

Rotoroa Island: A haven for endangered species

Andrew Maloy¹

Rotoroa Island, east of Waiheke Island in the Hauraki Gulf (Fig. 1), has been owned by the Salvation Army since 1908 when they purchased it to expand their then existing alcohol and drug rehabilitation facilities on nearby Pakatoa. For most of the following 100 years Rotoroa Island played a significant role in making a difference to the lives of those unfortunate souls who went there for treatment.



Fig. 1 The view from the highest point on Rotoroa Island south to Ponui Island (Chamberlins Island) and beyond to the Hunua Ranges and Firth of Thames. Photo: Rotoroa Island Trust.

Prior to 1908 most of the original native vegetation had been cleared from the 82-hectare island to provide grazing for sheep and cattle. The Salvation Army continued farming and added the infrastructure needed for their rehabilitation programmes. Photos taken around the 1950s show dormitories, hospital, kitchens, washhouses, staff houses, a chapel in a prominent central position on the hill, workshops, jailhouse and butcher's shop. There were also large vegetable gardens and orchards so, along with a plentiful local supply of fish and shellfish, the island population was largely self-sufficient for food. Rehabilitation involved working in the various aspects of life on the island so there was no shortage of physical activity for patients or staff. Yet, despite the difficulties of addiction and all the hard work, Rotoroa is described by many former residents as a sanctuary, a refuge from the temptations of city life.

The change started around 2005, by which time the Salvation Army had moved their rehabilitation services to the mainland and many of the buildings were in a poor state of repair. A group of like-minded people, in conjunction with the Salvation Army, came up with a plan leading to the establishment of the Rotoroa Island Trust in 2008, with the aim of creating a conservation park, a sanctuary where people can experience New Zealand's (NZ) wildlife, and also to show leadership in conservation management and education, at the same time respecting the island's heritage and history as a place of recovery and renewal. Funded entirely through private philanthropy, the Trust purchased a 99-year lease from the Salvation

Army and immediately set to work clearing away most of the derelict buildings and instigating major pest control and revegetation projects (Fig. 2A–B).



Fig. 2 A, photo taken in the mid-1900s, showing Salvation Army buildings in the central area of the island. Photo: Rotoroa Island Trust. **B**, a view of the same area in April 2019. Photo: Andrew Maloy.

The scale of what's been achieved on Rotoroa since 2008 is inspirational. Many of the old buildings contained asbestos which required specialist removers. Seven were kept and renovated; three are used for staff while the others now offer accommodation for up to 44 visitors, including the aptly named Superintendent's House which has been converted to suit backpackers.

More than 20,000 mature pines were felled and fed through what was then one of the largest chippers in the southern hemisphere to create mulch, used for some of the 400,000 native plants raised in nurseries on the mainland, barged over to the island and planted by contractors. Years later these now provide food and shelter for the increasing wildlife population and seeds to continue the regeneration cycle.

¹ 27 Tetley Road, Surfdale, Waiheke Island, Auckland 1081, New Zealand; ra.maloy@xtra.co.nz

A few of the most notable existing exotic trees have been left, as living memories of the island's history, including a mature stand of 11 Norfolk Island pines, *Araucaria heterophylla*, estimated to be well over 100 years old. The health of some of them is deteriorating and measures have been taken through fertilising and mulching to improve their condition. There are also 12 mature *Phoenix* palms, *P. canariensis*, which seed prolifically, and wilding palms often need to be dealt to among the native vegetation. To reduce this problem the seed heads are now cut off each year and seeds that do drop to the ground are collected by hand, as much as is practicably possible.

Following aerial bait drops and much trapping Rotoroa was declared predator free in 2015, but requires constant vigilance to keep it that way. Rats are the main problem, swimming from nearby islands, Waiheke, Ponui and Pakatoa, though a recent possible stoat sighting resulted in a major biosecurity response. Traps, tracking tunnels and bait stations throughout the island are checked and maintained regularly in the battle against these invaders and all visitors to the island are subject to a biosecurity check to minimise the chances of invasion of other unwanted pests, such as Argentine and Darwin ants.



Fig. 3 Adult takahē and chick. Photo: Andrew Maloy.



Fig. 4 Tieke (saddleback) have thrived on the island. Photo: James Gow.

Dogs are banned from Rotoroa because of the risk to kiwi, takahē and other birds, including shore-nesting dotterels and oyster catchers, yet not all boat owners respect these efforts to protect vulnerable species.

A five-year partnership with Auckland Zoo from 2013–18 enabled the release of several endangered species on to the island, including kiwi chicks hatched at the zoo as part of Operation Nest Egg. Released when just a few weeks old, they thrive there, free from competition with other animals in the safe, predator free environment. On reaching 1,000–1,200 grams in weight, they're taken off the island and released into other suitable sites where they'll breed the next generation of chicks. Kiwi chicks raised this way have a 60% greater chance of surviving into adulthood than those hatched in the wild among predators.

The island has transformed into a unique wildlife sanctuary where native plants and animals exist in a safe environment, for everyone to come and enjoy and be inspired. It is now a haven for kiwi, takahē (Fig. 3), tieke (saddleback; Fig. 4), pōpokotea (whitehead), pāteke (brown teal; Fig. 5), NZ dotterel (Fig. 6), weka, skinks and other endangered native species.

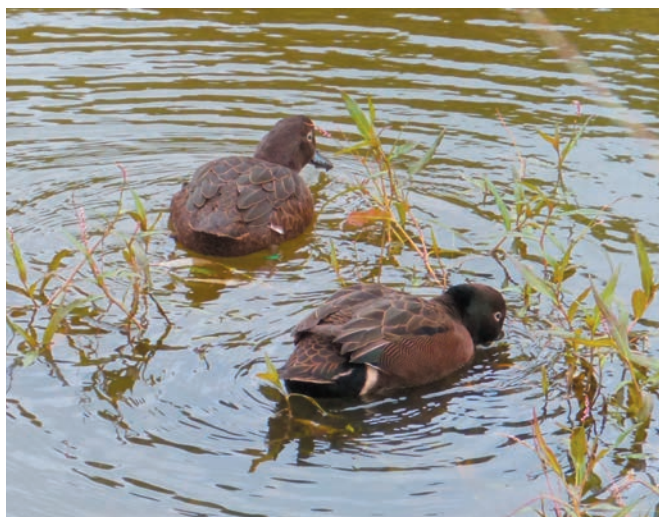


Fig. 5 Pāteke (brown teal) on Cable Bay Pond, Rotoroa Island. Photo: Andrew Maloy.



Fig. 6 Endangered NZ dotterels lay eggs in the sand just above the high tide mark. A wire cage with a small entrance hole placed over them provides protection from predation of eggs and chicks by larger birds, such as gulls and weka. Photo: Andrew Maloy.

The aim of the initial mass planting of native seedlings in 2–3 years from 2008 was to provide dense coverage as quickly as possible, to suppress competition from weeds and to allow for the inevitable losses due to drought and other adverse conditions. The range of species planted varied according to the site but mainly comprised those that could originally be found on Hauraki Gulf islands. They were largely selected on the basis of being hardy to the conditions, quick growing to cover bare ground, and early fruiting to attract native birds (Fig. 7A–B). Most were 1 litre pot size, 30–50 cm in height at planting.



Fig. 7 Restoration planting in the area known as Trevor's Pond. **A**, the bare slopes above Trevor's Pond, looking south, before planting commenced in 2008. Photo: Jo Ritchie. **B**, the same area in 2019, looking north. Trevor's Pond is now home to breeding pāteke and the bush abounds with birdlife. Photo: Andrew Maloy.

Around the coastlines and beaches, spinifex (*Spinifex sericeus*) (Fig. 8), pīngao (*Ficinia spiralis*), NZ ice plant (*Disphyma australe*), taupata (*Coprosma repens*), scrambling pōhuehue (*Muehlenbeckia complexa*), karo (*Pittosporum crassifolium*) (Fig. 9), harakeke (NZ flax, *Phormium tenax*), ngaio (*Myoporum laetum*), and pōhutukawa (*Metrosideros excelsa*) (Fig. 10) were widely used. Once established, spinifex proved exceptionally effective at stabilising sandy areas from tidal erosion, particularly at picturesque Ladies Bay, a popular swimming spot for visitors and boaties. Unfortunately, spinifex planted at nearby Mens Bay were just getting their roots down when a combination of high winds and a flood tide saw them all disappear out to sea overnight. Such are the challenges of working with the elements.



Fig. 8 Spinifex (*Spinifex sericeus*) proves effective at reducing erosion of the sandy shoreline at Ladies Bay. Photo: Andrew Maloy.



Fig. 9 Shiny, jet-black karo (*Pittosporum crassifolium*) seeds. Photo: Andrew Maloy.



Fig. 10 Pōhutukawa (*Metrosideros excelsa*), icon of the Hauraki Gulf islands and nearby Coromandel Peninsula. Photo: Andrew Maloy.

Further back from the shores some of the above species were also used with others added to the mix, including koromiko (*Veronica stricta*, formerly *Hebe stricta*; Fig. 11), tī kōuka (cabbage tree, *Cordyline australis*), mānuka (*Leptospermum scoparium*), kawakawa (*Piper excelsum*), karamū (*Coprosma lucida* and *C. robusta*; Fig. 12), several *Olearia* spp., sedges (*Carex* spp.), oioi (*Apodasmia similis*), toetoe (*Austroderia toetoe*, formerly *Cortaderia toetoe*), kōwhai (*Sophora* spp.; Fig. 13), karaka (*Corynocarpus laevigatus*), pūriri (*Vitex lucens*), nīkau (*Rhopalostylis sapida*), five-finger (*Pseudopanax* spp.), *Griselinia* spp., and others.



Fig. 11 Koromiko (*Veronica stricta*) in flower. Photo: Andrew Maloy.



Fig. 12 Birds love these juicy coprosma berries. Photo: Andrew Maloy.



Fig. 13 Planted in 2008 many of the kōwhai now provide a rich source of nutrition for nectar-feeding birds. Kererū (wood pigeon) also feed on their tender new leaves in spring. Photo: Andrew Maloy.

Providing a healthy environment for native flora and fauna is a priority on the island. Herbicide use is necessary but kept to a minimum and consists mainly of herbicide gel to control woody weeds and vines, some spraying of gravel paths, road edges and drains, and spot treatment with specific products for particular weed species.

In February 2020 Chris Ferkins, biodiversity advisor with Auckland Council, visited the island with friends from overseas, but also on a mission to check up on some plants he has a particular interest in, two species of *Epilobium*, *E. hirtigerum* and *E. cinereum*, both indigenous to New Zealand. On a previous visit in 2016 he had discovered some of these plants on the island.

Despite almost 50 years working in horticulture my knowledge of the genus *Epilobium* was limited, with fringed willow herb, *E. ciliatum*, being the species with which I was most familiar. Native to North and South America and East Asia, *E. ciliatum* is widespread throughout NZ and has become a common weed in many plant nurseries, in part because it has some natural resistance to glyphosate herbicide, and also because it sheds masses of wind-spread seeds on maturity. *E. ciliatum* is present on Rotoroa, possibly arriving as wind-borne seeds many years ago, but also likely to have been present among some of the plants raised in nurseries on the mainland and barged to the island for the revegetation planting.

There are some 52 species of *Epilobium* reported in NZ, 47 of which are native. Of the two indigenous species identified on Rotoroa Island, *E. hirtigerum*, hairy willow herb, was classified as Threatened – Nationally Critical in 2012. For those less familiar with herbaceous plants than our photogenic native birds, that's the same status as the kakapo, one step away from being extinct. Thus, in 2015 *E. hirtigerum* was nicknamed the 'Hobsonville kakapo' when a healthy population of it was discovered on a property in Hobsonville, west Auckland, and adopted by many in the local community as a special element in their landscape. In 2018 it was reclassified as At Risk – Recovering. In addition to being indigenous to NZ, *E. hirtigerum* is also native to Australia, Indonesia and South America. The other indigenous species on Rotoroa Island, *E. cinereum*, is not threatened (some botanists treat it as a subspecies of *E. billardierianum*).

The story of *E. hirtigerum*, hairy willow herb's change of classification from in danger of extinction to At Risk – Recovering is interesting. Chris Ferkins says the local recovery is due in part to the efforts of people who discovered new wild patches and also propagated and planted *E. hirtigerum* in their gardens. This creates satellite colonies which act as insurance should anything happen to the original colony. He says the aim is to get hairy willow herb to the point where it is no longer threatened and the 'value' of the species needs to be more than just due to it being threatened; that by engaging in 'saving' the species the relationship formed with the plant, and nature, helps build a sense of place and activities of care for nature in that place, which persist post threat.

On Rotoroa Island we now know there are at least three species of *Epilobium*, two indigenous, one of which is At Risk, and one a common exotic weed. Given these different statuses it is important for us to distinguish between the species and treat them accordingly.

Some points to consider for management of hairy willow herb, *E. hirtigerum*, on Rotoroa Island

Plant characteristics

The leaf is variable depending on time of year and stage of growth but is always large compared to other *Epilobium* species.

Adult plants are hairy in spring and summer with all parts except petals covered in greyish hairs.

Height ranges from 20–30 cm when juvenile, up to 1+ metre tall at maturity; compared with *E. cinereum* height of 20–30 cm at maturity.

Flowers are white and look like they never fully open (Fig. 14); compared with *E. cinereum* flowers that are usually pink and open fully (Fig. 15).

Life cycle stages

- Early/mid-winter, lush juvenile, often with reddish stems (Fig. 16).
- Spring, grey-leaved adult plant often with a lot of red (Fig. 17).
- Late summer, fruiting, seeding and senescence (Fig. 18).

Habitat

Grows best in good light, prefers little or no competition. It grows well in any soil, including clay. It needs good moisture, hence its presence in roadside drains on Rotoroa Island. It thrives in areas where the soil has been disturbed. Hairy willow herb plants Chris found in 2016 (Fig. 19) were no longer there in February 2020 as growth of nearby regeneration plantings had apparently shaded them out, but others had arisen elsewhere in more suitable spots. He suggests the current maintenance practice of using herbicide to control weeds on road edges helps create patches of bare soil, suitable habitats for hairy willow herb to populate, by preventing grass, clover and other weeds from dominating.

Population

Hairy willow herb on Rotoroa Island is present mostly as individual plants which are likely to have low resilience and little capacity to recover from adverse events. The ideal is to encourage development of clustered colonies to build resilience to the point where they can resist weed invasion and require little or no maintenance (Fig. 20).

Protection

Ensure maintenance staff and rangers are aware of the plants and their current location so management activities are adapted according to the site and management outcome needs. Collecting seed for sowing in suitable locations or in a nursery situation could be a useful way to increase plant numbers and establish dense new communities. Consider informative signs placed close to hairy willow herb populations.



Fig. 14 *Epilobium hirtigerum* has a white flower that does not appear to fully open. Photo: Andrew Maloy.



Fig. 15 *Epilobium cinereum* on Rotoroa Island, February 2020. Photo: Andrew Maloy.



Fig. 16 *Epilobium hirtigerum* juvenile growth with reddish stems. Photo: Chris Ferkins.



Fig. 17 *Epilobium hirtigerum* adult growth covered in grey hairs with some leaves turning reddish. Photo: Chris Ferkins.



Fig. 18 *Epilobium hirtigerum* seeding, Waiheke Island, February 2020. Photo: Andrew Maloy.



Fig. 19 *Epilobium hirtigerum* growing among revegetation plants on a Rotoroa Island roadside, 2016. Photo: Chris Ferkins.



Fig. 20 Juvenile growth of a dense and self-sustaining population of *Epilobium hirtigerum* in Henderson, Auckland, August 2015. This densely clustered population held off weed invasion for the period observed, over seven years. However, the disturbed sites *E. hirtigerum* often occupies mean it is vulnerable. This site was developed in 2019 and the population is now gone, which further highlights the important role local communities play in valuing special features of their local landscape, both urban (e.g., Hobsonville) and remote (e.g., Rotoroa Island). Photo: Chris Ferkins.

Acknowledgements

Thanks to Chris Ferkins for bringing the presence of *E. hirtigerum* on Rotoroa Island to the attention of the ranger staff and for his contribution to the text and photos, and to Murray Dawson for his editing comments.

This article adapts information from two previously published articles by A. Maloy: 'Rotoroa Island – it's about making a difference' (Kiwi Gardener magazine, issue 481, June 2019) and 'Hairy willow herb, *Epilobium hirtigerum*, once threatened with extinction, is recovering on Rotoroa Island' (TRILEPIDEA. Newsletter of the New Zealand Plant Conservation Network, October 2020).

Reference

Popay, I.; Champion, P.; James, T. (2010). An illustrated guide to common weeds of New Zealand. Third Edition. New Zealand Plant Protection Society.

Websites (accessed December 2020)

Auckland Botanic Gardens: www.aucklandbotanicgardens.co.nz/whats-on/news/the-hobsonville-kakapo/.

New Zealand Plant Conservation Network: *Epilobium cinereum*: www.nzpcn.org.nz/flora/species/epilobium-cinereum/.

New Zealand Plant Conservation Network: *Epilobium hirtigerum*: www.nzpcn.org.nz/flora/species/epilobium-hirtigerum/.

Rotoroa Island: www.rotoroa.org.nz/.

TRILEPIDEA. Newsletter of the New Zealand Plant Conservation Network, March 2016: www.nzpcn.org.nz/publications/documents/trilepidea-e-newsletter-no-148-march-2016/.

TRILEPIDEA. Newsletter of the New Zealand Plant Conservation Network, October 2020: www.nzpcn.org.nz/publications/documents/trilepidea-e-newsletter-for-october-2020/.