Macquarie Island: from rabbits and rodents to recovery and renewal

A majestic landscape

Roughly half way between Tasmania and Antarctica lies World Heritage listed Macquarie Island. This subantarctic island is renowned for the spectacular beauty of its remote and windswept landscape. Its steep escarpments, lakes, and dramatic changes in vegetation provide an outstanding spectacle of wild, natural beauty, complemented by vast congregations of wildlife including penguins and seals.

At approximately 34 km long and 5.5 km wide at its broadest point, the island is the only place in the world where rocks from the earth’s mantle are actively exposed above sea level. It provides a unique opportunity to study geological features and processes of oceanic crust formation and plate boundary dynamics.

Macquarie Island’s inscription on the World Heritage List in 1997 was in recognition of its outstanding natural values including its unique and delicate flora and fauna and unique geology. The island is an outstanding illustration of the major stages of the earth’s evolutionary history—demonstrating significant on-going geological processes in the development of landforms. The island provides evidence of rock types found at great depths in the earth’s crust and of plate tectonics and continental drift, processes which have dominated the earth for millions of years. These rocks are the foundation for the landforms and soils of the island.

Macquarie Island’s birdlife is also extraordinary. The breeding populations of penguins (including the endemic royal penguin), albatrosses, petrels and prions are recognised as one of the greatest concentrations of seabirds in the world.

Macquarie Island on a misty day. (Photo: Richard Dakin)

Main image: Shield ferns. (Photo: Stephen Horn)

Royal penguins. (Photo: Greg Stone)
Rabbit and rodent invasion

European rabbits were introduced to Macquarie Island in the 1870s, while ship rats and house mice were first recorded on the island in the 1890s. Following the eradication of feral cats in 2000, rabbits and rodents became the dominant pest species on the island. A dramatic increase in their populations caused devastating damage to the island’s vulnerable vegetation, wildlife and geology.

Rabbits consumed the large, leafy megaherbs and grasses, which lacked the ability to adapt to grazing. Extensive damage was occurring to the tall tussock grassland, resulting in a loss of breeding habitat for nesting seabirds and the destabilisation of slopes. Rats preyed on seabird chicks and eggs, and were a threat to at least nine bird species breeding on Macquarie Island. The presence of rats and mice was also inhibiting plant regeneration.

Eradicating the invaders

The Macquarie Island Pest Eradication Project was developed to remove all three invasive species at the same time. In June 2007, the Australian and Tasmanian governments agreed to $24.6 million in joint funding to implement the Plan for the Eradication of Rabbits and Rodents on Macquarie Island. The plan was based on New Zealand’s experience in successfully eradicating rabbits and rodents from similar, but smaller, subantarctic islands.

This important project required several years of detailed planning, with management by the Tasmania Parks and Wildlife Service. The project was overseen by a steering committee which included representatives from the Tasmanian Government, Australian Government and the New Zealand Department of Conservation. Poison baits were dropped by helicopter in the winter of 2010.
The bait drop was carried out in winter for three main reasons: to reduce the impact on native wildlife, much of which leaves the island during the winter; to target rabbits and rodents when they were at their lowest numbers; and to increase the likelihood of bait uptake by the target species as there is less alternative food available. Around eight per cent of the bait was distributed before bad weather forced the postponement of the bait drop to the winter of 2011. Rabbit and rodent activity decreased markedly in baited areas.

However, the number of seabird deaths following the limited baiting was higher than anticipated, primarily due to poisoned rabbit carcasses being eaten by scavenging seabirds. A review of the programme found that no entire population of seabirds was expected to be lost as a result of the continuation of the project. It also found that if the eradication programme was not continued catastrophic damage to the ecosystem would continue and some seabird populations could become extinct on the island. The eradication programme was subsequently modified to lessen the impact on native wildlife. Calicivirus was introduced early in 2011 with the aim of reducing the rabbit population and the number of poisoned rabbit carcasses following baiting. More people were employed to search the island and remove poisoned carcasses before they could be consumed by scavenging seabirds.

Aerial baiting was completed in the winter of 2011 and was supplemented by a limited amount of hand baiting. Ground hunting teams of skilled hunters and specially trained detector dogs worked to eliminate surviving rabbits. The dogs were trained to locate rabbits but not to harm native animals. In addition, three specially trained rodent detector dogs were sent to the island in March 2013. Ground hunting teams have covered over 90 000 km on foot since August 2011 looking for signs of rabbits and rodents.
Programme success

In March 2014, the steering committee announced there had been no confirmed sightings of ship rats or house mice since July 2011 and no confirmed sightings of rabbits since December 2011. Monitoring of the island will continue to not only ensure this remains the case, but also to measure and document the remarkable re-birth of the Macquarie Island World Heritage Area.