Monday 22 October

After cleaning up the lodge we drove to Urquharts Bay for a short walk along Smugglers Bay and around Busby Head. On the cliffs at the end of Smugglers Bay were *Scandia rosifolia, Stellaria decipiens, Arthropodium cirratum* and *Lobelia anceps.* A kaka was seen in a pohutukawa tree, and on the beach was found a large pink snaketail brittlestar (*Pectinura maculata*). On Busby Head there were many plants of *Thelymitra* aff. *longifolia*, with strongly perfumed flowers. At first we again saw the *Hebe ligustrifolia* with the dark stems, but soon the more common form with narrower leaves and yellow petioles and midribs was plentiful on the track sides. At the end of the walk by some old gun emplacements, *Calystegia tuguriorum* was common, with many large white flowers.

This ended a tiring, but interesting weekend in a fascinating part of Northland. We all agreed that when we next drive down the north side of the Brynderwyns and see the strange shapes of Bream Head and Mt Manaia in the distance, we will have a proprietary feeling towards them.

The following bird list was compiled by Stella and John Rowe and John Kendrick:

Shining cuckoo
Tui
Bellbird
Kaka
Fantail
Silvereye
Grey warbler
Eastern rosella
Tomtit
Morepork
NZ pigeon
Kingfisher
Pukeko
Californian quail
Pheasant
Peafowl
Swallow
Paradise shelduck
Chaffinch
Goldfinch
Thrush
Blackbird
Starling
Myna
Sparrow
Variable oystercatcher
Pied shag
Little shag
Black-backed gull
Red-billed gull
Gannet
Pipit

Acknowledgements

Thanks to the Manaia Baptist Camp for accommodation, to Lisa Forester and Wendy Holland for sharing their knowledge of the area, to Ray Pierce and Andrew and Ryan Townsend for their company.

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Rotoroa Island, inner Hauraki Gulf, trip report

Ewen K. Cameron (editor)

Introduction

Ewen Cameron

In continuation of the Auckland Botanical Society (ABS) visiting and recording the vegetation and floras of Hauraki Gulf Islands, on 4 Nov 2006, 43 people met at Pine Harbour marina, Beachlands, for the 8.30 am departure on the Salvation Army vessel, *Serenity Rotoroa* (a tidy double-hulled boat surveyed for 50 passengers), for a one-day field trip to Rotoroa Island in the inner Hauraki Gulf (Fig. 1). It was a beautiful clear day and the sea was calm.

Participants of the trip (Fig. 2): Rich Afford (Fig. 3), Chris & Noel Ashton, Tricia Aspin, Paul & Enid Asquith, Ross & Jessica Beever, Kerry Bodmin, Jonathan Boow, Ewen Cameron (leader), Stella Christoffersen, Colleen Crampton, Neil Davies, Peter de Lange, Gael Donaghy, Frances Duff, Raewyn Faloon, Jo Fillery, Alan Foubister, Kane Frost, Richard Gallen, Shelley Heiss-Dunlop, Wolfgang Heiss, Peter Hutton, Graeme Jane, Sandra Jones, Joan Kember, Helen Lindsay , Carol Lockett, Alistair MacArthur, Elaine Marshall, John Millett, Sharon Osman , Helen Preston Jones, Juliet Richmond, Josh Salter, Bec Stanley, Heather Stone, Shirley Tomlinson, Alison Wesley, Mike Wilcox, and Maureen Young. Trindi Walker (Fig. 3), Events & Booking Co-ordinator, of The Salvation Army welcomed us and gave us our induction to the island, her husband, Graeme Walker skippered the boat and was also the island Manager.

The landscape plantings at Pine Harbour marina included an ominous long row of mature bangalow palms (*Archontophoenix cunninghamiana*) – I hope they don't prove to be a seed source for the adjacent islands? Also concerning was the number of Norfolk Island hibiscus seedlings and saplings (*Lagunaria patersonia*) naturalising under planted adult trees by

the car park area. After leaving the marina we soon had a good view on the starboard side of Motukaraka (Flat Island), which ABS visited in September 1991 – several ABS articles about the island have been published (Cameron & Taylor 1990, Beever 1992, Cameron 1992, Russell et al. 2006). We reached the Waiheke Channel with Waiheke Island on our port side and Ponui Island on our starboard – southern Ponui Island had been our Society's previous island outing (see Cameron & de Lange 2006, Beever 2006a). Over the calm and sparkling sea Rotoroa Island was soon in sight with Pakatoa Island at its north end. Between Ponui and Rotoroa Islands the botanically interesting steep-sided unnamed islet ("Ruthe Islet") was visible – some of its natural history was disclosed by Cameron & Taylor (1992) and de Lange & McFadden (1995). After a 50-minute ride the boat berthed at the wharf on the western side of Rotoroa Island where we were welcomed by Trindi Walker of the Salvation Army, and made our way along the road to a large room in the settlement area.

Trindi gave us an OSH briefing and some of the island's history over the last century, then morning tea with some local baking and onto the Chapel for our final briefing and more island history. After a group photograph (Fig. 2) it was 11am and we then headed out to explore the island. Three of our group (Alan, Chris & Noel) headed off to circumnavigate the island, taking 2.5 hours to walk the 7 km, assisted by the 12.40 pm low tide. The rest of us headed east following a track to a dam. On the small adjacent headland on the north side of Ladies Bay there was a small historic cemetery, well maintained with 26 burials (patients and staff of the Salvation Army), the earliest in 1898 (Anon. 2006). From the cemetery our group split into two – one group heading north, the other south. After mainly following the coast everyone managed to meet up again at 4pm in the settlement area, a head count, and back on the boat, arriving back at Pine Harbour at 5.25 pm.

Brief history of Rotoroa and Pakatoa Islands (the last 100 years)

1907 – the Salvation Army (SA) purchased Pakatoa Island to provide a safe place for inebriates – in Dec 1907 it was up and running with 50 men and a doctor.
1908 (Sep) – SA purchased Rotoroa Island from the Ruthe family (it was commonly known at that time as Ruthe Island).
1911 (Jan) – the new accommodation for 100 men opened on Rotoroa (Fig. 4); and 50 women took the men's place on Pakatoa Island.
1912 – the first generator arrived along with water pumps.
1918 – SA purchased their first boat for the island; the inebriates were subjected to hard labour and the island was generally self sufficient – own milk, butter, bread, sheep, made own bricks, etc.
1942/43 – Porirua psychiatric hospital in Wellington was damaged by two earthquakes in 1942 and had to be demolished. The 800 patients were sent to institutions around New Zealand and in 1943 the Government leased Rotoroa for one year to function as a mental hospital; the women on Pakatoa were discharged or transferred to another facility, and the men were transferred to Pakatoa. On competition of the year the men moved back to Rotoroa and a decision was made not to reuse Pakatoa for women – it was used instead as an Aged Man's retreat until 1949.
1949 – SA sold Pakatoa Island.
1964 – Pakatoa Island was purchased by Sir Robert Kerridge who developed it into a holiday resort with self-contained chalets, a hotel with all amenities, heated swimming pool, boats for hire and miniature golf course. It has recently been sold to new owners who provide holiday and conference facilities.
1966 – changes in the Alcohol and Drug Addiction Act no longer saw the addiction as a criminal offence and the island became a rehabilitation centre for people with alcohol and drug addictions; the mains cable from Arran Bay (Waiheke Island) was installed.
1973 – the wooden accommodation block (Fig. 4) burnt down.
1977 – the new buildings were opened by Sir Robert Muldoon.
1982 –the island was no longer used to detox clients.
1985 – first female clients on Rotoroa Island.
1991 – outdoor pursuit course added.
2005 (Dec) – changes to the funding meant that the clients had to remain in their own community, so there was no longer funding available for clients to stay on the island.

Future – is under review, but the SA currently provides their island facility for church camps, spiritual retreats and family holiday accommodation. It is still owned and managed by the SA and alcohol and drugs are banned and no unauthorized visitors or boats are permitted to come ashore. Some type of subdivision on the island in the near future has been proposed.

General characteristics

Rotoroa Island is 2 km long (N to S), 1 km across at the widest point, and covers 90 ha (Taylor 1989) and has high points of 76 m at the north end and 58 m asl at the south end (Fig. 1). It is composed of Mesozoic Waipapa Terrane greywacke rocks with deeply developed clays and limonite boxwork weathering in some places; the east side is more exposed to the rough weather and is consequently more eroded (Bruce Hayward pers. comm.). Most of the island is of easy contours and has been farmed for over 100 years. At the time of our visit it was stocked with some 500 lambs, 300 ewes, six adult pigs, a donkey (Pokie), and fortunately for the remaining native vegetation no goats.

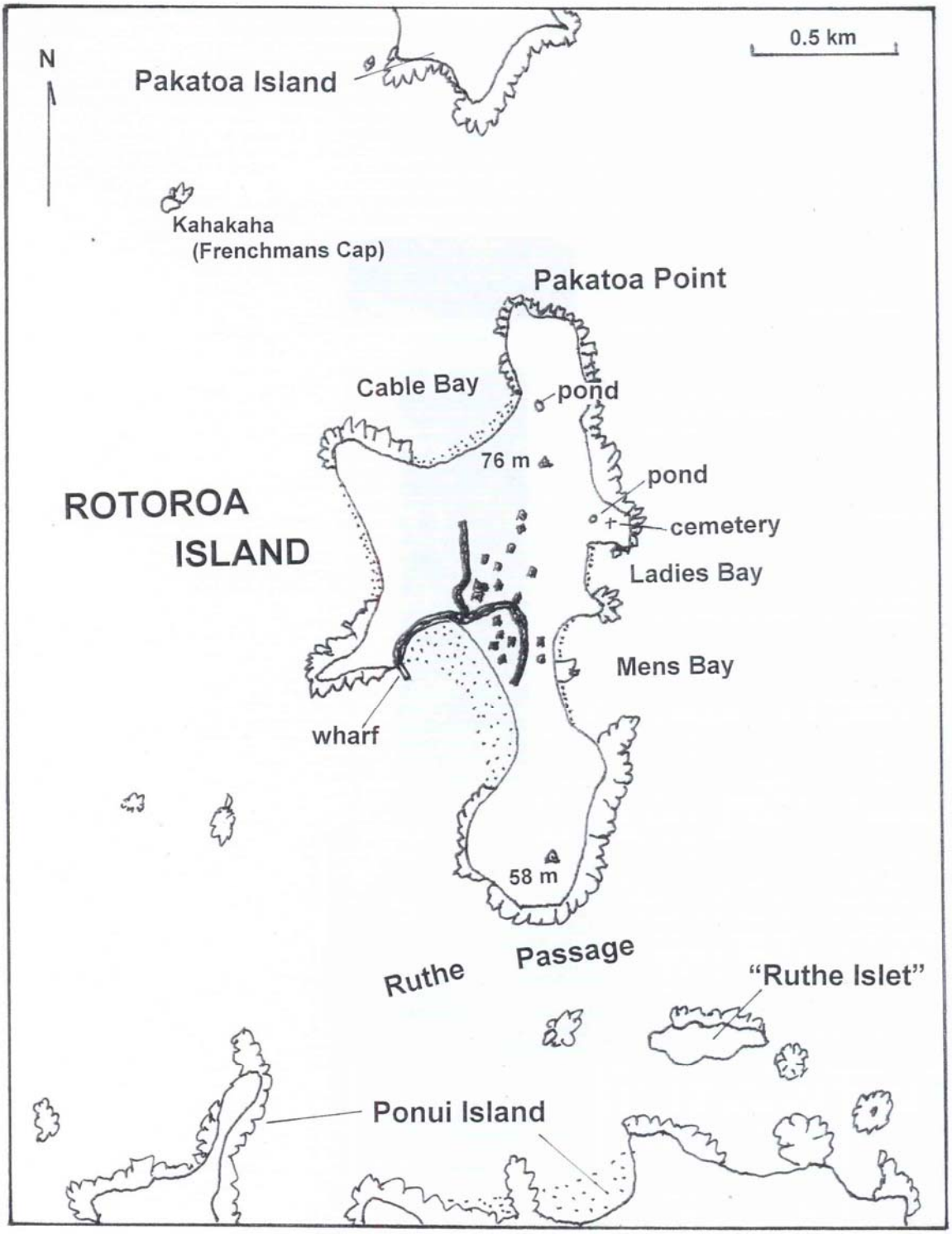

Fig. 1. Place names of Rotoroa Island, inner Hauraki Gulf.

Seven landscape photos taken in 1902 by Henry Winkelmann (held by the Auckland Museum, negs 2078-2084) show that the entire island was being farmed at that time, it was partly fenced, no original bush remained and only some of the steepest coastal slopes contained low scrub. A 1951 aerial photograph of the entire island (Fig. 5) shows a similar situation except some of the scrubby slopes had slightly better developed vegetation. Today some of those slopes contain even more advanced regeneration, although pines (*Pinus radiata*) (Fig. 6) and macrocarpa (*Cupressus macrocarpa*) now exist as a band on the moderate coastal slopes (planted c.30 years ago), and farm windbreaks are frequent (e.g., of *Acacia melanoxylon, Casuarina cunninghamiana,* x*Cupressocyparis leylandii*, *Eucalyptus* spp., *Salix* spp.), giving the island a bushy appearance. The pines were never pruned and evidently are not viable to log.

Fig. 4. The new accommodation block for 100 men (*Weekly News Supplement*, 24 Nov 1910, p.12) – it burnt down in 1973. Auckland Museum neg, no. C10841.

Vascular vegetation and flora

Ewen Cameron, Peter de Lange

The natural cliff vegetation

The current native vegetation is restricted to regenerating shrublands on the steeper parts of the coast, together with naturalised stands of two pines (radiata & macrocarpa), small areas of pohutukawa (*Metrosideros excelsa*) forest and scratchy coastal scrub usually dominated by manuka (*Leptospermum scoparium*), prickly mingimingi (*Leptecophylla juniperina*), akepiro (*Olearia furfuracea*), koromiko (*Hebe* spp.), mapou (*Myrsine australis*), karo (*Pittosporum crassifolium*) and scattered pohutukawa (Fig. 7). In places along the NE coast there was ample karo regeneration. Weeds like gorse (*Ulex europaeus*) and young plants of phoenix palm (*Phoenix canariensis*) were usually present. In many places the dry, crumbling greywacke cliffs offered poor habitat for native vegetation other than grasses, some native (e.g. *Dichelachne crinita, Lachnagrostis billardierei, L. littoralis, Rytidosperma unarede, Elymus multiflorus*), but the exotics were out competing them (e.g. *Aira caryophyllea, Briza minor, Dichelachne rara, Rytidosperma racemosum, Sporobolus africanus*). Two forms of *Thelymitra longifolia* were present here as well – the one with large white flowers, scented and all open at the same time (entomophilous form), and the other with smaller, unscented white flowers not opening all at once (autogamous form).

The southeastern part of the island also had steep coastal slopes but they were as dry and supported a greater abundance and diversity of coastal vegetation, with a good amount of rengarenga lily (*Arthropodium cirratum* and in some places *A. bifurcatum*), and such notable regionally uncommon specialties as *Scleranthus biflorus* (Fig. 8), *Paspalum orbiculare*, *Pomaderris rugosa, Linum monogynum* (Fig. 9) and in one place *Trisetum arduanum* and *Senecio scaberulus*.

Probably the best piece of native forest visited was the steep slope near the wharf (E-facing slope) (Fig. 10) on the western side of the island. The upper margin is

Fig. 5. Rotoroa Island, looking south, with Ponui Island behind and Orere Point in the background. Note – "Ruthe Islet" in the Ruthe Passage to the SE of Rotoroa Island. 3 Mar 1951. Whites Aviation Ltd.

an emergent canopy of pohutukawa, with a mapou thicket underneath; the canopy down the steep face is mahoe (*Melicytus ramiflorus*), towai (*Weinmannia silvicola*) and three species of tree ferns (*Cyathea dealbata, C. medullaris, Dicksonia squarrosa*). Shrubs that were present included: rangiora (*Brachyglottis repanda*), kawakawa (*Macropiper excelsum*), hangehange (*Genistoma ligustrifolium*), a kohekohe (*Dysoxylum spectabile*) sapling and the small native vine *Clematis cunninghamii* was locally common. Ground cover included: *Adiantum cunninghamii*, kiokio (*Blechnum novae-zelandiae*), *Oplismenus hirtellus, Polystichum neozelandicum* and a single clump of *Astelia trinervia*.

No streams or creeks exist on the island, and only one small wet seep on the coastal cliffs was seen – it was on a fault scarp at the southern end of the island, being the only place where the moisture-loving moss

Fig. 2. The ABS group, Settlement area, Rotoroa Island. Photo: camera of Ross Beever, 4 Nov 2007.

Fig. 3. Rich Afford, a foundation ABS member (he was a schoolboy when he joined as an inaugural member when the Society was formed in 1937), and our Salvation Army host, Trindi Walker and one of her children, settlement area, Rotoroa Island. Photo: EKC, 4 Nov 2006.

Fig. 6. Bare understorey of radiata pines planted c.30 years ago. Steep coastal slope just north of cemetery. Photo: EKC, 4 Nov 2006.

Fig. 7. Typical scrubby (plus pohutukawa), mainly native coastal cliff vegetation, NE coast midway between the cemetery and Pakatoa Point. Note – its low tide and lunchtime. Photo: EKC, 4 Nov 2006.

Fig. 8. Tight cushions of the regionally uncommon *Scleranthus biflorus*, coastal rocks, southeastern part of Rotoroa Island. Photo: Ross Beever, 4 Nov 2007.

Fig. 9. The white-flowering, regionally uncommon *Linum monogynum*, coastal rocks, southeastern part of Rotoroa Island. Photo: Ross Beever, 4 Nov 2007.

Fig. 10. Arriving at the only wharf, Rotoroa Island. Note – the good native bush behind, the pines and part of the settlement area on the right hand side. Photo: EKC, 4 Nov 2006.

Fig. 11. The pond near the cemetery. Note – mainly planted (1990s) kanuka, *Potamogeton cheesemanii* around the edge of the pond and paradise ducks with chicks on the pond. Photo: EKC, 4 Nov 2006.

Fig. 12. Phoenix palms naturalising along the roadsides near an avenue of adult palms, between the wharf and settlement. Smaller wildlings were frequent throughout the natural areas on the island. Photo: EKC, 4 Nov 2006.

Fissidens leptocladus was found. There were two man-made ponds, both fenced from stock: one on the eastern side of the island near the cemetery (c.30 x 15m) (Fig. 11); and the other in a paddock by Cable Bay (c.30m diameter) not visited by us – *Potamogeton cheesemanii* was abundant in the former and Fromont collected it and also noted raupo (*Typha orientalis*) from the latter.

The vascular flora

Nothing appears to have been previously published about the botany of Rotoroa Island. The first herbarium collections appear to be by Mairie Fromont (while a student at Auckland University) who visited the island on 2 Dec 1992 with John Craig and compiled a list of 167 vascular species (including 18 planted species) (Fromont 1996). Rhys Gardner visited the island on 30-31 Dec 2005 and his draft species list, combined with the earlier records, was used as the basis for the ABS field trip.

During our visit we recorded 377 native and naturalised wild species of vascular plants and five native hybrids. These records combined with 21 previous records (13 native, 8 naturalised) unseen by us bring the combined total vascular flora recorded for the island to 398 species, 44% being native species (Table 1). A full listing of the species is given separately by Cameron et al. (2007) and some of the woody cultivated species are recorded separately below. Although most of the records were from the steep coastal slopes, at least 20 species were limited to the modified settlement area, including one native species, *Epilobium nummularifolium*.

Threatened and uncommon vascular plants

Sixteen regionally threatened and uncommon vascular species (cf. Stanley et al. 2005) were recorded for Rotoroa Island:

"Regionally Critical" – *Hebe pubescens* subsp. *pubescens, Senecio scaberulus, Streblus banksii*;

"Regionally Endangered" – *Scleranthus biflorus*;

"Regionally Chronically Threatened/Serious Decline" – *Paspalum orbiculare*;
"Regionally Chronically Threatened/Gradual Decline" – *Elymus multiflorus, Geranium solanderi, Planchonella costata, Trisetum arduanum*;
"Regionally at Risk/Sparse" – *Einadia triandra, Linum monogynum, Olearia albida, Pomaderis rugosa, Psilotum nudum, Pteris comans*; and
"Data Deficient" – *Arthropodium bifurcatum*.

Plant grouping	Naturalised	Native	Totals
Ferns	2	26	28
Conifers	4	1	5
Dicotyledons	153	99	252
Monocotyledons	65	48	113
Totals	224	174	398

Table 1. The wild vascular flora of Rotorua Island in the different plant groupings and with naturalised and native status (the 5 native dicot hybrids are excluded).

Comment on three specific native vascular species

Arthropodium bifurcatum – was described from the Three Kings Islands, Poor Knights Islands, several other islands off Northland's east coast and several adjacent mainland sites as far south as the Mokohinau Islands and the Hen and Chicken Islands (Heenan et al. 2004). Therefore it was a surprising to find it on Rotoroa Island's SE cliffs associated with *A. cirratum* – a 100 km range extension into the inner Hauraki Gulf from the next nearest location which is Fanal Island in the outer Hauraki Gulf (CHR 569753). The small Rotoroa Island population definitely looked natural and its presence here perhaps reflects the exposed nature of eastern coast of this island – other Hauraki Gulf islands should be searched for this species.

Hebe pubescens **subsp.** ***pubescens*** – common along the southeastern coast of the island. The discovery of this dominantly Coromandel species this far west during the ABS trip by PdL and Graeme Jane has been documented by de Lange (2007). Plants were notable in that the leaf bud sinus, so prominent in this species was often greatly reduced, or at times absent. This seems to be a feature of some other *H. pubescens* subsp. *pubescens* populations along the Clevedon to Miranda Coastline, and also in some parts of the Coromandel Peninsula range of this subspecies.

Pomaderris rugosa – extends from its Coromandel stronghold out onto some of the Hauraki Gulf Islands (Karamuramu, Pakihi, Ponui, Ruthe, Rotoroa and Waiheke) and is locally common in the Kawakawa Bay area (Waitawa Regional Park to near Orere Point). The most western record is marginally the Waitawa Regional Park (AK 296555), followed closely by western Waiheke Island, and the most northern (excluding the Coromandel) is Waiheke Island (AK 280134) – this excludes records from Silverdale and Northland which Cameron (2005) considered to be human introductions.

Weeds [Dan – alone heading]

The wild vascular flora comprises 56% exotic species, many of which are harmless casuals, but a few are well-known aggressive environmental weeds and should be managed so that they do not spread further on the island, and especially to adjacent islands with more intact native vegetation, e.g. Tarahiki and Ruthe Islet. The most widespread and obvious naturalising species on Rotoroa were phoenix palm, radiata pine and macrocarpa. There is an avenue of planted mature phoenix palms between the wharf and the settlement area and many wildling palms were in this vicinity (Fig. 12). However, it was alarming to see young wild phoenix palms (mostly without trunks) present throughout the island in most scrubby/bushy coastal areas. Evidently wild phoenix palm is even more common on the adjacent Pakatoa Island where they are invading the bush from locally planted specimens (Andy Spence pers. comm., from observations on Pakatoa 4-5 years ago). The aggressive veldt grass (*Ehrharta erecta*) appeared to be localised to the main road to wharf, however, it was spreading and it has the potential to have a large impact on the open native vegetation of Rotoroa Island and adjacent islands. Gorse was locally common on the coastal cliffs and cotoneaster (*Cotoneaster glaucophyllus*) was locally present. Smilax was locally common on the northern NE coast, it wasn't seen elsewhere on the island except at the southeastern end (only a few tufts less than 10 cm tall), and it all had the rust (*Puccinia myrsiphyllii*). It was surprising to see *Carex divisa* growing along the cracks in the coastal greywacke around the high tide line locally at the northern tip and SE coast of the island. Its far more familiar habitat is at the back of estuaries, tidal creek margins, etc, where it is often sward-forming.

Revegetation

Mike Lee (1996) summarised the main revegetation period which he initiated: since 1991 two dam paddock areas, and an open area linking two bush areas at either side of Ladies Bay were retired from grazing; over the past five years c.5000 native trees mainly Rotoroa sourced pohutukawa supplied by Project Crimson and also other typical coastal species supplied by the Auckland City Council Waiheke nursery were planted mainly in the retired and fenced-off paddocks around two dams and at Ladies Bay; in

addition to pohutukawa, plantings of cabbage tree (*Cordyline australis*), wharangi (*Melicope ternata*), flax (*Phormium tenax*), karo, taupata (*Coprosma repens*), kanuka (*Kunzea* aff. *ericoides*) and *Olearia solandri* [we did not see this species but we did see the plantings of the superficially similar *O. lineata* 'Dartonii'] were made by Waiheke volunteers and island residents; *Cyperus ustulatus* was introduced in 1992 from Waiheke to provide cover around the southern dam for possible future brown teal releases; the plantings were estimated to have had a less than 40% success rate (because stock gained access to the areas).

Also Rotoroa Island clients used to be given a seed on arrival and they planted a seedling when they left the island. Between the southern pond and cemetery in 2006 we noticed plantings (1-4 m tall) of kanuka, taupata, puriri (*Vitex lucens*), *Olearia lineata* 'Dartonii', lacebark (*Hoheria populnea*), and elsewhere *Sophora* spp.; and in 1992 Mairie Fromont (1999) recorded *Pittosporum eugenioides* and *P. tenuifolium* as planted on the island.

Cultivated trees

Mike Wilcox

Various exotic trees and several native trees as well have been planted in the vicinity of the settlement or as shelter for stock on the coastal cliffs and farmland.

Acacia melanoxylon (farm shelterbelt)
Afrocarpus falcatus
Agathis australis
Araucaria heterophylla (large specimens in a row below the settlement)
Callistemon spp./cv.s
Casuarina cunninghamiana
Casuarina glauca
Cryptomeria japonica
Cupressus macrocarpa (extensive on cliffs)
X*Cupressocyparis leylandii* (shelterbelts)
Dacrydium cupressinum
Erythrina x*sykesii*
Eucalyptus botryoides (commonest eucalypt)
Eucalyptus cinerea
Eucalyptus globulus (a group of 6 trees, rather moribund)
Eucalyptus leucoxylon
Eucalyptus longifolia (a belt of large trees near one of the houses— not generally a common eucalypt in New Zealand).
Eucalyptus nicholii
Eucalyptus saligna
Fraxinus angustifolia subsp. *oxycarpa* 'Raywood'
Grevillea robusta
Lagunaria patersonia
Ligustrum lucidum
Liquidambar styraciflua (x1)
Magnolia grandiflora
Nerium oleander
Olearia lineata 'Dartonii' (*Olearia lineata* x*O. traversii*)
Olearia traversii
Phoenix canariensis (row of mature palms below the settlement)
Photinia serratifolia
Pinus pinaster (several intermixed with radiata pine)
Pinus radiata (the dominant trees on the coastal cliffs)
Populus x*euramericana* (syn. *P.* x*canadensis*) 'Flevo'
Quercus palustris (x2)
Quercus robur (x1 by cemetery)
Robinia pseudacacia
Salix matsudana 'Tortuosa'
Schinus molle
Syzygium smithii

Mosses

Jessica Beever

The main focus of the moss survey on Rotoroa was the family Pottiaceae, the so-called 'mosses of harsh environments' (Zander 1993). The time available was thus spent around the settlement, in the cemetery, on roadsides, in pasture, in former pasture now planted up with native trees and shrubs (at various stages of growth), and at the base of coastal cliffs. Some records were made of mosses in the forest remnants by two other members of the party, namely Ross Beever and Peter de Lange. A combined species list from the trip is given below.

Nine species of Pottiaceae were found on Rotoroa, including fruiting material of *Trichostomum* cf. *brachydontium*. The correct name for this quite common moss is still something of a puzzle. Sainsbury (1955) did not recognise it in his classic "Handbook of the New Zealand Mosses", but it is clear that he was aware of the taxon, including it within his description of *Weissia controversa.* Mature plants with capsules in good condition were found at the edge of the road to the wharf, where they grew on the vertical weathered greywacke cliff, partly shaded under overhanging coastal forest of pohutukawa with mahoe and red matipo.

An interesting substrate, at convenient height, was provided by midden material stabilised in a crib wall. Here the calciphile *Didymodon tophaceus* was found, along with two other members of the Pottiaceae: *Didymodon australasiae* and *Barbula unguiculata*. Another calcareous substrate, concrete in the small cemetery, bore the common 'wall moss', *Tortula muralis*.

No aggressive weedy mosses were seen on the island. A good look-out was kept for both *Fissidens taxifolius* and *Pseudoscleropodium purum*, invaders from the northern hemisphere, which are now well established on some other inner Hauraki Gulf Islands (Beever 1995, Wilcox *et al.* 2004, Beever 2006a), as well as in the Waitakere Ranges (Beever 2006b).

Species list: The following 31 species of moss were recorded. Moss names follow Beever *et al.* (1992), or, where names have been superseded, the name in that publication is given in brackets. Vouchers for each are lodged in the herbarium of the Auckland Museum (AK).

Barbula convoluta
Barbula unguiculata
?*Brachythecium* sp. AK 298758
Bryoerythrophyllum jamesonii
Bryum argenteum
Bryum campylothecium
Bryum erythrocarpoides
Bryum ?*sauteri* AK 298770
Ceratodon purpureus
Didymodon australasiae (*Trichostomiopsis australasiae*)
Didymodon tophaceus (*Desmatodon lingulatus*)
Eurhynchium praelongum (*Stokesiella praelonga*)
Fissidens bryoides
Fissidens curvatus var. *curvatus* (*Fissidens pungens*)
Fissidens leptocladus
Funaria hygrometrica
Hypnum cupressiforme
Leptostomum macrocarpon (*L. macrocarpum*)
Philonotis tenuis
Ptychomitrium australe
Ptychomnion aciculare
Racopilum robustum
Racopilum sp. AK 298782
Rhaphidorrhynchium amoenum (*Sematophyllum amoenum*)
Sematophyllum homomallum
Syntrichia papillosa (*Tortula papillosa*)
Thuidium furfurosum
Thuidium sparsum
Tortula muralis
Tortula truncata (*Pottia truncata*)
Trichostomum brachydontium

Lichens

Carol Lockett

There were five general lichen collection sites chosen because that was where I walked and had lunch in the time available.

The cemetery was the first area site. Samples collected from wooden and concrete fence posts included *Usnea* sp. and *Xanthoria ligulata*. The trees around the cemetery also produced a few good samples of *Ramalina celastri* and crustose species such as *Lecanora* and *Pertusaria*. The oak (*Quercus robur*) in the top corner of the cemetery had good specimens of *Pseudocyphellaria poculifera*.

Above the pond near the cemetery samples were collected from a stand of kanuka, on soil and from branches of kanuka. *Ramalina australiensis* was common but generally not a great variety of lichens were present in this area.

Along the ridge following the fence line samples collected from soil, twigs and trunk of the pines. *Parmotrema cetratum* and *P. reticulatum*, *Usnea* sp. and *Ramalina celastri* were common in this exposed area.

Ladies Bay was the chosen lunch site. A good variety of samples collected from rock on both sides of the bay and also from pohutukawa and other shrubs from the cliffs close to the beach. *Sticta squamata* and *Pseudocyphellaria crocata* found on bark and rock. Crustose *Porpidia* and *Pertusaria* species found on the rock were impressive. Common around the area was *Heterodermia speciosa*. An overhanging *Olearia furfuracea* on the north side of the bay was bright orange with a thick covering of *Trentepholia*.

The final area was between the settlement area and the wharf. The old *Schinus molle* had an abundance of *Collema kauaiense*. *Stereocaulon ramulosum* and *Cladia aggregata* could be found readily along the roadside and bank.

Mike Wilcox recorded the marine lichen *Lichina confinis* as frequent around the high tide mark.

Generally there were no surprises as to the lichen species found during this visit. They were all species that can be expected on coastal rock & vegetation both native and exotic.

Species List: All specimens have been accessioned to the Unitec Herbarium.

CHRYSOTRICHACEAE
Chrysothrix candelaris
CLADONIACEAE
Cladia aggregata
Cladonia ramulosa
COLLEMATACEAE
Collema kauaiense
Leptogium cyanescens
FUSCIDIACEAE
Fuscidea sp.
LECANORACEAE
Lecanora sp.
LICHINACEAE
Lichina confinis
LOBARIACEAE
Pseudocyphellaria crocata
Pseudocyphellaria poculifera
Sticta squamata
PANNARIACEAE
Degelia durietzii
Pannaria subimmixta
Pannaria sp.
Psoroma sp.
PARMELIACEAE
Flavoparmelia haysomii
Parmotrema cetratum
Parmotrema crinitum
Parmotrema reticulatum
Rimelia austrocetrata
Usnea rubicunda
Xanthoparmelia australasica
PERTUSARIACEAE
Pertusaria sp.
PHYSCIACEAE
Amandinea sp.
Dirinaria applanata
Heterodermia speciosa
PORPIDIACEAE
Porpidia sp.
RAMALINACEE
Ramalina australiensis
Ramalina celastri
ROCCELLACEAE
Dictyographa cinerea
Opegrapha sp.
STEREOCAULACEAE
Lepraria incana
Stereocaulon ramulosum
TELOSCHISTACEAE
Teloschistes chrysophthalmus
Xanthoria ligulata

Seaweeds

Mike Wilcox

Our visit was conveniently timed to coincide with a good low tide around 12.40 pm. The eastern shoreline of the island has attractive greywacke reefs and platforms with some interbedded softer sediments, and is only moderately exposed as there is shelter to the north from Pakatoa Island, to the south from Ponui Island, but with open water to the east across to Coromandel. I searched for but did not find the exotic *Colpomenia bullosa* (established on Rangitoto and Waiheke Islands). The seaweeds seen were as follows:

Upper shore
Apophlaea sinclairii, very sparse and uncommon, often associated with *Lichina confinis* (marine lichen)

Middle shore
Gelidium caulacantheum, abundant, greenish in colour, but a red alga
Hormosira banksii, abundant

Leathesia difformis, abundant on *Corallina*
Corallina officinalis, abundant turf
Pseudolithoderma australis (syn. *Ralfsia verrucosa*), a brown paint
Colpomenia peregrina, epiphytic on *Carpophyllum* and *Corallina*
Scytothamnus australis, frequent
Laurencia thyrsifera, a common red alga of the middle to lower shore

Lower shore
Carpophyllum flexuosum, frequent
Carpophyllum maschalocarpum, dominant fringing seaweed
Carpophyllum plumosum, common in pools
Champia laingii, a few plants of this iridescent red alga near the low water mark
Cladophora herpestica, short green tufts growing commonly on coralline paint beneath the cover of *Carpophyllum*
Codium convolutum, rare, but will become more prominent in summer
Codium fragile subsp. *tomentosoides* (an exotic species), on the western shore (facing Waiheke), attached to a pebble or shell
Cystophora torulosa, very common and conspicuous
Dictyota dichotoma, occasional in the sublittoral fringe
Ecklonia radiata, frequent, with *Carpophyllum maschalocarpum*
Glossophora kunthii, occasional in sublittoral
Sargassum sinclairii, drift only, from sub-littoral
Splachnidium rugosum, just a few, but generally more prominent in summer
Xiphophora chondrophylla, generally abundant

Birds

Paul Asquith

The birds seen during the ABS visit: blue penguin, Australasian gannet (flying close by), little shag (pied phase), white-faced heron, paradise shellduck (with chicks on dam pond), Australasian harrier, pheasant, weka (we were told they have been present on the island for 2-5 years – either an unofficial release or they walked/swam across from the adjacent Pakatoa Island during a very low tide?), pukeko (recent arrivals according to Trindi Walker), variable oystercatcher (several pairs), spur-winged plover, black-backed gull (1 nest on rock stack at south end of island), red-billed gull, white-fronted tern, eastern rosella, morepork, kingfisher (burrows in coastal cliffs on west and east side of island), welcome swallow, grey warbler, blackbird, song thrush, fantail, tui (many and very vocal), house sparrow, chaffinch, goldfinch, starling, myna, white-backed magpie, skylark, shining cuckoo, yellowhammer, and gannets flying close by. Old burrows, possibly abandoned petrel burrows were seen on the northeast side and south end of the island.

Animals other than birds

Ewen Cameron

Feral mammals
Possums and rabbits are absent. Norway rats are present – in 1991 there was an eradication attempt which was unsuccessful because of a lack of commitment re-baiting stations by island staff. There was a successful eradication in 1997 led by Mike Lee. However, the incursion rate was high (unknown whether from Waiheke or Ponui), and the stations were once again not properly maintained by island staff. Norway rats probably re-established around 1999 though kept at low density by continued erratic baiting. Mice appeared to invade Rotoroa in 2000, and were thought to have come in with pig food, though mice are almost impossible to detect when Norway rats are present and they may have been on the island for a long time (James Russell pers. comm.).

Frogs
During our visit Paul heard quite a 'frog chorus' in the short valley above the pond near the cemetery, presumably the southeast Australian golden bell or southern bell frogs (*Litoria aurea* or *L. raniformis*). Trindi mentioned that frogs used to be common on the island but that they are not anymore – could this be related to the introduction of weka?

Invertebrates
No exotic snails or slugs were seen but they must be there because many of the rengarenga lily specimens were snail/slug damaged.

Conclusions

Although most of the island is highly modified there is still a good native flora surviving on the eroding coastal slopes - this is reflected in the 16 regionally threatened and uncommon vascular species recorded for the island. Many environmental weed species are present and these need to be controlled to protect the surviving native biodiversity as many of the more interesting species are only locally present. Further plant surveys would add to this list because some parts of the island were not visited by us.

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