



Eradication of invasive rodents on South Georgia



Frequently Asked Questions

Prof. Tony Martin - Project Director, South Georgia Habitat Restoration Project



Q: What is the problem with having rats and mice on South Georgia?

A: South Georgia has no native mammals, so its wildlife evolved in the absence of mammalian predators. Brown rats are voracious killers of birds, and even mice can learn to eat the flesh of live seabirds, so their arrival on South Georgia as stowaways on ships had an immediate and catastrophic effect on the island's wildlife. Since that time, nearly all of the eggs or chicks of most small seabird species have been eaten, and the main island has been all-but abandoned by the storm-petrels, prions, diving petrels, blue petrels and pipits that once nested there. Other birds, such as ducks, terns, white-chinned petrels and shags are also likely to lose offspring to rats. The ecology of the island itself has also been affected. Rodents eat lots of insects, and affect the native vegetation by denying it the nutrients normally brought on shore by the birds that have been driven away. In short, invasive rodents have enormously damaged South Georgia's wildlife and ecology, and must be removed if the island is to recover.



Q: For how long have rodents been on South Georgia?

A: It is believed that the first rodents reached the island with sealers from the U.K. and U.S. in the late 1700s and early 1800s. But it is certain that new waves of furry immigration occurred throughout the next two centuries. An endless stream of rodent-infested vessels brought supplies to the sealing and whaling industries, and more recently ship-wrecked fishing boats probably added rats from other parts of the world. Although modern ships are much less likely to have rodents aboard, it is probable that small numbers of rats and mice reached shore from the many landings by scientific, tourist, naval and government vessels in recent decades.



Q: How can the rats and mice be removed?

A: The only feasible way to eradicate rodents on an island the size of South Georgia is to spread toxic bait by helicopter. A spreader bucket suspended below the aircraft spins the pellets up to 40 metres in each direction, creating a band 80 metres wide in which no point is more than a few metres from a pellet. The key is to ensure that every rat and mouse has access to enough bait - one or two pellets - to ensure its demise. This technique is now widely used around the world, and has proven to be effective and relatively affordable. On South Georgia we will need two helicopters, some 300 tonnes of bait and four seasons to complete the work. If carried out with care, as it will be, this operation should have more than a 95% chance of success.



Q: Is it really possible to kill every single rat and mouse on South Georgia?

A: Amazingly, the answer is yes. Experience from hundreds of eradication operations elsewhere demonstrates that the bait pellets we will be using are extremely attractive to rodents, and that they will eat them in preference to their natural food.

Q: What is the risk of humans being poisoned during this operation?

A: Near zero. The only way someone could be poisoned is if they deliberately set out to do so. The bait pellets used have such low concentrations of toxin in them that they are not even classified as hazardous cargo. The active ingredient, Brodifacoum, is not soluble in water, so you could put pellets



in a glass full of water and drink it with no ill-effect. Drinking the water from streams after baiting is risk-free, as will be drinking the tapped water at King Edward Point or Grytviken. You would need to eat the pellets (say, instead of a breakfast cereal!) for several days to become ill.

Q: Will South Georgia's native wildlife be affected by the poison?

A: We will take every precaution to minimise the risk to non-target fauna, and we are confident that no population of birds (there are no native mammals or amphibians on South Georgia) will suffer long-term damage. That said, it is almost inevitable that some individual birds will die due to either primary poisoning (eating the bait pellets direct) or secondary poisoning (eating animals that have themselves eaten the pellets). Most birds on South Georgia are seabirds that eat only prey from the oceans, and it is extremely unlikely that any of them will consume poison in any form. But scavengers such as skuas and giant petrels could ingest enough poison through eating dead or dying rats to become ill themselves, and a few birds such as ducks and gulls might be tempted to eat the pellets directly. We will carefully monitor each season's operation, and will be ready to modify or even stop the work altogether, if any wildlife looks likely to suffer long term population-level damage as a consequence of this operation.

Q: Will the noise or sight of helicopters cause damage to wildlife through fear or panic?

A: We are acutely aware that helicopters have the potential to scare wildlife, and are determined to ensure that our operations do not cause any such reaction. There are several ways in which this can be achieved. Firstly, by ensuring that our helicopters never startle birds - we will approach all penguin and albatross colonies slowly, and only go near them when actually spreading bait in the vicinity. Secondly, by flying high enough over them such that they do not panic. Thirdly, by keeping noise to a minimum by never hovering or turning over a bird colony. Seals are much more tolerant than birds to disturbance, but we will still minimise stress wherever possible. In all cases, observers on the ground will verify what impact our flying is having, and we will modify our procedures accordingly if necessary.



Q: Will tourists be affected by this work?

A: In the longer term, all visitors to South Georgia will benefit from this Project by virtue of experiencing much more abundant and diverse wildlife. In the short term, all ship visits will proceed as normal and personal risk will be zero because no helicopter will overfly tourists, either on a ship or on land. Some visitors to the island may, however, be inconvenienced in small ways by this work. For a few weeks a small part of Grytviken whaling station will be out of bounds during flying operations for safety reasons, and a helicopter may be seen or heard as it goes about its work. Visitors will be briefed about the work before coming ashore, and will be asked not to pick up any bait pellets they may find.



Q: How do the rats die?

A: The active ingredient in our bait pellets is Brodifacoum, a second-generation rodenticide. As with almost all rodenticides, Brodifacoum is an anti-coagulant, causing the animal to die of internal bleeding and organ failure. The affected animals become photophobic (scared of the light) and consequently most die in their burrows, inaccessible to potential predators. For this reason, deaths of scavengers (secondary poisoning) are relatively rare.

Q: Can rodents be removed from South Georgia in any other way?

A: No. Trapping or shooting could never be 100% effective, and would cost much more to even attempt. Hand-baiting would be hugely more expensive, and would fail because humans cannot access all places where rats live (e.g. on steep cliffs). All rodent baits that can offer 100% success act in a similar way to Brodifacoum; none offer a more humane solution to this problem.



Q: The rodents eating the poison will suffer before they die. How can you justify this?

A: Suffering by any animal is deeply regrettable, but consider the alternative. Unless rodents are removed from South Georgia, every year thousands, perhaps millions, of young birds will be eaten alive by rats. The death of one rat now will prevent the killing of many, many nestlings over time. The removal of every rat will allow South Georgia to be reclaimed by native wildlife, and probably save one bird (the South Georgia Pipit) from extinction. On balance, most people would agree that eradicating rodents from the island is justifiable, indeed necessary.



Q: If you succeed in getting rid of the rats, is it possible that mice could then explode in numbers and do similar (or worse) damage to wildlife?

A: This is possible, but very unlikely for two reasons. Firstly, mice do currently exist in areas of South Georgia without rats, and here they are neither very abundant nor are known to be damaging wildlife to any great extent. Secondly, our baiting regime is designed to offer a good chance of removing any mice that might live among the rats in any area.

Q: When will you know if the Project has been successful?

A: It may take a decade before we can be sure that no rats remain on South Georgia, but we expect to see some evidence of success in only one or two years. The resident pipit is likely to be the first bird to respond to the absence of rats - our equivalent of a canary in a coal mine. If pipit song is heard, and certainly if young pipits are seen, we can be sure that the rats have gone. We also have other means of checking for the presence of rats, and will be monitoring the baited areas each year.

Q: What are the chances of rodents re-invading the island after it has been cleared?

A: This is, of course, an issue of paramount importance. There is no point in going to the effort and expense of clearing South Georgia if rodents are allowed to subsequently re-invade. Rodents will only get back onto the island if humans take them there. The Government has already introduced measures to reduce the risk of this happening, and will continue to tighten and enforce them. Ultimately, keeping South Georgia free of invasive pests is dependent on the actions, care and vigilance of all its visitors. A single careless act could result in the whole island being lost to rats again, so the stakes are very high.

Q: Are rats and mice found all over South Georgia?

A: Rats occur throughout almost all of the hospitable, warmer areas of the island where wildlife is most abundant. Fortunately, they have hitherto been prevented from reaching a strip of land on the south coast due to protective glaciers. Mice are only confirmed as occurring in one area in the northwest, though reports of mouse sign elsewhere in the 2009/2010 season raise the possibility that they may have been recently accidentally introduced in new areas. Much of the inland part of the island is inhospitable to all life because it is covered in permanent ice.



Q: Why the urgency to carry out this work now?

A: South Georgia is many times larger than any area of land yet cleared of rodents, and the Project is only feasible because the island's rat population is divided into many independent units by rat-proof glaciers. But these glaciers are retreating rapidly as a consequence of global warming, and one-by-one they are going back to the point where they end on land rather than in the sea. When this happens, rats can run along the beach in front of the ice and invade areas to which they have previously been denied. Two glaciers have been lost in the past year, and others will soon follow. We cannot say exactly when the battle will be lost, but it cannot be many years from now. We therefore must act rapidly, or accept that rats will take over the whole of the island and be immune to removal attempts. We are ready to start now.





Q: What happens if you don't complete the Project?

A: Ultimately, the whole of South Georgia will be over-run by rats and mice unless every single animal is eradicated soon. Clearing some areas between glaciers, but not all, will bring temporary relief, but eventually the protective glaciers will retreat and rodents will reclaim those areas again, killing all small ground-nesting birds they find. Any areas of land where baiting is started but not finished will also soon be over-run by rats again, so we simply must complete in the same season anything we start. Our objective is clear - to remove every rodent from every piece of land on South Georgia, and leave it rodent free for generations to come.



Q: Who is doing this work?

A: The rodent eradication work is part of the South Georgia Habitat Restoration Project, financed and run by the South Georgia Heritage Trust (SGHT). The work is authorised by the Government of South Georgia and the South Sandwich Islands, which is contributing assistance in kind.



Q: How many people will be needed?

A: A team of 9 people for Phase 1, and then about 15 for Phase 2 (the remainder of South Georgia). Every person involved has specialist skills, and each is either very experienced in helicopter baiting operations or has many years of practical experience of South Georgia.

Q: How much does it cost?

A: The current estimate for removing rodents from all of South Georgia is £6m - £7m. Phase 1 of the Project (to clear the areas near Grytviken) is likely to cost about £1.6m.

Q: How can I help?

A: Plans are complete, team members have been chosen, and finance has been donated for Phase 1 of the Project. We now urgently require funding for Phase 2, allowing the remainder of South Georgia to be clear of killer rodent pests by the year 2014. A further £5m (\$7.5m U.S.) is needed to complete the work. You can directly help return millions of seabirds to South Georgia, and restore the island's native ecology, by joining the increasing number of donors who will make this all happen. Details are available on the South Georgia Heritage trust website (www.sght.org/projects.htm), or at the Museum in Grytviken.

Alternatively, donations will be gratefully accepted at the Museum in any currency, cheque or cash, and a receipt provided. The South Georgia Heritage Trust is a UK charity, so donations can be enhanced by the recovery of tax from UK tax-payers. US citizens can make tax deductible donations by downloading the form from the SGHT website at www.sght.org/usdonations.htm.