Department for Environment Food & Rural Affairs

DARWIN INITIATIVE

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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*

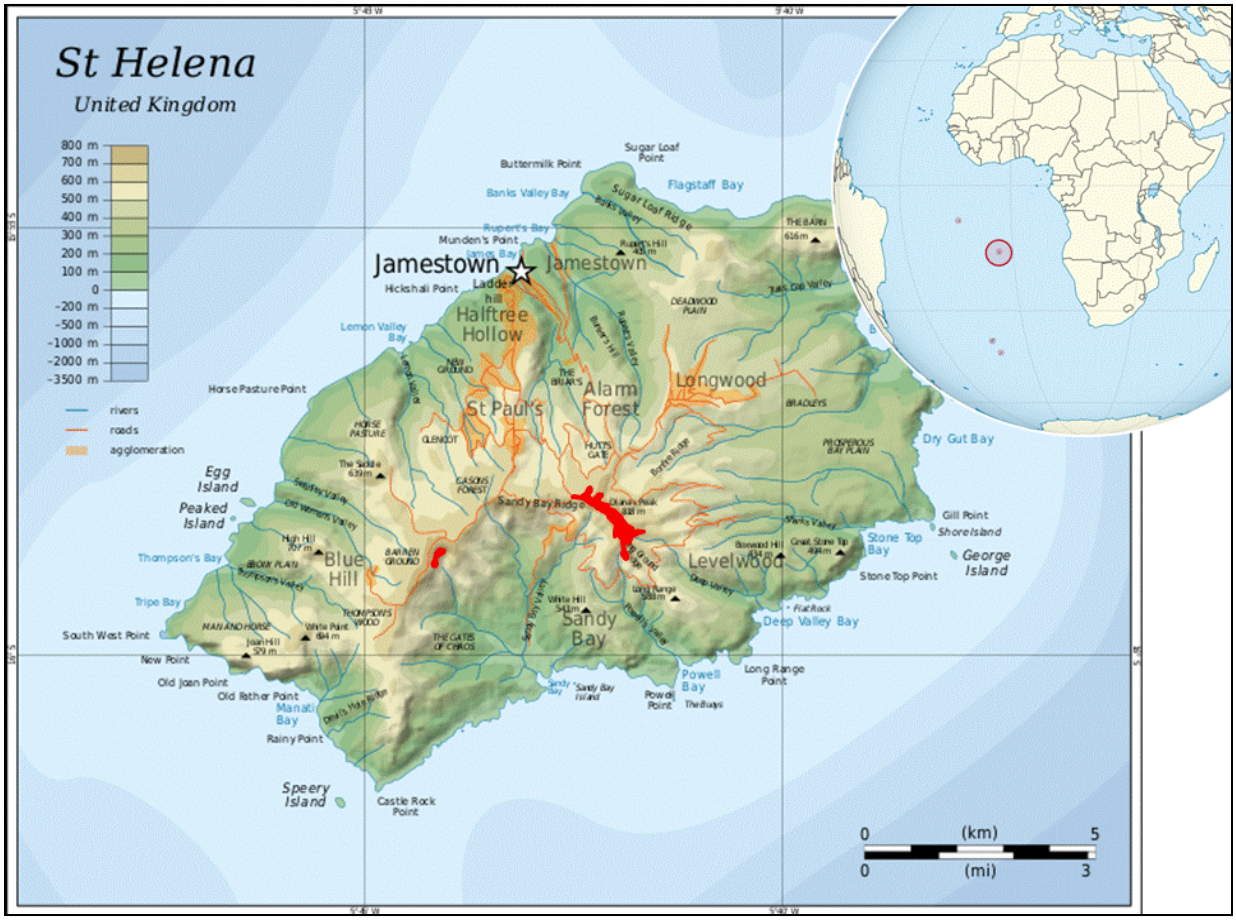
Darwin Project Information

Project reference	DPLUS029
Project title	Securing St Helena's cloud forest trees and associated invertebrates
Territory(ies)	St Helena
Contract holder Institution	St Helena Government, Environmental Management Division
Partner institutions	Buglife, RBG Kew, RSPB, SHNT
Grant value	£98,380
Start/end date of project	**01 February 2015 to** 31 March 2017 extended to 31 December 2017 [accepted 20 January 2016] & finally extended to **31 March 2018** [accepted 29 November 2017]
Project leader name	Lourens Malan
Project website/Twitter/blog etc.	N/A
Report author(s) and date	Andrew Darlow; Lourens Malan July 2018

1 Project Overview

St Helena is a 12 million years old oceanic island in the South Atlantic Ocean, close to the Mid Atlantic Ridge, 1950 kilometres from the southwest coast of Africa and 4000 kilometres east of Rio de Janeiro (see **Map 1** below).

With such extreme isolation, new species rarely arrived and successful colonisations were even rarer. The time between each arrival event allowed speciation to occur in the absence of pests, disease, competition or genetic reinforcement. Evolutionary processes gave rise to a diverse ecosystem of unique species. Following its discovery in 1502, the island underwent significant and rapid change with a consequent loss in native species numbers and diversity and massive reduction in habitat extent. The result today is a diminished native biodiversity (less than 1% of land area) which is heavily fragmented, depopulated and still under pressure from human development and aggressive introduced species to which the endemic fauna & flora have little to no defence.



Map 1 showing location of St Helena in relation to Africa (source: adapted from https://en.wikipedia.org/wiki/Saint_Helena) and the approximate location of areas holding cloud forest vegetation indicated in red

The remaining cloud forest vegetation is restricted to the steep sections of the higher altitudes (above c.700m) on the island's central ridge. Flax plantation development on the island in the early 20th century devastated the cloud forest habitat. The well established plantations were subsequently abandoned but continue to thrive, significantly reducing the water catchment potential of the cloud forest which remains the island's principal water resource (Refer to the Climate and Resource Management heading of the DPLUS051 project website substantiating the statement). Four key endemic tree species of the native cloud forest, he cabbage, false gumwood, dogwood and whitewood are still in decline, all critically endangered according to IUCN's red list 2018-1. Fragmentation has reduced the remaining population of each species to lone trees or small groups surrounded by a highly competitive invasive flora. This situation has resulted in reduced gene flow in the populations and recruitment levels which are inadequate for succession.

Historically, limited resources and difficulty in accessing steep slopes has led to under sampling of the remaining tree populations, but heavy oversampling of those trees which are easily accessible. Being used repeatedly as the source for propagation material for restoration work, this practice reduced the regenerative possibilities for these sites, caused frequent disturbance and generated progeny which is unrepresentative and continually inbreeding and genetically narrow.

The project is a high priority for St Helena and delivers the tools for: **National Goal 3 of St Helena Sustainable Development Plan,** *'Effective management of the environment';* **Principle 2 of SHG Land Development Control Plan,** '*Conserve and manage the natural … heritage of the Island to benefit tourism and the Island community.'*; **SHG Environment Charter,** *'ensure the protection and restoration of key habitats, species and landscape features through…appropriate management structures and mechanisms.'* **and,** *'encourage teaching…to promote the value of (the natural) environment,'* ***and commit to,*** *'attempt the control and eradication of invasive species'* through development of the practical methodology that will

inform the Peaks National Park action plan. The project has contributed to the **C**onvention on **B**iological **D**iversity & the Global Strategy for Plant Conservation Objective 1 (targets 2 & 3); Objective 2 (targets 4,5,7,8 & 10); Objective 5 (targets 15 &16). Details are summarized in the Darwin May 2018 Newsletter article on the project.

The project was proposed in order to secure the remaining gene pool of these four key tree species and bring them into a functioning long term programme to reverse or at least halt further genetic degradation within the species. Additionally data gathering was needed to map the tree sites and to build a knowledge base of the proximal habitats which support the trees and their associated invertebrate communities. These principal activities would provide valuable data to underpin conservation strategy and to provide the most genetically diverse materials possible to support restoration efforts.

Locally, the project supports the long term challenge for St Helena in maintaining, and in light of expected tourism, supplementing the natural water catchment potential of the Peaks by returning areas under flax plantation back to native cloud forest. It also reduces the risk potential of existing and future conservation efforts from pathological or pest catastrophes.

2 Project Stakeholders/Partners

The project has had the full support of project partners and stakeholders as demonstrated in the previous reports. **Buglife** provided valued input to the development of fieldwork and recording protocols and have provided ongoing support with invertebrate enquiries throughout the project. **RSPB** provide an ongoing and interactive support (see AR3 Annex14 & recent Service Level Agreement between **SHNT** & **SHG** describing facilitation of **RSPB** funds in **Annex1** and further supported through evidence in **Annex7**) for conservation on St Helena and have provided direct input to the project with advice, promotion and collaboration particularly with regard to the spiky yellow woodlouse conservation (see **DPLUS025** below). On island, stakeholders include St Helena National Trust (**SHNT**), other sections of the government's environmental management division (**EMD**) and private landowners. These have provided advice, assistance with aspects of fieldwork, identification services and sites for the development of living gene banks.
The **Terrestrial Conservation Section** of EMD, in particular their **Habitats Team** (See Photo Annex **figures1&2**) which make up the **Peaks Management Team** was an intrinsic part of the project and key to the success during and after the project, with support from their **Species Team** which focus on a wider range of endemic plant species, including some of the Cloud forest species. Most notable was the successful secondment to the project of the **Terrestrial Conservation Officer** in charge of the Peaks Management Team (see **section 4** Sustainability and Legacy) and thus retaining local knowledge essential to the project fieldwork. The project term overlapped with other Darwin funded projects on the island and where possible collaboration was undertaken as outlined below and in detail in the AR3 2017:

DPLUS051- **water security and sustainable cloud forest restoration on St Helena** referred to in the above section (with further information available on its project website) provided valuable support. Weather data collected by this project was used in combination with our field observations of vegetation responses to the weather patterns improving our understanding of cloud forest ecology. The cloud forest project has helped the water security project in study site selection and assisted in its design and development.
DPLUS052 – **mapping St Helena's biodiversity and natural environment**
We supported one another throughout both project terms. The Cloud forest project has helped the Mapping project with habitat classification and provided information to aid in their fieldwork. In return the Mapping project has given technical support with GIS issues and setting up the GeoPackage system now in use by the SHG GIS team from which all data sets could be accessed and Metadata relating to St Helena could be found and made available on request. Data are now available on a centralised server to all on island partners.
DPLUS025 – **conservation of the spiky yellow woodlouse (SYW) and black cabbage tree woodland**
The Cloud forest project team has been a key role-player helping the SYW project officer with fieldwork and support: Taking her to all the SYW sites found during the cloud forest fieldwork.

We also shared our access routes & GIS data layers (see **Annex 3**) and installed fixed access ropes enabling repeat monitoring of sites. The SYW habitat falls wholly inside the Cloud forest project area and as such the two projects have agreed and signed a data exchange agreement (refer to AR3 annex 6 & 7) to maximise the benefits to each project.

DPLUS040 – **securing the future for St Helena's endemic invertebrates**

The Invertebrate project and Cloud forest project have both received benefit from collaborative support. See **Annex 4 & 5** of DPLUS029 invertebrate data. With collaborative fieldwork the Invertebrate project got access to samples that otherwise would be lacking from their reference collection, in return we received assistance with invertebrate identification and significance.

DPLUS059 - **establishment of the national framework of invasive plant management on St Helena**

The project documents and data have been shared with this invasive plant project team and the Clearance Protocol (See AR3 2017 Annex15 showing project Protocol documents) is actively used by them to add and expand and update this dynamic document. The project team have also given advice on how we approached invaded sites in an adaptive – holistic – novel ecosystem approach and informed on more rigid historic efforts that have proven ineffectual (see Photo Annex **figure4** of project teams on site). In return the invasive plant project have supported Peaks Management efforts through sharing equipment (see **Annex 6**) and staff time where they needed space to undertake invasive control trials which is welcomed, furthering the collective understanding of most appropriate approaches.

DPLUS037 – **conserving the genetic diversity of St Helena's threatened endemic flora**

The project benefited from an 'exchange in expertise' with this RBG Kew run project culminating in a visit by the project manager to **RBG Kew** and Wakehurst Place (see AR2 2016 Annex1.12 showing a letter about information exchange by RBG Kew).

Further stakeholder engagement was with a private landowner who was given plants to set up an additional field gene bank at **Mnt. Pleasant** which is the midway between the two main parts of the Peaks (the two red dots on the map of **Map1** above) with photo and email evidence shown in the AR3 2017 Annex 10 of progress and planned expansion.

The project has provided a platform for engagement with overseas partners and stakeholders. Overlapping or consecutive projects allow for better communication and understanding to be continually developed rather than initiated each time. This in turn allows partners to be better placed to provide networking and advocacy for the conservation strategies being undertaken on island, better supporting **section 4.** *Sustainability & Legacy* visible throughout projects across St Helena. The value of this was given recognition in the last annual report AR3 2017 where the reviewer made special mention of it "*working well with host territory stakeholder groups, with the project highlighting collaborative support and an exchange in expertise between the four Darwin related projects on the island*…".

3 Project Achievements

3.1 Outputs

Output 1: **All wild trees accessed. Trees and habitat assessment made including suite of invertebrates present.**

At **project start** the recorded data comprised a simple tree count made in 1996 without locations, habitat or species specific information. Invertebrate species lists from various earlier surveys were also available, again with no detailed habitat information. There was however a valuable source of anecdotal information held by a senior Peaks conservation worker with memory of unknown numbers of 'old' trees in remote locations.

Post project all known wild trees, including a proportion discovered during the project, are now geo-referenced, with a proximal survey of vegetation and invertebrate habitat and with key physical and cultural data recorded; Data is summarized in Site Survey and Tree Survey reports showing **114 sites** made up of **403 trees**. In additional, access routes to these remote sites have been established and recorded and used by partners (see DPLUS025 referenced in **Section 2** *Project Stakeholders/Partners*). This data is now available and in use by the Peaks Management team as printed maps showing tree locations. More widely available is the full data set and related documents as described in **section 2** *Project Partners/Stakeholders* above under **DPLUS052** making the project's relational database and documents available to the

south Atlantic territory partners. Additionally, the location of the remaining trees and their habitats is now more widely understood and known amongst the Peaks conservation staff. This is a critically significant result, allowing much improved management decision making and restoration targeting.

Output 2: **Genetic material of rare Peaks trees collected, recorded and banked.**
Pre-project, only a few easily accessible wild trees were ever sampled, providing propagation material for restoration work that was poor in genetic variability. Seed and seedling collections from the existing plantings were similarly 'weak' in representing the remaining gene pool.
Post project, genetic material from 100% of known wild trees are now secured. The provenance of all collections has been recorded to the parent stock by a unique identifier (see AR3 2017 Annex13 showing Site & Tree survey documents) for each tree (Tangible proof of this is visible in the seed-orchard establishment discussed in **Output3** below and shown Photo Annex **Figures2; 3; 6 to 8**). Seed collections not used for the generation of plants have been recorded and banked in the island's endemic seed bank. Subsequently these materials were grown to saplings and then planted in the living gene banks locally known as seed-orchards.

Output 3: **Clonal material propagated and in 'seed-orchards'**.
Before the project no living gene banks or 'seed orchards' for the four tree species existed. Some cuttings were made on an ad-hoc basis from a few easily accessible individual trees and propagation efforts all came from the same trees and were carried out sporadically.
Post project, a purposeful propagation protocol (See AR3 2017 Annex15 showing project Protocol documents) has been created, specifically developed with the limitations of the basic nursery in the Peaks in mind, to give good results for dogwood, whitewood, he cabbage and false gumwood. The success rate in the nursery has been increased: **2015** totals **1,279** plants covering 8 different species; **2016** totals **5,452** plants covering 14 different species; **2017** totals **5,098** plants covering 16 species; & up to **6th June 2018** totals **8,674** plants covering 14 species. See **Annex9 & 10** showing overview tables of nursery records. New techniques have now been adopted as part of standard nursery practice.
Post project five living gene banks have been established (Locations of which is shown on the map in the AR3 2017 Annex11) from material collected from the remaining wild trees. These are already providing propagation materials, that are more genetically diverse and improving restoration efforts. A number of wild trees which died during the project term are now solely represented in the living gene banks. The planting records of living gene banks tie the clonal materials back to their original sources. Further genetic 'sets' are in propagation, for further living gene bank expansion and supplemental planting. These are being generated from cuttings taken from our first gene bank thus releasing the need to continue to harvest from the wild.

Output 4: **Practical methodology developed to inform Peaks National Park action plan**
Before the project, restoration and conservation work in the Peaks National Park had loosely evolved from land clearance and gardening techniques over the past two decades. As such it was inadequate for inclusion in an action plan, with little ecological basis and inefficient in terms of the long term improvement of Peaks biodiversity.
Post project, with a much more detailed understanding of the valuable remnant habitat, a more focussed action plan can be created which will feed into the planned Peaks Management Workshop to be held in December 2018 (see draft document in **Annex8** showing development of the workshop). Techniques trialled during the survey work focus on the gradual modification and extension of desirable habitats with focus on minimising disturbance while effecting favourable succession. An adaptive management approach has been adopted based on the novel ecosystem principals where invasive plants are considered a part of both the problem and the solution. The essence of this approach is captured in the Clearance Protocol document (See AR3 2017 Annex15 showing project Protocol documents) which has been produced as a working document that is in use by the Peaks Management team.
The Peaks Action Plan is one of a series of needed plans for the island's National Conservation Areas. This still has to be prioritised and funding sourced in order to complete. As a first stage, the Workshop mentioned above will set the framework for the action plans.

Output difficulties: Initial propagation from cuttings had a low success rate. Even though difficulties with propagation were identified as a possible low risk, the likelihood of this risk was underestimated. The likely impact was however identified to be high. Once the fairly basic facilities in the Peaks nursery were upgraded (See AR3 2017 Annex16: Photos showing upgrades) improvements in success rates were resolved. Failures were recorded and techniques modified accordingly. This development provided an opportunity for training the peaks staff on how to problem solve and achieve continual improvement and thus empower them with the skills needed for long term success. Some time was lost in needing to re-collect cuttings. Fortunately improvements in collecting, processing and propagating cuttings yielded better results for dogwood and whitewood. He cabbage cuttings proved more problematic to propagate successfully. In order to represent as much of the gene pool as possible, the successful he cabbage cuttings were complemented with collected seedlings (twice replicated over two seasons, see Photo Annex **figure5**) and seed which was grown on. With a lack of freely available materials and failure of the first few false gumwood cutting trials, the decision was made not to risk further vegetative attempts and potential losses to this rare species. With only six small wild trees remaining we focussed on securing seed from them which resulted in 80 saplings established in the field gene banks during the project.

Propagation of cuttings and seedling growth were impacted by low winter temperatures more than anticipated. This slowed progress to establish the gene banks. In the absence of heating capacity at the nursery, this had to be resolved by allowing a slower growth rate over a longer time. This has informed our production schedule for future restoration work. Darwin kindly granted us enough additional time to enable establishment of the now functioning genetic field gene banks. **Annex 11 & 12** gives detail on the change request history over the project term.

Because of health issues the entomologist originally identified to undertake the invertebrate part of Output 1 was unable to undertake a significant portion of invertebrate work in the project. Difficulties were met in trying to assign a replacement from a small pool of suitably qualified candidates within the project lifespan. Eventually by working in collaboration with the St Helena National Trust we were able to secure the services of an entomologist to undertake the work. Help came from the DPLUS040 project which eventually produced very useful results (see above Section 2 Project Stakeholders/Partners).

3.2 Outcome

Secure the existence of four endangered/critical endangered keystone endemic tree species and their associated invertebrate fauna of the Peaks National Park. Achieved by establishing seed-orchards using clones from the remaining trees.
This was refined as follows for the purposes of reporting and to fit with the new LogFrame format which was not a requirement in our original proposal document. The updated outcome statement summarises the outcome intended from the original statement above:
The remaining habitat fragments of St Helena's cloud forest which hold critically endangered trees included in ecological restoration targeting and full complement of remaining genetic diversity of the wild trees are used in restoration plantings.
The project has provided a good foundation for the successful achievement of this outcome with tangible evidence visible in the genetic field gene banks. The resultant outcome of this is evident in the Nursery Records **(see Annex 13)** showing where plants leaving the nursery are being planted. All known wild examples of the four key cloud forest trees are now represented in five living gene banks (see **Output 3** above). Ongoing restoration efforts use propagation material from these gene banks to improve diversity in restoration plantings and bolster existing but threatened native habitat. The Peaks Management team (mentioned in **Section 2** *Project Stakeholders/Partners* & further expanded upon in **Section 4** *Sustainability and Legacy* below) have adopted the project outputs which give the 'road map' to a successful outcome.
The life cycle of the species involved and the length of time required to ensure sustainable succession means it may be decades before the outcome can be claimed to have been fully achieved. One measure for this would be an improvement in IUCN red list status. For the individual trees which have died in the wild during the project lifespan, the living gene banks have certainly achieved the outcome in maintaining their genetic diversity within the remaining

population, at least ex-situ, until their offspring and or cuttings are successfully re-established in the wild.

3.3 Long-term strategic outcome(s)

In the absence of an Ecological Restoration Strategy for the Island or specific management plans for any of the National Conservation Areas like the Peaks, all terrestrial conservation planning and activities are informed by, or taken in support of the St Helena invertebrate strategy.

The cloud forest project has contributed significantly to the second part of the St Helena Invertebrate Conservation Strategy 2016 vision (available on the IUCN SSC Mid-Atlantic Island Invertebrates Specialist Group Website) stating: St. Helena's unique invertebrates are recognised as globally significant and locally valued**; and the habitats upon which they rely are understood, secured and improved, for future generations**.

Specific contributions to the Objectives of the Invertebrate Strategy are noteworthy and set out below where this project has demonstrated a working model which we hope would be adopted across the board as it has done so effectively on the Peaks:

- *Goal1 objective 1.1, completing their action1.1.2 produce practical guides on habitat restoration techniques which benefit invertebrates* (see **section3.1 Output4**)
- *Through the clearance work done on the project sites contributed to Action 1.1.4 expand and improve a total of 5 hectares of habitat over all priority sites….*
- Project data are being used to inform *action 1.1.5 identify and prioritise 10 new sites* …
- *Objective 1.3 action 1.3.1 develop and set…. defining protocols and methodology* (see **section3.1 Output4**) where relevant information could be extracted from the project Site & Tree Survey documents which describe site survey approach, methodology and results. Likewise the Clearance & Propagation Protocols are in use to inform invertebrate conservation action on the peaks as seen in the Secondment arrangement described in **section 2** Project Stakeholders & Partners
- Through the nursery improvements and increased capacity summarised in the Propagation Protocol document we have already exceeded *objective 1.4* which sets out to: *increase capacity to propagate plants for prioritised invertebrate habitat restoration work, with a 50% increase by 2021* within the Peaks nursery (see **section 3.1 Objective 3**) This will inform the other nurseries on island and also Ascension island where applicable through the available project protocol documents.
- Project survey data gave the evidence needed to inform *objective 1.5 … define "No Go Areas"… mitigate impacts of tourism…..* The detailed information from the project is carried over by the project manager who now resumed the position of Terrestrial Conservation officer as explained below in **section 4** Sustainability and Legacy
- The Clearance Protocol has proven a good starting point to achieve objectives under Goal 2 take action to contain the spread of invasive plants*… innovative measures based on priority endemic species and sites.* This document has been shared with the DPLUS059 project who will add and expand on it (see **section 2** Project Stakeholders/partners)
- *Goal 6 aiming to increase and diversify sources of funding that can contribute to invertebrate conservation*. The cloud forest project, through its existing finds of previously unknown populations of rare plants and animals, has been an effective catalyst that brought more attention to the rare plants and helped in engaging funders that have an interest in furthering the work we started (see **Annex2; 7 & 8**).. The Project participated in the Workshop through which the Invertebrate Strategy was produced (Workshop participant list is available in Annex 4 of the strategy document)

4 Sustainability and Legacy

The Terrestrial Conservation Officer (TCO) and manager of conservation activities in the Peaks National Park was seconded (**Annex14**) to the project which enabled a complete focus on the project activities from someone with sensitivity to and knowledge of issues specific to this environment. In turn this enabled a direct transfer of project benefits to the Peaks Management Team lead by the TCO.

The living gene banks are under active management. They are regularly monitored and maintained. Further clonal sets are being taken as nursery capacity allows, these will be used at suitable restoration sites to develop further living gene banks to further reduce the risk from losses and distribute the gene pool. The potential to collect genetically diverse seed and seedlings from the living gene banks is an achievement that greatly improves the efficiency of collecting propagation material, greatly reduces the need to harvest from wild trees and provides genetically robust plants for restoration work. Fewer visits are required to remaining habitat fragments, further reducing the associated damage caused to the fragile vegetation by way of foot fall.

The economies gained in collecting propagation material along with improvements in propagation techniques and survival rates developed under the project are translated into greater numbers of plants being grown for restoration work. Nursery records (see **Annex9 & 13**) show increased plant output into the wild shortly after the start of the project with a sustained increase post project: **2015** totals 1279 plants covering 8 different species; **2016** totals 5452 plants covering 14 different species; **2017** totals 5098 plants covering 16 species; & first half of **2018** up to 6th June totals 8674 plants covering 14 species. In turn this allows higher planting densities with a more diverse species mix in restoration sites which has proven to be an effective method to quickly achieving favourable ground cover at densities capable of reducing re-invasion events. This lowers the maintenance costs associated with invasive plant species which typically require continued long term intervention.

Data accumulated by the project and site maintenance trialled under the project will allow the future management of remaining wild trees' habitat to be better targeted on a recurrent schedule, and progress will be measured against the baselines established by the project. Photo records are kept from each visit. These subjective records assist in monitoring vegetation change and species abundance etc. These photo records also assist in reporting to partners and funders with specific interests, as is done with the RSPB funded position (see **Annex1**) seconded through the SHNT to the Peaks Management Team with the aim of satisfying actions under the Spiky Yellow Woodlice Strategy.

The majority of project staff were local people working in conservation. The knowledge they have accumulated remains lodged in the island's conservation community. As funding becomes available they will be employed to extend project objectives and further train other staff. This initiative is already under way with the Nurseries for Nature BEST2.0 funded project (see **Annex15**) where the regular nursery person (a position brought about through a need identified under the project and effected through collaboration with the TCO) is given further opportunity to develop and hone his skills with the aim of managing the nursery and related activities in the near future with support (outlined in **Annex16**) from Conservation & Clearance (principal project consultant and field work service provider) retained under the Nurseries for Nature project to cement the progress in the field gene banks and provide continuity of effort and enhance training & development of the regular nursery person and rest of the Peaks Management Team.
Project resources have been incorporated into EMD conservation assets and will bolster recurrent conservation activities that have already gained great benefit from nursery infrastructure improvements implemented by the project. The project highlighted further gains that could be made if facilities were expanded and have been instrumental in the successful bid for the Nurseries for Nature project which will continue to expand facilities to meet demand for increased production output.

5 Lessons learned

One aspect (as described above in **sections 2** *Project Stakeholders & Partners* and **4** *Sustainability and Legacy*) of the project which proved positive was the secondment of the substantive Terrestrial Conservation Officer to lead the project team (see **Annex 14**). This was made possible by employing a substitute manager to undertake the running of the Terrestrial Conservation Section for the duration of the project. Essentially the skill set required to run the TCS was easier to fulfil than that identified to successfully implement the project objectives. This process allowed the knowledge gained from the project to remain lodged within the island's conservation community.

A critical lesson is that future projects are designed to take into account the delays experienced by almost all projects, with uncertainties and challenges with regards to access, communications and shipping all major considerations. Due consideration to this should be given to future project proposals, making for more accurate Logical Frameworks and better scheduling.

The project also like to highlight ‘gentle change’ to be adopted in respect of cultural resistance to change. Experience over the years has taught us that creating working examples of intended solutions to a problem are better received in the long term. Persons are afforded time to adjust to something new and given chance to work out for themselves which elements of the ‘example’ they can adopt and make their own, without the need for offending local sensitivities. In addition, local pride is enhanced through self discovery and ownership affords an element of longevity and sustainability of the change.

We have where possible adopted a flexible approach to implementing the project. This has meant that we have developed our practical protocols 'on the fly' in order to interactively improve them in light of outcomes observed. A flexible approach has also allowed us to make best use of available time and resources in the light of the restriction and delays experienced and mentioned above. The rapid response through the straightforward Change Request process (see **Annex12**) was much appreciated when we were unable to accommodate issues through this flexible approach.

5.1 Monitoring and evaluation

We attempted to show our partners the work we do where and when possible to get first hand feedback on progress made, discuss potential further developments and future proposals.
We had a visit from RSPB in November 2017 which resulted in further interest from the RSPB in the investment potential of the restoration works within the Cloud Forest (see **Annex1;2;7&8**).
To ensure best synergy with on island partners presentations were given, one in March 2016 (see AR2 2016 section2 Lessons Learned) and another in April 2017 (see Photo Annex **Figure9),** where the project was explained, progress shared and lessons learned discussed.

5.2 Actions taken in response to annual report reviews

All annual report reviews have been forwarded to project partners for comment.

In the last AR review mention was made that “*the project has made a demonstrated effort to respond / act upon feedback from its previous review. This included highlighting project baselines/making them clearer, commenting on links to UKOT agreements, and highlighting where activities are interlinking. Significantly, the project has demonstrated significant improvements in reporting through the generation of a logframe. It should be noted that the project exit strategy has been advanced/enhanced, though this is not a direct response to previous feedback”*. It was suggested that the project submits a change request to formalise the logframe.
This advice was not followed. In hindsight this should have been done as it is a fairly simple process that would have made completion of the Final Report easier and made much of this explanation redundant.

6 Darwin Identity

The Darwin Initiative is a principle source of conservation funding on St Helena. Locally the project has been publicised in the local press and through government wide information releases (AR2 2016 Annex 1.7 to 1.10 and AR3 2017 Annex 16 FigureVI) and more recently in Darwin May 2018 Newsletter article. Additionally a widely read web blog highlighting St Helenian issues and culture has featured the work of this project. All correspondence relating to the project has carried the Darwin logo and project title. Although the project has been closely aligned with ongoing conservation activities in the Peaks National Park it has maintained an identity as a distinct project with regular reference to it in reports from other projects on St Helena that have benefited from the DPLUS029 Cloud Forest project as mentioned in **section 2** *Project Stakeholders/Partners*. The Darwin Initiative funding and support have been highlighted when explaining the field activities to visitors to the National Park. The Peaks nursery and primary field gene bank is adjacent to public way of access and one of the most visited public walks on the island. As such it is a common occurrence for visitors to engage with Peaks Management staff giving us opportunity to share our story (see Photo Annex **Figure10**) which includes explaining Darwin funding and continued support over the years to the Peaks management.

Further exposure was gained through a community event (see Photo Annex **Figure11**) where a display was made, showing islanders' photos of project sites and sharing with them their interest in St Helena's natural heritage.

To further advance the image of Darwin on island a presentation was made in April 2017 to on island partners and the wider conservation community with over 30 attendees (see Photo Annex **Figure 9**)

7 Finance and administration

7.1 Project expenditure

Project spend (indicative) since last annual report	2017/18 Grant (£)	2017/18 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)	Cost (£)
TOTAL	0

Consultancy – description of breakdown of costs	Other items – cost (£)

Conservation & Clearance engaged to deliver services under a Consultancy Agreement **Annex 17**	
TOTAL	

Capital items – description	Capital items – cost (£)
TOTAL	0

Other items – description	Other items – cost (£)
TOTAL	0

7.2 Additional funds or in-kind contributions secured

Source of funding for project lifetime	Total (£)
RSPB £3,000 grant; staff time, publicity	
Buglife technical support & training	
Use of SHG vehicle and trailer	
TCS work in kind	
TOTAL	

Source of funding for additional work after project lifetime	Total (£)
RSPB supply PPE for peaks management team	
TOTAL	

7.3 Value for Money

We believe that overall this project represented good value for money and highlighted in **section 5** Lessons Learned. Economy and efficiency are difficult to achieve in St Helena because of the island's remoteness and relative expense of freight, travel and import costs. This project was implemented by a small team relatively experienced at running projects on St Helena so some issues such as extended lead times for materials, the difficulties of sourcing specialist equipment and staff were mitigated against. Using local staff kept overheads down and also reduced the 'learning curve' often encountered by new personnel on the island. We tried to develop protocols from the project to be as efficient and economical as possible in order to be able extend project benefits with more limited resources once project funding has ended.

Ecologically the project has exceeded our expectations. Our vision to capture the remaining gene pool of four critically endangered endemic tree species has come to fruition. The primary genetic field gene bank itself has become a model for the restoration of native habitat from degraded land. Its prominence at the main entrance to the Peaks National Park has generated new levels of interest in endemic species and our conservation work from island visitors and locals alike.

Annex 1

Project's original (or most recently approved) logframe (if your project has a logframe), including indicators, means of verification and assumptions. N.B. Insert your full logframe. If your logframe has changed since your application and was approved by a Change Request the newest approved version should be inserted here, otherwise insert the logframe from your application. If your application's logframe is presented in a different format in your application, please transpose into the below template. Please feel free to contact Darwin-Projects@ltsi.co.uk if you have any questions regarding this.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Impact: St Helena's Peaks National Park consisting of continuous cloud forest vegetation holding succession of generations with natural regeneration of all keystone tree species commonplace			
Outcome: The remaining habitat fragments of St Helena's cloud forest which holds critically endangered trees included in ecological restoration targeting and full complement of remaining genetic diversity of the wild trees are used in restoration plantings	Clearance of invasive plants and supplemental planting are undertaken in habitat fragments. Peaks nursery producing steady output of genetic diverse saplings.	Peaks action plan and or work plans Nursery production records Photographs	Peaks nursery will get dedicated staff Record keeping is continued and up to date Fixed point photo records are kept to document change at selected fragments Project data support the case for including habitat fragments into work/action plans and this is taken on board by the Peaks Management team
Output 1 All wild trees accessed. Trees and habitat assessment made including suite of invertebrates present	Tree Locations geo-referenced, tree health and habitat assessments completed for each site 1.1 Number of trees accessed and recorded 1.2 GPS location waypoints recorded for each tree 1.3. Number of sites visited and surveyed with entomologist	1.1 Relational database containing all tree and habitat assessment data 1.2 GIS database linked to database above containing geo-reference data for all recorded trees 1.3. Invertebrate survey data gathered in collaboration with DPLUS040	All areas can be visited during project time All trees are accessible Project able to engage suitably qualified entomologist
Output 2 Genetic material of rare Peaks trees	Genetic material from all trees sampled will be collected and	2.1 Collections added to St Helena's endemic seed bank recorded in the	Clonal material (cuttings) can be propagated from the four key species. If

collected, recorded and banked	banked. All trees sampled will be cloned 2.1 Number of seed collections made and recorded 2.2 Number of trees accessed with genetic material secured in the nursery.	germplasm database 2.2 Nursery logbook records source, numbers and destination of all plant material entering and leaving the nursery	this proves impractical seed collections will be taken instead
Output 3 Clonal material propagated and planted in 'seed-orchards'	At least three locations identified, prepared and planted; first seed collected from planted clones by March 2016 3.1 Number of trees successfully cloned 3.2 Number of orchard sites established	3.1 Photographs of orchard sites 3.2 Nursery logbook showing destination of cloned plants 3.3 GIS maps of 'orchards' of propagated plants	Suitable sites will be available Ability to successfully produce material suitable for planting out Adverse weather will not impact negatively
Output 4 Practical methodology developed to inform Peaks National Park action plan	Adoption of methodologies by National Conservation Areas management team 4.1 All members of Peaks management team trained in propagation techniques 4.2 Number of management areas identified 4.3 Number of staff engaged in maintenance of project sites using protocols developed	4.1 Peaks National Park action plan 4.2 Nursery propagation protocols 4.3 GIS mapping database 4.4 Invasive species protocols for Peaks National Conservation Area	Management receptive to new methodology

Activities (each activity is numbered according to the output that it will contribute towards, for example 1.1, 1.2 and 1.3 are contributing to Output 1)

1.1 Survey to identify location of remaining isolated trees
1.2 Assess community composition of each site
1.3 Collect representative sample for invertebrate identification
2.1 Collection, recording and banking of seed
2.2 Secure clonal material for propagation
3.1.1 Propagation facility set up
3.1.2 Expand propagation facility
3.2.1 Clonal material propagated
3.2.2.Make duplicate sets of clones

3.3 Sites prepared for planting 3.4 Seed-orchards planted up and labelled 3.5 Establishment rates assessed 4.1 Field data collated and analysed 4.2 Produce protocols 4.3 Present completed protocols to NCA management team

Annex 2

Project summary	Measurable Indicators	Progress and Achievements for the life of the project
Impact: St Helena's Peaks National Park consisting of continuous cloud forest vegetation holding succession of generations with natural regeneration of all keystone tree species commonplace		Good step change enabled to prevent further loss of genetic diversity through establishment of diverse functional genetic field gene banks. A cost effective working solution established and set in motion which have been adopted across the Peaks National Park and could be adopted across the wider terrestrial conservation scene on St Helena and in the other South Atlantic OT's
Outcome The remaining habitat fragments of St Helena's cloud forest which holds critically endangered trees included in ecological restoration targeting and full complement of remaining genetic diversity of the wild trees are used in restoration plantings	Clearance of invasive plants and supplemental planting are undertaken in habitat fragments. Peaks nursery producing steady output of genetic diverse saplings.	A full complement of genetic diversity of the key species is planted and productive in the genetic field gene banks, providing further rare habitat as an example of holistic habitat restoration, conserving ecological functioning enhancing system services enabled through enhanced understanding of rare habitat fragments
Output 1. All wild trees accessed. Trees and habitat assessment made including suite of invertebrates present	Tree Locations geo-referenced, tree health and habitat assessments completed for each site 1.1 Number of trees accessed and recorded 1.2 GPS location waypoints recorded for each tree 1.3. Number of sites visited and	403 trees accessed as shown on the Cloud Forest Database; GIS spatial data relating to all trees lodged on SHG's GeoPackage system; Comprising 114 sites. Invertebrate niche data recorded at all sites and 11 representative sites analyzed in detail by entomologist to verify accuracy of 'site ecological importance' assessments based on invertebrate niche data See **section 3.1; annex 4 & 5**

	surveyed with entomologist	
Activity 1.1 Survey to identify location of remaining isolated trees		Completed
Activity 1.2 Assess community composition of each site		Completed
Activity 1.3 Collect representative sample for invertebrate identification		Completed
Output 2. Genetic material of rare Peaks trees collected, recorded and banked	Genetic material from all trees sampled will be collected and banked. All trees sampled will be cloned 2.1 Number of seed collections made and recorded 2.2 Number of trees accessed with genetic material secured in the nursery.	92 Seed collection records of which 50 are Secured in the TCS Seed Bank under an ECS assession number and recorded on the ECS Database managed by the Nursery Officer of the Species Team within EMD **Annex18**; 403 trees accessed and secured as shown on the Cloud Forest Database as shown in Annex 4 and section 3.1
Activity 2.1 Collection, recording and banking of seed		Completed
Activity 2.2 Secure clonal material for propagation		Completed
Output 3. Clonal material propagated and planted in 'seed-orchards'	At least three locations identified, prepared and planted; first seed collected from planted clones by March 2016 3.1 Number of trees successfully cloned 3.2 Number of orchard sites established	403 trees sampled and represented in the Seed Orchards (this indicator would have been better stated if 'cloned' was substituted with the word 'propagated' (Locations of which is shown on the map in the AR3 2017 Annex11); Five orchard sites established
Activity 3.1.1 Propagation facility set up Activity 3.1.2 Expand propagation facility		Completed
Activity 3.2.1 Clonal material propagated Activity 3.2.2 Make duplicate sets of clones		Completed
Activity 3.3 Sites prepared for planting		Completed
Activity 3.4 Seed-orchards planted up and labelled		Completed

Activity 3.5 Establishment rates assessed		Completed
Output 4. Practical methodology developed to inform Peaks National Park action plan	Adoption of methodologies by National Conservation Areas management team 4.1 All members of Peaks management team trained in propagation techniques 4.2 Number of management areas identified 4.3 Number of staff engaged in maintenance of project sites using protocols developed	All eight members of peaks management team trained; 16 distinct management areas identified (see **annex19**); 3 staff engaged specifically to manage project sites and the nursery
Activity 4.1 Field data collated and analysed		Completed
Activity 4.2 Produce protocols		Completed
Activity 4.3 Present completed protocols to NCA management team		Completed

Annex 4

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. weblink, contact address, annex etc)
Manual	L.Malan & A.Darlow, Clearance Protocol, 2018	South African	St Helena	Male	St Helena Government	Environmental Management Devision, Scotland, St Helena STHL 1ZZ
Document	A.Darlow & L.Malan, Tree Survey, 2018	British	St Helena	Male	St Helena Government	Environmental Management Devision, Scotland, St Helena STHL 1ZZ
Document	A.Darlow & L.Malan, Site Survey, 2018	British	St Helena	Male	St Helena Government	Environmental Management Devision, Scotland, St Helena STHL 1ZZ
GIS dataset	A.Darlow & L.Malan, Cloud Forest project data, 2018	British	St Helena	Male	St Helena Government	Environmental Management Devision, Scotland, St Helena STHL 1ZZ
Manual	L.Malan & A.Darlow, Propagation Protocol, 2018	South African	St Helena	Male	St Helena Government	Environmental Management Devision, Scotland, St Helena STHL 1ZZ

Annex 5 Darwin Contacts

To assist us with future evaluation work and feedback on your report, please provide details for the main project contacts below. Please add new sections to the table if you are able to provide contact information for more people than there are sections below.

Ref No	DPLUS029
Project Title	Securing St Helena's cloud forest trees and invertebrates
Project Leader Details	
Name	Lourens Malan
Role within Darwin Project	Project Manager
Address	
Phone	
Fax/Skype	
Email	
Partner 1	
Name	Derek Henry
Organisation	SHG
Role within Darwin Project	Director of the Environment and Natural Resources Directorate under which the Terrestrial Conservation section falls
Address	
Fax/Skype	
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Partner 2	
Name	Nicholas A. G. Yon
Organisation	SHG
Role within Darwin Project	Assistant Financial Secretary
Address	
Fax/Skype	
Email	

Supplementary material

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.	no
Have you involved your partners in preparation of the report and named the main contributors	no
Have you completed the Project Expenditure table fully?	yes
Do not include claim forms or other communications with this report.	