



## Darwin Initiative/D+ Project Half Year Report (due 31<sup>st</sup> October 2019)

<b>Project reference</b>	DPLUS080
<b>Project title</b>	Securing South Georgia's native habitats following invasive species control
<b>Country(ies)/territory(ies)</b>	South Georgia
<b>Lead organisation</b>	Royal Botanic Gardens, Kew
<b>Partner(s)</b>	Indigena and Durham University
<b>Project leader</b>	<i>Rosemary Newton</i>
<b>Report date and number (e.g. HYR3)</b>	<i>HYR2</i>
<b>Project website/blog/social media etc.</b>	<a href="https://www.kew.org/science/our-science/projects/south-georgias-native-habitats">https://www.kew.org/science/our-science/projects/south-georgias-native-habitats</a> Twitter: #KewSouthGeorgia

### 1. Outline progress over the last 6 months (April – Sept) against the agreed baseline timetable for the project (if your project has started less than 6 months ago, please report on the period since start up to end September).

Much of the activity over the past 6 months has been processing the samples that were received from South Georgia. A Kew Masters student, Kaitalin White, chose to work on the South Georgia project, generating interesting results from the soil sample analysis and achieving a distinction in her project and overall for her degree. Progress towards outputs in the project have been proceeding well and are detailed below.

**Output 1:** Activities 1.1 -1.5 have been completed. Activity 1.6: Data analysis of the success of control methods by Dr Wayne Dawson is currently in progress and on track.

**Output 2:** Activities 2.1 – 2.4 have been completed. Activities 2.5 – 2.7: Seeds from 20 ml subsamples of 20 soil samples (5 replicates of 4 sites) were extracted, identified (where possible), and viability determined by germination and tetrazolium testing of seeds under quarantine conditions. A total of 122 full seeds were extracted, of which 51 seeds were viable: 16 natives; 22 non-natives (18 Class 3 and 4 Class 1 species); 13 unidentifiable. The latter are being grown on for identification. Restrictive quarantine conditions resulted in seed extraction being more time consuming than expected, and so subsamples of one of the five replicates from all sites (26 in total) have been set up, moistened, and are being incubated in growth chambers at 25/10°C. Emergent seedlings are being monitored and will be identified when possible. We are seeking additional funding from other sources to try DNA barcoding as an alternative way to identify seedlings.

**Output 3:** Activities 3.1 – 3.5 have been completed. Activities 3.6 – 3.7: All seeds have been extracted from traps and identified where possible. From 30 seed traps, 530 seeds were found, with one trap containing 94 seeds and two traps containing no seeds. Of these, 5% were native, 62% non-native and 33% unidentifiable (and so unknown). Germination tests to quantify viability of seeds extracted from traps will commence soon to assess viability and to enable identification of unknown seeds.

**Output 4:** Activities 4.1 – 4.3 have been completed. Activities 4.4 – 4.5: Germination testing of species pairs has been slightly delayed as new seed collections for five of the six species were

required because collections stored in the Millennium Seed Bank were not suitable. The first thermal gradient plate germination experiment to characterise germination response to different constant and alternating temperatures and under simulated climate change scenarios has been completed for the native grass, *Poa flabellata*. Eleven of thirteen seed collections of the species selected for the thermal gradient plate work have been cleaned and are ready to be x-rayed and counted. The Collections Teams were unable to assist with processing these collections as expected which delayed progress in the thermal gradient plate work. Three collections appear green and immature and will need to be re-collected in the next field season. In spite of this delay, if the required species collections are successfully made in the upcoming field season, experiments will be able to commence next year and be completed on time.

**Output 5:** Activities 5.1 – 5.3 have been completed. Activity 5.4: A blog on the field season and progress on laboratory work has been written and will go live on the Kew website in early November. Activities 5.5 – 5.6: Seed germination tests at different conditions (e.g. constant and alternating temperatures), and with pre-treatments (such as chipping or cold stratification) on South Georgian seed collections, and also seed collections of species that occur on South Georgia, have been used to produce seed germination protocols. From these results an understanding of seed dormancy characteristics, and consequently the conditions required to break dormancy, have been determined for most of the native and non-native angiosperm species on South Georgia.

**Output 6:** Activity 6.1 has been completed. Activities 6.2 – 6.3: Half-yearly Skype meetings with Brad Myer of Indigena (based in New Zealand) and half yearly face-to-face meetings with Wayne Dawson (Durham University) have been held as planned. Activities 6.4 – 6.5: The half-year and annual reports for last year and this April were submitted as agreed and feedback on these welcomed.

Regular discussions between project partners have taken place. Whenever possible, we have communicated progress on the project to the wider community; for example, updating the Twitter feed with Kait's progress in the laboratory. Colin Clubbe gave a KABA Science Seminar at Kew Gardens on the South Georgia project in July, Kaitalin White gave a talk at the Linnean Society on her project in September, and Rosemary Newton presented latest findings at the Government of South Georgia & South Sandwich Islands annual stakeholder meeting held at Kew Gardens in September.

**2a. Give details of any notable problems or unexpected developments/lessons learnt that the project has encountered over the last 6 months. Explain what impact these could have on the project and whether the changes will affect the budget and timetable of project activities.**

First year difficulties, particularly associated with the amount of time taken to get the right permits in place to move soil from South Georgia into the UK via the Falkland Islands and arrange shipment, followed by the stringent procedures required in dealing with soil under quarantine conditions, has led to slower progress than anticipated, and consequently some delays in the laboratory work. Quarantine restrictions made it impossible to use water to separate seeds from soil samples; furthermore, seed trays could not be placed in glasshouse facilities for growing on germinated seedlings for identification. These difficulties have been dealt with by extracting seeds manually from dry soil using sieves and a microscope, and watering soil samples sealed in polyethylene bags in growth chambers, results of which are detailed in the previous section under Output 2. However, we are confident that we will be back on schedule by next year.

**2b. Have any of these issues been discussed with LTS International and if so, have changes been made to the original agreement?**

Discussed with LTS: No

Formal change request submitted: No

Received confirmation of change acceptance      No

**3a. Do you currently expect to have any significant (e.g., more than £5,000) underspend in your budget for this year?**

Yes     No     Estimated underspend:    £

**3b. If yes, then you need to consider your project budget needs carefully.** Please remember that any funds agreed for this financial year are only available to the project in this financial year.

If you anticipate a significant underspend because of justifiable changes within the project, please submit a rebudget Change Request as soon as possible. There is no guarantee that Defra will agree a rebudget so please ensure you have enough time to make appropriate changes if necessary.

**4. Are there any other issues you wish to raise relating to the project or to Darwin's management, monitoring, or financial procedures?**

No.

If you were asked to provide a response to this year's annual report review with your next half year report, please attach your response to this document. Additionally, if you were funded under R25 and asked to provide further information by your first half year report, please attach your response as a separate document.

Please note: Any planned modifications to your project schedule/workplan can be discussed in this report but **should also** be raised with LTS International through a Change Request. **Please DO NOT send these in the same email.**

Please send your **completed report by email** to [Darwin-Projects@ltsi.co.uk](mailto:Darwin-Projects@ltsi.co.uk). The report should be between 2-3 pages maximum. **Please state your project reference number in the header of your email message e.g. Subject: 25-035 Darwin Half Year Report**