annex 3 Darwin Contacts

Ref No	DPLUS 012
Project Title	Conserving plant diversity and establishing ecosystem based approaches to the management of forest ecosystems in the British Virgin Islands
Project Leader Details	
Name	Lynda Varlack
Role within Darwin Project	Director (Ag.) National Parks Trust of the Virgin Islands
Address	
Phone	
Fax/Skype	
Email	
Partner 1	
Name	Martin Hamilton
Organisation	Royal Botanic Gardens, Kew
Role within Darwin Project	UKOTs Programme Coordinator
Address	
Fax/Skype	
Email	
Partner 2 etc.	
Name	
Organisation	
Role within Darwin Project	
Address	
Fax/Skype	
Email	