

Eradication of brown rats *Rattus norvegicus* and black rats *Rattus rattus* to restore breeding seabird populations on Lundy Island, Devon, England

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SUMMARY

Manx shearwater *Puffinus puffinus* and Atlantic puffin *Fratercula arctica* ceased breeding on Lundy Island due to nest predation by introduced rats. Following successful rat removal, both seabird species have resumed breeding on the island.

BACKGROUND

Burrow-nesting seabird populations on Lundy have declined dramatically with no Manx shearwater *Puffinus puffinus* chicks found since 1959 or Atlantic puffins *Fratercula arctica* breeding for 20 years. The United Kingdom is internationally important for the Manx shearwater since it holds more than 90% of the global breeding population. The major reason for this loss of seabirds is attributed the presence of introduced brown rats *Rattus norvegicus* and black rats *Rattus rattus*. The Seabird Recovery Project was established with the aim of eradicating rats from Lundy to enable recovery of breeding seabirds and to improve the overall conservation potential of the island as a whole.

ACTION

Location: Lundy (National Grid ref: SS 136458; 51°10' N, 4°40' W) is an island of 5.6 km long by 0.8 km wide lying in the Bristol Channel between England and Wales.

Seabird Recovery Project: The presence of introduced black and brown rats on Lundy was considered to have led to the loss of Manx shearwaters and Atlantic puffins as breeding species. Both rat species are known nest predators of these two burrow-nesting seabirds. In June 2001 a feasibility study showed that eradication of brown and black rats was likely to

be possible on Lundy and subsequently the Seabird Recovery Project Partnership was formed. The work was undertaken by Wildlife Management International Limited (WMIL), funded by the Seabird Recovery Project Partnership: The National Trust, The Landmark Trust, RSPB and English Nature. The rat eradication project took place between January 2003 and March 2006.

Phase 1 – initial eradication programme: The first phase took place between 4 January 2003 and 5 June 2003. Bait stations were placed out on a 50 m grid over the entire island. This took between three to four weeks, with 1,923 bait stations and 2,000 monitoring stations in 2002/3. The bait stations were designed to allow easy access for rats but not non-target species, such as rabbits *Oryctolagus cuniculus* and birds. They were made from corrugated plastic drainage pipes (75 cm long, 10 cm diameter). Replacement/removal of bait was undertaken via a small hole (with a lid) cut in the top of the pipe, and the bait wired in. The poison used was a cereal-based wax block with 0.005% active ingredient difenacoum ('Ratak™'). Live and kill (snap) traps were used in areas where rat signs were recorded but no bait was being taken. Each monitoring station had an attractive food item (e.g. a piece of soap, candle, or small wooden stick dipped in vegetable oil) on which rats like to chew. Presence of rats could be identified by characteristic teeth marks.

Phase 2 – second eradication programme: As some rats were still present after the first phase (see Consequences section) the programme was repeated from 9 December 2003 to 5 March 2004. During this period, 1,958 bait stations and 2,500 monitoring stations were used. Due to concerns about the durability of Ratak™ (used in Phase 1), alternative baits were used for the second programme. These were ‘Contract™’ (a 28 g cereal-based wax block with 0.005% active ingredient bromadiolone) and ‘Neosorex Pro™’ (a 24 g cereal-based block with 0.005% active ingredient difenacoum). ‘Contract™’ was used between 9 December to 4 January. On 5 January, this was replaced by ‘Neosorex Pro™’, which was used until the end of the 2003/04 programme.

Monitoring: During both phases every station was checked every two to three day when possible, but when staff availability was low, checks occurred only every four to five days. Whether any bait had been taken was recorded and rat corpses were collected and appropriately disposed of. When eradication was considered to have been achieved (March 2004), permanent bait stations were established in five locations and long term monitoring stations were set up at intervals between them and monitored at regular intervals for two years.

At the end of this two year monitoring period, a final intensive monitoring check took place between 3 January and 14 February 2006. Additional monitoring lines were established from 5 to 8 January and checks carried out by a team of up to five people from 19 January to 14 February 2006. Each station consisted alternately of an open wire monitoring station or a plastic tube secured to the ground, again containing a piece of soap, a section of candle and a chew stick soaked in cooking oil. Stations were also established within buildings (in the kitchens) on the island and these also contained chocolate as additional bait. Checks took place every two to three days.

CONSEQUENCES

Eradication results: At the end of the first baiting programme (June 2003) it was thought that at least 14 rats were still present on the island. This was thought to be due to domestic waste providing an easy food source for the rats. This was rectified and the second baiting phase

took place, at the end of which (March 2004) no rat sign was recorded at any monitoring station. Neither the long term monitoring stations nor the final check in 2006 revealed any signs of rats.

Response of seabirds to rat removal: After the rats were removed, both Manx shearwaters and Atlantic puffins returned to Lundy to breed after an absence of many years. It is hoped that their numbers will gradually increase in future years.

Number of people days: The total programme involved some 2,695 people days, with the eradication itself taking 2,378 people days (1,120 for the first and 1,258 for the second phase). Monitoring between eradications involved 107 people days. The two year monitoring phase was undertaken by the island’s warden and their assistant. The final check involved 210 people days.

Programme cost: The cost of the rat eradication programme on Lundy, including ‘in kind’ contributions, is outlined below.

Feasibility study = £3,000

Eradication programme = £64,136 (Phase 1 - £26,484; Phase 2 - £37,652)

Final check = £9,400

Total expenditure = £76,536 (equivalent to £180/ha)

In kind contributions:

Landmark Trust - Staff time for project set up, two year monitoring, accommodation and transport for volunteers and contractors to and from the island plus transport of equipment/food/bait.

RSPB - Staff time for project set up, budget management, volunteer recruitment, contract management and public relations.

National Trust and English Nature – Staff time for project set up, bait administration and public relations.

Conclusions: The eradication of black and brown rats on Lundy Island through the two phase eradication programme was successful - Lundy is now declared a rat free island. Quarantine and contingency recommendations

have been set up on the island to help prevent the re-establishment of rats. After the rats were removed, both Manx shearwaters and Atlantic

puffins returned to breed. It is hoped that other fauna and flora may also benefit.

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