



## Darwin Initiative Final Report

### 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
Contract Holder Institution	South Georgia Heritage Trust (SGHT)
Partner Institution(s)	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Georgia and the South Sandwich Islands (GSGSSI) and Royal Society for the Protection of Birds (RSPB has subsequently withdrawn)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
Funder (DFID/Defra)	Defra
Start/End dates of Project	01/04/2013 – 31/03/2016
Project Leader's Name	Professor Anthony Martin
Project Website/blog/twitter	<a href="http://www.sght.org">www.sght.org</a> <a href="https://www.facebook.com/pages/South-Georgia-Heritage-Trust/107047869335869">www.facebook.com/pages/South-Georgia-Heritage-Trust/107047869335869</a> <a href="https://twitter.com/SGHTcharitysite">https://twitter.com/SGHTcharitysite</a>
Report Author(s) and date	Anthony Martin, June 2016

### 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 were found to 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 and other seabirds. A mouse infestation on Antipodes Island, New Zealand, has caused similar devastation and a campaign is currently underway (June 2016) in an attempt to eradicate them there. South Georgia has five ACAP-listed species vulnerable to mouse predation, including four 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 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 areas known to be mouse-infested prior to the project are located on the south coast of the island at its western end. Mice occupied (we hope and trust in the past tense!) the vegetated coastal fringe of these mountainous areas. Here, native tussac (a tall, stool-forming grass) dominates, producing deep peat soils over time. The peat provides excellent habitat for burrow-nesting seabirds, and tussac is the preferred habitat of the endemic South Georgia Pipit.

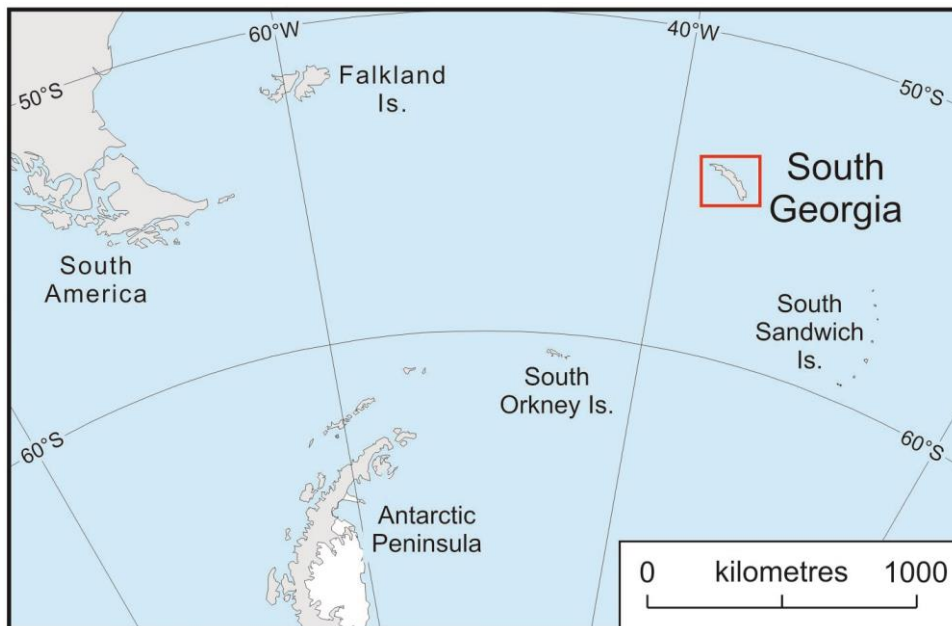


Fig. 1. Map of South Atlantic and Southern Ocean showing location of South Georgia

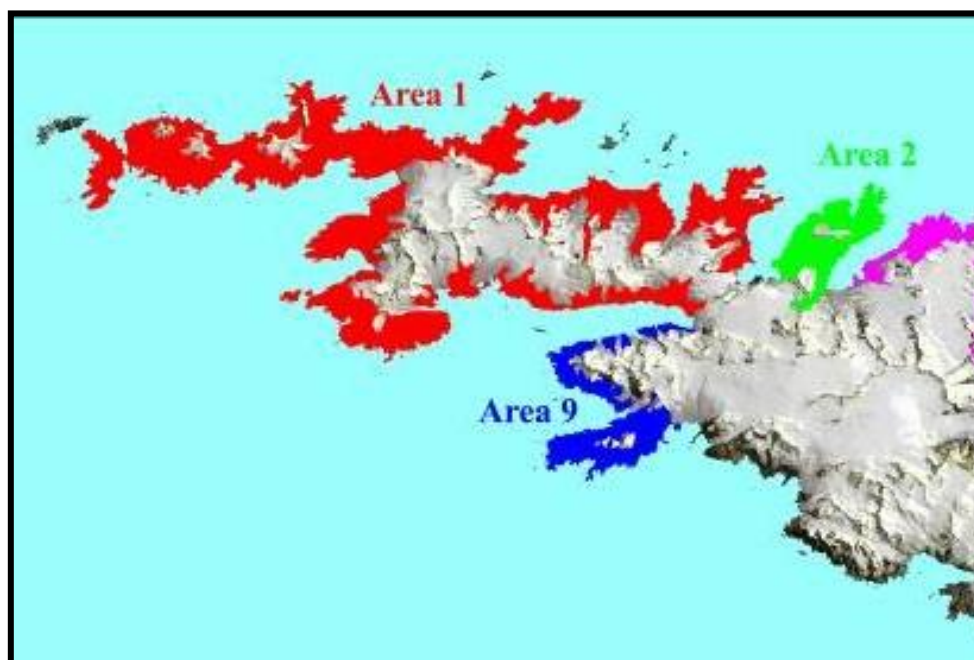


Fig. 2. Map of western end of South Georgia. The land that was mouse-infested is labelled 'Area 9' in blue, and comprises two adjacent blocks of land separated by a glacier. The total planar area of these two blocks is 4,932 ha (49.3 sq. km).

## 2 Project Achievements

### 2.1 Outcome

<p><b>Outcome:</b></p>	<p>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</p>			<p><b>Comments (if necessary)</b></p>
	<p><b>Baseline</b></p>	<p><b>Change by 2016</b></p>	<p><b>Source of evidence</b></p>	
<p><b>Indicator 1</b> No evidence of mice in Nunez and Rosa zones two years after completion of baiting, despite thorough monitoring</p>	<p>In 2012, mice were recorded at densities of c. 2 mice/ha in tussac habitat, and 9 mice / ha along a narrow shoreline fringe in some areas of Rosa and Nunez.</p>	<p>No sign of mice evident during three survey visits to the mouse zones</p>	<p>Reports of monitoring survey trips in Annexes 10 and 11.  (Baseline data is from <i>Field trials for the eradication of House Mice from South Georgia Fieldwork Report March-April 2012</i> – RSPB / GSGSSI by Richard Cuthbert, Andy Black, Graham Parker, Kalinka Rexer-Huber and Erica Sommer, available on GSGSSI website)</p>	
<p><b>Indicator 2</b> 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)</p>	<p>Sightings of pipits rare</p>	<p>Sightings of pipits and song display common (April 2015). No nests seen, but display song is strongly indicative of breeding.</p>	<p>Anecdotal evidence from Project Director visit April 2015 and verbal reports to SGHT Board on return to UK.</p>	

Simply stated, the project outcome is a mouse-free South Georgia. Evidence to date (i.e., Indicator 1 - no evidence of mice in Nunez and Rosa two years after completion of baiting despite thorough monitoring) suggests that this was achieved by the baiting operation in Year 1 of the project. The fact that many pairs of pipits were encountered during visits to the sites in early 2015 is also strong circumstantial evidence that this bird bred in these areas in the 2014/15 season. Indicator 2 - evidence of breeding of the endemic South Georgia pipit - remains as an appropriate means of gauging project success, though in truth it is possible that pipits could breed even if one or more small colonies of surviving mice remained in remote parts of the former range of this rodent.

## 2.2 Impact: achievement of positive impact on biodiversity and poverty alleviation

**Impact statement from logframe:** 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<sup>2</sup> 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 was sought in relation to eradicating rodents from the Shiant Islands (Hebrides), a project carried out 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. However, in many parts of the developing world mouse infestations cause very substantial damage to crops and grain stores, so experience gained on South Georgia may well have *indirect* benefits to human populations elsewhere.

## 2.3 Outputs

<b>Output 1</b>	Completion of bait spreading in mouse infested areas of SG		
	<b>Baseline</b>	<b>Change recorded by 2016</b>	<b>Source of evidence</b>
<b>Indicator 1.1.</b> GPS-derived evidence of comprehensive bait-sowing, with no gaps and at the planned sowing densities. Complete by end May 2013	Prior to the project no rodenticide bait had been applied in Rosa and Nunez, other than in four study grids during field trials in 2012.	Bait was sowed successfully, safely and on time in year 1, though original regime was adapted due to weather.	GPS maps showing helicopter baiting flight lines are provided in Annex 7A and B of this report. Photographs of the baiting fieldwork are supplied in Annex 8.

<b>Output 2</b>	Assessment of impacts on target and non-target fauna immediately after bait spreading and in year following		
	<b>Baseline</b>	<b>Change recorded by 2016</b>	<b>Source of evidence</b>
<b>Indicator 2.1.</b> Within 2 weeks after the second bait drop – results of a search for fresh evidence of mice and a count of bird carcasses.	Fresh evidence of mice and few obvious bird carcasses	Limited opportunity because of weather but observations revealed no fresh evidence of mice. No obvious bird carcasses were observed.	Anecdotal evidence from Project Director and Baiting Operations Manager visit to baiting zones by helicopter
<b>Indicator 2.2</b> 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.	Fresh evidence of mice and few obvious bird carcasses	No fresh mouse sign of any kind has been observed since baiting was carried out. Surveys indicate that any avian losses to bait ingestion have been recovered already (specifically in regard to skuas and ducks, the most vulnerable birds in the mouse zones).	SGHT HR Project Monitoring 2014 Field Report – Annex 10
<b>Output 3</b>	Final assessment of success of baiting and immediate faunal impacts		
	<b>Baseline</b>	<b>Change recorded by 2016</b>	<b>Source of evidence</b>
<b>Indicator 3.1</b> Two years after baiting – results of extensive search (at least 6 person weeks of effort) for fresh mouse sign and new survey of abundance of any bird species found to be vulnerable	Fresh evidence of mice.  Ducks and skuas occurred in moderate numbers.	No evidence of mouse sign two years after baiting.  Skuas and ducks were seen in as great abundance as before baiting (April 2015)	GSGSSI Mouse Monitoring Report January 2015 Annex 11  Anecdotal evidence from Project Director visit April 2015
<b>Output 4</b>	Dissemination of results and public outreach		
	<b>Baseline</b>	<b>Change recorded by 2016</b>	<b>Source of evidence</b>
<b>Indicator 4.1</b> Annual reports on baiting and monitoring published on SGHT website.	Prior to the project these documents were not available	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. Reports of the January	<a href="http://www.sght.org/newsletters-and-publications">http://www.sght.org/newsletters-and-publications</a>

		2015 and April 2015 fieldwork were submitted to the Steering Committee within months of fieldwork completion. The Habitat Restoration Project Newsletters available on the SGHT web site report baiting and monitoring progress.	
<b>Indicator 4.2</b> Press release on completion of baiting and on declaration of success in 2015 (assuming success is achieved).	Prior to the project these documents were not available	A press release relating to the completion of the baiting for the wider rodent eradication was put out on 25 March 2015. A further media briefing took place at the Linnean Society in London on Thursday 25 June 2015.	Press releases are provided in Annex 13 D.
<b>Indicator 4.3</b> At least 7 media articles on the eradication effort and its consequences	Public has little knowledge of South Georgia or the damage caused to native wildlife by introduced rodents.	Significant media coverage exceeding the target number of articles was achieved.	A list of media coverage in each year of the project is provided in Annex 13A, B and C.
<b>Indicator 4.4</b> At least 7 public talks/lectures on the eradication effort and its consequences	No talks or lectures prior to project commencing	During year 1, the Project Director gave lectures on the project and its impacts in the UK, Norway and Brazil, as well as several broadcast interviews. In the second year, the Project Director gave seven lectures on the project and its impacts in four countries. In year three, he lectured on the project eight times in five countries. Additionally, some 5,000 visitors to South Georgia during the 2015/16 summer season attended lectures about the project, delivered by SGHT staff on the island.	<a href="http://www.ukotcf.org/pdf/2015conf/Programme.pdf">www.ukotcf.org/pdf/2015conf/Programme.pdf</a> for the PD's Gibraltar talk

The Log Frame has four outputs:

**Output 1** (the sowing of bait) was completed successfully, safely and on time in year 1. 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.

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.

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 7) 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.

Output 2 (assessment of impacts on target and non-target fauna in the year after baiting) was 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)

Surveys of both the target and non-target fauna were carried out twice - in January 2015 (16th & 18th; summer) (GSGSSI Mouse Monitoring Report January 2015, please see Annex 11) and April 2015 (9th; autumn). This equates to 21 and 24 months after baiting was carried out. Fieldworkers were deployed by boat in January and by two helicopters in April.

Surveys for evidence of live mice were based on both checking detection devices deployed a year earlier and searching for tracks, faeces or other sign in fresh snow. Both surveys produced negative results, i.e. no mouse sign was discovered.

Evidence from bird sightings strongly indicates both that species at risk of poisoning and those likely to benefit in the short term from rodent eradication are doing well. The species most at risk were Antarctic skua, South Georgia pintail and snowy sheathbill. In 2015 skuas were breeding at densities similar to those encountered before the baiting work. Pintails are difficult to assess during the breeding season when they are cryptic, but on 9 April 2015 a flock of 72

was seen at Cape Rosa by the author - a larger number than he had seen in the area in earlier years - and substantial pintail flocks were evident in nearby areas which were treated for rats in 2013. Sheathbills are only normally numerous in penguin colonies, of which there are few in the mouse-infested areas, and none were visited during this survey. However, other penguin colonies treated for rats at the same time as the mouse areas were treated (March/April 2013) did have substantial numbers of sheathbills present in early 2015. It seems clear that the bait-broadcasting activities in early 2013, even if they did cause some sheathbill mortality as would be expected, did not bring about a major long-term loss of this taxon on South Georgia.

While the pintail population was expected to both suffer (in the short term) and benefit (in the longer term) from the baiting, pipits were only likely to benefit, and their response to the operation has been spectacular. Before the bait was sown, pipit sightings in areas with rodents were few and far between. Now they are seen routinely on every landing, no doubt because the species breeds at an early age and has the potential to produce many fledged young per season. At Cape Rosa a pair of pipits appeared overhead as soon as the helicopter blades stopped turning in April 2015, and the field team were never out of earshot of pipit calls throughout their visit. This species neither migrates nor assembles in flocks, remaining in scattered pairs or singles throughout the year. Post-breeding dispersal and the nature of preferred habitat renders estimates of population size to be prone to substantial error, but the increase in density and range in 2015 and 2016 was so profound that all observers familiar with the island were in agreement that the change was real and unmistakable. One hardened and very experienced visitor to South Georgia found himself in tears of joy at the sheer number of pipits in a place where they were previously rarely encountered. Other factors such as weather and climate change may well be involved in this recovery to some extent, but such a rapid change in pipit population fortunes can only plausibly be due to the equally rapid, and opposite, change in rodent numbers on South Georgia.

Two years is the absolute minimum length of time required to be able to assess the likely success or failure of even a small-scale eradication operation and its long-term impact on non-target fauna. Exactly 24 months after baiting one of the largest areas of land ever treated for mice, it was not possible to give a definitive answer to every question. However, it does seem reasonable to conclude the following:

1. Baiting appears to have been largely or totally effective in eradicating mice from South Georgia. No rodent sign has been found since baiting was carried out. Absence of evidence is not evidence of absence, but there are grounds to be cautiously optimistic that mice no longer occur on South Georgia.
2. Two years after baiting, the bird species expected to suffer losses from the baiting were present in numbers that indicated no long-term damage to their populations, and three years after baiting the picture remains equally positive.
3. The two species expected to benefit from rodent eradication in the medium term - pintails and pipits - are both present in abundance. It is likely that the endemic pipit is now more abundant and widespread than at any time since whaling began more than a century ago, and perhaps since shortly after sealers brought rodents to South Georgia a century earlier than that.

#### Output 4 (dissemination of results and public outreach)

Due largely to the engagement of an excellent public relations company, coverage was extensive, international, and reached high impact publications such as UK broadsheets The Times, Guardian and Independent, the Wall Street Journal, New York Times, Le Monde and the Economist Review of the Year 'The world in 2015'. The Project Director has given a variety of presentations and interviews about the project, nationally and internationally, as described in the table above. He was also interviewed for the BBC World Service, BBC Radio Scotland, Falkland Islands Radio and BBC World News Television, among others.

The media coverage is summarised in Annex 13, which also includes relevant press releases.

### **3 Project Partnerships**

The Government of South Georgia and the South Sandwich Islands (GSGSSI) has been closely involved in all elements of this project from the outset. In its capacity as regulator,



GSGSSI has two staff members on the project's Steering Committee, and formally approved the eight formal documents which set out how the project would be conducted and managed (Operational Plan, Environmental Impact Assessment, Health and Safety Plan, Oil Spill Response Plan, Search and Rescue Plan, Crash Recovery Plan, Monitoring Plan and Biosecurity Plan). GSGSSI's role as project partner has been one of logistical and monitoring support. In January 2015, the Government co-chartered a vessel that, as part of a bird survey expedition, visited the areas treated by SGHT for mice. An expert team then searched for mouse sign and recorded birds seen. The report of that work forms Annex 11 to this document.

As reported in our year 1 report, the intended partnership with the RSPB did not happen. This was because the RSPB staff member involved - the only person in the organisation with the required expertise - left the UK to work overseas for another agency. Fortunately this did not significantly harm the project. The results of his earlier research work on mice on South Georgia were made available to SGHT, and subsequent advice was available from experts in New Zealand.

## **4 Contribution to Darwin Initiative Programme Outputs**

### **4.1 Contribution to SDGs**

Most relevant to our project is Sustainable Development Goal 15, Life on Land, specifically the target "By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species". Though South Georgia is just one island, and the mice occupied just a part of it, the project contributed significantly to this SDG by providing a step change in the scale of land area on which mouse eradication could be attempted and evidence that a conservation project of global importance could be achieved by a small NGO.

### **4.2 Project support to the Conventions or Treaties (CBD, CMS, CITES, Nagoya Protocol, ITPGRFA)**

The Convention on Biological Diversity (CBD) was signed by the UK in 1992 and ratified in 1994, but that ratification did not include South Georgia and the South Sandwich Islands. On 27/03/15 GSGSSI announced that the Foreign Secretary had agreed to declare an extension of the Convention on Biological Diversity to South Georgia & the South Sandwich Islands. The extension of the CBD to SGSSI is a demonstration of the commitment of the GSGSSI, the UK Government and partners such as SGHT to the conservation of the flora and fauna of South Georgia and the South Sandwich Islands and is, in part, a consequence of recent work to protect the biodiversity of the Territory. In making this announcement, GSGSSI made reference to SGHT's "world leading" rodent eradication work, which, alongside other non-native species eradications, has been a factor in facilitating the extension of the CBD to South Georgia (the GSGSSI press release is supplied in Annex 12).

Island Biodiversity is a thematic programme under the 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).

#### **4.3 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.

#### **4.4 Gender equality**

Since South Georgia has no permanent human residents, the project does not address gender equality issues.

#### **4.5 Programme indicators**

- Did the project lead to greater representation of local poor people in management structures of biodiversity?
- Were any management plans for biodiversity developed?
- Were these formally accepted?
- Were they participatory in nature or were they 'top-down'? How well represented are the local poor including women, in any proposed management structures?
- Were there any positive gains in household (HH) income as a result of this project?
- How many HHs saw an increase in their HH income?
- How much did their HH income increase (e.g. x% above baseline, x% above national average)? How was this measured?

As South Georgia has no permanent human residents, the bullet points above are not applicable to our project.

#### **4.6 Transfer of knowledge**

Did the project result in any formal qualifications?

- i. How many people achieved formal qualifications?
- ii. Were they from developing countries or developed countries?
- iii. What gender were they?

This section was also not relevant to our project.

## 4.7 Capacity building

As the second largest mouse eradication operation ever attempted, this project represented capacity building on a global scale. The knowledge generated and experience gained has already contributed to two other large scale island mouse eradications. The Antipodes Island (NZ) campaign is underway now (June 2016), and three of its senior staff were part of the South Georgia project. The Gough Island operation, planned for 2019 by the RSPB, has recently employed the South Georgia Baiting Operations Manager as a formal advisor, and the South Georgia Project Director is also providing advice.

As a direct consequence of the mouse- and rat-eradication projects on South Georgia, both supported by the Darwin Initiative, SGHT is hosting the third international Island Invasives conference in Dundee in 2017 ([www.islandinvasives2017.com](http://www.islandinvasives2017.com)). This meeting will bring together experts, managers and decision makers from across the world, and represents a rare and valuable opportunity for knowledge transfer. The RSPB is supporting this conference and has indicated that it will financially support attendees from developing nations where rodent eradications offer a substantial opportunity for biodiversity enhancement.

## 4.8 Sustainability and Legacy

This project was centred around a key objective which, if achieved, could and should endure in perpetuity. As far as we can tell at present, that objective - the eradication of mice on South Georgia - has probably been achieved. However, removing damaging invasive fauna is only half the battle; the other half is to prevent re-invasion. The responsibility for that belongs to our project partner GSGSSI.

Fortunately, the areas where mice occurred are infrequently visited by humans and, because re-invasion could only happen if mice are transported by vessel, the risk of them becoming re-established in the same area must be considered low. The highest risk of mice going ashore again is at the administrative and logistical base at King Edward Cove on the north coast of South Georgia. Here, tens of ships deliver passengers ashore every year, and some ships and yachts tie up alongside two jetties. The real and continuing risk of rodent invasion was demonstrated in October 2014, when a rat disembarked at the main jetty and made its way onto the island. GSGSSI promptly implemented its pre-prepared incursion response plan to eliminate the rat. Nonetheless, the event has caused us to reassess the risk as stated in our original log frame that the probability of reintroduction is “now close to zero”. Until this type of event is definitively prevented, there remains a risk that mice will also find a way back on to South Georgia, thereby negating the achievement of this project.

GSGSSI has a biosecurity policy which is under annual review (available on their web site [http://www.gov.gs/docsarchive/Environment/Biosecurity/Biosecurity%20Handbook\\_2016-2017\\_FINAL.pdf](http://www.gov.gs/docsarchive/Environment/Biosecurity/Biosecurity%20Handbook_2016-2017_FINAL.pdf)). GSGSSI also has a policy relating to visitors and permitted landing sites. This has also been reviewed in light of the assumption that the entire island is now free of rodents for the first time since shortly after the initial landing by Capt Cook in 1775.

After the completion of baiting work on South Georgia, most of the project staff (who were on temporary contracts) moved on to other work, including rodent eradication campaigns elsewhere. The Project Director remained in post to wrap up the operation (multiple reports such as this one, and a book), to plan an expedition at the end of 2017 to search for surviving rodents with trained dogs and to oversee the disposal of physical assets. Five other staff remain in part-time capacities to achieve these objectives and to raise funds for them.

## 5 Lessons learned

This project was based on earlier, similar, fieldwork on South Georgia and consequently was planned with the benefit of considerable experience. By far the biggest lessons learned, or confirmed, were the importance of contingency planning and the ability to respond rapidly and effectively to changing circumstances. Weather will always be a major factor in field planning in wild and remote places like South Georgia, especially for those relying on helicopters for working or transportation.

The assessment, minimisation and management of risks were crucial elements of planning for this project, as they must be for any that cannot quickly replace damaged or lost equipment and supplies, or indeed key personnel. The helicopters were by far the largest, most complex and most expensive equipment, but the project was as strong as its weakest link, and numerous pieces of equipment (and people) were equally fundamental to project success. Risk assessment and management necessarily included tough decisions on how much money could and should be spent on insurance - not only in the sense of financial recompense but, more importantly from a strategic perspective, in the sense of buying, transporting and holding spares of key resources.

The other overarching lesson was the crucial role played by the Steering Committee. By inviting key stakeholders to be involved in the oversight of the project, *its* success became *their* success, and we are confident that this led to easier working relationships than would otherwise have been the case. Certainly, the territory Government was always perceived to be extremely vigilant and demanding in terms of documentation, permitting and day-to-day monitoring, but at least its staff knew that nothing was hidden. Project management and decision making was transparent and open from the start, and management benefitted from having few layers. Responsibilities were clear.

The project benefited greatly from the cooperation between lead and partner organisations. Getting people with the right expertise to South Georgia for long periods and with the ability to land and travel safely is both expensive and challenging. To have two teams deploy to the remote, rarely visited mouse areas at different times of the 2014/15 season was exceptional, and only possible by virtue of pooling resources of GSGSSI and SGHT.

## **5.1 Monitoring and evaluation**

Throughout, the project was overseen by a multi-agency Steering Committee (SC) chaired by a trustee of SGHT. The SC met quarterly and often conducted urgent business by email and phone between meetings. The Project Director reported to the SC and, on financial and non-operational matters, to the SGHT Board.

Progress made on the various elements of the project was monitored by way of a Microsoft Project database. This allowed participants and stakeholders to quickly understand how the elements were interlinked, which were running to schedule and which were not. Ultimately, responsibility for monitoring the project's progress, work plan and budget was that of the Project Director.

The only substantial change to the project design was brought about by a prolonged period of poor weather, even by South Georgia's standards, during the baiting phase in Year 1. After many weeks of almost no flyable weather, it became apparent that the plan to sow bait over the entire area twice, with an interval of days between, could simply not be achieved. A meeting of the Project Director's Decision Support Team on the island concluded that the best chance of eradication success given the remaining time available would be offered by a single bait drop focussed on the terrain at lower elevations where mice were most likely to live. This modified plan was accomplished in a 6-day weather window. It transpired that, had the original operational design been followed, it would have had to be abandoned part way through, leaving half the terrain unbaited, with mission failure an inescapable consequence.

## **5.2 Actions taken in response to annual report reviews**

Feedback following the Year 1 report pointed out a degree of confusion between monitoring and evaluation of the project itself and that carried out by the project in the field. This was rectified in the Year 2 report, which raised no further issues needing attention.

## 6 Darwin identity

The Darwin Initiative logo was placed on SGHT's helicopters (this is clearly visible in the helicopter photographs in Annex 9) and images of them are universally used both in presentations about the work and in publicity material. The Darwin Initiative funding has been publicised on SGHT's web site <http://www.sght.org/latest-news-page>, where it was made explicit that the Darwin Initiative was funding the discrete mouse-eradication sub-project as distinct from the larger rat eradication programme.

The Darwin Initiative is now widely known in conservation circles, and to have won an award is recognised as a mark of esteem, so there is mutual advantage in publicising the fact that this project is supported by the Darwin Initiative. SGHT does have a Twitter account, and this is indeed linked back to the Darwin account.

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 other projects and as Lead Institution for a Darwin Plus award relating to the management of invasive plants.

Looking ahead, the Island Invasives 2017 conference ([www.islandinvasives2017.com](http://www.islandinvasives2017.com)) will be a large international forum within which the Darwin Initiative contribution to the South Georgia work will be well publicised.

## 7 Finance and administration

### 7.1 Project expenditure

Project spend (indicative) since last annual report	2015/16 Grant (£)	2015/16 Total actual Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)				
Consultancy costs				
Overhead Costs (audit)				
Travel and subsistence				Although the Project Director delivered the required number of talks about the project, some of this travel was dual purpose and funded by other means, thus could not be claimed from Darwin.
Operating Costs				
Capital items (see below)				
Others (see below)				
<b>TOTAL</b>	6,500	4,413.66		<b>As above</b>

Staff employed (Name and position)	Cost (£)
------------------------------------	----------

n/a	
<b>TOTAL</b>	

<b>Capital items – description</b>	<b>Capital items – cost (£)</b>
n/a	
<b>TOTAL</b>	

<b>Other items – description</b>	<b>Other items – cost (£)</b>
n/a	
<b>TOTAL</b>	

## 7.2 Additional funds or in-kind contributions secured

<b>Source of funding for project lifetime</b>	<b>Total (£)</b>
Dundee University	
Alastair Salvesen's Charitable Trust	
Garfield Weston Foundation	
Cruise Ship passenger donations	
<b>TOTAL</b>	<b>166,450</b>

<b>Source of funding for additional work after project lifetime</b>	<b>Total (£)</b>
Individuals	
US Foundations	
Cruise Ship passenger donations	
<b>TOTAL</b>	<b>49,450</b>

## 7.3 Value for Money

Compared to similar operations elsewhere (e.g. on Campbell Island and Macquarie Island, and the projected cost of the forthcoming Gough Island project), this project offered very good value for money. Cost efficiency was partly due to the scale of the operation, but also to the fact that it was run by a small charity. Previous eradications on anything like this scale have always been administered by Governments or large NGOs. Inevitably, their management structure is multi-layered, more complex and more expensive.

Additionally, the personnel and infrastructure to effect a mouse 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.

It is important to emphasise that in keeping costs to a minimum no corners were cut in terms of Health and Safety or adherence to legislation. Safety was always the highest priority. The aircraft were flown on the UK CAA register and were both operated and maintained to the highest standards of the relevant authority, EASA (European Aviation Safety Agency). The pilots employed were the best in the world in this field. During more than 1,000 hours of flying over rough terrain and in often very rough weather, not one forced- or emergency-landing occurred. H&S risk assessments were completed for all activities to UK standards, and full appropriate PPE was always worn, again to current UK standards. No life-threatening accidents occurred, and injuries were minor. The team included a fully qualified specialist in emergency medicine, but thankfully his skills were not required.

# Annex 1 Project's original (or most recently approved) logframe, including indicators, means of verification and assumptions.

**Note: Insert your full logframe. If your logframe was changed since your Stage 2 application and was approved by a Change Request the newest approved version should be inserted here, otherwise insert the Stage 2 logframe.**

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p><b>Impact:</b></p> <p>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.</p>			
<p><b>Outcome:</b></p> <p>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.</p>	<p><u>Indicator 1</u></p> <p>No evidence of mice in Nunez and Rosa zones two years after completion of baiting, despite thorough monitoring</p> <p><u>Indicator 2</u></p> <p>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)</p>	<p>Annual report of monitoring of the treated areas (Nunez Peninsula and Cape Rosa). To be written, circulated and published on the SGHT website</p> <p>Field notes collected on a daily basis which provide the substance for the report above</p>	<p>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</p> <p>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</p>



			<p>again the following year.</p> <p>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.</p>
<p><b>Outputs:</b></p> <p>1. Completion of bait spreading in mouse infested areas of SG</p>	<p>1a. GPS-derived evidence of comprehensive bait-sowing, with no gaps and at the recommended sowing densities. Complete by end May 2013.</p>	<p>Bird Survey field notes</p> <p>Mouse survey field notes</p> <p>Annual reports of fieldwork.</p>	<p>That the required number of flying hours can be achieved within the time allocated and before winter snows prevent further bait spreading</p> <p>That two or three (of three) helicopters remain functional throughout almost all of the operation</p> <p>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</p>
<p>2. Assessment of impacts on target and non-target fauna immediately after bait spreading and in year following</p>	<p>2a. Within 2 weeks after the second bait drop - results of a search for fresh evidence of mice and a count of bird carcasses</p> <p>2b. 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.</p>		

<p><b>3. Final assessment of success of baiting and immediate faunal impacts</b></p>	<p>3a 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</p>		
<p><b>4. Dissemination of results and public outreach</b></p>	<p>4a. Annual reports on baiting and monitoring published on SGHT website.</p> <p>4b. Press release on completion of baiting and on declaration of success in 2015 (assuming success is achieved).</p> <p>4 c. At least 7 media articles on the eradication effort and its consequences</p> <p>4d. At least 7 public talks/lectures on the eradication effort and its consequences</p>		

**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)

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 3.2 Comprehensive 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 2 Report of progress and achievements against final project logframe for the life of the project

Note: For projects that commenced after 2012 the terminology used for the logframe was changed to reflect DFID's terminology.

Project summary	Measurable Indicators	Progress and Achievements in the last Financial Year 2015-16	Actions required/planned for next period
<p><b>Goal/Impact:</b></p> <p>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.</p>		<p>Seabirds are long-lived and reproduce slowly, so their recovery will be evident on a scale of decades. However, the endemic SG pipit, which reproduces rapidly, can be considered as our equivalent of the canary in a coal mine, and is already showing clear signs of post-baiting recovery, as described under 2.3 above.</p>	<p>Do not fill not applicable</p>
<p><b>Purpose/Outcome</b></p> <p>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</p>	<p><u>Indicator 1</u></p> <p>No evidence of mice in Nunez and Rosa zones two years after completion of baiting, despite thorough monitoring</p> <p><u>Indicator 2</u></p> <p>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)</p>	<p>Given the nature of the project, the main outcome was either achieved, or not, in Year 1 when the baiting was carried out. If the eradication was successful, the resultant benefits to the island's ecology, flora and fauna will occur, regardless of whether or not mouse eradication is proven. The task following the baiting work was to establish, to the extent possible, whether every single mouse was indeed killed. Progress towards this goal was substantial, as was conveying news of the work to others in the UK and overseas. There was no sign of mice in either of the zones treated and strong circumstantial evidence that pipits bred in the treated areas less than two years after treatment.</p>	<p>Do not fill not applicable</p>
<p><b>Output 1.</b></p> <p>Completion of bait spreading in mouse infested areas of SG</p>	<p><u>Indicator 1.</u>GPS-derived evidence of comprehensive bait-sowing, with no gaps and at the planned sowing densities. Complete by end May 2013.</p>	<p>The bait spreading was completed successfully, safely and on time as detailed in our year 1 report.</p>	

Activity 1.1 Establish and provision Forward Operating Bases		Completed, as reported in Year 1 report
Activity 1.2 , Set up camps in sequence and carry out baiting work using three helicopters and a team of 23		Completed, as reported in Year 1 report
Activity 1.3 Carry out bait-spreading by helicopter		Completed, as reported in Year 1 report
<b>Output 2.</b> Assessment of impacts on target and non-target fauna immediately after bait spreading and in year following	<p><u>Indicator 1</u> Within 2 weeks after the second bait drop - results of a search for fresh evidence of mice and a count of bird carcasses.</p> <p><u>Indicator 2</u> 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.</p>	Year 1 output – completed, as reported in Year 1 report
Activity 2.1.Survey potentially vulnerable bird species before and immediately after baiting		Completed – see year 1 report
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 – see year 1 report
Activity 2.3 Search for mouse sign after bait drops		Completed – see year 1 report
Activity 2.4 Survey potentially vulnerable bird species in year after baiting		Completed – see year 1 report
Activity 2.5 Comprehensive search for mouse sign in year after baiting		Completed – see year 1 report
Activity 2.6 Survey breeding birds expected to react positively and rapidly to mouse eradication in year after baiting.		Completed – see year 1 report
<b>Output 3.</b> Final assessment of success of baiting and immediate faunal impacts	<p><u>Indicator 1</u> 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.</p>	Surveys of evidence of population status for both target and non-target species were carried out at two different times of year. The total amount of effort was as expected (in excess of 6 person weeks) but appalling weather in March 2015, intended to be the focus of fieldwork, meant that the observers were unable to access the treated sites at all in that month. Consequently the team was diverted from other tasks in April 2015 eventually accessed both areas and carried out the work necessary.

Activity 3.1. Survey potentially vulnerable bird species two years after baiting	Completed.
Activity 3.2 Comprehensive search for mouse sign two years after baiting.	Searches were carried out, but the second round of surveys did not cover as much ground as had been hoped, due to prolonged poor weather at the end of March preventing access to the land in question for all but a few days.
Activity 3.3. Survey breeding birds expected to react positively and rapidly to mouse eradication two years after baiting.	Completed.
<b>Output 4.</b> Dissemination of results and public outreach	<p><u>Indicator 1</u> Annual reports on baiting and monitoring published on SGHT website.</p> <p><u>Indicator 2</u> Press release on completion of baiting and on declaration of success in 2015 (assuming success is achieved).</p> <p><u>Indicator 3</u> At least 7 media articles on the eradication effort and its consequences</p> <p><u>Indicator 4</u> At least 7 public talks/lectures on the eradication effort and its consequences</p> <p><u>Indicator 1.</u> The Habitat Restoration Project Newsletters available on the SGHT web site report baiting and monitoring progress. <a href="http://www.sght.org/newsletters-and-publications">http://www.sght.org/newsletters-and-publications</a></p> <p><u>Indicator 2</u> – A press release relating to the completion of the baiting for the wider rodent eradication was put out on 25 March 2015. A further media briefing took place at the Linnean Society in London on Thursday 25 June 2015.</p> <p><u>Indicator 3</u> – significant media coverage exceeding the target number of articles achieved. See Annex 13</p> <p><u>Indicator 4</u> – During year 1, the Project Director gave lectures on the project and its impacts in the UK, Norway and Brazil, as well as several broadcast interviews. In year 2 he gave seven lectures on the project four countries. In year 3, he lectured on the project in Gibraltar, Paris, Brazil, South Africa, London (twice) and Cambridge (twice). Additionally, c. 5,000 visitors to South Georgia during the 2015/16 summer season attended lectures about the project, delivered by SGHT staff on the island.</p>
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. Reports of the January 2015 and April 2015 fieldwork were submitted to the Steering Committee within months of fieldwork completion.
Activity 4.2. Write final report of mouse eradication operation and faunal impacts & publish on website	These reports are referred to under activity 4.1 above.
Activity 4.3 Hold press event and circulate press release to announce eradication of introduced mice on South Georgia (assuming success is achieved)	A press event reporting on progress to date was completed in year 1, resulting in national and international press coverage. Further press coverage of our rodent eradication efforts on South Georgia was achieved in years 2 and 3. See Annex 13
Activity 4.4 Project Director to disseminate results through talks at conferences and to stakeholder groups	During year 1, the Project Director gave lectures on the project and its impacts in the UK, Norway and Brazil, as well as several broadcast interviews. In year 2 he gave seven lectures on the project four countries. In year 3, he lectured on the project in Gibraltar, Paris, Brazil, South Africa, London (twice) and Cambridge (twice). Additionally, c. 5,000 visitors to South Georgia during the 2015/16 summer season attended lectures about the project, delivered by SGHT staff on the island



## Annex 3 Standard Measures

Code	Description	Total	Nationality	Gender	Title or Focus	Language	Comments
<b>Training Measures</b>							
1a	Number of people to submit PhD thesis						
1b	Number of PhD qualifications obtained						
2	Number of Masters qualifications obtained						
3	Number of other qualifications obtained						
4a	Number of undergraduate students receiving training						
4b	Number of training weeks provided to undergraduate students						
4c	Number of postgraduate students receiving training (not 1-3 above)						
4d	Number of training weeks for postgraduate students						
5	Number of people receiving other forms of long-term (>1yr) training not leading to formal qualification(e.g., not categories 1-4 above)						
6a	Number of people receiving other forms of short-term education/training (e.g., not categories 1-5 above)						
6b	Number of training weeks not leading to formal qualification						
7	Number of types of training materials produced for use by host country(s)(describe training materials)						



<b>Research Measures</b>		<b>Total</b>	<b>Nationality</b>	<b>Gender</b>	<b>Title</b>	<b>Language</b>	<b>Comments/ Weblink if available</b>
9	Number of species/habitat management plans (or action plans) produced for Governments, public authorities or other implementing agencies in the host country (ies)						Participatory process?
10	Number of formal documents produced to assist work related to species identification, classification and recording.						
11a	Number of papers published or accepted for publication in peer reviewed journals						
11b	Number of papers published or accepted for publication elsewhere						Location?
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country						
12b	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country						
13a	Number of species reference collections established and handed over to host country(s)						
13b	Number of species reference collections enhanced and handed over to host country(s)						

<b>Dissemination Measures</b>		<b>Total</b>	<b>Nationality</b>	<b>Gender</b>	<b>Theme</b>	<b>Language</b>	<b>Comments</b>
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work						
14b	Number of conferences/seminars/ workshops attended at which findings from Darwin project work will be						

	presented/ disseminated.						
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Physical Measures		Total	Comments				
20	Estimated value (£s) of physical assets handed over to host country(s)						
21	Number of permanent educational, training, research facilities or organisation established						
22	Number of permanent field plots established		Please describe				

Financial Measures		Total	Nationality	Gender	Theme	Language	Comments
23	Value of additional resources raised from other sources (e.g., in addition to Darwin funding) for project work	215,900	n/a	n/a		n/a	

## Annex 4 Aichi Targets

	Aichi Target	Tick if applicable to your project
1	People are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.	
2	Biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.	
3	Incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.	
4	Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.	
5	The rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.	
6	All fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.	
7	Areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.	
8	Pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.	
9	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.	✓
10	The multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.	
11	At least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.	
12	The extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.	✓
13	The genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for	

	minimizing genetic erosion and safeguarding their genetic diversity.	
14	Ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.	
15	Ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.	
16	The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.	
17	Each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.	
18	The traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.	
19	Knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.	✓
20	The mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.	

## Annex 5 Publications

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. web link, contact address etc)
Book	'Reclaiming South Georgia', author Tony Martin, 2015	UK	UK	M	South Georgia Heritage Trust, Dundee	SGHT or Natural History Book Service, UK