



Department
for Environment
Food & Rural Affairs

Darwin Fellowship - Interim Report

(Please check guidance for submission deadlines, maximum 3 pages)

Darwin Fellowship Ref No.	DPLUS024
Name of Darwin Fellow	Shayla Ellick
UK organisation	University of York; Centre for Ecology and Hydrology, Edinburgh
Fellow's organisation(s)	Environmental Management Division, St Helena Government;
Fellow's role within the organisation	Species Conservation and Environmental Research Officer
Start/end date of Fellowship	01.04.14 / 31.10.15
Location	St Helena/ York
Darwin Fellowship grant value (£)	£21,617
Type of work (e.g., research, training, if other please specify)	Research
Main contact in UK organisation	Dr Rob Marchant; Dr Alan Gray
Author(s) and date	Shayla Ellick 22.04.15

1. Background

- Describe aim and objectives of the Fellowship, and programme of work.

The Fellowship aims to research the carbon sequestration potential of selected endemic trees on St Helena, with the Fellow ultimately obtaining an MSc by Research from the University of York in June/July 2015. The Fellowship is researching the amount of carbon stored in five major terrestrial pools for selected endemic trees on St Helena, looking at aboveground living biomass, belowground biomass, soil, litter and deadwood. Measurements of these 5 carbon pools will allow the Fellow to calculate the carbon sequestration potential of selected endemic trees. This data will allow the St Helena National Trust to set up a local carbon off-setting scheme, in anticipation of St Helena's first airport becoming operational in February 2016. The money from this scheme will help the Millennium Forest project to become more financially sustainable, in addition to providing a sustainable income that encourages the restoration of endemic habitat.

- Briefly describe the roles of the UK and Fellow's institutions.

The University of York, through Dr Rob Marchant, is providing supervisory support as well as laboratory facilities and will be the examining and degree awarding body. The Centre for Ecology and Hydrology, through Dr Alan Gray, is providing supervisory support as well as lending field equipment to carry out the project.

The Environmental Management Division (EMD) is providing staff time in kind, in allowing the Fellow to work on the project during normal working hours, as it the research contributes towards the Division's core work programme and National Environment Management Plan targets. EMD along with the St Helena National Trust (SHNT) also provides work in kind, through fieldwork assistance. EMD provides office space and facilities, use of a vehicle for fieldwork and laboratory facilities.

2. Progress

- Provide a brief account of your work since the start of your Fellowship, showing progress against the programme of work.

A pilot study was carried out from July- early September 2014 of 5 endemic species at 10 sites across the island. The Fellow spent time at the University of York from late September to early December 2014 undertaking relevant modules necessary to complete the research project and provide a more thorough understanding around the subject of carbon sequestration.

Particularly useful was the Research Skills and Statistical Methods module in providing training on data exploration and analysis, and well as an introduction to the 'R' statistical analysis package. During the time at the university, discussions with both supervisors led to the project being refocused to just 2 species (Gumwood and Dwarf Ebony). This was to allow more robust data collection and provide more scientific rigour to the research project, within the time period allotted to complete the Master's degree. A change request was submitted to, and approved by, Darwin (LTS) via email on 11/12/2014.

The main site the project is now looking at is the Millennium Forest, a Community Forest site managed by the SHNT. In total six study plots and two control plots were surveyed.

Aboveground live biomass in the study plots has been estimated, soil, litter, tree cores and deadwood samples have been collected, and all have been weighed and dried in the lab; standing root biomass has been estimated. Also, basic nutrient and chemical analysis was carried out at all plots in the field. Soil samples and basic vegetation surveys were carried out at the study plots.

The thesis is well underway, with the literature review and methods section mostly completed and the data analysis, results and discussion sections in progress.

- Provide an account of any problems encountered and how you have or are planning to overcome them.

The only muffle furnace (that could be found) on the island broke after only one lot of plot soil samples had been ignited to determine carbon content in the soil. Contact was made with the University of York's Environment Department to gain a revised copy of their UK soil import license, including St Helena on the list of countries. The samples are now on their way to the UK via Ascension Island and will be processed once the Fellow arrives in the UK in mid-May.

While standing root biomass has been estimated, there was not enough time left to go back and re-sample the in growth cores to estimate root production over the period of late January – late March 2015. The standing root biomass will still allow estimation of carbon content.

Some of the project fieldwork (and thus data analysis and part of the write-up) was delayed due to unforeseen personal circumstances. It is hoped to be able to re-sample the root cores in July after the Fellow's return to the island, pending time availability. This is because all the fieldwork was hoped to be completed by the end of summer 2015. The Fellow's work commitments to EMD will also be changing over the coming months and will limit the amount of time that can be dedicated to fieldwork this coming winter. The fieldwork also depends on availability of field assistants, as the root cores must be sampled by two people.

Due to time constraints, the destructive sampling of a selected number of Ebony trees did not occur. Again, it is hope to be able to carry this out in winter 2015, pending time and field assistant availability.

Collateral damage is to be expected with field research projects, and unfortunately two of the increment borers borrowed from the CEH are no longer usable. One was found to be twisted upon arrival and the other broke while obtaining a tree core from a large gumwood at Peak Dale. A replacement has been purchased through the project, to cover the broken increment borer. Two more were purchased by the project to ensure long-term sustainability of the research, as no others were available on the island.

- Are there any issues you would like to raise?

This final year of the project should yield savings, due to some travel invoices being paid in the previous financial year. It would be useful to purchase a replacement muffle furnace with these

savings, if possible, to continue with soil carbon analysis in future. A change request outlining this will be prepared for submission over the coming weeks.

3. Achievements and Outcomes

- What have been the main achievements and outcomes to date, and how do they relate to the overall aim and objectives of the Fellowship?

Completion of fieldwork necessary to estimate carbon sequestration potential of the Millennium Forest site.

Completion of modules useful for data analysis etc.

Development of protocols and alternative methods (through the literature review) to allow future study of carbon sequestration potential on the island in other species, and other sites.

The identification of lab facilities on island (large drying oven, digital balance, porcelain crucibles, muffle furnace) that allowed the analysis of most of the field samples. These lab facilities will allow the project to continue locally without having to pay large amounts to have field samples analysed in overseas labs, as there is very little headroom in the recurrent EMD budget to support this.

4. Next Steps

- Briefly describe forthcoming activities, events, and milestones.

In late April the Fellow will leave St Helena to return to the UK to finish writing the thesis and complete the viva. The Fellow will stop off in Tanzania on the way to York to meet with relevant organisations (Isaac Maluga- WWF Tanzania, Charles Meshake –TFTG and other relevant people), arranged by Dr Marchant, to discuss the implementation of carbon projects in Tanzania: successes, lessons learnt etc. The Fellow will also visit some monitoring plots in the Udzungwa National Park, which will be useful in gaining practical advice and alternative methods for monitoring carbon in bigger trees and over a larger area.

It is hoped that the thesis will be ready to hand in by the end of May, with the viva taking place towards the end of June.