Department for Environment Food & Rural Affairs

DARWIN INITIATIVE

Foreign & Commonwealth Office

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Darwin Plus:
Overseas Territories Environment and Climate Fund

Final Report

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

Darwin Project Information

Project reference	DPLUS052
Project title	Mapping St Helena's Biodiversity and Natural Environment
Territory(ies)	St. Helena, South Atlantic Ocean
Contract holder Institution	Environment and Natural Resources Directorate, St Helena Government (ENRD, SHG)
Partner institutions	Environment Systems, Aberystwyth University, South Atlantic Environment Research Institute (SAERI)
Grant value	£212135
Start/end date of project	1st April 2016 – 30th June 2018
Project leader name	Derek Henry & Samantha Cherrett
Project website/Twitter/blog etc.	None
Report author(s) and date	Samantha Cherrett 28/09/2018

1 Project Overview

St Helena is one of the most remote islands in the world. It is situated in the South Atlantic Ocean 1200 miles from Southern Africa and 1800 miles from South America. The Island's first international airport opened to commercial flights in October 2017.

Mapping St Helena's Biodiversity and Natural Environment aimed to produce a series of high-detail island-wide maps and datasets, showing a baseline of habitat types, soils and other associated environmental information. The purpose of this information is to provide up to date baseline data to support island conservation and future management activities. Baseline data has been produced that will be used in a multitude of fields including supporting the understanding of biodiversity, species (particularly endemic) geographic distribution and dynamic, protecting and restoring native habitats, controlling invasive species, aiding sustainable agriculture, land resource planning and water resource management.

These maps and dataset outputs were derived from a combination of analysis of multi-spectral satellite imagery, ground-truthing field work and analysis of relevant historical and current datasets available. Additionally, training was provided to local stakeholders in order for this data to be updated over time, via a 'living map'. Subjects covered in the training included an introduction to remote sensing and the derivation of environmental data, field work methodology and data collection, and mapping techniques.

The data is available for any organisation involved in decision making to do with land and species management; numerous stakeholders on St Helena who deal with land management and conservation challenges have access to the output data including the Environmental and Natural Resources Directorate (encompassing the Environmental Management Division and Agriculture and Natural Resources Division), St Helena National Trust (SHNT) (including the Landscape and Mitigation Programme), Connect St Helena, St Helena Nature Conservation Group and other local individuals.

2 Project Stakeholders/Partners

Involvement by project stakeholders over the course of the project have been summarised in reports 002-AR1_D-Annual-Report-2017_DPLUS052_F2 and 004-AR2_D-Annual-Report-2018_DPLUS052_F2. In year three of the project, all of the organisations named previously have been involved mainly through training and dissemination of project data.

SAERIs involvement in the project has been key to completing the project and their involvement includes travel to St Helena for setting up of IT for the web mapping as well as training to all of the on-island stakeholders. Environment Systems and Aberystwyth University have been involved in the presentations to Elected Members, report writing, map and data generation as well as finalising output documentation and on island workshops and training.

The following stakeholders, departments and organisations have benefitted or been involved in the project in the last three months of the project;

- ENRD GIS Department; four staff members trained in QGIS, spatial databases, geopackages and webGIS.

- ENRD Agricultural and Natural Resources Division; staff attended sessions relating to habitat and soil data as well as GIS training. Included staff from forestry, agriculture, biosecurity, and invasive species specialists.
- ENRD Environmental Management Division (EMD); staff attended sessions relating to habitat and soil data as well as GIS training. This included staff from terrestrial conservation, environmental protection, endemics nursery and marine conservation.
- ENRD/SHNT Landscape and Ecological Mitigation Programme; staff attended sessions relating to habitat and soil data as well as GIS training.
- St Helena National Trust (SHNT); staff attended sessions relating to habitat and soil data as well as GIS training.
- Connect St Helena; attended GIS training.
- Independent individuals and private consultants with environmental interest.
- Local companies with interest in the data; Local companies Thorpes and Solomons plc are interested in the soil data for future projects on their land.
- The following Darwin Plus Projects (includes some duplication of individuals identified above) have been involved in training, data collection and field-based activities or benefitted from project activities: DPLUS029, DPLUS040, DPLUS051, DPLUS059, DPLUS070. Some of these projects are already using the output data in them.
- The final data has been provided for the Natural Capital Assessment project being undertaken by SAERI.

Because of the wide and increasing range of interest in the data and GIS training, finding a suitable time for all interested parties to attend whilst the project team were on island proved difficult. Therefore, subsequent one on one training sessions have also been provided at after the project end date. For the main training sessions we aimed to give all attendees as much notice as possible regarding dates and the content of training, to enable them to adjust around their normal work schedules and duties.

3 Project Achievements

3.1 Outputs

Output 1: Satellite imagery sourced and processed resulting in preliminary habitat and soil maps, supported by existing collated geospatial data;

As indicated in previous reports, all intended imagery has been acquired and processed. Additionally, some cloud-free Sentinel 1 & 2 imagery has been acquired by Environment Systems and training given (April 2018) in how to register, search for and acquire new Sentinel imagery for St Helena. During the recent training, Environment Systems advised that the Sentinel satellites pass by St Helena every five days, providing a new resource for mapping on St Helena.

At the start of the project, St Helena Government (GIS Department) had access to true colour imagery from 2005, 2009 and November 2014. It now has 4-band multispectral imagery from 2014 (November and December), January 2017 and it also has the ability and guidance for acquiring new, more recent, Sentinel imagery.

The draft habitat and soils maps have been produced and refined to create the final maps (see later outputs). Existing geospatial data was utilised where suitable but as noted in previous reports, much of it was too detailed or not detailed enough to be incorporated into the map. Other island GIS layers have been utilised by Environment Systems for final map production. Existing soils data was utilised by Aberystwyth University for planning and data validation.

Output 2: Habitat and soil maps ground-truthed and refined with field data and local expertise;

Habitat and soil fieldwork, conducted by both visiting project team and later on-island project team, has been completed. During the final visit from Environment Systems and Aberystwyth (April 2018) additional soil sampling (45 locations) was undertaken with two purposes; to target native and restored gumwood sites (which from previous sampling were particularly noted as

having a possibility of having interesting soil/vegetation relations) and also to revisit areas to confirm preliminary unexpected soil carbon results. During this visit both visiting organisations spoke with local experts about the additional sampling.

In total over the course of the project 1630 habitat segments were assessed and samples form 175 locations analysed.

Following on from completion of the maps and field data, a newer final habitat classification was completed for use in any future field work and habitat assessments. This version has notes on native/non-native status and detail outlining why a habitat may not have been mapped: this has been made available as a project output.

Output 3: Workshops held on remote sensing techniques, field techniques and monitoring systems creation;

In addition to workshops held in the first two years, further sessions were held during the April and June visits by Project Partners. In April 2018, Environment Systems held a training session on finding, downloading and processing sentinel imagery (which was attended by the GIS department staff and another ENRD staff member); this supports the monitoring systems output by providing access to updated imagery for future monitoring. Additional workshops that were held by Environment Systems and Aberystwyth allowed people to ask about the sampling techniques, future sampling and update procedures. SAERIs GIS training in June 2018 also covered tools available on-island for working with satellite imagery and raster imagery in general (as well as vector data).

Training certificates were issued upon completion of all training and workshops. In total, over the course of the project, 31 people attended more than one workshop, training session or field day, with more attending one session only at some point during the project.

The only issues encountered for this output, again, involved interested parties fitting the training around their existing schedules, and finding suitable times to allow the greatest number to attend.

Output 4. Development of final maps and specific management tools informed by the baseline data;

The final habitat and soil maps have now been produced. These are available to stakeholders and island residents as well as internationally. Several options for distribution are available including a web map accessible via the St Helena Government website as well as in PDF form and also in GIS form (currently as a Geopackage but with a view to be available via central a central server managed by the GIS department).

Following the visit from Environment Systems in April 2018, where the ecosystems services maps were discussed, the following maps were created:

- Habitat Classification At Level 1
- Habitat Classification At Level 2
- Habitat Classification At Level 3 Habitat_Level3.png AND Habitat_Level3_Legend.png
- Biodiversity
- Status Of Habitats As Introduced vs Native and Planted vs Naturally Established
- Carbon Stocks (Mg/Hectare) Climate Change Mitigation Service
- Carbon Percentage – Production, soil conservation, climate change mitigation & biodiversity services
- Soil Electrical Conductivity (Ec) – Production & Biodiversity Services
- Unsaturated Hydraulic Conductivity – Production, water regulation & biodiversity services
- Land Productivity Potential (Landform Considered)
- Overall Soil Quality (Landform Not Considered)
- Soil pH – Production, water regulation & biodiversity services
- Aggregate stability – Soil conservation, water regulation service

- Erosion Risk And Drainage Channels
- Risk of Loose Soil And Pollutants Being Transported Into Coastal Waters
- Opportunities To Manage Erosion Risk
- Risk Of Land Contributing To Poor Water Quality And Where Crops And Livestock Might Show Signs Of Deficiencies
- Risk Of High Sediment Load In Drainage Channels And Streams
- Development Opportunities on Flat Land (Less than 7°) That Cannot Be Seen From The Coast
- Flat Land (Less Than 7°) Not Visible From The Coast
- Flat Land (Less Than 11°) Not Visible From The Coast
- Land Visible From The Coast
- Distance Of Roads From Flat Land (Less Than 7°) That Cannot Be Seen From The Coast
- Steepness of Slope in 5 Degree Intervals
- Steepness Of Slope In ALC Classes

The base data used to create these maps have also been made available.

The data can be viewed here: https://data.saeri.org/saeri_webgis/lizmap/www/

During SAERIs visit, the server purchased was set up as a data server, and this is now being managed by the SHG GIS department. This was something that was uncertain towards the later stages of the project but was resolved during SAERIs visit. This is contrary to the original plan of hosting the web map on St Helena but due to internet limitations and IT restrictions, this was deemed the best option with available resources. The 'living map' web map is hosted by SAERI at Dundee University. The data will be managed and updated on St Helena by the GIS department and sent to the SAERI representative in Dundee for the map to be updated.

The server has also been made available for marine conservations DPLUS070 project for their collected data. Access to the server is predominantly in one government building but is accessible by others, following discussions with IT, and has the potential in the future to be accessed by most of government. This is an unexpected bonus as previously IT have been reluctant to allow this. As a backup, QGIS Geopackages of the data were created and distributed to satellite offices and other interested parties who would be unable to access the server and who would use the data directly rather than view the web map version. Because of this, we have established several options for supporting the living map for future updates;

- whole island updates by GIS using Sentinel (or other) imagery; training on how to do this was provided.
- a form which allows data users to update smaller areas
    - Update the digital version themselves and submit to GIS for checking (for those who are confident about GIS).
    - Update by viewing only and submitting the data by description (for those using the web map or who are not regular GIS users).

Metadata for the output data has been created and submitted to SAERIs regional database for the South Atlantic. This allows the details of the outputs produced by this project to be identified internationally by any interested party. Data restrictions are held by the GIS department who will approve dissemination of maps as per requests.

In addition to the maps and data outputs, Aberystwyth University plan on producing papers in the next 6-12 months, with results from some of the soil tests.

Supporting evidence provided is listed in Annex 6 or has been provided with previous reports.

3.2 Outcome

Project Outcome: Production of St Helena's most comprehensive environment maps showing the functioning of habitats and soils; creating an accessible digital system to utilise RS for now

and future ecosystem services monitoring; develop transferable skills, produce factual maps, concise baseline data and adaptable tools that are used for decision making, informing policy and combined to solve existing and future problems faced locally.

Based on this statement, we believe that the project outcome has largely been achieved;

- production of St Helena's most comprehensive environment maps showing the functioning of habitats and soils;
    - Evidence provided in form of the final maps.
- creating an accessible digital system to utilise RS for now and future ecosystem services monitoring;
    - https://data.saeri.org/saeri_webgis/lizmap/www/
- develop transferable skills,
    - Evidence provided as training attendance over the course of the project.
- produce factual maps (jpg versions can be accessed here),
    - http://www.sainthelena.gov.sh/dplus052-mapping-st-helenas-biodiversity-and-natural-environment/
- concise baseline data and adaptable tools that are used for decision making,
    - Evidence provided as metadata summary and by providing multiple ways of accessing the data (web GIS, Geopackage, server access, paper maps).
- informing policy and combined to solve existing and future problems faced locally
    - Ongoing; further detail outlined in section 3.3.

3.3 Long-term strategic outcome(s)

The project has produced island-wide baseline datasets on some of the environmental conditions on St Helena, available to aid decision making on land use and development. In the last three months of the project an additional presentation was made to councillors, introducing them to the data and its potential uses and raising the profile of the project outputs with senior government officials who were interested in certain conditions at a site currently under potential for development. A press release also informed the wider island community to the availability of the data.

Since the project ended, the following have used or are planning on using the data:

- Invasive species project DPLUS040 in presentations to the islands councillors
- Invertebrates project DPLUS059.
- Data is planned for use in EMD documentation including in a review of the of National Conservation Area boundaries
- Data was used in an exercise to identify potential future landfill sites on St Helena (https://www.south-atlantic-research.org/spatial-planning-exercise-in-st-helena-where-could-you-locate-a-new-landfill-ask-gis/)
- Data to be used for Natural Capital Assessment project (SAERI).
- Data referred to for use in this year's Darwin Plus applications for new projects

The output data provides a starting point for future funded projects and core government work which, if updated regularly, can support projects indefinitely. Additionally, the development of the data server for GIS means that all future Darwin Plus (and other) projects now have a secure data storage method and data management system; DPLUS070 is already benefitting from this.

4 Sustainability and Legacy

The project has done its best to implement systems which can be easily updated to ensure sustainability and legacy, with regards to the maps and data produced; we have also built good links with organisations who now understand St Helena and its needs and can assist with similar exercises, soil testing and data management in the future. One of the biggest achievements, the setup of the GIS server, is a key project legacy which had tremendous help and support from IT. The web map is being managed off island in Dundee.

In the last few months of the project we made steps in raising awareness of the data outputs and how they are derived from this project, including senior government managers and

councillors. We hoped that by informing senior officials as to the availability of the data, and getting the data used in key decision making processes, that it will require it to be a dataset that's maintained, because it has been used for strategic level decisions.

Future management of the data server and raw data has been passed to the GIS department (who to date unfortunately do not have GIS Manager recruited as discussed in our previous report), whilst providing other end users the capability to update and manage the data themselves, before it is quality checked by GIS and finalised. Other physical project assets (such as the Yuma2 GPS tablet, soil testing kit, scales, laptops, hard drives etc.) have been distributed across the Environment and Natural Resources Directorate.

For the two main project staff; the project lead remains on island and has assisted government and non-governmental staff with utilising the project data in their own work, assisted with further GIS training following on from the project training as well as supporting other Darwin Plus projects. The project assistant has left St Helena to attend University, undertaking an Environmental and Conservation degree which covers many of the areas worked on in this project.

5 Lessons learned

Over the course of the project we learned the following lessons (some of which were discussed in previous reports);

- Flexibility; concerning both finances and timescales to account for unforeseen circumstances. Rigid projects timescales could have really caused problems for this project. From this, having a good understanding of you budget and how you can adapt it for these unforeseen changes is crucial.
- Background logistics; allowing time to plan field work to ensure it goes smoothly, particularly when involving multiple organisations. Detailed plans (and back up plans and equipment) and standard forms for data entry really helped our field work. Mapping our planned field work also helped, particularly when liaising with other organisations.
- Communication: ensuring that all interested parties are included in planning and project updates. One piece of verbal feedback received was a thanks for our communication to various people.
- Personnel; allow enough funds to ensure that the workload is sufficiently covered (without relying too much on temporary or short term expertise) and that their overheads (IT, utilities, phones etc.) are covered financially too.

During the project, the travel issues that we had affected our end results; we would have liked more time to check the final habitat data and make amendments to it and the habitat classification, but the delays meant that we did not have time. Unfortunately, this was largely out of our control as previously reported.

In future, if repeating a similar project, we would allow more budget for more soil testing (either additional sampling or additional tests). It became apparent during the project that the soil results were of key interest to various stakeholders and it would have been good to do additional tests or allow more locations to be sampled across the island.

5.1 Monitoring and evaluation

No additional changes to the project were made in the remaining three months of the project and previous changes have been covered in reports 002-AR1_D-Annual-Report-2017_DPLUS052_F2 and 004-AR2_D-Annual-Report-2018_DPLUS052_F2.

The logframe outputs and activities are robust enough to mark the project progress against, and along with the list of project partner responsibilities included in their organisations MOUs, gives targets for completion for us to mark our developments against.

Communication with the project team at regular and key points of the project have continued. Stakeholders on island have been regularly informed of progress and consulted if aspects of the project involved them.

No internal or external evaluation of the project has taken place and none are planned. The reporting by Environment Systems and Aberystwyth University can additionally be referred to for findings from the project.

5.2 Actions taken in response to annual report reviews

Three comments were included in the second Annual Report Review; the responses are as follows:

Comment 1: Immediately after receiving the Annual Review Report, the Project Manager contacted Darwin to discuss very recent developments with regards to the matters that raised concerns. In the time between the report being written and the review being undertaken, many of the issues raised had been resolved during and after the two-week visit from SAERI. These were outlined in an email to Darwin (08/06/18). In the end, we created multiple options for data distribution and update, to ensure that an exit strategy was in place, but as mentioned earlier in this report, the GIS department have been handed all the data and had server training for future data management.

Comment 2: It was always the intention that end users would be able to update detail for the habitat map; the 'living map' project aspects was always intended to be a way that the habitat map could be developed as the island continues to develop, for example when a wooded area is cleared or open land developed for urban use. A form has been provided for any user to suggest changes to the map as well as a guidance docmuent. These are discussed elsewhere in this report. Other training documentation has been created to allow users to collect further habitat and soils data in an identical manner in the future, should further maps be required or major updates be needed.

Comment 3: The section in the second Annual Report referring to stakeholder availability mainly related to their availability at the same time as the visiting project partners were on island. Over the course of the project Environment Systems have spent two weeks and an additional one week on island, Aberystwyth University spend three weeks and an additional one week on island and SAERI spent two weeks on island. It was more a statement that interested parties were unable to attend at the times project partners were on island due to existing work commitments and unforeseen last minute issues they had to deal with. Once a visit to St Helena from a project partner was confirmed, all interested parties were made aware of the dates and planned activities for the trip, so they had as much warning as possible to arrange their work schedules.

Overall, we were very happy with the review, and it was encouraging that the reviewer felt positive about the project progress and its management, despite the concerns we had at the time.

6 Darwin Identity

Previous Darwin projects have raised awareness on this small island and so governmental staff, stakeholders, councillors and local population are familiar with its remit and its value to island work. Our output documentation all carry the Darwin logo and logos of partner organisations and recognise the Darwin Initiative.

Additionally, as part of this project (in a way of disseminating our project data) we created a web page on the St Helena Government website outlining our Darwin Plus projects: http://www.sainthelena.gov.sh/environment-and-natural-resources/. The page allows any other Darwin project to then have their own project page should they choose to.

Once the project was completed we created a press release summarising this Darwin Plus project (http://www.sainthelena.gov.sh/mapping-st-helenas-biodiversity-and-natural-environment/?highlight=darwin) which was then covered in one of the local papers.

SAERI have produced a blog outlining the work done on St Helena for the project (and general support of data management: https://www.south-atlantic-research.org/webgis-the-intelligent-link-between-people-and-data/.

7 Finance and administration

To be completed upon receipt of final finances from Corporate Finance.

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 (£)
Samantha Cherrett (Darwin Project Manager)	
Elizabeth Cairns-Wicks (Darwin Project Assistant)	
Rhys Hobbs (Field Support)	
David Pryce (Field Support)	
Environment Systems (Partner)	
Aberystwyth University (Partner)	
SAERI (Partner)	
TOTAL	

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

Capital items – description	Capital items – cost (£)
n/a	0
TOTAL	0

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

7.2 Additional funds or in-kind contributions secured

Source of funding for project lifetime	Total (£)
TOTAL	

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

7.3 Value for Money

This project offers value for money as it is already aiding other current Darwin Plus, other funded projects and proposed projects by providing baseline data, equipment and tools for data management, distribution and publicity. The project training provided training opportunities for sampling, mapping and software skills, for as many people as possible both, within government and in other island organisations. Our project partners understand St Helena and therefore any future similar work, or work that could build on this information, can be done without starting from nothing, and without needing to take time to familiarise an organisation with St Helena's unique constraints and challenges.

The project also offers value for money as it covered many areas of work on St Helena; conservation, planning, forestry, agriculture, water resources, marine, and others, therefore not just focussing on one specific area.

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: To create robust data and systems to support the long term strategic planning, development and adaptation of St Helena's public, private and voluntary sectors for environmental and climate change management.			
Outcome: Production of St Helena's most comprehensive environment maps showing the functioning of habitats and soils; creating an accessible digital system to utilise RS for now and future ecosystem services monitoring; develop transferable skills, produce factual maps, concise baseline data and adaptable tools that are used for decision making, informing policy and combined to solve existing and future problems faced locally.	0.1 Imagery acquired for use and combined with existing harvested data. 0.2 Field methodologies, mapping methods and classifications designed, understood and implemented. On-going strategy developed. 0.3 Training completed for minimum of a one training or workshop session for at least one participant per stakeholder organisation. Skills for surveying and analysis acquired. 0.4 Surveying completed for soils and habitat. Final summary reports for each created. 0.5 Final non-editable and paper maps produced. Digital layers produced. Reporting by consultants. 0.6 Living maps and subject specific tools, maps and data layers created. Specific for invasive species control, habitat management, land	0.1 Recent imagery purchased, available for use, metadata submitted to IMS-GIS Data Centre. Methodologies circulated. 0.2 Documentation finalised, circulated and agreed by project partners. 0.3 Training manuals produced. Training verified by participation statistics. 0.4 Metadata for reports and spatial data submitted to IMS-GIS Data Centre. 0.5 Metadata for final 'static' products submitted to IMS-GIS Data Centre. Reports circulated. 0.6 Stakeholder organisations successfully use these tools for decision making.	Suitable imagery is available and licence restrictions do not hinder project aims. Stakeholder organisations continue project involvement.

	management and water resource management are utilised by stakeholders.		
Outputs: **1**. Satellite imagery sourced and processed resulting in preliminary habitat and soil maps, supported by existing collated geospatial data.	1.1 Acquisition of suitable satellite imagery, within budget. 1.2 Processed imagery used to produce a preliminary habitat and soils map. 1.3 Collated soils, habitat and species data from assessment of existing data held on island. Assessed for usefulness to identify potential additional field work. 1.4 Classifications and field surveys designed for habitat map.	1.1 Imagery provided to SHG. 1.2 Preliminary maps provided to SHG and stakeholders by Environment Systems and Aberystwyth University. 1.3 Suitable soils, habitat and species data provided to Aberystwyth University and Environment Systems by SHG, including habitat surveys, 2015 1m DEM, 1989 imagery, soil reports, vegetation reports, and other relevant data. 1.4 Classifications agreed by project team and stakeholders involved in long term use.	Suitable cloud-free satellite imagery can be purchased within budget. There is a low risk of the imagery being unsuitable or costly; options have already been investigated by Environment Systems and two WorldView 2 images identified. Additional free imagery has been sourced and only one of the WorldView 2 images could be used should costs escalate. Existing data identified at early stages is suitable and does not require additional field work for ground truthing and sampling. A contingency of local consultancy and field work has been included, should this happen. Medium risk of existing soils map is comprehensive enough and cannot be improved upon although it is expected that this will not be the case. Focus will shift to transferring the historical data to a format upon which it can be used for this project, check the spatial accuracy and develop soils services maps based on existing map after validation whilst substituting with additional

			soil samples and analysis to measure relevant parameters.
2. Habitat and soil maps ground truthed and refined with field data and local expertise.	2.1 Practical field work for vegetation and soils ground truthing in areas of uncertainty involving project team where necessary. Supplementary soil analysis. Preliminary map refined. 2.2 SHG and available field based staff in stakeholder organisations complete field work for ground truthing and collate all existing data required to fill data gaps.	2.1 Days in the field catalogued and collected data incorporated into preliminary map. Data gaps identified for additional field work. Analysis of collected data. On island publicity. 2.2 Days in the field catalogued and collected data incorporated into maps. Samples sent to partner organisations if required.	A low risk that field based staff in partner organisations are fail to or unable to assist at key times. A contingency for local consultancy and field work has been included, should this happen, however stakeholders have proven historical working relationships and have pledged in-kind time.
3. Workshops held on remote sensing techniques, field techniques and monitoring systems creation.	3.1 SHG and available field based staff in stakeholder organisations attend workshops and training sessions on field techniques required for successful ground-truthing prior to start of surveying for data gaps. 3.2 Training session on remote sensing techniques. 3.3 Monitoring systems developed and training session delivered.	3.1 Attendance certificates issued. Feedback gathered for hosts. 3.2 Attendance certificates issued. Feedback gathered for hosts. 3.3 Monitoring systems in place for training. Attendance certificates issued. Feedback gathered for hosts. On island publicity.	Travel costs for off island trainers and trainees is a huge uncertainty at present and the most fluid aspect of the budget, due to the unknown cost of flights from Feb 2016 and potential accommodation and other on-island costs in 2017-2018 after air access. A contingency has been included to allow for increases in costs.
4. Development of final maps and specific management tools informed by the baseline data.	4.1 Creation of final maps and integration with regional data management system. Reporting by consultants. 4.2 Creation of 'living map' comprising geospatial data.	4.1 Metadata provided to IMS-GIS Data Centre. Reports circulated. 4.2 Creation of map incorporating historical and current data as a basis upon which to add additional data in the future	Low risk that the outputs are not comprehensive enough to fulfil the needs of the department. The key needs of the stakeholders has been discussed to try to identify the most useful information and the development of the living map will allow more data to be added in the

	4.3 Tools for management of invasive species, water resources, agricultural management habitat conservation and restoration created.	4.3 Creation of project environment and training with stakeholders involved in each specific aspect. On island publicity.	future to fill any gaps that might exist.
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 Sourcing of suitable satellite imagery. 1.2 Processing of imagery to produce preliminary maps. 1.3 Review of data held in IMS-GIS Data Centre. Visit to SHG archives and department offices to search for other historical non-digital data. Create digital versions of useful data. 2.1 Field surveys for vegetation and habitat mapping. Field surveys for soil sample collections. 2.2 Field surveys habitats, vegetation and soils for remaining data outstanding. 3.1 Ground truthing training and workshops for data collection occur. 3.2 Remote sensing training and workshops occur. 3.3 Creation of monitoring systems. 4.1 Preliminary maps updated with survey data to produce final maps. 4.2 Digital data combined into 'living map'. 4.3 Development of subject specific tools for individual stakeholders.			

Annex 2 Report of progress and achievements against final project logframe for the life of the project (<u>if your project has a logframe)</u>

Project summary	Measurable Indicators	Progress and Achievements for the life of the project
Impact To create robust data and systems to support the long term strategic planning, development and adaptation of St Helena's public, private and voluntary sectors for environmental and climate change management.		Development of habitat classification for long term use. Data collection and creation of datasets: satellite imagery, historical data, new baseline environmental datasets for the maps, field data. Creation of final baseline conditions maps. Ongoing development of training and support documentation for future and repeat work.
Outcome Production of St Helena's most comprehensive environment maps showing the functioning of habitats and soils; creating an accessible digital system to utilise RS for now and future ecosystem services monitoring; develop transferable skills, produce factual maps, concise baseline data and adaptable tools that are used for decision making, informing policy and combined to solve existing and future problems faced locally.	0.1 Imagery acquired for use and combined with existing harvested data. 0.2 Field methodologies, mapping methods and classifications designed, understood and implemented. On-going strategy developed. 0.3 Training completed for minimum of one training or workshop session for at least one participant per stakeholder organisation. Skills for surveying and analysis acquired. 0.4 Surveying completed for soils and habitat. Final summary reports for each created. 0.5 Final non-editable and paper maps produced. 0.6 Living maps and subject specific tools, maps and data layers created.	0.1 Achieved. All imagery purchased and future free imagery available and training provided. 0.2 Achieved. Habitat Classification v7 is now final. 0.3 Achieved. Multiple attendees from all stakeholder organisations attended over the course of the project. 0.4 Achieved. Report generated from Environment Systems and Aberystwyth University. Internal reports and guides generated. 0.5 Achieved. Paper versions printed as required. 0.6 Achieved. Web link, ecosystems services maps and living map update procedures available. Workshops held. Evidence provided in report above and Annex 6.
Output 1. Satellite imagery sourced and processed resulting in preliminary habitat and soil maps,	1.1 Acquisition of suitable satellite imagery, within budget.	1.1 Completed. Purchase and orthorectification completed. Additional free imagery training completed April 2018. 1.2 Completed. 1.3 Completed. Data usefulness document available.

supported by existing collated geospatial data.	1.2 Processed imagery used to produce a preliminary habitat and soils map. 1.3 Collated soils, habitat and species data from assessment of existing data held on island. Assessed for usefulness to identify potential additional field work. 1.4 Classifications and field surveys designed for habitat map.	1.4 Completed. Version 7 is final. Available on the Government website as well as being distributed with final data. Evidence provided in report above and Annex 6.
Activity 1.1 Sourcing of suitable satellite imagery.		Completed. Year 1
Activity 1.2 Processing of imagery to produce preliminary maps.		Completed. Years 1/2
Activity 1.3 Review of data held in IMS-GIS Data Centre. Visit to SHG archives and department offices to search for other historical non-digital data. Create digital versions of useful data.		Completed. Years 1/2
Output 2. Habitat and soil maps ground-truthed and refined with field data and local expertise.	2.1 Practical field work for vegetation and soils ground-truthing in areas of uncertainty involving project team where necessary. Supplementary soil analysis. Preliminary map refined. 2.2 SHG and available field based staff in stakeholder organisations complete field work for ground truthing and collate all existing data required to fill data gaps.	2.1 Completed. Final maps produced. 2.2 Completed. Data used to produce maps. Evidence provided in report above and Annex 6.
Activity 2.1 Field surveys for vegetation and habitat mapping. Field surveys for soil sample collections.		Completed. Years 1/2/3
Activity 2.2 Field surveys habitats, vegetation and soils for remaining data outstanding.		Completed. Years 1/2/3
Output 3. Workshops held on remote sensing techniques, field techniques and monitoring systems creation.	3.1 Attendance certificates issued. Feedback gathered for hosts. 3.2 Attendance certificates issued. Feedback gathered for hosts.	3.1 Completed. Certificates issued at end of project to those who had attended more than one session. 3.2 Completed. Certificates issued at end of project to those who had attended more than one session.

	3.3 Monitoring systems in place for training. Attendance certificates issued. Feedback gathered for hosts. On island publicity.	3.3 Complete. Use of Sentinel imagery (training provided April 2018) and small area update procedures created. Certificates issued at end of project to those who had attended more than one session. Feedback requested from attendees. Publicity undertaken to promote project outputs. Darwin Plus section created on government website. Evidence provided in report above and Annex 6.
Activity 3.1 Ground truthing training and workshops for data collection occur.		Completed. Years 1/2/3. Training material created.
Activity 3.2 Remote sensing training and workshops occur.		Completed. Years 1/2/3. Refresher training given April and June 2018.
Activity 3.3 Creation of monitoring systems.		Completed. Year 3. Use of Sentinel imagery (training provided) and small area update procedures created.
Output 4. Development of final maps and specific management tools informed by the baseline data.	4.1 Creation of final maps and integration with regional data management system. Reporting by consultants. 4.2 Creation of 'living map' comprising geospatial data. 4.3 Tools for management of invasive species, water resources, agricultural management habitat conservation and restoration created.	4.1 Completed. Final maps completed. Data and metadata added to regional management system and local data management system. Report competed by Environment Systems and Aberystwyth University. Academic papers to be written. 4.2 Completed. Living map accessible via web GIS with multiple update possibilities from GIS and non-GIS users. 4.3 Completed. Maps created are based upon the needs identified by stakeholders during April 2018 workshops. Baseline environmental conditions maps to be used as tools by stakeholders. Evidence provided in report above and Annex 6.
Activity 4.1 Preliminary maps updated with survey data to produce final maps.		Completed. Year 3. Final maps available on government project website.
Activity 4.2 Digital data combined into 'living map'.		Completed. Web map, digital data and 'living map' update procedures created – training provided.
Activity 4.3 Development of subject specific tools for individual stakeholders.		Completed. Baseline environmental conditions maps to be used as tools by stakeholders. Ecosystems services maps identified by stakeholders themselves based on needs.

Annex 3 Standard Measures

Code	Description	Totals (plus additional detail as required)
Training Measures		
1	Number of (i) students from the UKOTs; and (ii) other students to receive training (including PhD, masters and other training and receiving a qualification or certificate)	
2	Number of (i) people in UKOTs; and (ii) other people receiving other forms of long-term (>1yr) training not leading to formal qualification	
3a	Number of (i) people in UKOTs; and (ii) other people receiving other forms of short-term education/training (i.e. not categories 1-5 above)	
3b	Number of training weeks (i) in UKOTs; (ii) outside UKOTs not leading to formal qualification	
4	Number of types of training materials produced. Were these materials made available for use by UKOTs?	
5	Number of UKOT citizens who have increased capacity to manage natural resources as a result of the project	>10
Research Measures		
9	Number of species/habitat management plans/ strategies (or action plans) produced for/by Governments, public authorities or other implementing agencies in the UKOTs	
10	Number of formal documents produced to assist work in UKOTs related to species identification, classification and recording.	1
11a	Number of papers published or accepted for publication in peer reviewed journals written by (i) UKOT authors; and (ii) other authors	None so far 2-3 (estimated/in progress)
11b	Number of papers published or accepted for publication elsewhere written by (i) UKOT authors; and (ii) other authors	
12b	Number of computer-based databases enhanced (containing species/genetic information). Were these databases made available for use by UKOTs?	
13a	Number of species reference collections established. Were these collections handed over to UKOTs?	

Code	Description	Totals (plus additional detail as required)
13b	Number of species reference collections enhanced. Were these collections handed over to UKOTs?	
Dissemination Measures		
14a	Number of conferences/seminars/workshops/stakeholder meetings organised to present/disseminate findings from UKOT's Darwin project work	>10
14b	Number of conferences/seminars/ workshops/stakeholder meetings attended at which findings from the Darwin Plus project work will be presented/ disseminated	
Physical Measures		
20	Estimated value (£s) of physical assets handed over to UKOT(s)	
21	Number of permanent educational/training/research facilities or organisation established in UKOTs	
22	Number of permanent field plots established in UKOTs	
23	Value of resources raised from other sources (e.g., in addition to Darwin funding) for project work	

Annex 4 Publications

Two to three publications planned by Aberystwyth University – details not yet available

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)

Annex 5 Darwin Contacts

Ref No	DPLUS052
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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	YES
Have you completed the Project Expenditure table fully?	NO
Do not include claim forms or other communications with this report.	