Darwin Plus:

Overseas Territories Environment and Climate Fund

Annual Report

It is expected that this report will be a **max** of 20 pages in length, excluding annexes.

Submission Deadline: **30th April 2020**.

1. Darwin Plus Project Information

Project reference	DPLUS084
Project title	Identifying and conserving resilient habitats in the British Virgin Islands
Territory(ies)	British Virgin Islands (BVI)
Lead organisation	Royal Botanic Gardens, Kew
Partner institutions	National Parks Trust of the Virgin Islands (NPTVI), Fort Worth Zoo (FWZ)
Grant value	£275,258
Start/end dates of project	1st April 2019 – 31st March 2022
Reporting period (e.g. Apr 2019-Mar 2020) and number (e.g. Annual Report 1, 2)	April 2019 – March 2020, Annual Report 1
Project Leader name	Dr Martin Hamilton
Project website/blog/social media	Twitter: @KewUKOTs, #DPLUS084 Moment kew.org: https://www.kew.org/science/our-science/projects/resilient-habitats-bvis ResearchGate: https://www.researchgate.net/project/Identifying-and-conserving-resilient-habitats-in-the-British-Virgin-Islands-DPLUS084
Report author(s) and date	M.A. Hamilton, K. Bradley, N. Pascoe and T.M. Heller 29 April 2020

Please note - Annex 3: Supplementary Materials and References provides a list of files making up the references, supplementary materials and pieces of evidence referred to in the report. These materials are available online for ease of access and to limit the file size of this report.

2. Project summary

Through field survey and mapping, the project will improve understanding of the status of the British Virgin Islands (BVI)'s forests and the globally threatened plant and animal species and ecosystem services they support. International partnerships will deliver up-to-date biodiversity information and resources, *ex-situ* collections of globally threatened plant species and strengthened local capacity key to habitat recovery and mitigation of natural disasters. This will enable management that encourages future resilience and BVI partners will be empowered to secure biodiversity into the future.

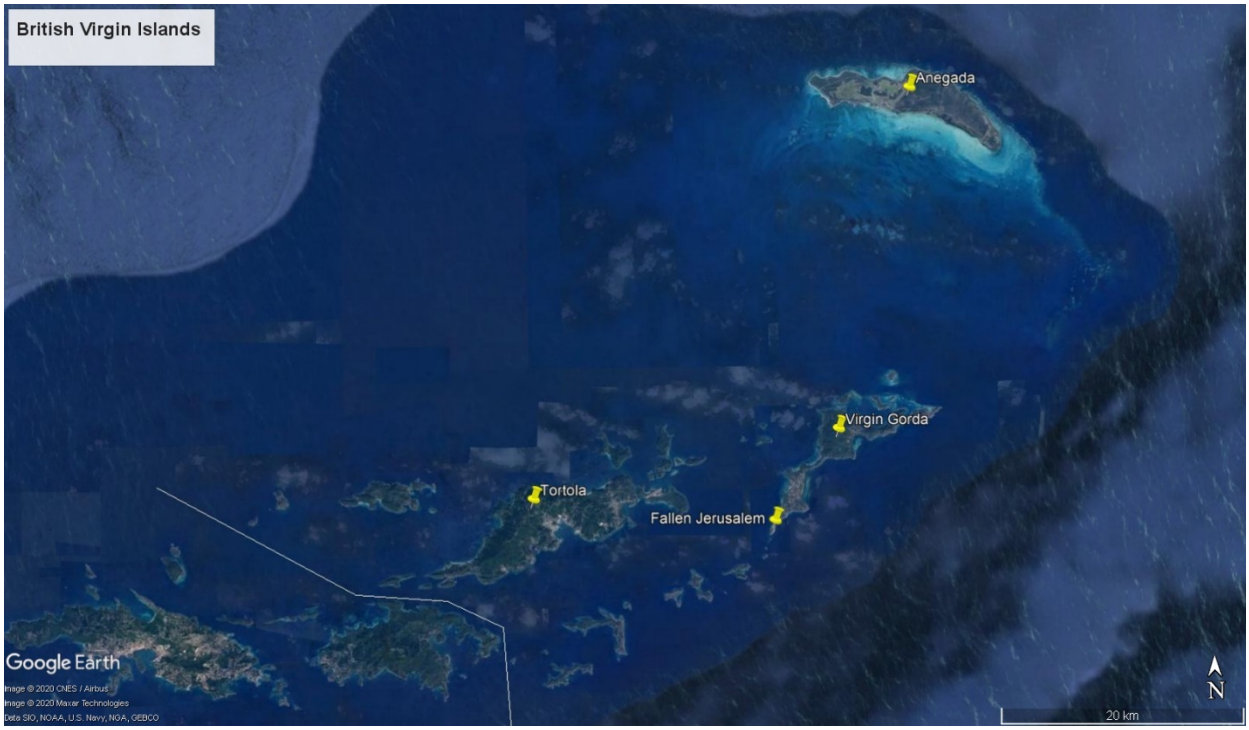

Figure 1: Map of the British Virgin Islands, with the four islands targeted by the project labelled.

3. Project stakeholders/partners

NPTVI has a long history of project collaboration with both Kew and FWZ, so uniting in this project is cost effective and time efficient in terms of joining fieldwork missions. It builds upon existing strengths within each partner organisation during training in flora and fauna identification and survey techniques.

The three project partners (Kew, NPTVI, FWZ) are represented on the project Steering Group, co-chaired by Dr Colin Clubbe (Head of Conservation Science, Kew) and Dr Cassander Titley O'Neal (Director, NPTVI, since October 2019), providing a regular forum for engagement in project planning, monitoring and evaluation and decision making.

Meeting minutes are available in reports by Dani Sanchez and Hamilton (2019), Heller, Woodfield-Pascoe and Hamilton (2019) and Dani Sanchez *et al.* (2020, n. App. 3).

All project partners are integral members of fieldwork teams, with five members of NPTVI personnel (Natasha Harrigan, Keith Grant, Nancy Woodfield-Pascoe, Michael Young and Creightanya Brewley (NPTVI intern)) having participated in fieldwork in BVI and/or fieldwork training in USVI. NPTVI staff are the focus of capacity building as part of the project, with training having been delivered in the field for four NPTVI staff members across four target islands (Anegada, Fallen Jerusalem, Tortola and Virgin Gorda) and in the nursery at the J.R. O'Neal Botanic Garden (JRONBG) on Tortola. Fieldwork reports demonstrating project team involvement and providing evidence of training by Hamilton, Bradley and Heller (2019), Heller (2020) and Dani Sanchez *et al.* (2020) are available on ResearchGate, see also DPLUS084_M&E_Workbook_Training_AR1.pdf listed under Annex 3: Supplementary Materials and References.

4. Project progress

4.1 Progress in carrying out project Activities

Output 1: Detailed census of globally threatened species (five plants and 2 animals) and population ecology profiled

Activity 1.1 Fieldwork to survey globally threatened species.

Please note that the standard IUCN threatened category abbreviations (IUCN, 2012, p. 5) are used throughout this report: EXTINCT (EX), EXTINCT IN THE WILD (EW), CRITICALLY ENDANGERED (CR), ENDANGERED (EN), VULNERABLE (VU), NEAR THREATENED (NT), LEAST CONCERN (LC), DATA DEFICIENT (DD), NOT EVALUATED (NE).

Joint fieldwork was undertaken in April 2019, June 2019 and January-February 2020, as planned. Surveys in forest habitat critical for globally threatened flora and fauna were undertaken on four islands (Anegada, Fallen Jerusalem, Tortola, Virgin Gorda), including several national parks and Tropical Important Plant Areas (TIPAs). Surveys for exemplar species included the five target tree species: *Myrcia neokiaerskovii* (syn = *Calyptranthes kiaerskovii*) (CR), *Myrcia neothomasiana* (syn = *C. thomasiana*) (EN), *Vachellia anegadensis* (EN), *Varronia rupicola* (EN), *Zanthoxylum thomasianum* (EN); and two animal species: *Cyclura pinguis* (CR), *Spondylurus anegadeae* (CR). During field survey the team continued to make new records for other globally threatened and native species of flora (e.g. *Maytenus cymosa, Croton fishlockii*) and fauna (e.g. *Ameiva exsul, Anolis cristatellus wileyae, Borikenophis portoricensis*). Fieldwork reports providing evidence of surveys by Hamilton, Barrios and Dani Sanchez (2019, p. 28), Hamilton, Bradley and Heller (2019, p. 24) and Dani Sanchez *et al.* (2020, pp. 44–71) are available on ResearchGate.

As well as mapped occurrence data for target species derived through direct observation, the project team is using several monitoring techniques for exemplar species of flora and fauna. This includes deploying: camera traps on Anegada, Fallen Jerusalem, Tortola and Virgin Gorda, see Dani Sanchez *et al.* (2020, p. 52); ink tracking tunnels on Anegada and Fallen Jerusalem, see Hamilton, Bradley and Heller (2019, pp. 29–31) and Dani Sanchez *et al.* (2020, p. 59); and artificial retreats (pipes for fauna to use) on Anegada, see Dani Sanchez *et al.* (2020, p. 59).

Activity 1.2 Genetic analysis of *Z. thomasianum* populations.

The known subpopulations of *Z. thomasianum* in the BVI on Tortola and Virgin Gorda have been sampled as leaf tissue dried in silica gel during fieldwork in Year 1. These samples will form the basis of the population genetic analysis under this activity, scheduled to take place in Year 2 of the project. In addition to BVI samples, funding was secured to undertake fieldwork to sample populations of the species in the US Virgin Islands (Thomas M Heller, 2020) funded by the Bentham Moxon Trust and Puerto Rico (Hamilton, Bárrios and Heller, 2020) funded by the US Fish and Wildlife Service (USFWS). The samples collected through this work await export to the UK as they require special permits from USFWS. The permit application will be prepared early in Year 2 as it can only be submitted once the quantities/types of material to be exported are known. Kew have recently secured permits for other species from USFWS and this process is not expected to be an obstacle. Also, herbarium collections at Kew, New York Botanical Gardens and the Smithsonian Institution have been consulted and leaf samples taken for phylogenomic analysis of *Zanthoxylum* in the Caribbean to better understand *Z. thomasianum* evolution and taxonomic relationships in the region.

Evidence of population-level samples collected is presented in the collections tables appended to fieldwork reports from the BVI (Hamilton, Barrios and Dani Sanchez, 2019, n. App. 2; Hamilton, Bradley and Heller, 2019, n. App. 2), USVI (Thomas M Heller, 2020, n. App. 1) and Puerto Rico (Hamilton, Bárrios and Heller, 2020, n. App. 2).

Evidence of herbarium specimen sampling is presented in Heller (2020, p. 17) for activities at the New York Botanical Gardens, and Dani Sanchez *et al.* (2020, p. 31) for the Smithsonian Institution.

Activity 1.3 Produce GIS occurrence layers for globally threatened species.

During the first year of the project those data available from previous work (e.g. Kew and NPTVI data held in Kew's UKOTs Species and Specimens Database, FWZ data held in Kelly Bradley GPS unit) and those data collected during fieldwork in April 2019, June 2019 and January-February 2020 were compiled into a project GIS. This comprises >10,000 plant occurrence records, including 2,030 collected during Year 1 of the current project. Faunal observation data comprises 60 field records of reptiles and amphibians, mostly collected in the past year. A body of data held by Kelly Bradley (FWZ) will be added to the project GIS in Year 2 of the project, as further work is necessary to process those data before incorporating. Evidence is presented in Appendix 5 of the January-February 2020 fieldwork report (Dani Sanchez *et al.*, 2020) available on ResearchGate.

Output 2: Habitat requirements of globally threatened species (five plants and 2 animals) characterised

Activity 2.1 Establish experimental design for vegetation survey plots.

The Rapid Botanical Survey (RBS) methodology developed by researchers at Oxford University (Hawthorne and Marshall, 2016) has been adopted, with modifications, for the vegetation survey plots undertaken during Year 1 of this project. The approach was trialled during collaborative fieldwork in December 2019 in the US Virgin Islands (Thomas M Heller, 2020, p. 28) and early 2020 on Virgin Gorda (Dani Sanchez *et al.*, 2020, p. 66), the project team also developed a methodology for undertaking surveys of fauna in the RBS plots, referred to as a Rapid Fauna Survey (RFS). Details of the project's methodology is available in Appendix 4 of the January-February 2020 fieldwork report (Dani Sanchez *et al.*, 2020) available on ResearchGate.

Activity 2.2 Field work to gather vegetation and habitat data.

Habitat and vegetation data were collected during collaborative fieldwork on Anegada, Virgin Gorda, Fallen Jerusalem and Tortola in April 2019, June 2019 and Jan-Feb 2020, with the plot-based methodology deployed in full during the latter fieldwork. Evidence is presented in the April 2019 (Hamilton, Barrios and Dani Sanchez, 2019, p. 28), June 2019 (Hamilton, Bradley and Heller, 2019, p. 24) and January-February 2020 (Dani Sanchez *et al.*, 2020, p. 44) fieldwork reports available on ResearchGate.

Activity 2.3 Consult archives, historical records for land use history and maps

The National Archives in Kew, UK, were consulted for historic land use maps, with several reports and maps of interest gathered for the project. Those of greatest interest are a 1798 plan of Tortola with plantations and their principle crops marked; a 1898 map of Tortola indicating locations of sugar cane estates; an 1899 report by travelling Superintendent for the Imperial Department of Agriculture for West Indies regarding suitability of sites on Tortola for agriculture, including brief descriptions of sites and soils plus comments on deforestation at higher elevations. A summary report of the documents found has been uploaded to ResearchGate (Thomas M. Heller, 2020).

Activity 2.4 Produce GIS layers of forest plot data and forest habitat critical for globally threatened flora and fauna

Forest plot data have been added to the project database. Statistical analyses of those data will be undertaken as the project progresses. The results will be reported in the final project report and processed layers added to the GIS at the end of the project. Evidence of layers available in the GIS are presented in Appendix 5 of the January-February 2020 (Dani Sanchez *et al.*, 2020) fieldwork report available on ResearchGate.

Output 3: *Ex-situ* collections of five globally threatened plants strengthened to support conservation

Activity 3.1 Collect seed material of five globally threatened plant species from wild populations for *ex-situ* conservation and seed storage behaviour studies.

Seed collections of seven globally threatened plant species were collected from wild populations during Year 1: *Vachellia anegadensis* (EN, collected June 2019), *Maytenus cymosa* (EN,

collected October 2019), *Agave missionum* (VU, collected October 2019), *Argythamnia stahlii* (VU, collected January 2020), *Zanthoxylum flavum* (VU, collected January 2020), *Guaiacum officinale* (EN, collected January 2020) and *Varronia rupicola* (EN, collected Feb 2020). Amongst these were two of the exemplar species, *Vachellia anegadensis* and *Varronia rupicola,* targeted by the project. Collections are held in seed banking facilities at JRONBG on Tortola and, where size of collection allows, duplicated at Kew's Millennium Seed Bank in the UK. Seeds of several species have also been sown in the nursery of the JRONBG. Evidence is presented in the June 2019 (Hamilton, Bradley and Heller, 2019, p. 4) and January-February 2020 (Dani Sanchez *et al.*, 2020, n. Pg. 19, 56; App. 2) fieldwork reports. Further collections will be made from threatened plant species as seed becomes available in wild populations during the project.

Activity 3.2 Undertake seed storage behaviour studies.

Seeds of *Bastardiopsis eggersii* (EN) were collected from plants cultivated at JRONBG, and used for a desiccation tolerance test, following the Millennium Seed Bank Partnership's 100 seed test protocol (Gold and Hay, 2008), adapted to make best use of available facilities. The test is still underway, with germination of seeds dried and stored, and those stored under moist condition still progressing. The results of this test and others to be undertaken will be detailed in future reports. Evidence of the setting up of the test is presented in the January-February 2020 fieldwork report (Dani Sanchez *et al.*, 2020, pp. 37–39). Further seed storage behaviour studies will be carried out for other threatened species as seed becomes available in wild populations during the project, with those exemplar species that have never had seeds banked before being a high priority.

Activity 3.3 Collect plant material from wild populations for vegetative propagation and *ex-situ* conservation.

Cuttings were taken from two *Z. thomasianum* trees impacted by road cut erosion at Leverick Bay, Virgin Gorda and a seedling growing in the middle of a path in Gorda Peak National Park on Virgin Gorda was rescued. These collections were transferred to JRONBG for *ex-situ* conservation. Likewise, vegetative cuttings of *Z. thomasianum* were made from plants at the Hawk's Nest population on Tortola for propagation and *ex-situ* conservation at JRONBG. Evidence is presented in the January-February 2020 fieldwork report (Dani Sanchez *et al.*, 2020, n. Pg. 44; Figs. 42 & 43). Further *ex-situ* collections will be made from threatened plant species in wild populations during the project.

Output 4: Capacity building to enable NPT to manage rare and threatened species

Activity 4.1 Training and Evaluation Plan produced

A Training and Evaluation plan has been produced and agreed by the Steering Group. The plan includes training covering germination experiments (100 seed desiccation tolerance test), survey techniques (vegetation and reptiles), and species identification (plants and reptiles). It is intended that the document will remain in active development over the course of the project to adapt to the needs of partners. The plan, currently version 1.1, is available in Dani Sanchez *et al.* (2020, n. App. 8) on ResearchGate.

Activity 4.2 Training of four NPTVI staff in germination experiments, plot-based quantitative survey techniques, presence/absence survey and species identification delivered by Kew and FWZ specialists.

Training of NPTVI staff in Year 1 was undertaken for the following topics, during fieldwork in BVI and USVI, and sessions at JRONBG:

Germination trials: training in germination trials (working with *Maytenus cymosa* seed) and seed desiccation tolerance (*Bastardiopsis eggersii*) was delivered to NPTVI staff member Natasha Harrigan by Kew specialists in January 2020.

Plant and vegetation survey: presence/absence survey and Rapid Botanical Survey methodology training was provided to three NPTVI personnel (Keith Grant, Natasha Harrigan and Creightanya Brewley) by Kew specialists.

Reptile survey: presence/absence survey training was provided to two NPTVI personnel (Keith Grant, Natasha Harrigan and Michael Young) by FWZ specialist staff.

Plant identification: identification of native and introduced plant species training was provided to three NPTVI personnel (Keith Grant, Natasha Harrigan and Creightanya Brewley) by Kew specialists.

Reptile identification: identification of native and introduced reptile species training was provided to two NPTVI personnel (Keith Grant and Natasha Harrigan) by FWZ specialist staff. A draft guide to the field identification of amphibians and reptiles has been produced by Kelly Bradley (Dani Sanchez *et al.*, 2020, n. App. 6), and will be finalised in Year 2 of the project.

Evidence is presented in fieldwork reports on ResearchGate from BVI June 2019 (Hamilton, Bradley and Heller, 2019), USVI December 2019 (Thomas M Heller, 2020) and BVI January-February 2020 (Dani Sanchez *et al.*, 2020), see also DPLUS084_M&E_Workbook_Training_AR1.pdf listed under Supplementary Materials.

Activity 4.3 Training of four NPTVI staff evaluated by Kew and FWZ specialists and reviewed by Steering Group

Steering Group reviewed training and discussed evaluations during February 2020 meeting (Dani Sanchez *et al.*, 2020, n. App. 3). Based on discussions of training and evaluations, the training plan was updated (Dani Sanchez *et al.*, 2020, n. App. 8). Steering Group reviewed training in April 2020 (Heller and Hamilton, 2020).

Activity 4.4 Produce Final report 'Training and Evaluation' section

Training delivered during the project has been recorded in fieldwork reports and the project M&E Workbook (see DPLUS084_M&E_Workbook_Training_AR1.pdf). These will be our primary sources of information and evidence for the Training and Evaluation of the final report, along with the evaluations carried out under activity 4.3.

Output 5: Monitoring and Evaluation and project reporting

Activity 5.1 Produce Monitoring and Evaluation Plan

A Monitoring and Evaluation Plan was agreed by the project steering group early in the project. The M&E plan outlines the responsibilities of the project team members and the steps being taken to ensure the project is managed adaptively. As with the Training and Evaluation Plan, this document is intended to be continually developed and changes tracked using version control, see (Dani Sanchez *et al.*, 2020).

Activity 5.2 Produce quarterly reports

The project Steering Group has been kept up to date on project progress through comprehensive fieldwork reports, covering activities relating to capacity building, project GIS development, as well as activities undertaken in the field. The Monitoring and Evaluation Implementation Worksheet (see DPLUS084_M&E_Workbook_Implementation_AR1.pdf listed under Supplementary Materials) is updated and circulated in advance of Steering Group meetings held in April 2019 (Heller, Woodfield-Pascoe and Hamilton, 2019), November 2019 (Hamilton, Bradley and Heller, 2019), February 2020 (Dani Sanchez *et al.*, 2020, n. App. 3) and April 2020 (Heller and Hamilton, 2020).

Activity 5.3 Undertake Steering Group meetings and produce minutes

Steering Group meetings have taken place to plan and review project progress during the first year of the project, with an inaugural meeting held in BVI in April 2019 (Hamilton, Barrios and Dani Sanchez, 2019, p. 18; Heller, Woodfield-Pascoe and Hamilton, 2019), followed by meetings in November 2019 via Skype (Heller, Woodfield-Pascoe and Hamilton, 2019), and January 2020 in BVI (Dani Sanchez *et al.*, 2020). A year-end meeting, delayed due to Covid-19, was held via Skype in April 2020 (Heller and Hamilton, 2020).

Activity 5.4 Produce final report

The project activities recorded in the M&E Workbook (see DPLUS084_M&E_Workbook_Implementation_AR1.pdf under Supplementary Materials), fieldwork and other reports, and Steering Group minutes described in 5.1 – 5.3, above, will be integral to producing the final project report to demonstrate the degree of success in achieving the desired Outcome.

4.2 Progress towards project Outputs

Output 1: Detailed census of globally threatened species (five plants and 2 animals) and population ecology profiled

At the beginning of the project, existing GIS data from past fieldwork was available for BVI's threatened plant species, but with significant gaps in coverage (areas without survey), and very variable in level of detail, particularly with respect to population ecology. Regarding threatened reptiles, long term data has been gathered for *Cyclura pinguis*, but a need for collating and making this available in a single GIS was identified, while no dedicated surveying for *Spondylurus anegadae* has been carried out. *Cyclura pinguis* was last assessed for the IUCN Red List in 1996 (Critically Endangered) and *Spondylurus anegadae* in 2016 (Critically Endangered, possibly Extinct).

Progress towards this output:

- 1.1 Data from four islands has been collected during fieldwork in June 2019 and Jan-Feb 2020 and collated in GIS. This includes data from sites that had not been previously surveyed, as well as more detailed census data from known populations of threatened species. Summary of data added to the project GIS is given in Appendix 5 of Dani Sanchez *et al.* (2020).
- 1.2 Leaf tissue samples and associated ecological data has been collected from across the range of *Zanthoxylum thomasianum* with US territory material to be imported to UK. This will enable the population structure and ecology of this species to be profiled. Evidence of collections is presented in the tables of samples collected appended to fieldwork reports from the BVI (Hamilton, Barrios and Dani Sanchez, 2019, n. App. 2; Hamilton, Bradley and Heller, 2019, n. App. 2), USVI (Thomas M Heller, 2020, n. App. 1) and Puerto Rico (Hamilton, Bárrios and Heller, 2020, n. App. 2). Also, leaf tissue samples have been made from herbarium collections (at Kew, New York Botanical Gardens and the Smithsonian Institution) of other species of *Zanthoxylum* species from across the Caribbean, with a focus on the closest relatives of *Z. thomasianum* in Section *Tobinia*. These will be included in phylogeographic studies of this taxonomically complex group. Evidence of herbarium specimen sampling is presented in Heller (2020, p. 17) for activities at the New York Botanical Gardens, and Dani Sanchez *et al.* (2020, p. 31) for the Smithsonian Institution.
- 1.3 Data collected for the project so far has been cleaned and collated in preparation for generating the final GIS occurrence layers to be uploaded to the BVI National GIS. Summary of data added to the project GIS is given in Appendix 5 of Dani Sanchez *et al.* (2020). A draft Red List re-assessment of *Cyclura pinguis* has been prepared by FWZ staff and co-authors, and submitted to IUCN based on up-to-date census information from the project (Heller and Hamilton, 2020).

Output 2: Habitat requirements of globally threatened species (five plants and 2 animals) characterised

At the outset of this project, the habitat preferences of threatened species were only very broadly characterised, with no quantitative data on associated species assemblage or vegetation structure or history.

Progress towards this output:

- 2.1 Methodology for gathering plant community-level data has been finalised, and data for two areas of dry forest on Virgin Gorda are in the project database. The methodology is presented in Appendix 4 of Dani Sanchez *et al.* (2020).
- 2.2 Details of historical land use retrieved from archives for Tortola, giving valuable insights into patterns of agriculture in areas now forested. Such level of detail for other islands less available. A report on archival records consulted is presented in Heller (2020).
- 2.3 Data collected for the project so far has been cleaned and collated in preparation for generating the final GIS layers to be uploaded to the BVI National GIS. Summary of data added to the project GIS is given in Appendix 5 of Dani Sanchez *et al.* (2020).

Output 3: *Ex-situ* collections of five globally threatened plants strengthened to support conservation

Though much work has taken place in the BVI to improve *ex-situ* conservation of threatened species, with most of the BVI's globally threatened plant species represented in seed banks (Millennium Seed Bank in the UK, JRONBG in BVI), these are mostly as single accessions, and some species are not represented at all. *Ex-situ* nursery plants grown at JRONBG suffered major losses as a result of Hurricane Irma in 2017, leaving most of the BVI's threatened species not represented in *ex-situ* collections in the conservation nursery or plantings there.

Progress towards this output:

- 3.1 A germination trial for threatened species *Maytenus cymosa*, and a seed desiccation tolerance test for threatened species *Bastardiopsis eggersii* was started in January/February 2020. The results of these with inform protocols for *ex-situ* conservation in the BVI. See Dani Sanchez *et al.* (2020, pp. 37–43) for details.
- 3.2 New *ex-situ* collections of eight globally threatened plant species have been established at JRONBG from wild sources: *Agave missionum* (seeds), *Argythamnia stahlii* (seeds), *Guaiacum officinale* (seeds), *Maytenus cymosa* (seeds), *Vachellia anegadensis* (seeds), *Varronia rupicola* (seeds), *Zanthoxylum flavum* (seeds), *Zanthoxylum thomasianum* (cuttings and rescued seedling). See Hamilton, Bradley and Heller (2019, p. 26) and Dani Sanchez *et al.* (2020, pp. 44–45) for details. Amongst these new *ex-situ* collections were three exemplar species targeted by the project.

Output 4: Capacity building to enable NPTVI to manage rare and threatened species

NPTVI staff have gained good levels of field and horticultural experience in the years leading up to this project, mostly working with a subset of threatened and other native species. However, gaps identified include skills in identifying a broader range of native and non-native species, quantitative vegetation survey techniques and germination testing. No training in reptile identification and census has been delivered previously.

Progress towards this output:

- 4.1 A Training and Evaluation Plan is available to guide the project team in the delivery of this Output, see Appendix 8 of Dani Sanchez *et al.* (2020).
- 4.2 Four NPTVI personnel have gained skills in germination experiments, quantitative survey techniques, presence/absence survey, and species identification. Evidence is provide throughout field reports from BVI (Hamilton, Barrios and Dani Sanchez, 2019; Hamilton, Bradley and Heller, 2019; Dani Sanchez *et al.*, 2020) and USVI (Thomas M Heller, 2020), summarised in DPLUS084_M&E_Workbook_Training_AR1.pdf listed under Supplementary Materials and see reply to 4.3 below.
- 4.3 The project steering group reviewed training of NPTVI staff that was evaluated by Kew and FWZ specialists during the Steering Group meetings held in February 2020, see Appendix 3 in Dani Sanchez *et al.* (2020), and April 2020 (Heller and Hamilton, 2020).
- 4.4 Details of the training delivered to date has been documented in the project M&E Workbook (see DPLUS084_M&E_Workbook_Training_AR1.pdf listed under Supplementary Materials) to be used as evidence for the final Training and Evaluation report.

Output 5: Monitoring and Evaluation and project reporting

A coordinated effort to survey and provide training for flora and fauna did not exist prior to the project. To ensure successful delivery of project goals, effective Monitoring and Evaluation was one of the priorities to implement from the outset of the project.

Progress towards this output:

- 5.1 A Monitoring and Evaluation Plan has been agreed by the project steering group and was updated in February 2020, see Appendix 7 of Dani Sanchez *et al.* (2020).
- 5.2 Reports for fieldwork and minutes of Steering Group meetings were produced and circulated to the Steering Group from April 2019 (Heller, Woodfield-Pascoe and Hamilton, 2019), June 2019 (Hamilton, Bradley and Heller, 2019), November 2019 (Hamilton, Bradley and Heller, 2019) and February 2020 (Dani Sanchez *et al.*, 2020, n. App. 3), and a first half-year report was supplied to Darwin in October 2019. A year-end Steering Group meeting, delayed due to Covid-19, was held via Skype in April 2020 (Heller and Hamilton, 2020).
- 5.3 Steering Group meetings held in April and November 2019, January 2020, and an end-of-year meeting in April 2020. Minutes compiled and circulated to project team, see response above for 5.2 and under 4.1 for Activity 5.3 for list of citations.
- 5.4 Progress against project activities and milestones have been recorded in a Monitoring and Evaluation Workbook for final report development. The M&E Workbook is reviewed during Steering Group meetings and the progress recorded in the workbook is the basis for the responses provided in this report (see DPLUS084_M&E_Workbook_Implementation_AR1.pdf under Supplementary Materials).

4.3 Progress towards the project Outcome

The Project outcome, as defined in the original application is:

> "BVI's forest habitats resilient to natural disasters and critical for supporting threatened species are well understood and spatially identified; globally threatened species secured *ex-situ* to mitigate against future disasters."

As the project is only just entering its second year, there is still a great deal of work to undertake towards the project Outcome. However, we are very satisfied with the progress we have achieved to date and, the impacts of the ongoing Covid-19 pandemic notwithstanding (see section 10, below), are on schedule to achieving our desired Outcome.

Outcome indicator 0.1: Locations of forest habitat critical for globally threatened flora and fauna on four islands identified, mapped and GIS layer produced. Evidence for progress: Fieldwork reports (Hamilton, Barrios and Dani Sanchez, 2019; Hamilton, Bradley and Heller, 2019; Dani Sanchez *et al.*, 2020) and summary of GIS development in Appendix 5 of Dani Sanchez *et al.* (2020).

In the first year of the project, we have made good progress towards this outcome, with new areas of forest visited and occurrences of threatened trees and reptiles mapped. With our methodology for surveying forest quality and diversity established and started to be rolled-out across the project area, we have begun to fill a significant gap in our understanding of the forests that demonstrate a resilience to natural disasters and support threatened species. At the outset of the project, detailed habitat-level data was lacking for most sites, and no attempt had been made to integrate this with threatened species occurrence data, which itself has gaps.

Outcome indicator 0.2: Live plants and/or seeds of at least five globally threatened plant species secured at the J.R. O'Neal Botanic Garden. Evidence for progress: Fieldwork reports (Hamilton, Bradley and Heller, 2019; Dani Sanchez *et al.*, 2020).

New *ex-situ* collections of eight globally threatened plant species were established in the first year of the project, seven as banked seed collections, some of which are additionally being grown on from sown seed in the plant nursery at JRONBG, and one species propagated from wild-collected vegetative cuttings, see Output 3 under sections 4.1 and 4.2. This exceeds the target set and includes three of the exemplar plant species. The project team will continue to develop

ex-situ collections over the lifetime of the project, securing as much potentially genetically diverse material from different localities as possible.

4.4 Monitoring of assumptions

Assumption 0.1: Weather conditions allow boat access and fieldwork to be completed.

High sea swell prevented access to Fallen Jerusalem to conduct vegetation and reptile surveys in February 2020. This can hopefully be overcome by re-scheduling the visit in the summer months when the sea swell is not as great. This risk continues to hold true for future fieldwork.

Assumption 0.2: All target species can be reproduced from cuttings or produce enough seeds during the lifetime of the project to allow safe collection for storage and not impact the future survival of native populations.

The seven species secured in *ex-situ* seed bank collections to date have all produced sufficient seeds while staying within safe collecting limits. *Zanthoxylum thomasianum* is the only threatened species for which vegetative propagation has been attempted during the past year, and successfully so. This assumption still holds true for other species yet to be targeted.

Assumption 1.1 Team able to visit all sites to collect data unhampered by weather conditions.

See Assumption 0.1 about sea swell. Fortunately, no extreme weather events (e.g. hurricanes) or inclement weather conditions impacted fieldwork in Year 1. This risk continues to hold true for future fieldwork.

Assumption 1.2 NPTVI boat/local ferries operational and able to transport team to field sites.

All known BVI subpopulations of *Zanthoxylum* have now been visited and samples successfully collected, with no transport problems.

Assumption 1.3 BVI NGIS continues to be maintained as the national GIS repository.

The BVI NGIS was maintained during the first year of the project. This assumption still holds true through project completion.

Assumption 2.1 Team able to visit all sites to collect data unhampered by weather conditions.

See responses to Assumptions 0.1 and 1.1.

Assumption 2.2 Adequate archives exist and are accessible.

The original assumption “NPTVI boat/local ferries operational and able to transport team to field sites” was not correct as the output not dependent on weather. This was a clerical error made when copying text from offline application text into the online submission portal. The Steering Group reviewed the error and agreed that the text should be corrected for this assumption. The National Archives were visited in Year 1 and many useful materials were located, see Activity 2.2 under sections 4.1 and 4.2. The corrected assumption holds true for Year 2 as further archives will be consulted in BVI.

Assumption 2.3 BVI NGIS continues to be maintained as the national GIS repository.

See response to Assumption 1.3.

Assumption 3.1 Adequate seed can be sourced for germination experiments.

For the two germination experiments started in Year 1, adequate quantities of seeds have been available without exceeding safe collecting limits. This assumption remains true for the project to be able to conduct future experiments.

Assumption 3.2 Target species can be reproduced from cuttings or produce sufficient seeds.

Vegetative propagation and seed banking have proved to be appropriate *ex-situ* conservation approaches for the species targeted to date. The assumption still holds true for other species not yet targeted.

Assumption 4.1 ResearchGate website continues to be maintained and available for free public use.

Reports pertaining to the progress of this project have been successfully uploaded to ResearchGate and remain accessible. This assumption still holds true through project completion.

Assumption 4.2 NPTVI staff available to attend training.

NPTVI staff have been available during all visits to the BVI by Kew and FWZ specialists, participating in training in the field and at JRONBG. One member of staff scheduled to participate in training during December 2019 delivered in the US Virgin Islands was left unable to travel after having their passport stolen without time to secure a replacement, though other personnel were still able to attend. The staff member attended replacement training organised in BVI in February 2020. This assumption remains true through project completion.

Assumption 4.3 Specialists and Steering Group able to agree training successfully delivered and capacity built.

Documents and reports pertaining to the training provided have enabled the Steering Group to agree training successfully delivered and capacity built during Year 1. This assumption remains true through project completion.

Assumption 4.4 ResearchGate website continues to be maintained and available for free public use.

See Assumption 4.1, above.

Assumption 5.1 ResearchGate website continues to be maintained and available for free public use.

See Assumption 4.1, above.

5. Project support to environmental and/or climate outcomes in the UKOTs

The main stakeholder is the local project partner, NPTVI, which is BVI's statutory body with responsibility for managing terrestrial and marine biodiversity within protected areas. The outputs of this project will provide NPTVI with direct evidence and the tools required to advocate for the BVI's forest habitats to be actively and sustainably managed and protected in a way that delivers resilience. This can be through recommendations of new sites for inclusion in the protected area network, GIS mapping of sensitive forest habitats that provide ecosystem services to reduce the impacts of natural disasters, and the submission of technical advice to the Town and Country Planning Department during the development planning process to reduce land clearance beyond the construction area.

Though still early in the project, species census (see Output 1 under sections 4.1 and 4.2) and habitat (see Output 2 under sections 4.1 and 4.2) data compiled in the project GIS (see Appendix 5 of Dani Sanchez *et al.* (2020)) and passed to the NGIS, coupled with capacity built through training (see Output 4 under sections 4.1 and 4.2) and strengthened *ex-situ* collections at JRONBG (see Output 3 under sections 4.1 and 4.2), will empower NPTVI and enable long-term outcomes for the natural environment. The enhanced plant collections at JRONBG will provide a unique visitor experience and enable public outreach and education. Resilient forests strengthen the BVI's green economy through increased tourism opportunities and enhanced watershed protection and demonstrate the value of conserving the natural environment.

Recent census data has already enabled an updated Red List assessment of *Cyclura pinguis*, to be drafted and submitted to IUCN with three members of NPTVI staff listed as contributors. A re-assessment of *Spondylurus anegadae* will be possible by the end of the project. Two sightings

have been recorded (one during this project) since the last assessment of Critically Endangered (Possibly Extinct) was published.

6. OPTIONAL: Consideration of gender equality issues

The project team is very balanced in terms of gender, at all levels, across the field team and Steering Group, and those receiving training. The project is ensuring shared authorship of reports/outputs (see References) and shared responsibilities for undertaking and delivering project activities which are demonstrated in field reports by Hamilton, Barrios and Dani Sanchez (2019), Hamilton, Bradley and Heller (2019) and Dani Sanchez *et al.* (2020) available on ResearchGate.

7. Monitoring and evaluation

Monitoring and Evaluation has been explicitly included as an Output in the project logframe. One of the first activities of the project was to form a project Steering Group and agree a Monitoring and Evaluation plan that engages all partners in M&E. Quarterly meetings provide the opportunity to evaluate progress against the project logframe and make decisions on project implementation, making changes as necessary to version controlled documents, see also responses for Output 5 under sections 4.1 and 4.2. The M&E process has been designed to review progress quarterly enabling the implementation of the project to be adaptive. Outcome-level indicators and means of verification that are logically and directly linked to the outputs have been chosen to ensure the impact intended. We have visualised this as:

Accessible species and habitat data + *ex-situ* collections + capacity building → effective management of resilient habitats that support threatened species.

Although scheduling meetings when all members of the Steering Group are available and the technical hurdles of conducting effective meetings online can be challenging, the M&E system we have adopted is proving to be effective with good progress made and documented toward the project outcome (see section 4.3) and across the Activities (see section 4.1) and Outputs (see section 4.2).

8. Lessons learnt

As mentioned in section 7, scheduling meetings when all members of the Steering Group are available and the technical hurdles of conducting effective meetings online proved challenging. To address this challenge, we started using Doodle to arrange meeting times and agreed a single, free to use platform, Skype, for holding meetings remotely.

We found it relatively easy to integrate faunal and floral survey work once we all understood the requirements of each group for effective survey (e.g. time required for survey and data recording). Trialling new survey methods as a team was a really good way to build our working relationships and everyone learned new skills bringing excitement to the fieldwork. Training was often two-way as the BVI team shared their practical experiences in the field during formal training which enhanced the overall training experience. During Year 1, we ensured that all field team members got to experience different types of survey methodologies and monitoring techniques (e.g. deploying camera traps, ink traps, artificial retreats). This was well received and will be incorporated into future fieldwork as standard practise.

Large swells in February 2020 prevented safe landing on Fallen Jerusalem to undertake fieldwork. Scheduling visits to offshore islands in the winter season is unreliable as the swells can be large meaning boat access might not be possible.

9. Actions taken in response to previous reviews (if applicable)

Not applicable.

10. Other comments on progress not covered elsewhere

The impact of the global Covid-19 pandemic during the reporting period has largely been limited to the ease with which the project Steering Group team can meet to complete the Monitoring and

Evaluation and collaborate on the Annual Report, as many government measures to prevent transmission has come in the last week of Year 1, with all members limited to working from home.

However, impacts on the second year of the project are likely to be much greater. The first month of Year 2 of the project has seen all project staff working from home (with some special allowance for staff in BVI to attend to *ex-situ* collections at JRONBG). Kew staff working on the project have been furloughed for the month of May, under the UK Government's Job Retention Scheme, with fieldwork planned for June (including cancellation of Kew MSc projects linked to this activity) and access to laboratories having to be postponed. Training activities hosted at Kew and planned for Autumn 2020 may also be impacted.

The Steering Group will keep in close communication and agree necessary steps to take, considering the impacts on project activities caused by measures to combat the pandemic (e.g. border closures, travel bans, staff furlough, cancellation of MSc student projects, etc). The project leaders will ensure any foreseeable impacts on project delivery are promptly communicated to LTS International and seek agreement for changes to project implementation where thought necessary. Possible responses already discussed include delivering training remotely, using online communication platforms such as Skype (Heller and Hamilton, 2020)

11. Sustainability and legacy

The project has been well received in BVI with Representatives of HMG in BVI promoting the project on social media (e.g. Twitter using #DPLUS084, see DPUS084_Twitter_Compilation_YR1.pdf under Supplementary Materials) via @bvigovoff (Governor's Office BVI) and @GusJaspert (Governor of the British Virgin Islands) and Government of the Virgin Islands officials mentioning the project in public comments (e.g. Minister Honourable Vincent Wheatley, BVI Ministry of Natural Resources, Labour and Immigration) and private conversations (e.g. Dr Marcia Potter, Permanent Secretary for BVI Ministry of Natural Resources, Labour and Immigration) with project team members and community leaders. The project profile was raised through a press release (Hamilton *et al.*, 2019) that was picked up locally and internationally through Kew and FWZ and an article written for the May 2019 Darwin Initiative Newsletter pgs. 27-28 (Heller and Hamilton, 2019).

The project activities that have taken place in Year 1 and all the project outputs will have a legacy impact beyond the life of the project, especially the work undertaken for Output 3: development of *ex-situ* collections and Output 4: capacity building. The legacy of Outputs 1 & 2 will be seen through the availability of species census and habitat data for making informed management decisions and informing recovery, mitigation and planning activities. This will be achieved through incorporation of project compiled data into the BVI National Geographic Information System (NGIS). The project outputs will also be invaluable in supporting the dissemination of information to the wider BVI community, with NPTVI's goal to make this research accessible to all sectors of society, from Government decision makers to students and visitors. New information is to be incorporated into pages of the NPTVI website and other educational materials. The annual Iguana Fest event on Anegada has been identified as an important outlet for communicating the project's outputs to the wider community. This is an all-day outdoor iguana ecology engagement event open to all citizens of the BVI, and an ideal forum for raising awareness of the project's activities.

The project Steering Group feel that the exit strategy is still valid.

12. Darwin identity

The Darwin Initiative has been acknowledged as the funder of this project wherever information on the project has been presented in the public domain. The Kew team make regular use of Twitter, from the @KewUKOTs account, and individual team member's accounts, tagging posts with @Darwin_Defra, #KewBVI and #DPLUS084 to ensure that the project has a distinct identity through that channel. A compilation of tweets (DPLUS084_Twitter_Compilation_YR1.pdf) is accessible online via Supplementary Materials and a Twitter Moment is publicly available.

Likewise, all reports and documents produced for the project have the Darwin Initiative prominently acknowledged as the funder, including the Darwin Initiative logo. The project has an open access page on ResearchGate, where many the project reports can be downloaded.

The Darwin Initiative has long been a supporter of environmental and conservation initiatives in the BVI, having funded several projects in the past 25 years. The role Darwin Initiative has in enabling the positive impact of this work is well recognised, especially within government agencies, local NGOs and environmentally engaged members of the public. Kew, NPTVI and FWZ are pleased to ensure that this legacy is widely acknowledged.

13. Safeguarding

Kew, the lead organisation for this project, has two policy documents pertinent to this matter: a staff Code of Conduct, which forms part of staff contract of employment at Kew, and a safeguarding policy. The latter is publicly available on Kew's website: https://www.kew.org/about-us/reports-and-policies/safeguarding.

The Code of Conduct outlines Kew staff roles and responsibilities (professional, legal, ethical), and protocols for reporting improper conduct, with further guidance on Kew's stance on bullying and harassment.

Though the main focus of Kew's safeguarding policy is safeguarding children and vulnerable adults visiting Kew and Wakehurst, and furthermore, this project does not have a significant component that is working directly with communities or informant networks, there are a number of articles relevant to carrying out this project, namely: 5.6 (compulsory awareness training for all staff, volunteers and students); 5.11 (safeguarding and social media); 5.15 (overseas work and safeguarding).

14. Project expenditure

Table 1: Project expenditure <u>during the reporting period</u> (1 April 2019 – 31 March 2020)

Project spend (indicative) in this financial year	2019/20 D+ Grant (£)	2019/20 Total actual D+ Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs				
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items				
Others (Please specify)				
TOTAL				

15. Annex 1: Report of progress and achievements against Logical Framework for Financial Year 2019-2020

Project summary	Measurable Indicators	Progress and Achievements April 2019 - March 2020	Actions required/planned for next period
Impact The status of the BVI's forests, and the threatened species and ecosystem services they support, is improved through evidence-based recovery, management and restoration, and more resilient to future natural disasters.		In the first year of the project, we have made good progress towards the outcomes that will enable the project to achieve its desired impact as shown in sections 4.1, 4.2, 4.3 and below.	
Outcome BVI's forest habitats resilient to natural disasters and critical for supporting threatened species are well understood and spatially identified; globally threatened species secured *ex-situ* to mitigate against future disasters.	0.1 Locations of forest habitat critical for globally threatened flora and fauna on four islands identified, mapped and GIS layer produced 0.2 Live plants and/or seeds of at least five globally threatened plant species secured at the J.R. O'Neal Botanic Garden	0.1 Forest surveys undertaken on four islands in June 2019 and Jan-Feb 2020, and data collated in GIS. 0.2 *Ex-situ* collections of eight globally threatened species secured: *Agave missionum, Argythamnia stahlii, Guaiacum officinale, Maytenus cymosa, Vachellia anegadensis, Varronia rupicola, Zanthoxylum flavum, Zanthoxylum thomasianum.*	0.1 Further forest surveys to be undertaken on four islands and data collated in GIS. 0.2 Further *ex-situ* collections secured, including remaining two exemplar plant species, *Myrcia neokiaerskovii (*syn. *Calyptranthes kiaerskovii), M. neothomasiana (*syn. *C. thomasiana).*
Output 1. Detailed census of globally threatened species (five plants and 2 animals) and population ecology profiled	1.1 Detailed quantitative surveys of known populations and unsurveyed areas 1.2 Population genetics of BVI populations of *Z. thomasianum* researched 1.3 GIS occurrence layers of globally threatened species produced	1.1 Data from four islands has been collected during fieldwork in April and June 2019 and Jan-Feb 2020 and collated in GIS. Summary of data added to the project GIS is given in Appendix 5 of Dani Sanchez *et al.* (2020). 1.2 Leaf tissue samples from across range of *Z. thomasianum* now secured, US territory material to be imported to UK. Leaf samples from historic herbarium collections from *Zanthoxylum* across the Caribbean are also now available. Evidence is presented in the tables of samples collected appended to fieldwork reports from the BVI, USVI and Puerto Rico, see list of evidence cited for Activity 1.2 under section 4.1. 1.3 Data collected for the project so far has been cleaned and collated in preparation for generating the final GIS occurrence layers to be	

Project summary	Measurable Indicators	Progress and Achievements April 2019 - March 2020	Actions required/planned for next period
		uploaded to the BVI National GIS. Summary of data added to the project GIS is given in Appendix 5 of Dani Sanchez *et al.* (2020).	
Activity 1.1 Fieldwork to survey globally threatened species		In April and June 2019 and January-February 2020, fieldwork was undertaken on Anegada, Tortola, Virgin Gorda and Fallen Jerusalem. New data was collected for exemplar tree species: *V. anegadensis*, *V. rupicola*, *M. neokiaerskovii, M. neothomasiana*, *Z. thomasianum*; and animals *Cyclura pinguis* and *Spondylurus anegadae*.	Further sites will be surveyed for threatened trees and reptiles, with detailed quantitative surveys of known populations and unsurveyed areas to be undertaken on Anegada, Tortola, Virgin Gorda and Fallen Jerusalem.
Activity 1.2 Genetic analysis of Z. thomasianum populations.		Leaf tissue samples of samples were collected from Virgin Gorda and Tortola for fine-scale genetic structure analysis of the species. Sampling of historic herbarium specimens for phylogenomic analysis has also been taking place. Separately funded fieldwork has secured samples of *Z. thomasianum* from US Virgin Islands and Puerto Rico to be included in the analysis.	Final gaps in phylogenomic sampling of herbarium specimens will be filled. DNA extraction of all samples completed and undertake microsatellite (population studies) and target capture (phylogenomic) analysis of *Zanthoxylum* samples.
Activity 1.3 Produce GIS occurrence layers for globally threatened species		Field data was added to the project GIS.	All new field data will be cleaned and added to the project GIS.
Output 2. Habitat requirements of globally threatened species (five plants and 2 animals) characterised	2.1 Quantitative forest surveys undertaken within and outside of globally threatened species habitat on four islands	2.1 Methodology for gathering plant community-level data has been finalised, and data for two areas of dry forest on Virgin Gorda are in the project database. The methodology is presented in Appendix 4 of Dani Sanchez *et al.* (2020).	

Project summary	Measurable Indicators	Progress and Achievements April 2019 - March 2020	Actions required/planned for next period
	2.2 Study of vegetation history on four islands completed 2.3 GIS layers produced of forest plot data and an expert reviewed layer showing locations of forest habitat critical for globally threatened flora and fauna	2.2 Details of historical land use retrieved from archives for Tortola. Such level of detail for other islands less available. A report on archival records consulted is presented in Heller (2020). 2.3 Data collected for the project so far has been cleaned and collated in preparation for generating the final GIS layers to be uploaded to the BVI National GIS. Summary of data added to the project GIS is given in Appendix 5 of Dani Sanchez *et al.* (2020).	
Activity 2.1 Establish experimental design for vegetation survey plots		Experimental design for the vegetation survey plots discussed during collaborative fieldwork in June 2019 and sampling protocol established. The first vegetation survey plots were undertaken to test the Rapid Botanical Survey methodology in February 2020, and protocols finalised.	Activity completed. No further activity required.
Activity 2.2 Field work to gather vegetation and habitat data		Habitat and vegetation data collected during collaborative fieldwork in April and June 2019 and Jan-Feb 2020.	Rapid Botanical Surveys will be carried out at a broad range of sites across Anegada, Tortola, Virgin Gorda and Fallen Jerusalem.
Activity 2.3 Consult archives, historical records for land use history and maps		The National Archives in Kew, UK were consulted for historic land use maps, with several reports and maps of interest gathered for the project.	Archives in the BVI will be consulted for evidence of historical land use.
Activity 2.4 Produce GIS layers of forest plot data and forest habitat critical for globally threatened flora and fauna		Survey and sampling data added to project GIS.	All new field data will be cleaned and added to the project GIS.

Project summary	Measurable Indicators	Progress and Achievements April 2019 - March 2020	Actions required/planned for next period
Output 3. *Ex-situ* collections of five globally threatened plants enhanced to support conservation.	3.1 Seed quality and storage behaviour studies completed for five plant species 3.2 Seed or cuttings from 5 globally threatened plants held at J.R. O'Neal Botanic Gardens for propagation	3.1 A germination trial for threatened species *Maytenus cymosa*, and a seed desiccation tolerance test for threatened species *Bastardiopsis eggersii* were started in January/February 2020. See Dani Sanchez *et al.* (2020, pp. 37–40) for details. 3.2 New *ex-situ* collections of eight globally threatened plant species have been established at JRONBG from wild sources, see Output 3 under section 4.2 for list of evidence provided.	
Activity 3.1 Collect seed material of five globally threatened plant species from wild populations for *ex-situ* conservation and seed storage behaviour studies		Seed collections for *ex-situ* conservation were made in Year 1 of threatened species: *A. missionum*, *A. stahlii*, *G. officinale*, *M. cymosa*, *V. anegadensis*, *V. rupicola*, *Z. flavum.*	Seed collections of threatened species will be made as plants come into fruit and seeds can be harvested in Year 2.
Activity 3.2 Undertake seed storage behaviour studies		Seed storage behaviour study undertaken using *B. eggersii*.	Seed storage behaviour studies will be undertaken on further threatened species as seed becomes available, with high priorities species being *Z. thomasianum*, *M. neokiaerskovii* and *M. neothomasiana.*
Activity 3.3 Collect plant material from wild populations for vegetative propagation and *ex-situ* conservation		Cuttings of *Z. thomasianum* were made from plants on Tortola and Virgin Gorda for propagation and *ex-situ* conservation at JRONBG. A seedling of *Z. thomasianum* was rescued from Virgin Gorda.	Further cuttings of threatened species will be made in Year 2 with high priorities species being *Z. thomasianum*, *M. neokiaerskovii and M. neothomasiana*.
Output 4. Capacity building delivered to enable NPTVI to establish new ex-situ collections of	4.1 Training and Evaluation Plan produced 4.2 Training of four NPTVI staff in germination experiments, plot-	4.1 A Training and Evaluation Plan was developed to guide the project team in Output delivery, see Appendix 7 in Dani Sanchez *et al.* (2020). 4.2 Four NPTVI personnel have gained skills in germination experiments, quantitative survey techniques, presence/absence survey,	

Project summary	Measurable Indicators	Progress and Achievements April 2019 - March 2020	Actions required/planned for next period
globally threatened plant species, identify suitable habitat for those species and implement management to enhance resilience	based quantitative survey techniques, presence/absence survey and species identification delivered by Kew and FWZ specialists 4.3 Training of four NPTVI staff evaluated by Kew and FWZ specialists and reviewed by Steering Group 4.4 Final report 'Training and Evaluation' section produced	and species identification, see Output 4 under section 4.2 for list of evidence provided. 4.3 Training of NPTVI staff was evaluated by Kew and FWZ specialists and reviewed by Steering Group, see Appendix 3 of Dani Sanchez *et al.* (2020). 4.4 Details of the training delivered to date has been documented in meeting minutes (see Output 4 for evidence provided) and project M&E Workbook, to be used as evidence for the final Training and Evaluation report.	
Activity 4.1 Training and Evaluation Plan produced		Training and evaluation plan produced and updated as appropriate through Steering Group approval.	The Training and Evaluation Plan will be updated as necessary in order to provide the most effective capacity building.
Activity 4.2 Training of four NPTVI staff in germination experiments, plot-based quantitative survey techniques, presence/absence survey and species identification delivered by Kew and FWZ specialists		Four NPTVI staff trained in survey techniques and species identification by Kew and FWZ specialists during collaborative fieldwork. One NPTVI staff trained in germination experiments by Kew specialists.	Training of more NPTVI staff is planned, both during joint fieldwork in the BVI, as well as at FWZ and Kew where good use can be made of the expertise and facilities available at each location.
Activity 4.3 Training of four NPTVI staff evaluated by Kew and FWZ specialists and reviewed by Steering Group		Specialists evaluated NPTVI staff through discussions and observations during and following training sessions. Specialists conveyed evaluations to Steering Group during meetings.	Further training is planned that will be evaluated by specialists and reviewed by Steering Group.

Project summary	Measurable Indicators	Progress and Achievements April 2019 - March 2020	Actions required/planned for next period
Activity 4.4 Produce Final report 'Training and Evaluation' section		Training recorded in field reports and project M&E Workbook for final report development.	Details of training delivered will continue to be documented for the final report.
Output 5. Monitoring and Evaluation and project reporting	5.1 Monitoring and Evaluation Plan produced 5.2 Quarterly reports produced 5.3 Steering Group meetings held, and minutes produced 5.4 Final report produced	5.1 A Monitoring and Evaluation Plan has been agreed by the project steering group and updated in February 2020, see Appendix 7 of Dani Sanchez *et al.* (2020) . 5.2 M&E Workbook circulated prior to Steering Group meetings which were minuted, see Output 5 under section 4.2 for list of evidence provided. 5.3 Steering Group meetings held in April and November 2019, January 2020, and an end-of-year meeting in April 2020. Minutes compiled and circulated to project team, see Output 5 under section 4.2 for list of evidence provided. 5.4 Progress against project activities and milestones have been recorded in a Monitoring and Evaluation Workbook that was used to complete this report and will be used for final report development.	
Activity 5.1 Produce Monitoring and Evaluation Plan		Monitoring and Evaluation Plan agreed and updated as appropriate through Steering Group approval.	The Monitoring and Evaluation Plan will be updated as necessary in order to manage the project adaptively.
Activity 5.2 Produce quarterly reports		M&E Workbook circulated prior to Steering Group meetings to enable quarterly updates.	Meetings and project activities will continue to be fully documented in M&E Workbook, minutes and reports and circulated among the project team.
Activity 5.3 Undertake Steering Group meetings and produce minutes		Steering group meetings held in April and November 2019, January 2020, and an end-of-year meeting	Project progress will continue to be reviewed during Steering Group meetings with necessary actions identified and minuted.

Project summary	Measurable Indicators	Progress and Achievements April 2019 - March 2020	Actions required/planned for next period
		in April 2020. Minutes compiled and circulated to the project team.	
Activity 5.4 Produce final report		Project activities recorded in M&E Workbook for final report development.	Project activities will continue to be recorded in M&E Workbook for final report development.

16. Annex 2: Project logframe

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Impact: The status of the BVI's forests, and the threatened species and ecosystem services they support, is improved through evidence-based recovery, management and restoration, and more resilient to future natural disasters.			
Outcome: BVI's forest habitats resilient to natural disasters and critical for supporting threatened species are well understood and spatially identified; globally threatened species secured ex-situ to mitigate against future disasters.	0.1 Locations of forest habitat critical for globally threatened flora and fauna on four islands identified, mapped and GIS layer produced 0.2 Live plants and/or seeds of at least five globally threatened plant species secured at the J.R. O'Neal Botanic Garden	0.1 Summary report published on ResearchGate 0.2 UKOTs Species and Specimens Database for plant data and GIS layers in BVI NGIS for all taxa and plot data	0.1 Weather conditions allow boat access and fieldwork to be completed 0.2 All target species can be reproduced from cuttings or produce enough seeds during the lifetime of the project to allow safe collection for storage and not impact the future survival of native populations
Output 1. Detailed census of globally threatened species (five plants and 2 animals) and population ecology profiled	1.1 Detailed quantitative surveys of known populations and unsurveyed areas 1.2 Population genetics of BVI populations of Z. thomasianum researched 1.3. GIS occurrence layers of globally threatened species produced	1.1 Raw field data available to partners and fieldwork reports available on ResearchGate 1.2 Population genetic data summarised in Final report available on ResearchGate 1.3.BVI NGIS	1.1 Team able to visit all sites to collect data unhampered by weather conditions 1.2 NPTVI boat/local ferries operational and able to transport team to field sites 1.3 BVI NGIS continues to be maintained as the national GIS repository
Output 2. Habitat requirements of globally threatened species (five plants and 2 animals) characterised	2.1 Quantitative forest surveys undertaken within and outside of globally threatened species habitat on four islands 2.2 Study of vegetation history on four islands completed 2.3 GIS layers produced of forest plot data and an expert reviewed layer showing locations of forest	2.1 Forest survey documented in fieldwork reports available on ResearchGate 2.2 Report on vegetation history of four islands available on ResearchGate 2.3 BVI NGIS	2.1 Team able to visit all sites to collect data unhampered by weather conditions 2.2 Adequate archives exist and are accessible 2.3 BVI NGIS continues to be maintained as the national GIS repository

Project summary	Measurable Indicators	Means of verification	Important Assumptions
	habitat critical for globally threatened flora and fauna		
Output 3. Ex-situ collections of five globally threatened plants enhanced to support conservation	3.1 Seed quality and storage behaviour studies completed for five plant species 3.2 Seed or cuttings from 5 globally threatened plants held at J.R. O'Neal Botanic Gardens for propagation	3.1 Results of study available on ResearchGate 3.2 UKOTs Online Herbarium database and Final report listing accession available on ResearchGate	3.1 Adequate seed can be sourced for germination experiments 3.2 Target species can be reproduced from cuttings or produce sufficient seeds
Output 4. Capacity building delivered to enable NPTVI to establish new ex-situ collections of globally threatened plant species, identify suitable habitat for those species and implement management to enhance resilience	4.1 Training and Evaluation Plan produced 4.2 Training of four NPTVI staff in germination experiments, plot-based quantitative survey techniques, presence/absence survey and species identification delivered by Kew and FWZ specialists 4.3 Training of four NPTVI staff evaluated by Kew and FWZ specialists and reviewed by Steering Group 4.4 Final report 'Training and Evaluation' section produced	4.1 Training and Evaluation Plan available on ResearchGate 4.2. Training documented in project reports available on ResearchGate 4.3 Minutes circulated to Steering Group 4.4. Final report available on ResearchGate	4.1 ResearchGate website continues to be maintained and available for free public use 4.2 NPTVI staff available to attend training 4.3 Specialists and Steering Group able to agree training successfully delivered and capacity built 4.4 ResearchGate website continues to be maintained and available for free public use
Output 5. Monitoring and Evaluation and project reporting	5.1 Monitoring and Evaluation Plan produced 5.2 Quarterly reports produced 5.3 Steering Group meetings held, and minutes produced 5.4 Final report produced	5.1 M&E Plan circulated to Steering Group 5.2. Reports published on ResearchGate 5.3 Minutes circulated to Steering Group	5.1 ResearchGate website continues to be maintained and available for free public use

Project summary	Measurable Indicators	Means of verification	Important Assumptions
		5.4. Report published on ResearchGate	
Activities: 1.1 Fieldwork to survey globally threatened species 1.2 Genetic analysis of Z. thomasianum populations 1.3 Produce GIS occurrence layers for globally threatened species 2.1 Establish experimental design for vegetation survey plots 2.2 Field work to gather vegetation and habitat data 2.3 Consult archives, historical records for land use history and maps 2.4 Produce GIS layers of forest plot data and forest habitat critical for globally threatened flora and fauna 3.1 Collect seed material of five globally threatened plant species from wild populations for ex-situ conservation and seed storage behaviour studies 3.2 Undertake seed storage behaviour studies 3.3 Collect plant material from wild populations for vegetative propagation and ex-situ conservation 4.1 Training and Evaluation Plan produced 4.2 Training of four NPTVI staff in germination experiments, plot-based quantitative survey techniques, presence/absence survey and species identification delivered by Kew and FWZ specialists 4.3 Training of four NPTVI staff evaluated by Kew and FWZ specialists and reviewed by Steering Group 4.4 Produce Final report 'Training and Evaluation' section 5.1 Produce Monitoring and Evaluation Plan 5.2 Produce quarterly reports 5.3 Undertake Steering Group meetings and produce minutes 5.4 Produce final report			

17. Annex 3: Supplementary Materials and References

18. Checklist for submission

	Check
Is the report less than 10MB? If so, please email to Darwin-Projects@ltsi.co.uk putting the project number in the Subject line.	Yes
Is your report more than 10MB? If so, please discuss with Darwin-Projects@ltsi.co.uk about the best way to deliver the report, putting the project number in the Subject line.	No
Have you included means of verification? You need not submit every project document, but the main outputs and a selection of the others would strengthen the report.	Yes
Do you have hard copies of material you want to submit with the report? If so, please make this clear in the covering email and ensure all material is marked with the project number. However, we would expect that most material will now be electronic.	No
Have you involved your partners in preparation of the report and named the main contributors	Yes
Have you completed the Project Expenditure table fully?	Yes
Do not include claim forms or other communications with this report.	