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: 30 April**

Darwin Plus Project Information

Project Ref Number	DPLUS015
Project Title	Strategic management of invasive alien plants on South Georgia
Territory(ies)	South Georgia
Contract Holder Institution	Government of South Georgia and the South Sandwich Islands
Partner Institutions	Royal Botanic Gardens Kew
Grant Value	£92,200
Start/end date of project	September 2014 – September 2016
Reporting period (e.g., Apr 2015-Mar 2016) and number (e.g., AR 1,2)	September 2014 – March 2015 Annual Report 1
Project Leader	Jennifer Lee
Project website	N/A
Report author and date	Jennifer Lee, April 2015

1. Project Overview

South Georgia is a globally important area for wildlife but one that is affected by invasive species. In recent years, great progress has been made in eradication of invasive mammals and this project provides the basis to control and eradicate some the 39 species of non-native plant species that are currently on the island. Non-native plant species have the potential to change ecosystems and impact the character of the landscape so taking action to control populations and prevent further spread is vital.

The first stage of this project focuses on gathering spatially explicit distribution data for the non-native plant species. Some of these data had been gathered by a team from the Royal Botanic Gardens Kew (RBG Kew) in 2009 but there were some gaps remaining which needed to be filled, especially around the sites of old whaling stations that were previously inaccessible. Once species distribution data is gathered, it will be analysed and a weed management plan finalised. Herbicide control will then be used to target priority species.

In parallel with survey and weed control activities, biosecurity protocols will be reviewed and an early detection, rapid response strategy produced. Revised biosecurity protocols will be used by all visitors to South Georgia including personnel based at King Edward Point (KEP) which, as the logistic hub for the island a high risk for being both a source and recipient of invasive plants.

Undertaking strategic weed management on South Georgia will protect the Territory's native biodiversity, benefiting all who visit the island. The database and weed management framework will be available online and so will create a valuable resource for other Overseas Territories wishing to undertake control of non-native plants.

2. Project Progress

2.1 Progress in carrying out project activities

The main focus of the first part of the year was to recruit staff, agree processes and purchase necessary project equipment. Progress towards these activities was detailed in the half year report.

Fieldwork on South Georgia began in December 2014 with initial surveys in the area surrounding KEP and then with the arrival of the main project team in January, survey work was expanded to other areas (see section 2.3). Concurrent with the survey work, herbicide control of selected species was undertaken. Weekly operations reports can be found in annex 1.

A face-to-face meeting between Kelvin Floyd, Jennifer Lee and Helen Peat (British Antarctic Survey data manager) was held at KEP to discuss the work flow required in order to make the weed management database available online and what additional features could be added to make this a more useful resource e.g. photographs, project reports, funding applications etc . This work is ongoing but for reference the current database can be accessed at: http://apex.nerc-bas.ac.uk/f?p=337:1. (user name: SGweeds password weed_data)

An important activity for next year will be to work on an early detection, rapid response strategy and as part of this RBG Kew will produce a weed guide for South Georgia. Some of the information and images needed for this could be gained from archive materials but to ensure the guide has the most up-to-date, relevant material available, 95 additional photographs covering 17 species were taken throughout the season and are available for use in the ID guide

Trails of selective herbicides at different concentrations were undertaken in the Grytviken area. A total of eight trial plots were set up. At each site target species, non-target species and herbicide application details were recorded. These sites will be re-visited next season to determine the effects of each treatment on target and non-target species. These trials are important to ensure that local effects are taken into consideration when formulating the final version of the weed management plan.

2.2 Project support to environmental and/or climate outcomes in the UKOT's

The principal environmental outcome is to reduce the extent and impact of non-native plants on South Georgia. This is particularly important now that reindeer have been eradicated as there is no longer any grazing pressure to limit the growth of many species. Reduction of the size and extent of non-native plant populations aligns with the Territory's Environmental Charter Commitment 7 that commits GSGSSI to "restoring native biodiversity and habitats".

In March 2015, GSGSSI requested the United Kingdom extend its ratification of the Convention of Biological Diversity to South Georgia and the South Sandwich Islands. GSGSSI is fully committed to working towards the CBD's Aichi Targets and this project makes an important contribution to Target 9 which states "by 2020, invasive alien species and pathways are identified, prioritized and controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment".

By working with weed management experts from New Zealand (Kelvin Floyd, environmental consultant; Bradley Myer, Project Officer) local staff have had the opportunity to learn about different types of herbicides and their application and how to go about assessing the feasibility of eradication or control on a local and landscape scale. This has increased capacity, not just in South Georgia, but through outreach activities (see annex 2) project workers have endeavoured to increase capacity in the Falkland Islands. The whole project team see this expansion of regional capacity as an important output of the project. As well as continuing to work with colleagues in the Falkland Islands, we hope to undertake further outreach in Ascension Island later this year.

2.3 Progress towards project outputs

The first project deliverable that was achieved was agreement of a formal partnership process between GSGSSI and RBG KEW (output 4.1). This agreement outlines the roles and responsibilities of each organisation and arrangements for the transfer and use of data (output 5.1). A copy of the agreement is attached (see annex 3).

In the second part of the year, the focus shifted towards fieldwork. The priority for the project team was to complete a weed survey of sites with a history of human habitation with a particular focus on areas that were inaccessible during the 2009 RBG Kew survey. In total more than 6,000 ha were surveyed, including comprehensive searches of the old whaling stations at Prince Olav, Husvik, Leith and Stromness were made (Figure 1, output 1.1). This spatial data has been collated into the weed database and a survey report compiled (output 1.2 – annex 4)

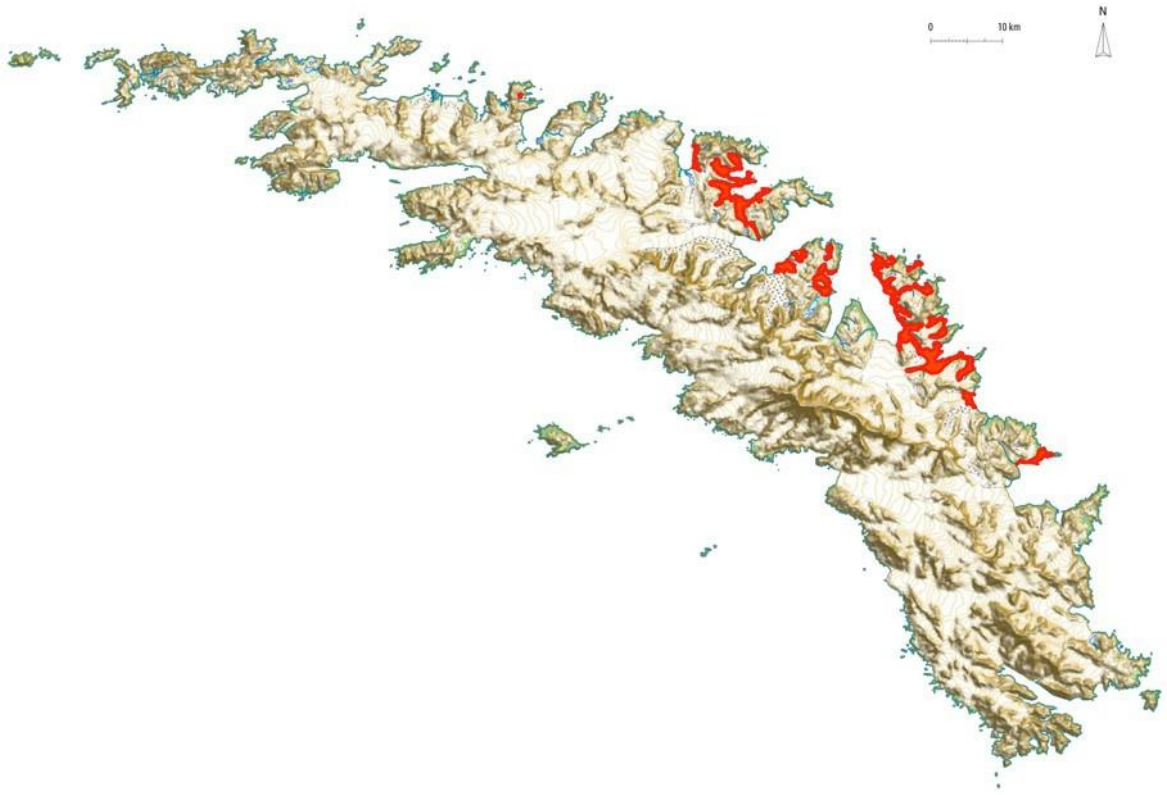

Figure 1. Areas in red are those which have been surveyed in the 2014/2015 season

Another important element of the fieldwork was to undertake control as per the weed management strategy (output 3.1). Accepting that this could not be finalised until survey work had been completed, it was nevertheless important to use herbicide to target known priority species to prevent their continued spread and further adding to the seed bank. In total 15,845 m^2 have been treated.

Recording of both distribution and herbicide control data has been undertaken throughout the season (output 3.2). For Darwin use only, a login password and username have been created so that a version of the weed database can be accessed GSGSSI environmental data portal http://apex.nerc-bas.ac.uk/f?p=337:1. (user name: SGweeds password weed_data). *Note: the data base is still in development stages and will be added to and refined throughout the course of the projec*t. The meeting with the BAS data manager was an important first step in establishing how to make the data base available online to the general public and how to format the information so it is useful and accessible (output 5.1). Work is underway to establish how best to integrate this data with the RBG Kew online herbarium and to make it more accessible to the general public.

2.4 Progress towards the project outcome

The outcome of this project is to enable South Georgia to protect its native biodiversity by controlling weed species and improving biosecurity and providing guidance for other overseas territories to do the same.

Because of the harsh winter weather on South Georgia, the fieldwork component of this work can only be undertaken in the summer season. As per our project plan, in our first year, the surveys have been undertaken which will allow the weed management strategy to be finalised and project workers now have the resources needed to complete this task during the coming months. The priority for next season will be to undertake weed control and reduce many species to zero population density.

Outreach work both within South Georgia and with other overseas territories is ongoing (see above) and will continue throughout the duration of the project.

In summary, project outcomes are likely to be achieved by the end of the funding cycle and although complete eradication of some weed species will take many years, a key project legacy will be to have built in sufficient capacity within the territory to continue this work.

2.5 Monitoring of risks

The primary risks associated with this project involve either further spread of existing non- native plants as a result of the survey work or introduction of new non-native plants with project equipment being introduced from elsewhere. Both of these risks are mitigated by implementing a comprehensive biosecurity regime which involves ensuring that all visitors to the island undertake boot washing and gear checking procedures and that cargo and equipment is checked in a designated biosecurity facility immediately upon arrival in the Territory.

Another risk that was identified in the project proposal was damage to non-target plant species. Trials with new, selective herbicides and use of extremely diluted herbicides aim to develop a system whereby target species are controlled with minimal impact on native flora (see section 2.1).

An additional risk which has been identified this year is the ability to control species which were thought to be highly restricted in distribution but have subsequently been found at remote sites. Species such as *Sagina procumbens* was initially thought to be restricted to three old whaling

station sites (Grytviken, Husvik and Leith). In the absence of grazing pressure by reindeer, this species has prospered and survey teams have detected plants at remote sites outside of the main whaling station complexes (Figure 2). These outlying plants have been treated with herbicide and will receive follow-up visits but if surveys in future years find additional populations, the overall aim of eradication of this species may be compromised.

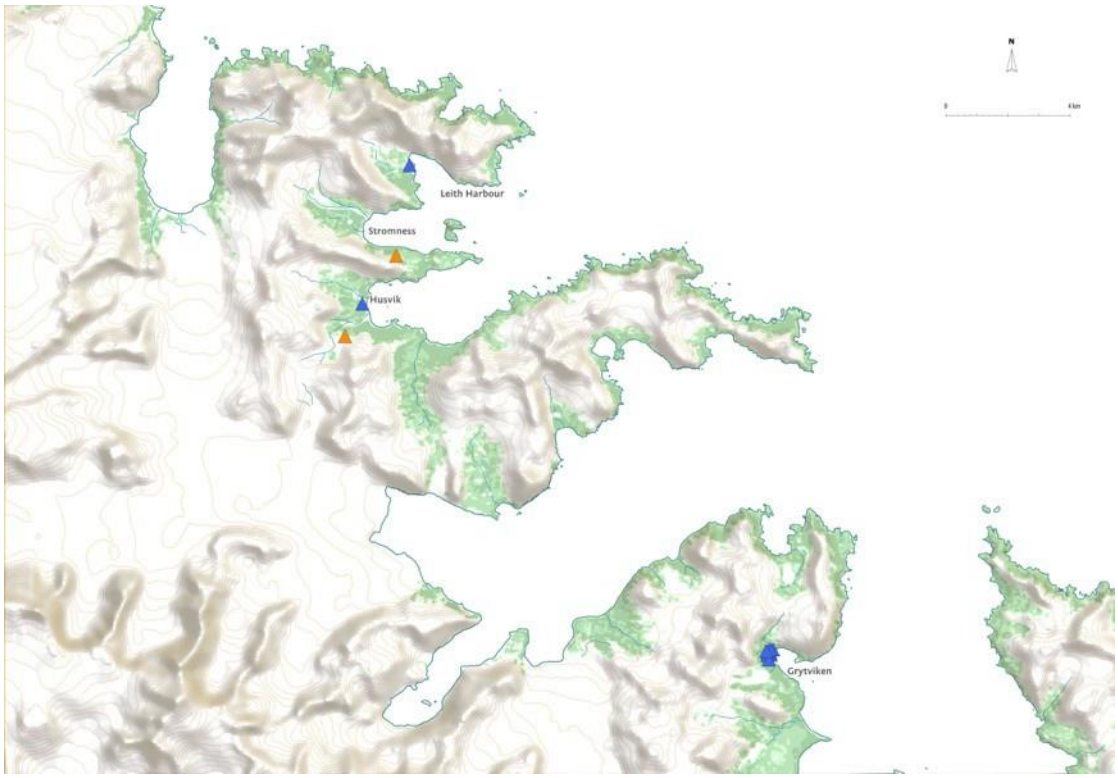

Figure 2. Blue triangles indicate previous known distribution of *Sagina,* orange triangles indicate additional records as a result of survey work

3. Project Stakeholders

The project partners and principal stakeholders are GSGSSI, RBG Kew and Kelvin Floyd (Consultant). The principal stake-holders all worked together in recruitment of the Project Officer. Because of the different locations and time zones, this was principally done via conference call.

Other important stakeholders are the British Antarctic Survey who manage the station at KEP. Because there is no native population on South Georgia, working with those that live and work on the research station is a key element of local engagement. Base members were kept updated on the progress of the project in the weekly base meeting and biosecurity risks are highlighted in the base induction which all personnel receive on arrival at KEP.

On a lighter note, awareness about invasive species in general, but with a particular focus on the interactions between introduced mammals and invasive plants was highlighted at an invasive species pizza night. The highlight of the evening was the reindeer and bittercress pizza (Figure 3). In such a small community, this type of event was very successful in maintaining goodwill of local stake-holders and highlighting the work that the weed management team had been involved in.

Figure 3. Reindeer and bittercress pizza

The next phase of the project which will involve finalisation of the weed management strategy and environmental impact assessment will require a far greater degree of stakeholder involvement. Both documents will be sent for expert review.

4. Monitoring and evaluation

One of the key monitoring tools employed throughout the field season was the weekly report that was written by the Project Officer. These short reports gave an overview of the week's activities and a look forward at plans for the week ahead. It took a little work to find the best format for these reports but in the end they provided a useful tool, especially enabling project partners not based on South Georgia to better follow progress (see annex 1).

Over the course of the season, team meetings were held every two weeks to discuss progress towards objectives so far and the work plan for the next two weeks. The fortnightly interval was chosen because weather conditions meant that on a week-to-week basis, the balance between indoor and outdoor work was hard to predict, but over a two-week period it was possible to manage time to meet objectives set for that work period. When teams were working remotely, they would give input to the Project Officer by e-mail and this would be fed into the wider group meeting. In this way we ensured that project objectives were met within the agreed time frame.

At the end of the season, project workers were given a feedback from where they could reflect on their achievements over the season, any problems and lessons learned which could be used to improve for next year. This was followed up via an interview with the GSGSSI Environment Officer.

5. Lessons learnt

Project team members travelled to South Georgia from across the globe in order to undertake this seasons work and because of the limited availability of berths on vessels and concurrent work commitments, it was not possible to have a full face-to-face team meeting at the start of the season. This was overcome with conference calls, e-mails and smaller group meetings and therefore it did not affect the overall outcomes of the project; however if logistically possible, an early season team meeting would be useful.

KEP is a busy research station and over the summer season, project workers stay in shared accommodation and contribute to domestic tasks on base. This community living is for some a highlight of their time on South Georgia but the lack of personal space can be a challenge. Project workers are briefed on what to expect during the season but the focus was mainly on practical details rather than social setting. On reflection, this element should be emphasised more to ensure that personnel are prepared for the experience. If other projects are in a similar position and require staff to move to the overseas territory, especially if they have not worked in a small community before, a thorough orientation about what to expect would be beneficial.

One element of the project which worked really well this year was combining experience of project workers who had in depth local knowledge and field experience on South Georgia with project workers from New Zealand who had expertise in the most up-to-date best practice with herbicide. In combination this meant that we had an incredibly strong team with complimentary skill sets and puts us in an excellent position to finalise the weed management plan and associated environmental impact assessment.

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

N/A

7. Other comments on progress not covered elsewhere

A reindeer eradication project has been underway on South Georgia for the last three years, and came to its completion in early 2015. The removal of nearly 7000 reindeer from the island has meant that vegetation (both native and invasive) has been released from grazing pressure and made a remarkable recovery. The increased growth and visibility of weeds has helped greatly with the survey work but has also served as a stark reminder that weed management must now be an urgent priority as many populations are on the verge of expanding beyond the point at which control is feasible.

Working out fine scale financial planning in relation to salaries has been problematic as there are a limited number of berths available to get people to and from South Georgia. This means it is hard to predict expenditure on salaries, as just because of changes in shipping availability, project workers may have to extend or shorten their work period by several weeks. To combat this we were careful to prioritise work loads so critical tasks were completed early in the season and there was enough additional work to keep project staff occupied in the event that north bound ships were delayed. One consequence of this which was more difficult to control was the effect this had on staff salaries and subsistence and travel costs. Because the majority of staff are employed in the austral summer, just before the end of the UK financial year, there is little time to refine budgets before the end of the financial year.

Herbicide trials will be of great value in the long-term as they will provide experimental data on which chemicals are effective against various target species, and what is the optimal concentration to minimise impacts on non-target species. These trial plots were established this season and will be monitored both next year, and in subsequent years. As this data becomes available they will be fed into the weed management strategy. As a result, the strategy which is produced as part of this project will be reviewed and further refined on a five year cycle. This term aligns the strategy with reviews of the overall plan for South Georgia.

8. Sustainability

When travelling back through the Falkland Islands, the Project Officer engaged in some outreach activities with the local community including site visits and meetings with government officials (see annex 2). This raises awareness about invasive plants and increases capacity in the South Atlantic region more generally, potentially providing a pool of seasonal workers who could be engaged on South Georgia.

More generally, we have worked to ensure that there is comprehensive project documentation (including herbicide use guides) so that existing GSGSSI staff have the necessary information in order to maintain control of high priority species if in the worst case scenario additional personnel are not available. To ensure that future project workers have access to the necessary resources to sustain the project into the future, species specific information on control methodology, herbicide use and timing is being written for inclusion in the weed database (Figure 4).

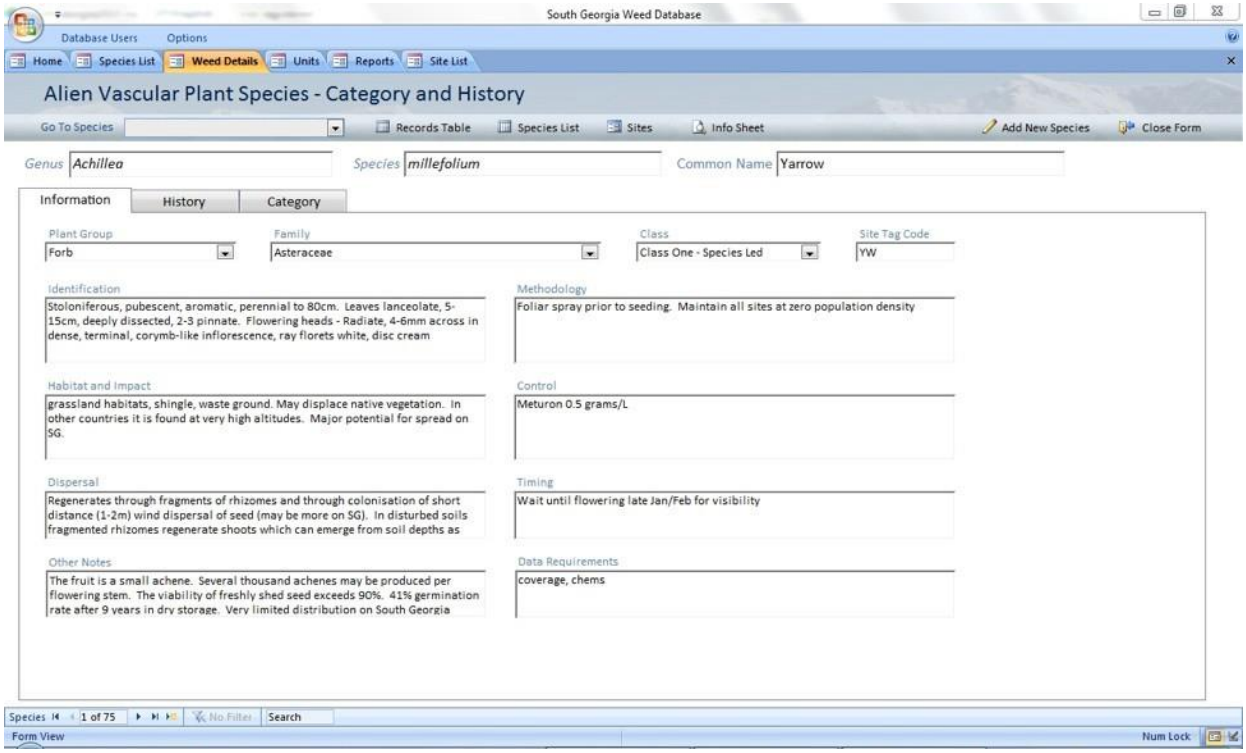

Figure 4. Screen shot showing an example of species specific control information

9. Darwin Identity

The Darwin identity was promoted through Twitter posts that related to work carried out by the project team throughout the season. The following tweets were made, which were subsequently re-tweeted by Darwin.

GSGSSI @GovSGSSI 05/01/2015

The @Darwin_Defra funded project to battle invasive bittercress on #SGSSI gets underway

GSGSSI @GovSGSSI 23/01/2015

Old whaling stations are a hot spot for invasive plants but our @Darwin_Defra eradication team is on the case

GSGSSI @GovSGSSI 02/02/2015

The @Darwin_Defra weed eradication team heads out to Stromness Bay to search out some more #invasive plants

The weed project also featured in the GSGSSI February newsletter (http://www.sgisland.gs/index.php/%28h%29South_Georgia_Newsletter%2C_February_2015) and in the 2014 annual report (http://www.sgisland.gs/download/reports/Annual%20report%202014.pdf)

Locally residents of King Edward Point were kept up to date on the activities of the project team at weekly meetings where the Darwin identity was re-enforced

Government Officers give a mandatory briefing to all visitors to South Georgia. As part of this briefing they provide information about biosecurity and weed control (including what measures visitors can take to prevent spreading non-native plants). As part of this presentation, the role of the Darwin initiative in funding the current weed management project team is highlighted and the Darwin logo has now been included on slides (Figure 5). This briefing has been given to 64 ships and been seen by approximately 7800 passengers.

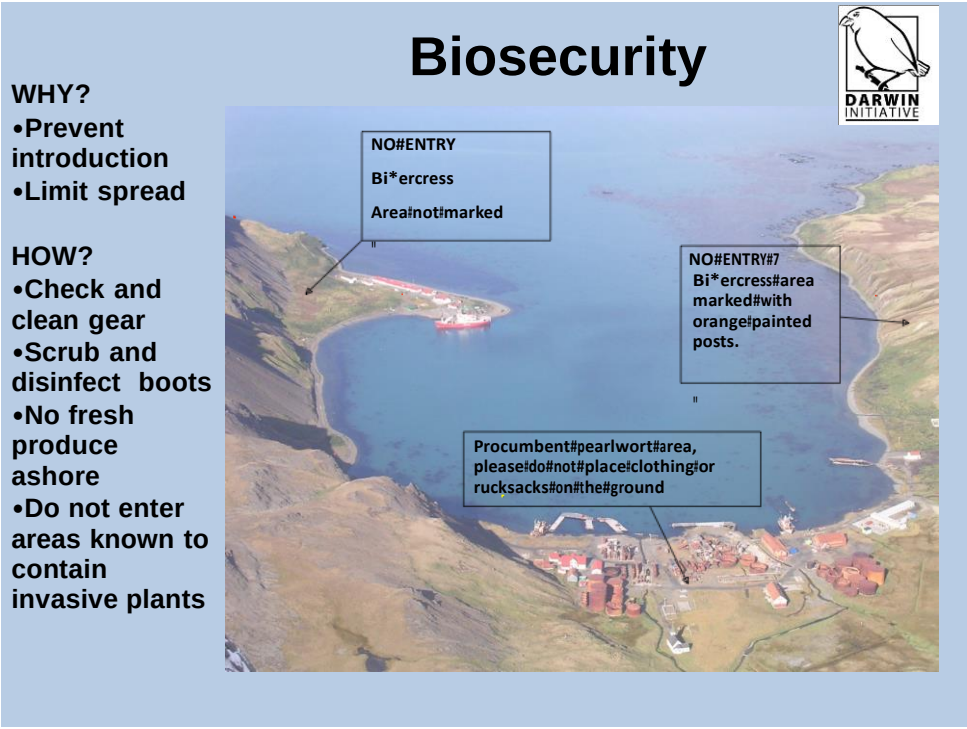

Figure 5. Slide used by Government Officers during passenger briefings

In each case, the project was recognised as a distinct project with a clear identity.

10. Project Expenditure

Table 1 Project expenditure during the reporting period (1 April 2014 – 31 March 2015)

Project spend (indicative) in this financial year	2014/15 Grant (£)	2014/15 Total actual Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs				An invoice from RBG Kew was not received in time to be included in

				this years budget
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items				
Others (Please specify)				
TOTAL	**£46,300**	**£45,982**	**0.7%**	

11. OPTIONAL: Outstanding achievements of your project during the reporting period (300-400 words maximum). This section may be used for publicity purposes

I agree for the Darwin Secretariat to publish the content of this section:

It is an exciting time to be working on South Georgia. Invasive species and the effects of climate change pose a massive threat to our fragile sub-Antarctic ecosystem and therefore large habitat restoration projects have been undertaken to try and return the island to a near pristine state. Over the last five years, projects have worked to remove rats and reindeer and now control of invasive alien plants is a priority.

Over the last six months, a team of dedicated project workers from the Falkland Islands, UK and New Zealand have been working to tackle this next big challenge facing the island. The first task facing the team was to get a hand on the scale of the problem and complete a comprehensive survey of the areas where weeds occur. A massive 6,000 ha of rugged, mountainous terrain was surveyed in weather that ranged from pleasant summers days, to ferocious winds and freezing temperatures. This distribution data is vital as it shows not only the area affected by weeds, but by comparing it with historic data, it tells the project team how quickly they might spread and by what method.

While covering so much ground, the project team used the opportunity to use herbicides to control some of target species before they had opportunity to spread any further. In total 15,845 m^2 was treated. Although the weed management strategy will only be finalised next year, this initial control work on certain high priority species provides vital information on how both weeds and native plants react to herbicide.

Even after long days and weeks in the field, members of the project team have taken the opportunity to share the knowledge they have gained with people both on South Georgia and in the Falkland Islands. Combining the in-depth local knowledge with expert advice on the most up-to-date methods of weed control is a powerful combination, and one that can have profound benefits for the flora of our overseas territories.

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?	Yes
Do not include claim forms or other communications with this report.	