



Department
for Environment
Food & Rural Affairs



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Department
for International
Development



Darwin Plus: Overseas Territories Environment and Climate Fund Annual Report

Important note *To be completed with reference to the Reporting Guidance Notes for Project Leaders:
it is expected that this report will be about 10 pages in length, excluding annexes*

Submission Deadline: 30th April 2017

Darwin Plus Project Information

Project reference	DPLUS040
Project title	Securing the future of St Helena's endemic invertebrates
Territory(ies)	St Helena
Contract holder institution	St Helena National Trust
Partner institutions	St Helena Government The Natural History Museum, London Museum für Naturkunde und Vorgeschichte, Dessau, Germany Buglife
Grant value	£179,332
Start/end date of project	1 st August 2015 to 31 st July 2018
Reporting period (e.g., Apr 2016-Mar 2017) and number (e.g., AR 1,2)	Apr 2016-Mar 2017, AR2
Project leader name	David Pryce
Project website/blog/Twitter	http://www.nationaltrust.org.sh/shnt-conservation-programmes/natural-heritage/bugs-on-the-brink-our-invertebrates/
Report author(s) and date	David Pryce, 29 May 2017

1. Project overview

St Helena, a small island in the South Atlantic Ocean, is a major biodiversity hotspot with about 470 species of endemic terrestrial invertebrates. Invertebrates on St Helena are under threat from invasive plants and animals, loss and fragmentation of habitat, and infrastructure development. Efforts to conserve important habitats have been underway for decades; however, due to the lack of knowledge about invertebrates, these efforts have mainly focused on plant and vertebrate species and their habitats.

Invertebrate survey work has been sporadic and has usually been conducted in the local 'summer' (December-May); the only island-wide survey (two expeditions in the late 1960's from the Royal Museum for Central Africa), is now out of date and, while thorough, did not employ standardised methodology at each site.

Past revegetation work has seldom been monitored at an accuracy that will allow precise determination of success. Mapping key habitat areas accurately will create a baseline map so that future conservationists will be able to assess changes over time. This technology will also

allow the collection of ecological data on rare and poorly understood species such as the Prosperous Bay Plain Mole Spider.

An invertebrate survey comparing natural vegetation, restored and non-native habitat will allow an assessment of the success of conservation work for invertebrates and determine issues that need addressing (e.g. the impacts of invasive predatory species). This will also provide a baseline for future work and determine the effects of seasonality for the first time.

A complete set of resources will be assembled at the Museum of St Helena so that terrestrial invertebrate identification and research can be undertaken on-island after the life of the project.

2. Project stakeholders/partners

The project team have been working closely with the St Helena Government (SHG) throughout the planning and execution of the project. The collection of invertebrates for research is regulated under the *Environmental Protection Ordinance 2016*; as a consequence, it was necessary that the project engage with every environmental government officer before surveying could commence. Signed consent for access to land was sought from the Environmental Management Division of SHG. A land access permission form for setting up malaise traps is the culmination of many negotiations with stakeholders and is included as evidence.

The project assisted SHG Biosecurity by providing two days of training on invertebrate identification skills. An additional four days were spent training 27 local staff in invertebrate identification and pest control, and one day spent training the St Helena Museum Manager in identification and curation. An invertebrate training record and a quote for entomological services to Biosecurity (SHG) are included as evidence.

Sam Cherrett, the project manager for *Mapping St Helena's biodiversity and natural environment* (DPLUS052 – SHG) has increased her involvement in the project by creating base layers needed for invertebrate species on the IUCN Red List of Threatened Species™. An image of QGIS layers used for Red Listing is provided as evidence.

The project has engaged with the *Water security and sustainable cloud forest restoration on St Helena* project (DPLUS051 – SHG) by sharing weather data at three sites in the Peaks National Park. Malaise traps have been set up at each of the three weather stations and it is hoped that meteorological information will help determine invertebrate seasonality at those sites. A photo of a malaise trap adjacent to a weather station is included as evidence.

The project has collaborated with the *Securing St Helena's rare cloud forest trees and associated invertebrates* project (DPLUS029 – SHG and Buglife) to assess the associated invertebrate fauna of endemic trees in the Peaks National Park. A standardised sampling methodology has been developed to minimise the risk to populations present at these sites. A total of 17 sites have been surveyed so far and an objective scoring system developed to assess the relative importance of the sites. This has generated significant important material for the invertebrate collection; so far a total of 20 species not seen since the last major survey in 1967 have been identified, including one species not seen since 1867. In total 115 species were recorded, 74 of which are endemic. An image showing the locations of the 17 DPLUS029 sites in the Peaks National Park, and a spreadsheet of the survey results for DPLUS029 are provided as evidence.

The Natural History Museum, UK, was involved with the project through a 15-day field survey on St Helena by visiting entomologist Howard Mendel. During fieldwork Howard trained six local staff in field techniques, which the staff will be able to use to conduct future field surveys for the project. He confirmed the identification of the invasive non-native banyan beetle (*Xylopsocus capucinus*), and confirmed the presence of the Mt Vesey leaf hopper (*Sanctahelenia insularis*). Photographs of Howard Mendel training project team members, the banyan beetle that Howard confirmed, and the Mt Vesey leaf hopper that Howard found during his surveys are provided as evidence.

The Project Manager visited the Natural History Museum for a day in July 2016 to meet with Mick Webb, curator of Hemiptera, to discuss identification of *Iassomorpha* species, a genus of leaf hopper which has appeared recently on St Helena. A copy of a taxonomic paper for the species is included as evidence of the visit.

The Museum für Naturkunde und Vorgeschichte, Germany, was involved with the project through a 24-day survey on St Helena by visiting entomologist Timm Karisch. His surveys resulted in 10 new species of fungus moth (*Opogona* sp. – one of the big radiations on the island), and new specimens of Wollaston's shield bug (*Macrorhaphis wollastoni*). His surveys added several species new to science to the island's species list. He also ran a workshop on moths for eight local staff. Thanks to the training, project staff are now competent at preserving moths in the dry collection. Photographs of Timm Karisch surveying for moths with project staff, the Wollaston's shield bug that Timm found, and Timm training local staff in the workshop are provided as evidence.

Buglife and SHG were involved in the project through co-authorship of the *St Helena Invertebrate Conservation Strategy 2016-2021*, published in May 2016. The strategy builds directly on the results of the 19-029 'Laying the foundations' project, providing a practical strategy for conservation of the islands invertebrates. A copy of the strategy is included as evidence.

The project assisted the *Conservation of the spiky yellow woodlouse and black cabbage tree woodland project* (DPLUS025 – SHNT and Buglife) project to estimate population numbers of woodlice. The Project Manager was a co-author of a scientific article (submitted to *Myriapod and Isopod Bulletin*) about spiky yellow woodlice fluorescence under ultraviolet light and the potential for nocturnal surveys. Copies of the spiky yellow woodlouse population assessment spreadsheet and the scientific article are provided as evidence.

3. Project Progress

Project highlights:

- 1 island outreach event (Longwood Nature Day)
- 1 international conference attended (Island Biology 2016 Conference, Azores)
- 2 researchers visited St Helena for a total of 39 days
- 3 months of malaise trap surveys completed
- 3 Ascension Island conservation staff attended project training
- 4 microscopes purchased
- 10 days of invertebrate training delivered by project team
- 24 malaise traps set up for invertebrate surveys
- 31 local staff attended invertebrate training
- 88 classes of invertebrate education delivered to 1,222 students
- 94 species added to the Red List, resulting in a total of 110 species to date
- 2,484 specimens of 421 species included in collection (30% of species recorded)

3.1 Progress in carrying out project Activities

Outcome 1 – Conservation management will be improved in terms of the Island's endemic invertebrates.

- 1.1 Visit the Royal Museum for Central Africa in Tervuren, Belgium to photograph specimens.

The visit to the Royal Museum for Central Africa in Tervuren, Belgium, has been cancelled. While the visit would have been valuable, it was possible to photograph the St Helenian specimens in the Natural History Museum collection in London, making a special trip to Belgium unnecessary. This activity feeds directly into Activity 2.1 so it is important to note that despite the cancellation of this visit Activity 2.1 will still be successful. Change request no.3 was approved in May 2017 and is attached as evidence.

- 1.2 Visit the Natural History Museum in London to photograph specimens.

Activity was completed in 2015; however, this activity feeds directly into Activity 2.1 so it is important to report on development of the photographed specimens. The project continues to build on the visit to the Natural History Museum and is taking high quality macro photographs of additional species as they are identified and added to the collection. The project now has 1904 stacked images of 517 species available to assist with specimen identification; this represents 58% of species that it is possible to use this technique to image. The St Helena terrestrial invertebrates v5-3 file is included as evidence, refer to column R (stacked images). The file is the synthesis of all invertebrate records for St Helena.

1.3 Conduct a year-long invertebrate survey.

The year-long invertebrate survey began in January 2017. Twenty-four traps were erected and three months of specimens have now been collected. In order to minimise the risks to endemic invertebrate species an initial three-day sample was collected across all sites. Following this it was determined that the initial plan to attach the collecting bottles for seven days at a time on a four-weekly cycle for a year was acceptable and unlikely to harm the invertebrate populations present at these sites. A photograph of 24 malaise trap locations, and photographs of a malaise trap in situ and a typical sample are provided as evidence.

1.4 Identify specimens.

It is proving possible to identify nearly all larger (>2mm) invertebrates and about 50% of species below this size, this includes nearly all beetles and true bugs; however, there are some smaller species (particularly among the flies and wasps) that are more difficult to identify. In total, approximately 95% by volume of each sample is being identified to species level, equating to about 75% of all species present. Work continues to be undertaken on improving the identification tools and resources to allow some of this material to be processed later.

1.5 Produce reports.

Reports will be produced by the end of the project.

1.6 Re-assess any Red Listed species where new data may affect the listing

Data from the survey are already permitting changes to be made to Red Listings as they are being undertaken. It results from the fact that most of the commoner endemic species present at a site will already have been found in the samples processed to date and only species that are truly rare will not have been found already. In the past year 94 Red Listings have been submitted and are currently being reviewed and should be published on the IUCN website in the next few months; adding to 16 species from past years to make a total of 110 species Red Listed. The 94 species submitted this year include all of the endemic fungus weevils, spiders and true bugs. A spreadsheet of the Red Listings submitted this year is provided as evidence. Data generated by the project were used in 58 of the following Red Listings:

The Red Listing categories for the St Helena species assessed so far is as follows:

- Extinct – 2
- Critically Endangered – 34 (13 of these being Critically Endangered (Possibly Extinct))
- Endangered – 44
- Vulnerable – 17
- Near Threatened – 2
- Least Concern – 11

In July 2016, the Project Manager attended the Island Biology 2016 Conference hosted by the University of the Azores. The conference provided a platform to raise awareness of St Helena and the many issues regarding conservation on the island. It was also very useful for networking and informal meetings were held with numerous workers from institutions such as Kew Gardens and Buglife. Preceding the conference was a two-day Red Listing workshop attended by the Project Manager and members of the Mid Atlantic Island Invertebrate Specialist Group (MAISG).

Participants included Vicky Wilkins from project partner Buglife, and Axel Hochkirk, Chair of Othoptera Specialist Group of IUCN. The conference program, photographs of Vicky Wilkins and Axel Hochkirk presenting at the Red Listing workshop are provided as evidence.

1.7 Make data available.

Data will be made available at the end of the project.

Outcome 2 – A complete invertebrate identification toolkit will have been assembled.

2.1 Take data from Outputs 1.1, 1.2 and the outputs from the 'Laying the foundations' project to create a resource set.

There are no data from Activity 1.1 because the visit to Belgium has been cancelled (see section 1.1); however, the stacked images from Activity 1.2 have been added to the “St_Helena_Invertebrates” digital resource set which continues to be developed and improved. The file now contains 18,212 individual items in 885 folders and is 22.1 GB in size. This resource set contains taxonomic papers, reports, species photographs taken in the field, high quality stacked specimen images, keys and any other resources that have been found to be of assistance with invertebrate identification or provide historical records. It is the sum total of all information known about St Helena’s invertebrates.

As an example, the resource set includes the species list for the island. The list now contains 1421 species. It continues to grow and be updated on an almost daily basis as new information is found and added. This list includes data such as higher classification, scarcity, the year a species was first and last seen, Red List status, how many specimens of each species are in the collection and where to locate them, plus file management information. There is also a sheet of metadata explaining what the data means and a full bibliography. The St Helena terrestrial invertebrates v5-3 (species list) is included as evidence that a lot of hard work has gone into a resource set.

The resource set includes educational programs which have built on the ‘Laying the foundations’ project outputs. That project had two educational outputs: (1) delivering training programmes to increase local capacity and skills in invertebrate conservation, and (2) delivering educational and awareness raising programmes about invertebrates and their ecosystem services, to increase public support and engagement. Training programmes have been delivered by the Project Manager and visiting experts to local staff. Educational and awareness programs have been delivered by the Education and Project Officer.

The Project Manager spent two days training three Biosecurity staff in invertebrate identification skills, four days training 27 local SHG staff in identification and pest control skills, and one day training the Manager of the St Helena Museum in identification and curation of invertebrates. In addition, five days of training was delivered to conservation staff on Ascension Island during the return leg of the Island Biology 2016 Conference trip. Timm Karisch from The Museum für Naturkunde und Vorgeschichte, Germany, ran a workshop on moths for eight local staff. An invertebrate training record, a quote for entomological services to Biosecurity, a photograph of training on Ascension, and photographs of Timm training local staff in the workshop are included as evidence.

The Education and Project Officer continues to improve and enhance the educational resources developed during the ‘Laying the foundations’ project. The officer spends one day a week delivering invertebrate themed activities in conjunction with the National Trust’s Forest School Officer through the Forest School programme. Eighty-eight classes were delivered in the reporting period to 1,222 school students (many are repeat students). The programme reaches students from all three primary schools and the high school, essentially providing invertebrate education to all school aged children on island. Photographs of the project team delivering classes to children are included as evidence. The invertebrate education records sheets which include dates and duration of classes, ages and numbers of students, and topics taught, are included as evidence.

2.2 Create accurate, tested invertebrate keys.

Keys have now been created for 386 species and these are continually being tested and improved. Most of the keys published in French in 'La faune terrestre de l'île de Sainte-Hélène' (1970-77) have been translated into English and are in the process of being simplified and improved. A draft test key to the fungus weevils (Athriddidae) which was created in the reporting period is included as an example of one of the keys created.

2.3 Improve the field guide with new information and photographs.

Production of the field guide has now passed to Roger Key, an entomologist in the UK. He is working on the guide one section at a time. Seven sections are now completed, with more to go as the surveys progress. Sections are intended to be published electronically on the National Trust website by the end of the project. Copies of the sections for grasshoppers (Orthoptera) and wasps (Hymenoptera) are included as evidence that production of the field guide is progressing.

2.4 Improve the Museum of St Helena reference collection.

The invertebrate collection that will be handed over to the Museum of St Helena at the end of the project now contains 2,484 specimens and includes 421 species or 30% of the species recorded from St Helena. The majority of species are in the dry, pinned collection; this contains 1,398 specimens referable to 370 species. The wet (alcohol) collection contains 1,086 specimens referable to 67 species. The alcohol collection is primarily for those species that do not store well dry, and also for holding bulk samples of common species for use in training.

Four microscopes have also been purchased for the Museum of St Helena, these comprise:

1. A compound microscope with digital camera for photographing specimens on slides.
2. A compound microscope with long working distance objective lenses to allow photography of invertebrate legs, antennae, etc.
3. A binocular zoom microscope with digital camera for photographing specimens and parts of specimens.
4. A high-quality binocular zoom microscope with video camera and large screen for training.

Photographs of the invertebrate collection and the microscopes in use are provided as evidence that the Museum of St Helena's reference collection has improved.

2.5 Make the contents of the reference collection available online.

The contents of the reference collection are not online yet but preparations are being made to enable this to happen. In the meantime specialist museum database software, Adlib Museum, has been purchased and installed at the Museum of St Helena. This will allow comprehensive data about the specimens in the collection to be entered onto their computers. A photograph of an example of an entry from the collection in the Adlib Museum program is provided as evidence. It is expected that the reference collection will be available online in the next year.

Outcome 3 – The three main areas of restoration work undertaken will have been mapped at high resolution.

The project team has been preparing for the surveys to commence in the next year of the project. The project has changed the intended approach to habitat surveys. Rather than monitoring individual plants to centimetre accuracy, the project will focus on assessments of habitats as a whole, while maintaining acceptable outcomes. GIS equipment will be procured which will allow the three main areas of restoration work to be mapped. A Trimble Yuma 2 GPS device will be purchased, resulting in project savings of £16,000. The device can take photographs that are geo-referenced and upload them directly into the GIS system used by SHG and the National Trust, allowing enhanced data sharing across organisations. It results in improved efficiencies and enables the project to adapt to changes. A change request approved in May 2017 outlines

these changes. The mapping data will link to the results of the invertebrate surveys and will allow us to gain a better understanding as to how well current conservation work is helping associated invertebrate species. These data will be made available at the end of the project.

Outcome 4 – Areas of natural regeneration will have been recorded at high resolution.

Very similar to Outcome 3 above, the project team has been preparing for the surveys to commence in the next year of the project. The project has changed the intended approach to habitat surveys. Rather than monitoring individual plants to centimetre accuracy, the project will focus on assessments of habitats as a whole, while maintaining acceptable outcomes. GIS equipment will be procured which will allow the five main areas of natural regeneration to be recorded. A Trimble Yuma 2 GPS device will be purchased, resulting in project savings of £16,000. The device can take photographs that are geo-referenced and upload them directly into the GIS system used by SHG and the National Trust, allowing enhanced data sharing across organisations. It results in improved efficiencies and enables the project to adapt to changes. A change request approved in May 2017 outlines these changes. The recorded data will link to the results of the invertebrate surveys and will allow us to gain a better understanding as to how well current conservation work is helping associated invertebrate species. These data will be made available at the end of the project.

Outcome 5 – There will be increased knowledge of the ecology and distribution of the Prosperous Bay Plain Mole Spider.

A preliminary survey of the spatial extent of the Prosperous Bay Plain Mole Spider sites has been undertaken with handheld GPS and this has been plotted using QGIS software; these data have been shared with SHG and the Air Access Office, and forms the basis of further surveys for distribution and abundance which will commence in the next year of the project. GIS equipment will be procured which will allow the Mole Spiders to be mapped in detail. A QGIS image of the spatial extent of Mole Spiders is provided as evidence.

3.2 Progress towards project Outputs

Output 1: Conservation management will be improved in terms of the Island's endemic invertebrates.

Preliminary results from the survey shows that the more mobile endemic species (particularly flies, wasps and true bugs) are able to migrate and take advantage of conservation work that has been undertaken (for example, to migrate into restored habitat areas); it is also apparent that several endemic species have adapted to non-native species or habitats and are therefore much less threatened than had previously been thought.

The project team are gathering the information needed to make informed decisions for improving management of conservation areas. The invertebrate surveys have been on-going for three months and are returning excellent specimens which are constantly being added to the collections. The habitat recording which will provide evidence to link habitats to the species recorded will be conducted in the next year and preparations are being made to ensure this goes ahead. There have been delays starting the assessment of health of key areas of endemic plants and the success of conservation work (explained at length in sections 6 and 7); however, the steps have been taken to ensure that this output will be delivered as planned.

Output 2: A complete invertebrate identification toolkit will have been assembled.

The digital resource is constantly growing as more information is added. The collections are increasing in number and a wealth of knowledge is being acquired about St Helena's invertebrates. Keys for identifying invertebrates are continually being developed as more information is received from the surveys. The St Helena Museum is being prepared to take on the collections at the end of the project.

The indicator of having 50% of species known from the island being represented in the collection at the St Helena Museum is achievable and is still valid. Currently the collection contains 30% of known invertebrate species.

Output 3: The three main areas of restoration work undertaken will have been mapped at high resolution.

Surveys will commence in the next year of the project. The indicator of locations of at least 10,000 plants recorded between the sites High Peak, Millennium Forest and Blue Point is still valid.

Output 4: Areas of natural regeneration will have been recorded at high resolution.

Surveys will commence in the next year of the project. The indicator of at least 26 days having been spent accurately mapping at least five areas of accessible natural regeneration is still valid.

Output 5: Increased knowledge of the ecology and distribution of the Prosperous Bay Plain Mole Spider.

Knowledge of the Mole Spider is increasing slowly. A preliminary survey of the spatial extent of the Prosperous Bay Plain Mole Spider has been undertaken with handheld GPS and this has been plotted using QGIS software. A screenshot of the spatial extent of Mole Spiders is provided as evidence. Some of this information was already known but needed to be reconfirmed in order to establish more thorough surveys in the next year of the project. The indicator of at least 52 days spent over the period of one year accurately surveying the Mole Spider is still valid.

3.3 Progress towards the project Outcome

Project Outcomes:

- 1) An assessment of the success of conservation work for endemic terrestrial invertebrates and a baseline survey in natural and restored habitats against which future changes can be measured
- 2) A high-resolution record of conservation work undertaken and endemic species regeneration so that spatial changes can be monitored accurately in the future.

Sections 3.1 and 3.2 have provided an update on project progress against the indicators with evidence of progress. The indicators are all still valid for measuring the outcomes. The resignation of the Project Officer has caused delays to the surveys and processing of specimens. These delays have been compounded by the Project Manager dealing with significant personal issues, and a greater administrative load than anticipated relating to logistical and human resources challenges. A change request approved in May 2017 allowed the role of Surveyor to take on all project management duties, freeing the Project Manager to focus on survey work, training staff, and processing specimens for the collection.

The invertebrate baseline survey is on track and samples are being processed, in preparation for handover to the St Helena Museum. Targeted sampling is occurring outside of the main baseline survey to locate hard-to-find species.

Habitat and restoration records and surveys are on track to happen in the next year of the project. The information gathered will be sufficient to evaluate the success of conservation work for endemic terrestrial invertebrates and to provide recommendations for their future management.

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

Assembling a complete invertebrate identification toolkit is a goal of the project. The collection has dramatically increased in the last year. Taxonomic keys have been established to help

identification of species which add to the general pool of scientific knowledge and have great relevance for invertebrate studies elsewhere.

The legacy of this project will be an invertebrate collection housed at the St Helena Museum, the first invertebrate collection on island, and will be available to everyone. At least two local St Helenians will be invertebrate specialists who can work and train others.

Five days of invertebrate training was delivered to conservation staff on Ascension Island in August 2016. This training has helped Ascension staff in identification and has improved awareness of invertebrates. A photograph of training on Ascension and the training record spreadsheet are provided as evidence.

At the Island Biology 2016 Conference in the Azores, the Project Manager was involved in workshops and conference sessions directly related to supporting environmental outcomes in the UKOTs. The conference provided a platform to raise awareness of St Helena and the many issues regarding conservation on the island. The Project Manager also attended a two-day Red Listing workshop with other professionals involved in conservation in UKOTs, and attended a meeting of the Mid Atlantic Island Invertebrate Specialist Group (MAIISG). Photographs of Axel Hochkirk (MAIISG) and Vicky Wilkins (Buglife) presenting at the workshop, and the conference program are provided as evidence.

3.5 Monitoring of assumptions

The assumptions made regarding the project objectives have not changed and some of them were realised during the year.

Endemic invertebrate species may be negatively impacted by the survey. There is still a risk that endemic species may be negatively impacted either from over-sampling in malaise traps or from unintended impacts of the project team, such as from trampling endemic habitat. The survey aspect of the project assesses the effect of seasonality and therefore it is expected that there will be some months with more specimens collected than other months. A precautionary approach was taken at the beginning of the surveys, collecting for only three days. The collection period was extended to seven days once it was determined that only a small number of specimens were collected. Samples from key sites are prioritised for identification so that an assessment can be made as to whether unacceptably large numbers of rare species are being caught. Traps will be moved if damage is perceived to be occurring.

Intentional damage to monitoring sites by external parties. There has not been any vandalism to monitoring sites despite the close proximity to public walking trails. Sites were chosen as a compromise between ease of accessibility for project team and risk of damage to habitats by walking off paths. There is still real risk of vandalism for the next 9 months while the traps are in the field; however, informative signage at the sites and a promotional campaign by the project team in the local newspapers has helped inform people of the malaise traps. A copy of the newspaper article is included as evidence.

Change of personnel. The project team has unfortunately been disrupted by changes of personnel during the year. Sasha Bargo, the Project Officer, who was responsible for identification of invertebrate samples and conducting field surveys, resigned in February after six months employment. The project was busy with the year-long survey so the resignation came at a bad time for the project. It will take approximately three months to recruit and train a new employee which will cause delays to the project. A change request approved in May 2017 allowed for a three-month project extension and a change to the duties of each staff member in order to get samples processed, surveys completed, and the project administration back on track. A copy of the change request no. 3 is included.

4. Monitoring and evaluation

This has mainly been covered in earlier sections, especially 3.1 and 3.2. However, the “St_Helena_Invertebrates” digital resource set is the main monitoring tool of the project. It is the sum total of all information about St Helena’s invertebrates and is used on a daily basis. It allows the project team to monitor how many specimens have been identified to species level or morphotype. Combining the habitat mapping data with this resource set will allow assessments of the health of key areas of endemic plants and associated invertebrates and the success of conservation work to be made.

5. Lessons learnt

The resignation of the Project Officer has been very disruptive to the project. There was nothing that the Project Manager or the National Trust could have done to change this since the Officer’s new position paid much more than the project could offer. It highlighted that the roles of project staff needed to be altered in order to help with identification and surveying. A change request approved in May 2017 allowed for changes to the duties of each staff member in order to get samples processed, surveys completed, and the project administration back on track.

There could have been a higher level of communications between Project Manager and the Director of the National Trust. Steps have been made to improve communications and avoid any further issues arising. In particular, regular meetings are now scheduled and the project office has relocated to the National Trust headquarters so that it is now adjacent to the Director’s office.

Setting up of the malaise traps was a success and initial findings are showing good results. It was particularly successful because the Project Manager personally approached all necessary people to discuss the location of the traps and get their signed permission for use of the land. The same approach will be used in future for smooth communications among project partners. Signed consent for land access for surveying is included as evidence.

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

The AR1 stated that the project was progressing very slowly and in their opinion not all outputs will be achieved. The reviewer was rightly concerned about the amount of slippage that had occurred in the project timeframe and with the exception of Output 2, greater progress should have been made. The project is almost in the same situation now, one year on from the AR1. Outputs 1 and 2 have had all the focus, while Outputs 3 and 4 have had no focus whatsoever, and Output 5 had only a cursory glance (preliminary survey of Mole Spiders completed).

There has been mention in this report of the reasons why the project experienced more delays this year: the Project Officer resigned, the Project Manager experienced significant personal issues that hindered his efficient working on the project, as well as internal communication issues. These reasons, although valid explanations for the current state of the project (and discussed at length with Darwin), may not persuade a reviewer that the project will be successful and outputs will be achieved.

However, in response to these problems, a radical change to project management has been implemented by the Director of the National Trust. A change request approved in May 2017 (outside of the reporting timeframe but relevant to the reviewer) allowed the incoming role of Surveyor to take on all Project Management duties, freeing the current Project Manager to focus on survey work, training staff, and processing specimens for the collection. In addition to managing the project, the Surveyor will begin the habitat and Mole Spider surveys (Outputs 3, 4 and 5) in June 2017. Even though the specialist GIS equipment will not arrive on island for 2-3 months, the project is able to hire identical GIS hardware from SHG. Long-term hire of the device is not possible; however, for the 2-3 months until the device arrives on-island hiring from SHG will help the project to establish the habitat and Mole Spider surveys and finally commence progress towards Outputs 3, 4 and 5.

Additionally, in response to the previous review, this report contains a large amount of evidence compared to the last report. Management/stakeholder coordination mechanisms employed in the project have been reported on and evidence has been provided. Section 3.1 has recorded

progress against each specific activity. Where the project is adding to outputs from project 19-029 'Laying the foundations', these additions have been identified in section 2.1. And the project indicators have been re-worked, based on project 19-029 which was used as a model, both for quality of indicators and for subsequent reporting of progress against them, but will be submitted in a change request soon.

7. Other comments on progress not covered elsewhere

N/A

8. Sustainability and legacy

Project legacy includes a collection of invertebrate specimens housed at the St Helena Museum, equipment for their study, keys for their identification and a standardised invertebrate sampling protocol. In addition, information on habitat preferences and requirements of invertebrates will feed into conservation management protocols.

The permanency of the St Helena Museum to maintain the collection and equipment, and the determination of Government policies and legislation to conserve endemic biota and habitats in perpetuity, guarantee that project outputs, outcome and impacts can be sustained.

There will be increased local and international awareness of St Helena's invertebrates through public relations work done by the project team and Buglife. Local knowledge will be greatly increased and sustained through at least two local invertebrate specialists being trained through the project, and by the National Trust whom is dedicated to invertebrate conservation beyond the life of the project.

9. Darwin identity

St Helena's population and Elected Members are familiar with the Darwin identity as several Darwin Plus funded projects are operating on the island and have previously been completed on St Helena. Since April 2016 Darwin and/or the project is being promoted on:

- The *St Helena Invertebrate Conservation Strategy 2016-2021*
- Longwood Nature Day, a promotional and educational activity day organised by the National Trust (newspaper article as evidence)
- Sentinel and Independent newspapers, St Helena (articles as evidence)
- Project vehicle branding with Darwin logo
- National Trust newsletter articles
- St Helena National Trust website <http://www.nationaltrust.org.sh/>

10. Project Expenditure

Table 1: Project expenditure during the reporting period (1 April 2016 – 31 March 2017)

Project spend (indicative) in this financial year	2016/17 D+ Grant (£)	2016/17 Total actual D+ Costs (£)	Variance %	Comments (please explain significant variances)

Staff costs			+24%	Reimbursement to project staff for salaries for the previous year.
Consultancy costs			-61%	Consultancy costs still need to be paid from Q4, we are waiting for invoices from consultants. Darwin is aware that these costs still need to come out of Q4.
Overhead Costs			+42%	Some overhead costs from 2015-16 were paid in 2016-17 resulting in variance.
Travel and subsistence			0%	
Operating Costs			+1%	
Capital items			0%	
Others (Please specify)			0%	
TOTAL	79,476.68	72,437.95	-9%	There was an overall project underspend of £7,038.73 for the year

Annex 1: Report of progress and achievements against Logical Framework for Financial Year 2016-2017 – if appropriate

Project summary	Measurable Indicators	Progress and Achievements April 2016 - March 2017	Actions required/planned for next period
<p>Impact</p> <p>St Helena has all the skills and resources to identify invertebrates and conservation efforts work in favour of endemic invertebrates.</p>			
<p>Outcomes</p> <p>To carry out a year-long baseline invertebrate survey across the island to determine how the effectiveness of conservation work that has been undertaken for plants is working for their respective invertebrates, and to determine how species vary seasonally;</p> <p>To conduct physical survey work to record sites of conservation interest, including natural regeneration and conservation plantings, so that changes at these sites can be monitored in the long term; also to conduct physical surveys at Prosperous Bay Plain Mole Spider sites in an attempt to gain further understanding of the species' ecology.</p>	<p>0.1 Conservation management will be improved in terms of the Island's endemic invertebrates.</p> <p>0.2 A complete invertebrate identification toolkit will have been assembled.</p> <p>0.3 The three main areas of restoration work undertaken will have been mapped at high resolution.</p> <p>0.4 Areas of natural regeneration will have been recorded at high resolution.</p> <p>0.5 There will be increased knowledge of the ecology and distribution of the Prosperous Bay Plain Mole Spider.</p>	<p>Malaise trap survey began in January 2017 with 24 traps across island.</p> <p>30% of species recorded on St Helena included in collection.</p> <p>Visit to St Helena by Timm Karisch and Howard Mendel for specialist surveys.</p> <p>Keys for 386 species created.</p> <p>Preliminary survey of spatial extent of Mole Spiders completed.</p> <p>Attended Island Biology 2016 Conference.</p> <p>Attended two-day Red-Listing workshop in Azores with project partners.</p> <p>94 species Red-Listed (to make total of 110 species).</p>	<p>Procure GIS equipment.</p> <p>Mapping restoration areas.</p> <p>Mapping areas of natural regeneration.</p> <p>Mole Spider surveys.</p> <p>Recruit replacement project staff.</p> <p>Year-long invertebrate survey continues.</p> <p>Assembling of complete identification tool kit continues.</p> <p>Recruitment of Surveyor and Assistant Project Officer positions.</p> <p>Second visit to St Helena by Timm Karisch for specialist surveys.</p>
<p>Output 1.</p> <p>Conservation management will be improved in terms of the Island's endemic invertebrates.</p>	<p>(a) The invertebrate survey will be completed and all identifiable specimens identified to species level or morphotype.</p>	<p>The invertebrate survey was set up with 24 malaise traps across the island. An assessment of health of key areas of endemic plants is on track to be completed at the end of the survey and links to Outputs 3 and 4. An assessment of the success of conservation work in terms of the associated endemic invertebrates is on track to be completed at the end of the survey and links to Outputs 3 and 4.</p>	

	<p>(b) An assessment of the health of key areas of endemic plants for their associated invertebrates will have been made.</p> <p>(c) An assessment of the success of conservation work in terms of the associated endemic invertebrates will have been made.</p>	The verification indicators are still valid.
Activity 1.1 Visit the Royal Museum for Central Africa in Tervuren, Belgium to photograph specimens.		Visit has been cancelled. A change request approved in May 2017 allowed this visit to be cancelled and funds distributed elsewhere. While the visit to the Royal Museum for Central Africa would be worthwhile, it has now become apparent that this is a luxury than the Project cannot afford.
Activity 1.2 Visit the Natural History Museum in London to photograph specimens.		Complete. The visit to the Natural History Museum happened at the start of the project. Stacked images were brought to St Helena and are now filed. The images have greatly assisted the identification of numerous species and are an invaluable resource.
Activity 1.3 Conduct a year-long invertebrate survey.		24 Malaise traps were set up in January 2017. Three out of 12 months have been completed, with at least 9 months remaining in the next period.
Activity 1.4 Identify specimens.		30% of species recorded on St Helena are included in collection.
Activity 1.5 Produce reports.		Reports will be produced at the end of the project when all data can be analysed together in the next period, in conjunction with information from Outputs 3 and 4.
Activity 1.6 Re-assess any Red Listed species where new data may affect the listing		94 species have been Red Listed this year. 16 species were Red Listed previously, resulting in a total of 110 species to date. Red Listing will continue as new data becomes available from Activities 1.3 and 1.4.
Activity 1.7 Make data available.		Adlib Museum software has been purchased for the St Helena Museum. All materials, tools and collections will be permanently housed at the St Helena Museum at the end of the project.
<p>Output 2.</p> <p>A complete invertebrate identification toolkit will have been assembled.</p>	<p>(a) A near-complete set of keys will have been compiled and tested. [It should be noted that this will not be possible for some groups where there is considerable taxonomic uncertainty or where the species require highly</p>	<p>Keys for 386 species have been completed.</p> <p>Currently 30% of species recorded on the island are represented in the collection, which the St Helena Museum will inherit at the end of the project. It is expected that 50% will be completed in the next period. The means of verification are still valid.</p>

	<p>specialist knowledge, skills or techniques to identify them].</p> <p>(b) The Museum reference collection will be considerably expanded with reference specimens from the survey. Over 50% of species known from the island should be represented in the collection.</p>	
Activity 2.1. Take data from Outputs 1.1, 1.2 and the outputs from the 'Laying the foundations' project to create resource set.		1.1 has been cancelled, see Section 1.1. However, data from Output 1.2 and the 'Laying the foundations' project are currently being used in the daily identification of specimens and educational activities by the Education and Project Officer who has delivered 88 classes to 1,222 students.
Activity 2.2. Create accurate, tested invertebrate keys.		Keys for 386 species have been produced in reporting period.
Activity 2.3 Improve the field guide with new information and photographs.		7 sections of the field guide have been completed.
Activity 2.4 Improve the Museum of St Helena reference collection.		1421 species on species list. Collection has 2484 specimens from 421 species, representing 30% of species recorded. Adlib software has been procured and installed at the St Helena Museum. Microscopes have been procured.
Activity 2.5 Make the contents of the reference collection available online.		Contents of the reference collection will be made available by the end of the project.
<p>Output 3.</p> <p>The three main areas of restoration work undertaken will have been mapped at high resolution.</p>	<p>Restoration work at the Millennium Forest, High Peak and Blue Point will be accurately mapped with the locations of at least 10,000 plants recorded.</p>	<p>This output will commence in the next period once the Surveyor has been employed and GIS equipment is procured.</p> <p>The means of verification are still valid.</p>
Activity 3.1. Map the Millennium Forest.		This task will be carried out in the next period once the Surveyor has been employed and GIS equipment is procured.
Activity 3.2. Map High Peak.		This task will be carried out in the next period once the Surveyor has been employed and GIS equipment is procured.
Activity 3.3 Map Blue Point.		This task will be carried out in the next period once the Surveyor has been employed and GIS equipment is procured.
Activity 3.4 Make data available.		Data will be made available by the end of the project.

<p>Output 4. Areas of natural regeneration will have been recorded at high resolution.</p>	<p>At least 26 days will have been spent accurately mapping at least five areas of accessible natural regeneration.</p>	<p>The activities to achieve this output will commence in the next period once the Surveyor has been employed and GIS equipment is procured. The means of verification are still valid.</p>
<p>Activity 4.1. Map Flagstaff Scrubwoods.</p>		<p>This task will be carried out in the next period once the Surveyor has been employed and GIS equipment is procured.</p>
<p>Activity 4.2. Map Pipe Path Scrubwoods.</p>		<p>This task will be carried out in the next period once the Surveyor has been employed and GIS equipment is procured.</p>
<p>Activity 4.3 Map Signal House Scrubwoods</p>		<p>This task will be carried out in the next period once the Surveyor has been employed and GIS equipment is procured.</p>
<p>Activity 4.4 Map Peak Dale Gumwoods.</p>		<p>This task will be carried out in the next period once the Surveyor has been employed and GIS equipment is procured.</p>
<p>Activity 4.5 Map Blue Point Scrubwoods.</p>		<p>This task will be carried out in the next period once the Surveyor has been employed and GIS equipment is procured.</p>
<p>Activity 4.6 Make data available.</p>		<p>Data will be made available by the end of the project.</p>
<p>Output 5. There will be increased knowledge of the ecology and distribution of the Prosperous Bay Plain Mole Spider.</p>	<p>At least 52 days will be spent over the period of one year accurately surveying the Mole Spider.</p>	<p>A preliminary survey of the spatial extent of Mole Spiders was completed which will be used to plan the accurate survey. However, the activities to achieve this output will commence in the next period once the Surveyor has been employed and GIS equipment is procured. The means of verification are still valid.</p>
<p>Activity 5.1. Repeatedly map the molehills to see spatiotemporal movement.</p>		<p>This task will be carried out in the next period once the Surveyor has been employed and GIS equipment is procured.</p>
<p>Activity 5.2. Assess population size (outside assistance may be required here).</p>		<p>This task will be carried out in the next period once the Surveyor has been employed and GIS equipment is procured.</p>
<p>Activity 5.3 Make data available.</p>		<p>Data will be made available by the end of the project.</p>

Annex 2: Project’s full current logframe as presented in the application form (unless changes have been agreed) -- if appropriate

N.B. 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:			
Outcome:			
Output 1 Add more outputs as necessary	1.1 1.2 1.3. etc.	1.1 1.2 1.3. etc.	
Output 2	2.1 2.2	2.1 2.2	
Output 3	3.1	3.1	
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)			

Annex 3 Onwards – supplementary material (optional but encouraged as evidence of project achievement)

Supplementary material is located on the project Drop Box folder. The material can be located at: https://www.dropbox.com/sh/ukxmwtkw6ieksao/AABUXw_mo7R5kWEB74leGC1ba?dl=0

The Drop box folder contains the following documents:

Adlib Museum data entry example
Biosecurity work quote for entomological services
Change request no.3
Draft test key to the fungus weevils (Athrididae)
Field guide section on grasshoppers (Orthoptera)
Field guide section on wasps (Hymenoptera)
Iassomorpha identification information paper
Image of the 17 DPLUS029 sites in the Peaks National Park
Invertebrate education records sheet 2016
Invertebrate education records sheet 2017
Invertebrate training record
Island Biology 2016 Conference in the Azores program
Land access permission form for setting up malaise traps
Local newspaper article about malaise trap survey
Longwood Nature Day newspaper article
Malaise trap at DPLUS051 weather station
Photograph of 24 malaise trap locations
Photograph of Axel Hochkirk from MAISG presenting at the Red Listing workshop
Photograph of delivering invertebrate classes to children 1
Photograph of delivering invertebrate classes to children 2
Photograph of Howard Mendel training project team members
Photograph of malaise trap in situ
Photograph of new microscopes in action
Photograph of the banyan beetle that Howard confirmed
Photograph of the Mt Vesey leaf hopper that Howard found during his surveys
Photograph of the reference collection
Photograph of the Wollaston's shield bug that Timm Karisch found
Photograph of Timm Karisch surveying for moths with project staff
Photograph of Timm Karisch training local staff in the workshop 1
Photograph of Timm Karisch training local staff in the workshop 2
Photograph of training on Ascension
Photograph of Vicky Wilkins from Buglife presenting at the Red Listing workshop
QGIS image of the spatial extent of Mole Spiders

Red Listings completed in the report period
Sample Red Listing layers in QGIS
Spiky Yellow Woodlice fluorescence under ultraviolet light
Spiky yellow woodlouse population assessment
St Helena Invertebrate Conservation Strategy 2016-2021
St Helena terrestrial invertebrates v5-3 file
Survey results for DPLUS029
Typical sample collected in malaise trap

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.	