Darwin Initiative Annual Report

Submission Deadline: 30 April

Darwin Project Information

Project Reference	20-003
Project Title	South Georgia Island Habitat Restoration Project: Mouse Eradication Sub-Project
Host Country/ies	South Georgia and the South Sandwich Islands (a UK OT)
Contract Holder Institution	South Georgia Heritage Trust (SGHT)
Partner institutions	Government of South Georgia and the South Sandwich Islands (GSGSSI) and Royal Society for the Protection of Birds (RSPB has subsequently withdrawn)
Darwin Grant Value	£253,058 over three years
Start/end dates of project	01/04/2013 – 31/03/2016
Reporting period (eg Apr 2013 – Mar 2014) and number (eg Annual Report 1, 2, 3)	Apr 2013 – Mar 2014 Annual Report 1.
Project Leader name	Professor Anthony Martin
Project website	www.sght.org
Report author(s) and date	Anthony Martin 22 April 2014

1. Project Rationale

The problem addressed by this project was the accidental introduction of a rodent (house mouse - *Mus musculus*) to an island ecosystem that had evolved in the absence of mammals. House mice were very likely taken accidentally to South Georgia by British and American sealers in the late eighteenth century, since they occur remote from the whaling stations which were established a century later.

The impact of these rodents on the fauna and flora of the UK Overseas Territory of South Georgia had not been studied, but experience on other islands in similar latitudes left little doubt that the mice had, or would at some stage have, a profound impact if left *in situ*. On the UK Overseas Territory of Gough Island, for example, house mice have become destructive predators of nestlings of the endemic Tristan albatross. South Georgia has 5 ACAP-listed species vulnerable to mouse predation, including 4 albatrosses. The endemic South Georgia Pipit is also very vulnerable to rodent predation.

Another key element of the rationale for the work was that the personnel and infrastructure to effect an eradication attempt was due to be on the island for an attempt to eradicate rats in adjacent blocks of land. Consequently, mouse eradication work could be carried out at a small fraction of the cost of a stand-alone operation.

As South Georgia has no permanent human residents, this project was not required to address development challenges.

The main challenges to be overcome were the scale of the task, the remoteness of South Georgia, the hostile landscape and climate, and the need to kill every single rodent in the target area.

South Georgia lies just south of the Antarctic Convergence and is situated some 1,800km east of the southern tip of South America. The two mouse-infested areas are on the south coast of the island at its western end.

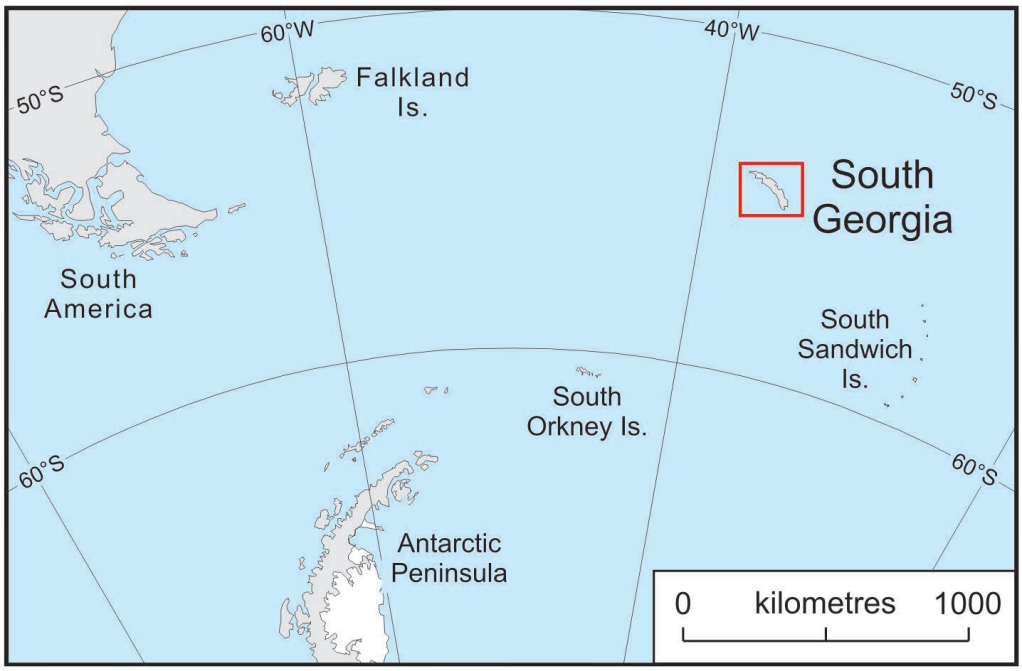

Fig. 1. Map of South Atlantic and Southern Ocean showing location of South Georgia

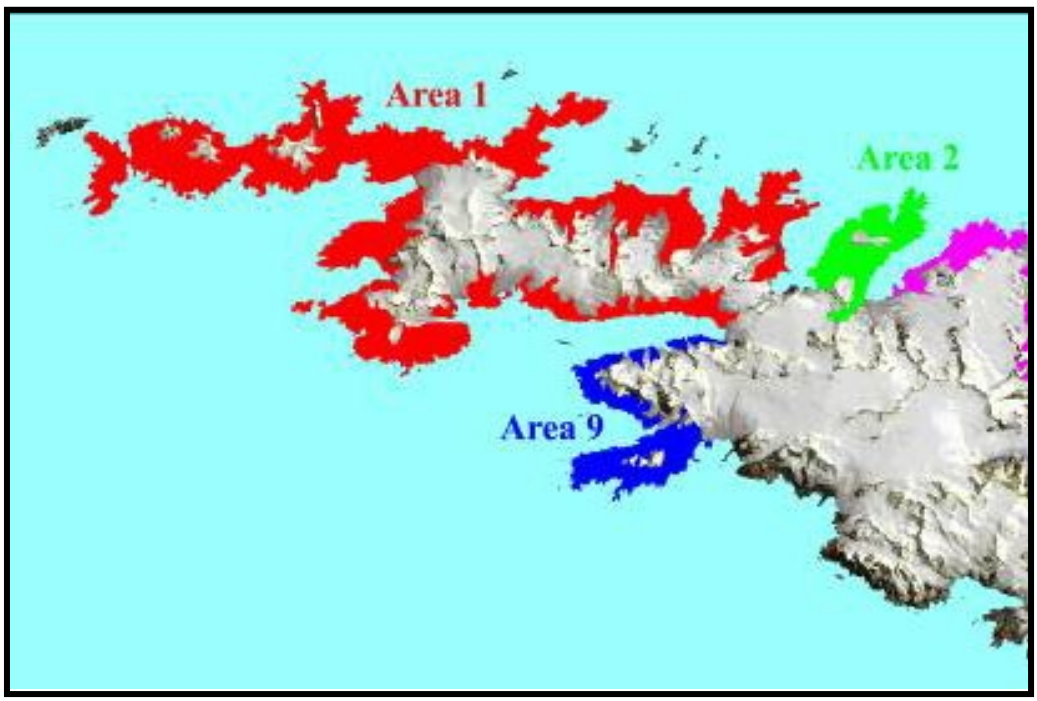

Fig. 2. Map of western end of South Georgia. The mouse-infested land is labelled 'Area 9' in blue, and comprises two adjacent blocks of land separated by a glacier. The total planar area of these two blocks is 4,932 ha (49.3 sq. km).

2. Project Partnerships

The host country partner is the Government of South Georgia and the South Sandwich Islands (GSGSSI). The Government has three main roles in the work - to ensure it is well planned and responsibly carried out, to provide logistical and other assistance, and to provide monitoring effort. The project is overseen by a Steering Committee, and the Government has two representatives on this body (its CEO and Environment Officer), so it is an important project stakeholder in every regard.

To date GSGSSI has carried out its responsibilities in terms of checking the planning and execution of the operation, and assisted with some very welcome and important logistical support. It was not, however, able to undertake any monitoring work in the mouse zones in this reporting year, so SGHT assumed responsibility for this and used the DI funds earmarked for this work following approval of a change request submitted in November 2013. It is expected, however, that GSGSSI will be able to carry out monitoring in the mouse zones in the second year of the project.

The second partner is the RSPB, whose previous (Darwin Initiative-funded) work on mice on South Georgia was central to the planning for this operation. Unfortunately, the RSPB's only expert in this field (Richard Cuthbert) left the organisation before he could properly fulfil his intended role in this project. However, the results of his earlier research work on mice on South Georgia were made available to SGHT, and in fact proved crucial in the development of a revised baiting strategy, forced upon the field team by the worst weather in living memory (see 3.1 below).

3. Project Progress

3.1 Progress in carrying out project activities

The project has progressed very satisfactorily this year, and the eradication fieldwork operation was concluded successfully, safely and on time. Both of the areas of land infested with mice were treated with specially-formulated bait pellets using three helicopters and supported by a team of 23 people alongside the Project Director and Deputy Director. The team was accommodated in a substantial field camp; the bait and fuel for the operation had previously been flown ashore by helicopter from the helideck of the RRS *Ernest Shackleton*, which had been chartered for the work.

Exceptionally poor weather in the weeks prior to the mouse eradication, and indeed during the entire summer and autumn on South Georgia, led to a realisation (fortunately in good time) that the planned two-drop strategy was unlikely to be completed, and that a modified strategy should be developed. The original plan required a minimum 10-day interval between two identical baiting operations, and by early April it became clear that this was not likely to be achieved. Two factors were taken into account when developing a revised strategy. Firstly, the rat bait pellets that had been spread in early March were remaining in good condition for 4 weeks or more, so the main purpose of a second coverage (to replace pellets that had deteriorated) was therefore nugatory. Secondly, research carried out by the RSPB under Darwin Initiative award 'Developing knowledge to eradicate mice from UK OT islands' (Project Ref 18-017) demonstrated that mice only occurred in vegetated areas at lower elevations, so there was no point in spreading bait over bare rock at higher elevations.

The new strategy, agreed by consensus within the field team, which included several NZ rodent eradication specialists, was therefore to spread the bait in one coverage and to restrict bait to areas of vegetation and scree. Within these habitats, bait density was increased from 8kg/Ha to 10kg/Ha, and swath overlap was increased to 50% in order to ensure that no gaps could occur. In addition, a coastal swath was flown, providing an extra 3kg/Ha in the area where most mice occur.

It so happened that the one period of several consecutive days of flyable weather during the entire field season occurred when the team was positioned to carry out the mouse work. Consequently the revised strategy was implemented in mid-April 2013, in conditions of relatively light winds, resulting in the pellets falling in the expected swath below the aircraft. Careful analysis of the path of each helicopter during every sowing run (see Annex 4) demonstrated that no gaps were left, and we are confident that pellets were deposited in the home range of every mouse in these two adjacent areas of land. A visit by helicopter more than 5 weeks after sowing demonstrated that pellet material remained available to mice at that time, and that the originally planned second bait sowing was indeed not required.

The second major activity of this first year of the project was monitoring the impacts on both the target and non-target fauna. This was accomplished, and is discussed below.

3.2 Progress towards project outputs

The Log Frame has four outputs:

Output 1 (the sowing of bait) was completed successfully, safely and on time, as evidenced by GPS data from the three baiting aircraft (see Annex 4).

Output 2 (assessment of impacts on target and non-target fauna in the year after baiting) has also been accomplished, although weather conditions prevented more than a cursory attempt at Indicator 1 - a survey of target and non-target fauna immediately after the baiting. Of much greater importance was Indicator 2 - a more intensive survey one year later. To this end, a survey expedition was in the field aboard an expedition yacht from mid-March 2014 and 7 experienced field staff deployed 146 detection devices (chew boards, chew sticks, wax tags, tracking tunnels and PIR-triggered cameras) in the two mouse zones. These devices were revisited 13 days later, and none showed any sign of rodents.

Equally reassuring was that substantial numbers of the birds most at risk from the toxin in the bait (Brodifacoum) were seen during this survey. Most species are not vulnerable because they eat only food caught at sea, but land-based birds can be. The endemic South Georgia Pipit was remarkably abundant in April 2014, and this may even indicate that it bred in the first season after baiting. Antarctic Skuas were also seen frequently, and a large flock of South Georgia Pintails demonstrated that this species too has quickly recovered from any mortality it may have incurred during and after the baiting work a year previously. In every respect, therefore, evidence to date is consistent with the prospect that the mouse eradication attempt in 2013 was successful in selectively removing every rodent, but left the native fauna essentially intact.

Output 3 (extensive survey work 2 years after baiting) is a task for the next reporting year.

Output 4 (dissemination of results and public outreach) was mainly intended for year 3, but has been substantially addressed this year as part of the wider rodent-eradication media coverage. A press event was held at the Royal Geographical Society in London on July 3rd 2013 following the return of the team. This resulted in coverage in The Times, Guardian and Independent newspapers here in the UK and on BBC online, as well as items in the New York Times, Le Monde, Global Mail, Global News, the Toronto Star in Canada and The Times of India. The Project Director was interviewed for the BBC World Service, BBC Radio Scotland, Falkland Islands Radio and BBC World News Television. A summary of media highlights is included as Annex 6. During the reporting year, the Project Director has given lectures on the project and its impacts in England, Scotland, Norway and Brazil.

3.3 Progress towards the project Purpose/Outcome

The purpose of this project is simply stated - the eradication of mice from South Georgia. If that objective is achieved, the outcome will be a cessation of mouse-inflicted damage to the island's native flora and fauna and the elimination of a risk that the mouse population will expand as glacial barriers disappear. It will be at least another year before we can say if eradication has been achieved, but evidence to date is consistent with that eventuality. The bait was spread, and a survey of the two areas of land one year later has not revealed any sign of rodents.

The purpose level assumptions still hold true, and the indicators remain adequate for measuring outcomes.

3.4 Goal/ Impact: achievement of positive impact on biodiversity and poverty alleviation

The Goal/Impact in our original application form was stated as follows:

"In the absence of rodents, South Georgia's native biodiversity and ecosystem function will be restored, with the anticipated return of over 100 million seabirds to their ancestral home. The project will have a worldwide impact by virtue of informing, encouraging and inspiring other rodent eradication operations. The recovery of South Georgia's birds will be a major international conservation story. It should encourage more sustainable tourism to the island, generating revenue for its Government which is substantially reinvested to improve wildlife protection."

The impact of the work is both local and global. At the local level, the island's native flora and fauna in an area of 48 km^2 will be freed of human-induced damage and, in time, a natural regeneration of native seabirds and other fauna and flora will occur. At the global level, a milestone in the fight back against invasive species will have been achieved. Moreover, this ambitious challenge will have been undertaken successfully and efficiently by a small UK charity, providing inspiration to many NGOs around the world. This is already being seen in numerous enquiries from groups in countries such as Mauritius, the Falkland Islands, the Antipodes and Auckland Islands (NZ) and the French sub-Antarctic islands of Crozet and Kerguelen. Nearer to home, SGHT's expertise has been sought in relation to eradicating rodents from the Shiant Islands (Hebrides), a project being scoped by RSPB Scotland, neatly reciprocating the advice provided by the RSPB in regard to the mouse work on South Georgia.

As South Georgia has no permanent human residents, this project is not expected to make direct contributions to human development, poverty alleviation and welfare.

4. Project support to the Conventions (CBD, CMS and/or CITES)

Island Biodiversity is a thematic programme under the Convention on Biological Diversity (CBD), and invasive alien species is a cross cutting issue. This project relates particularly to CBD *Article 8. In-situ Conservation:*

(f) Rehabilitate and restore degraded ecosystems and promote the recovery of threatened species, inter alia, through the development and implementation of plans or other management strategies;

(h) Prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species;

In terms of the Aichi Targets, the project supports *Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use, Target 9: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment*

The project also relates to the Agreement for the Conservation of Albatrosses and Petrels (ACAP) under the CMS. Seven of the 29 currently listed ACAP species breed on South Georgia and South Sandwich Islands (SGSSI). For all of these species, SGSSI hosts significant proportions of the global breeding population, including the largest populations for four of the seven species.

The following ACAP obligations concerning the conservation of breeding sites are of particular relevance to this project:

1. Conserve and, where feasible and appropriate, restore those habitats that are of importance to albatrosses and petrels (Art III, 1a).

2. Prevent introductions, eliminate or control non-native species detrimental to albatrosses and petrels (Art III, 1b).

The Government of South Georgia and the South Sandwich Islands (GSGSSI) is responsible for the management of the territory's biodiversity and marine resources. GSGSSI took part in meetings with SGHT in December 2013 and early April 2014 to discuss this and other projects.

5. Project support to poverty alleviation

Since South Georgia has no permanent human residents, this project does not contribute to the Darwin Initiative criteria relating to poverty alleviation. This was recognised in the invitation from the Darwin Secretariat to submit a Stage 2 application, which stated that 'meeting all the ODA criteria is not necessarily required for this application'.

Nonetheless the project may have some relevance for poverty alleviation on inhabited islands elsewhere. Many invasive alien species increase human poverty, and rodents are among the most destructive in this regard. Although rodent eradication is still in its infancy as a tool, this project offers a step-change in the land area that can be tackled for mice, and runs alongside an eradication of brown rats (*Rattus norvegicus*) that is an order of magnitude larger than anything yet attempted. Each rodent eradication is informed by its predecessors, and this South Georgia project is attempting to clear rodents from land areas greater than many inhabited islands.

6. Monitoring, evaluation and lessons

Monitoring and evaluation has been covered above. The major lessons learned during this first year of the project have been the requirement to (a) plan every detail thoroughly and realistically, and then (b) retain operational flexibility to the greatest extent possible. This project was indeed very carefully planned, taking into account the substantial experience of the Project Director and other members of the team, and every element of the planning was reviewed by experts and stakeholders. But the best plans, including substantial allowance for contingencies, can be challenged in a complex operation such as this, being carried out at the end of a 8,000 mile supply chain, at the onset of winter on a remote sub-Antarctic island with no road, rail or air links and few ship visits.

Even on an island infamous for its climate, the 2012/13 season was remarkable for the endless stream of storms that came in from the west, bringing the worst weather in living memory. Fortunately, the mouse eradication work was planned to occur mid-way through the larger rat eradication operation, so lessons learned immediately beforehand could be applied to the Darwin Initiative-supported project. As mentioned elsewhere, this experience indicated that the planned two-drop strategy for the mouse baiting would almost certainly fail due to the improbability of being able to return and carry out the second drop after an interim period of at least 10 days. A rapid convening of the project's Decision Support Team, fortuitously augmented by two people who had taken part in the earlier Darwin Initiative research project *'Developing knowledge to eradicate mice from UK OT islands*' (Project Ref 18-017), resulted in a thorough re-evaluation of the situation pertaining and a revised baiting strategy for the mouse zones. This strategy was then successfully implemented. Whether or not it has achieved mouse eradication we do not yet know. But it certainly provided a better probability of this than had we persisted with the original plan, and it also meant that we did not leave large quantities of unused fuel and bait on the hill, to be collected at huge expense in a subsequent season.

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

n/a. This is first year report.

8. Other comments on progress not covered elsewhere

Based on experience elsewhere, the project faces the substantial risk that the target mouse population was not entirely removed by the 2013 baiting work. It is possible that some small pockets of mice persist, even though survey work to date has not detected any survivors. This was recognised from the outset. That said, even if a small proportion of the mouse population

does survive the baiting effort, there is an enhanced probability that the population would then die out naturally. Sub-Antarctic South Georgia represents an extremely challenging environment for a small rodent, and food shortages or extreme weather must sometimes put the population under even more pressure. We know already that the South Georgia mouse population has been dramatically reduced in size by the baiting work carried out under this project, so it will be at much greater risk of extinction due to stochastic events than previously, even if it has not already been eliminated.

9. Sustainability

The profile of the project has been raised by international media coverage, regular dissemination of newsletters to supporters and those following our progress across the world, and lectures by our SG-based staff on board nearly all cruise ships visiting the island. The project is regularly mentioned in the South Georgia Newsletter produced by GSGSSI at www.sgisland.gs.

The project has already inspired governments and other NGOs to seriously consider eradications of IAS in their own parts of the world, and the South Georgia Government has responded to SGHT's work by both tightening biosecurity to prevent subsequent rodent introductions and eradicating the other introduced mammal on the island - reindeer.

The sustainability of the project outputs and impacts is dependent on no further introductions of mice to the island. Recent attention to the risk of new introductions of IAS to South Georgia by GSGSSI, including strict administrative procedures, infrastructure and public awareness has brought about improvements which mean that the probability of reintroduction is now close to zero.

The exit strategy for the project is clear-cut. Advice from the world's most expert group in this field - the Island Eradication Advisory Group (Dept. of Conservation, NZ) - is that there is little or no point in attempting a re-baiting operation in a subsequent year, even if surviving mice are found in the treated areas. Either the aerial eradication technique works in a particular location and habitat, or it doesn't. Having carried out the baiting work, SGHT will now oversee subsequent monitoring effort and then conclude the operation.

10. Darwin Identity

The Darwin Initiative funding has been publicised on SGHT’s web site, with logo, both on the home page and in the ‘latest news’ section. This makes explicit that the Darwin Initiative is funding the discrete mouse–eradication sub-project as distinct from the larger rat eradication programme.

As mentioned previously, there are no permanent residents on South Georgia, but the island’s Government is very aware of the Darwin Initiative both as a partner in this and previous projects and as Lead Institution for a new Darwin Plus award relating to the management of invasive plants.

11. Project Expenditure

Table 1 project expenditure during the reporting period (1 April 2013 – 31 March 2014)

Project spend since last annual report	2013/14 Grant (£)	2013/14 Total actual Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)				
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items (see below)				
Others (see below)				
TOTAL				

Breakdown of staff costs

Staff employed	Total pay for period worked	% on mouse work	Total Charged to Darwin grant	Original Darwin budget amount
Tony Martin, Project Director, SGHT pay				
Rob Webster, Deputy Project Director				
Deirdre Galbraith, Medic				
Sally Poncet, FOB work				
David Will, GIS specialist				
Gerard Baker, Cook/base assistant				
Antony Dubber, Cook/base assistant				
Oliver Prince, Cook/base assistant				
Keith Springer, Field Assistant/Loader				
Richard Hall, Field Assistant/Loader				
James Doube, Field Assistant/Loader				

Sam Moore, Field Assistant/Loader				
Sam Burrell, Field Assistant/Loader				
Oliver Bonner, Field Assistant/Loader				
Roger Stillwell, Field Researcher				
George Lemann, Field Researcher				
Liz Pasteur, Camp Builder/ GA				
Geoff Pring, Camp Builder/ GA				
Nick Torr, Assistant Project Director				
Peter Garden, Chief Pilot				
Dave McLaughlin, Pilot 1				
Tony Michelle, Pilot 2				
George Phillips, Pilot 3				
Mark Paulin, Mechanic 1				
Paul Wilkinson, Mechanic 2				
Additional assignments by Peter Garden and Wiz Pasteur				
Geoff Pring, Stanley rep				
HR logistics and support - Alison Neil, CEO				
HR logistics and support - Nici				
Richard Cuthbert, RSPB				
Total				

Breakdown of capital items

Capital items	**Purchase price**	**% allocated to Darwin grant**	**Darwin claim amount**
Iridium phone			
Trail Camera UK			
GPS Units			
Mouse Traps			

Helicopter parts			
Total			

12. 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 (please leave this line in to indicate your agreement to use any material you provide here)

In this, the first reporting year, the project has carried out the world's second largest eradication operation on introduced mice, and by far the largest attempted by a non-governmental organisation. The work was not only on a vast scale, but necessitated complex logistics both to carry out aerial baiting with the required accuracy and to deploy the tonnes of bait and fuel beforehand. The operation required the use of three specially-adapted helicopters and a substantial camp to house the team of bait-loaders, pilots, engineers and medical doctors who carried out the work. It is too early to say definitively whether the mice have really all gone after two centuries of impacting the island's native flora and fauna, but one year after the bait-spreading was concluded there is no visible sign of them. Better still, South Georgia's endemic pipit and pintail were found in significant numbers during the survey, showing that the island's wildlife was not negatively impacted by the bait and is already responding positively to its new rodent-free status.

The project fieldwork was completed safely, on time, and on budget.

Annex 1: Report of progress and achievements against Logical Framework for Financial Year 2013-2014

Project summary	Measurable Indicators	Progress and Achievements April 2013 - March 2014	Actions required/planned for next period
Goal/Impact In the absence of rodents, South Georgia's native biodiversity and ecosystem function will be restored, with the anticipated return of over 100 million seabirds to their ancestral home. The project will have a worldwide impact by virtue of informing, encouraging and inspiring other rodent eradication operations. The recovery of South Georgia's birds will be a major international conservation story. It should encourage more sustainable tourism to the island, generating revenue for its Government which is substantially reinvested to improve wildlife protection.		It is too early to report on progress towards this higher level goal.	
Purpose/Outcome South Georgia will be free of mice for the first time since shortly after discovery by Captain Cook in 1775, and the likely spread of mice to other parts of South Georgia, due to the rapid retreat of glacial barriers, will be prevented. Mouse-inflicted damage to the island's native flora and fauna will cease; five ACAP-listed breeding species and many other vulnerable birds, including the endemic pipit, will be protected. Mouse eradication programmes on other UK Overseas Territories and beyond will be informed by the South Georgia operation, which represents a landmark in the global race against invasive alien species.	<u>Indicator 1</u> No evidence of mice in Nunez and Rosa zones two years after completion of baiting, despite thorough monitoring <u>Indicator 2</u> Within 3 years evidence of breeding of the endemic South Georgia pipit - the most obvious of the birds that are expected to benefit from mouse eradication (and the only songbird on SG)	<u>Indicator 1</u>No evidence of mice has been found by a recent monitoring expedition in the treated areas one year after baiting. This is encouraging progress towards achieving the project purpose, but it will be at least another year before we can say definitively if eradication has been achieved. <u>Indicator 2</u>. No proof positive of breeding yet, but the surprisingly high number of pipits seen during the recent monitoring survey is indicative that pipit breeding occurred in the 2013/14 summer season	During the next 12 months we are planning more survey work with a view to being able to declare the area mouse free in year 3 of the project.
Output 1. Completion of bait spreading in mouse infested areas of SG	Indicator 1. GPS-derived evidence of comprehensive bait-sowing, with no gaps and at the planned sowing densities. Complete by end May 2013.	The bait spreading was completed successfully, safely and on time – see report section 3.1 for details.	
Activity 1.1 Establish and provision Forward Operating Bases		Completed	

Activity 1.2, Set up camps in sequence and carry out baiting work using three helicopters and a team of 23		Completed
Activity 1.3 Carry out bait-spreading by helicopter		Completed
Output 2. Assessment of impacts on target and non-target fauna immediately after bait spreading and in year following	Indicator 1 Within 2 weeks after the second bait drop - results of a search for fresh evidence of mice and a count of bird carcasses. Indicator 2 By end of summer in the year after baiting - results of extensive search (at least 4 person-weeks of effort) for fresh mouse sign and a survey of abundance of any bird species found to be vulnerable.	Indicator 1 The mouse zones were revisited on 20 May 2013 to check the condition and availability of bait, to look for live and dead birds, and to check for obvious mouse sign. The delay in the baiting due to persistent poor weather caused this follow-up visit to occur much later than planned, and consequently laying snow covered most of the terrain. However, sufficient bait was found to show that it had lasted well, and no mouse tracks were seen on the snow. Indicator 2. In March 2014 4 person-weeks of effort were invested in a survey of both mouse zones. Nearly 150 detection devices were deployed, and no sign of rodents was found. A survey of birds at the same time revealed good numbers of the species most vulnerable to the bait (ducks and skuas).
Activity 2.1.Survey potentially vulnerable bird species before and immediately after baiting		The mouse areas were visited on the ground, and aerially surveyed, in mid-February, with the objective of mapping the precise area to be baited (glacial retreat changes the extent of permanent ice each year) and assessing the number of birds potentially vulnerable to poisoning. Only a short visit was possible immediately after baiting, due to persistently poor weather. The conditions were inadequate to allow any survey of bird numbers.
Activity 2.2.Search for carcasses of birds and test whether they had eaten the bait in weeks after baiting		Not possible due to persistent poor weather
Activity 2.3Search for mouse sign after bait drops		Completed
Activity 2.4Survey potentially vulnerable bird species in year after baiting		Completed
Activity 2.5Comprehensive search for mouse sign in year after baiting		Completed
Activity 2.6Survey breeding birds expected to react positively and rapidly to mouse eradication in year after baiting.		Completed. Both species involved - pintails and pipits were found in unprecedented numbers in the treated areas.
Output 3. Final assessment of success of baiting and immediate faunal impacts	Indicator 1 Two years after baiting - results of extensive search (at least 6 person-weeks of effort) for fresh mouse sign and a new survey of abundance of any bird species found to be vulnerable.	To report in Year 2
Activity 3.1.Survey potentially vulnerable bird species two years after baiting		Year 2 activity

Activity 3.2Comprehensive search for mouse sign two years after baiting.		Year 2 activity
Activity 3.3. Survey breeding birds expected to react positively and rapidly to mouse eradication two years after baiting.		Year 2 activity
Output 4. Dissemination of results and public outreach	Indicator 1 Annual reports on baiting and monitoring published on SGHT website. Indicator 2 Press release on completion of baiting and on declaration of success in 2015 (assuming success is achieved). Indicator 3 At least 7 media articles on the eradication effort and its consequences Indicator 4 At least 7 public talks/lectures on the eradication effort and its consequences	Indicator 1. The Habitat Restoration Project Newsletters available on the SGHT web site report baiting and monitoring progress. http://www.sght.org/newsletters-and-publications Indicator 2 – intended for 2015 Indicator 3 – intended for 2015 but significant media coverage already achieved. See Annex 4. Indicator 4 –In the first year, the Project Director has given lectures on the project and its impacts in England, Scotland, Norway and Brazil
Activity 4.1.Write annual reports of fieldwork, submit to Steering Committee & publish on website		The Project Director completed his report on the baiting work immediately after the fieldwork was completed, and submitted this to the Steering Committee. The Deputy Project Director did the same in regard to the March/April 2014 Monitoring Expedition, which he led.
Activity 4.2.Write final report of mouse eradication operation and faunal impacts & publish on website		Year 3 activity
Activity 4.3Hold press event and circulate press release to announce eradication of introduced mice on South Georgia (assuming success is achieved)		Year 3 activity. However a press event reporting on progress to date was completed in year 1, resulting in national and international press coverage (see Annex 4)
Activity 4.4Project Director to disseminate results through talks at conferences and to stakeholder groups		Annual activity, completed for the year.

Annex 2. Project's full current logframe

Project summary	Measurable Indicators	Means of verification	Risks and Assumptions
Goal/Impact In the absence of rodents, South Georgia's native biodiversity and ecosystem function will be restored, with the anticipated return of over 100 million seabirds to their ancestral home. The project will have a worldwide impact by virtue of informing, encouraging and inspiring other rodent eradication operations. The recovery of South Georgia's birds will be a major international conservation story. It should encourage more sustainable tourism to the island, generating revenue for its Government which is substantially reinvested to improve wildlife protection.			
Purpose/Outcome South Georgia will be free of mice for the first time since shortly after discovery by Captain Cook in 1775, and the likely spread of mice to other parts of South Georgia, due to the rapid retreat of glacial barriers, will be prevented. Mouse-inflicted damage to the island's native flora and fauna will cease; five ACAP-listed breeding species and many other vulnerable birds, including the endemic pipit, will be protected. Mouse eradication programmes on other UK Overseas Territories and beyond will be informed by the South Georgia operation, which represents a landmark in the global race against invasive alien species.	<u>Indicator 1</u> No evidence of mice in Nunez and Rosa zones two years after completion of baiting, despite thorough monitoring <u>Indicator 2</u> Within 3 years evidence of breeding of the endemic South Georgia pipit - the most obvious of the birds that are expected to benefit from mouse eradication (and the only songbird on SG)	Annual report of monitoring of the treated areas (Nunez Peninsula and Cape Rosa). To be written, circulated and published on the SGHT website Field notes collected on a daily basis which provide the substance for the report above	Mice occur on just two land areas of South Georgia. There is a slim possibility that mice may be more widespread on South Georgia than is currently recognised, as their numbers could be suppressed by the presence of rats. Even if this is the case, there will be a substantial probability that the mice will succumb to the rodenticide used for the rats. Monitoring of all areas treated for rodents will demonstrate whether mice have survived in areas where rats have been eradicated The mouse eradication will be 100% successful. Experience elsewhere has shown that the probability of eradication is much lower for mice than for rats. Changes to methodology (e.g. smaller pellets, greater pellet density on the ground to reduce inter-pellet distance, greater swath overlap, and repeat coverage) should improve the probability of success on South Georgia. Nonetheless, following treatment of each zone, monitoring will take place in the future to check that complete eradication of rodents has

			been accomplished. If any survive, the area will be treated again the following year. Mice will not be reintroduced. Should rats or mice be found at any location on SG subsequent to an eradication operation, they will be genetically tested to determine whether they are newly arrived or derived from survivors of the baiting attempt. Reference samples of the extant population will be securely archived in anticipation of this eventuality. However, strict biosecurity measures are already in place to prevent the re-introduction of rodents to the islands. Recent attention to the risk of new introductions of IAS to South Georgia by GSGSSI, including strict administrative procedures, infrastructure and public awareness has brought about improvements which mean that the probability of reintroduction is now close to zero.
Outputs 1. Completion of bait spreading in mouse infested areas of SG	GPS-derived evidence of comprehensive bait-sowing, with no gaps and at the recommended sowing densities. Complete by end May 2013.	Bird Survey field notes Mouse survey field notes Annual reports of fieldwork.	That the required number of flying hours can be achieved within the time allocated and before winter snows prevent further bait spreading That two or three (of three) helicopters remain functional throughout almost all of the operation That any injury or illness within the field team is limited to manageable levels and does not disable both key staff and their replacements for other than short periods of time
2. Assessment of impacts on target and non-target fauna immediately after bait spreading and in year following	Within 2 weeks after the second bait drop - results of a search for fresh evidence of mice and a count of bird carcasses. By end of summer in the year after		

	baiting - results of extensive search (at least 4 person-weeks of effort) for fresh mouse sign and a survey of abundance of any bird species found to be vulnerable.		
3. Final assessment of success of baiting and immediate faunal impacts	Two years after baiting - results of extensive search (at least 6 person-weeks of effort) for fresh mouse sign and a new survey of abundance of any bird species found to be vulnerable		
4. Dissemination of results and public outreach	Annual reports on baiting and monitoring published on SGHT website. Press release on completion of baiting and on declaration of success in 2015 (assuming success is achieved). At least 7 media articles on the eradication effort and its consequences At least 7 public talks/lectures on the eradication effort and its consequences		

Activities Activity 1.1 Establish and provision Forward Operating Bases Activity 1.2, Set up camps in sequence and carry out baiting work using three helicopters and a team of 23 Activity 1.3 Carry out bait-spreading by helicopter Activity 2.1.Survey potentially vulnerable bird species before and immediately after baiting Activity 2.2.Search for carcasses of birds and test whether they had eaten the bait in weeks after baiting Activity 2.3 Search for mouse sign after bait drops Activity 2.4 Survey potentially vulnerable bird species in year after baiting Activity 2.5 Comprehensive search for mouse sign in year after baiting Activity 2.6 Survey breeding birds expected to react positively and rapidly to mouse eradication in year after baiting. Activity 3.1.Survey potentially vulnerable bird species two years after baiting Activity 3.2Comprehensive search for mouse sign two years after baiting. Activity 3.3. Survey breeding birds expected to react positively and rapidly to mouse eradication two years after baiting. Activity 4.1.Write annual reports of fieldwork, submit to Steering Committee & publish on website Activity 4.2.Write final report of mouse eradication operation and faunal impacts & publish on website Activity 4.3 Hold press event and circulate press release to announce eradication of introduced mice on South Georgia (assuming success is achieved) Activity 4.4 Project Director to disseminate results through talks at conferences and to stakeholder groups	

Annex 3 Standard Measures

Table 1 Project Standard Output Measures

Code No.	Description	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	Total to date	Number planned for reporting period	Total planned during the project
Established codes								
8	Number of weeks to be spent by UK project staff on project work in the host country	263				263		
14B	Number of conferences/seminars/ workshops **attended** at which findings from Darwin project work will be presented/ disseminated							7
15C	Number of national press releases in UK	1				1	0	1
16A 16B 16C	Number of newsletters to be produced Estimated circulation of each newsletter in the host country(ies) Estimated circulation of each newsletter in the UK	4 40 1000				4 40 1000		12
19A 19B 19C 19D	Number of national radio interviews/features in host county(ies) Number of national radio interviews/features in UK Number of local radio interviews/features in host country(ies) Number of local radio interviews/features in UK	1 (Falklands Radio) 3 n/a 9						2
New - Project specific measures								

Table 2 Publications

Type (eg journals, manual, CDs)	**Detail** (title, author, year)	**Publishers** (name, city)	**Available from** (eg contact address, website)	**Cost £**

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.	✓
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.	✓
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	n/a this year
Have you completed the Project Expenditure table fully?	✓
Do not include claim forms or other communications with this report.	