

Updated vascular flora of Wooded Island, off Tiritiri Matangi Island

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Fig. 1. Helen Lindsay and EKC returning to Tiritiri from Wooded Island (in distance). Photo: Shelley Heiss-Dunlop, 16 Jun 2010.

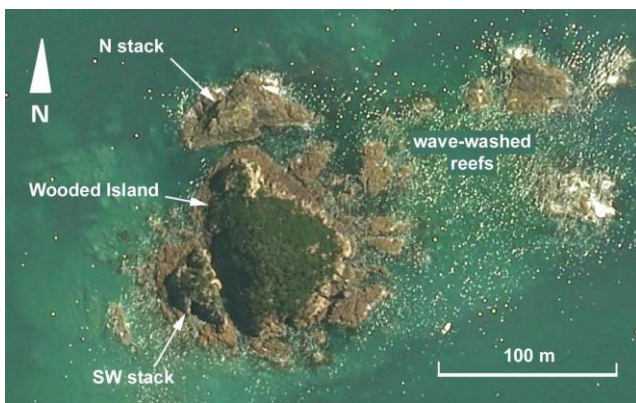


Fig. 2. Wooded Island at low tide. Image from: Auckland Council GIS Viewer; additions by J Salter.



Fig. 3. Looking SSE at low tide, between the main Wooded Island (left) and its SW stack (right) crowned by pohutukawa 2.5m tall. Photo: EKC, 7 Nov 2010.

Introduction

Wooded Island (0.95 ha) is an important seabird island dominated by taupata (*Coprosma repens*) scrub and lies 200 m off the northeastern coast of Tiritiri Matangi Island, in the inner Hauraki Gulf (Lat. 36° 35'S, Long. 174° 53'E) (Fig. 1). With its sharp rocky coast and no beaches the island is rarely visited by humans. It is comprised of the main island at 35 m asl, two adjacent stacks and associated wave-washed reefs (Fig. 2). It is dry between the SW stack (c.20 m asl) and the main island at low tide (Fig. 3), but a 4 m-wide channel is maintained between the N stack (c.8 m asl) and the main island (Fig. 4). The group is composed of eroded greywacke rocks (Jurassic-Triassic) with younger basal Waitemata conglomerate (Miocene) overlying it (Fig. 5). The first vascular flora of the island was by Taylor & Tennyson (1999) based on two visits to the island on 29 August 1987 and 1 February 1989; they recorded the vascular plant species, surveyed the seabirds, noted the landbirds and searched for reptiles. The vegetation has since been significantly altered by the removal of boxthorn (*Lycium ferocissimum*) in 2005 and northern diving petrel chick translocations from the island during 2007-09. This update is based on two visits by me to the main island and its SW stack on 16 October and 7 November, 2010.

Vegetation

Taylor & Tennyson (1999) recorded the vegetation of the main island as covered in a low forest of taupata (Figs. 6 & 7) and coastal mahoe (*Meliclytus novae-zelandiae*), with occasional emergent pohutukawa (*Metrosideros excelsa*) near the summit and a dense stand of boxthorn on the western and lower northern slopes. Because of the importance of seabirds on the island, Taylor & Tennyson (1999) recommended the urgent removal of boxthorn during the months when the seabirds are absent. The Department of Conservation (DoC) carried out this impressive eradication in late January-February 2005 (S. Heiss-Dunlop pers. comm.) (Figs. 8 & 9), and since then follow-up removal of boxthorn regrowth and seedlings has continued annually until 2010 and, it is now hoped to be, every two years (H. Lindsay pers. comm.). After the boxthorn eradication some planting of taupata, pohutukawa, coastal mahoe and possibly ngaio (*Myoporum laetum*) was carried out (Ian Price pers. comm.). The SW stack has open woody vegetation crowned by small pohutukawa (Fig. 3) and the N stack is mainly bare rock (Fig. 4) with salt-tolerant herbs and some prostrate taupata.

Flora updated

Taylor & Tennyson (1999) recorded 33 vascular species; this present survey of two visits records a total flora of 45 species (62% native) – a 27%

Table 1: Vascular flora of Wooded Island for the three separate islets recorded in 1987-89 (Taylor & Tennyson 1999) and 2010.

Note - although the N stack was not landed on in 2010, some plant records are included as sight records from the main island.

Key: * = naturalised; ** = planted; a = abundant; c = common; o = occasional; l = local; s = scarce (<5 plants seen)

	Main Island		SW stack		N stack		Comments on current populations (unless otherwise stated)
	1987-89	2010	1987-89	2010	1987-89	2010	
FERNS (2 + 0)							
<i>Asplenium haurakiense</i>	o	o-lc	o	o			Open steep rocky slopes and partial shade
<i>Pyrrhosia eleagnifolia</i>		s					Leather fern. Low epiphyte on taupata near summit and on shaded rock. AK 318481
DICOTYLEDONS (21 + 11)							
<i>Coprosma repens</i>	a	a	a	a	c	c	Taupata. Main woody vegetation 1.5-3(-4)m tall; prostrate at lower fringe
<i>Cotula australis</i>	o	o	o	lc			Soldier's button. Open sites; dried up in November
<i>Crassula decumbens</i> *		lc					On open rocky ledges where there is no soil, often with <i>C. sieberiana</i> . AK 318470
<i>Crassula sieberiana</i>	o	lc	o	o			On rock in the open. AK 318467, 318477
<i>Dichondra repens</i>			c	lc			Mercury Bay weed. Partial shade
<i>Disphyma australe</i>	a	la	a	a	c	c	NZ ice-plant. Mats in open sites, mainly low down
<i>Einadia triandra</i>			o				Not recorded in 2010
<i>Einadia trigonos</i>	a	la	o	o	o		Mats in open sites
<i>Lepidium didymium</i> *		l		l			Twin cress. Amongst grass in open
<i>Lycium ferocissimum</i> *	a	s	c	s			Boxthorn. Major eradication in 2005; regularly managed regrowth and new plants since that time; only 1 adult and 1 seedling in Feb 2013 (H Lindsay pers. comm.)
<i>Malva parviflora</i> *	[s]	lc		s			Small-flowered mallow. In canopy gaps; mistakenly recorded as <i>Pelargonium inodorum</i> in 1999? AK 314032, 317881, 318445-47
<i>Melicytus novae-zelandiae</i>	c	c	o	o	o		Coastal mahoe. More frequent near summit, same height as taupata
<i>Metrosideros excelsa</i>	o	o	o	o			Pohutukawa. To 6m tall, tallest ones on the island flanks.
<i>Muehlenbeckia complexa</i>	o	l	c	c			Pohuehue. Low tangles in open
<i>Myoporum insulare</i> × <i>M. laetum</i> **		s					Australian ngaio hybrid. Four plants, round-headed 1-2m tall, suspected to be planted after the boxthorn eradication. AK 313713, 318479
<i>Parietaria debilis</i>		l					In canopy gap with nightshades and inkweed. AK 318474
<i>Peperomia urvilleana</i>		s					Terrestrial on shaded northern slope

<i>Phytolacca octandra</i> *	s	o					Inkweed. In canopy gaps
<i>Pittosporum crassifolium</i>	s	o	o	lc	s		Karo. Mainly as exposed shrubs on SW stack
<i>Polycarpon tetraphyllum</i> *		o	o				Allseed. Open sites
<i>Sarcocornia quinqueflora</i>	c	lc	c	c	a	a	Glasswort. Clumps in open near splash zone
<i>Senecio hispidulus</i>		s					Fireweed. Canopy gap
<i>Senecio lautus</i>	c	c	c	c	c	lc	Shore groundsel. Open sites, including canopy gaps
<i>Sicyos mawhai</i>							Mawhai. Historical record, 1906-1909. AK 9198
<i>Solanum nigrum</i> *	c	c		o			Black nightshade. Canopy gaps and understorey. AK 237516
<i>Solanum nodiflorum</i>	c	c	s	o			Small-flowered nightshade. Canopy gaps and understorey
<i>Sonchus oleraceus</i> *	s	s	o	lc			Sow thistle. Open sites
<i>Spergularia tasmanica</i>	o	lc			o	lc	Native sea spurrey. Open rocky sites
<i>Stellaria media</i> *	s						Chickweed. Not recorded in 2010
<i>Tetragonia implexicoma</i>		l	o	o	s		Native spinach. Mats in partial shade
<i>Verbena bonariensis</i> *			s				Purple-top. Not recorded in 2010
<i>Wahlenbergia vernicosa</i>	s						NZ harebell. Not recorded in 2010

MONOCOTYEDONS (5 + 6)

<i>Astelia banksii</i>				l			Coastal astelia. At least 7 small tussocks in open at SW end of SW stack
<i>Arthropodium cirratum</i>	s		c	c			On steep rocky face (NE-facing) of SW stack
<i>Bromus diandrus</i> *		lc		lc			Ripgut brome. In open with other grasses. AK 317493
<i>Bromus hordeaceus</i> *				l			Soft brome. In open with other grasses. AK 318484
<i>Bromus willdenowii</i> *	o	l	o	lc	s		Prairie grass. In open and canopy gaps. AK 318850
<i>Ficinia nodosa</i>	s	l					Knobby sedge. Open sites
<i>Holcus lanatus</i> *	s						Not recorded in 2010
<i>Lachnagrostis littoralis</i>	s	lc		lc			Coast wind grass. Open rocky ledges below the taupata canopy. AK 318463
<i>Poa annua</i> *	o	l	s				Annual poa. Open sites
<i>Rytidosperma biannulare</i>			s	l	s		Danthonia. In open with other grasses. AK 318482
<i>Vulpia bromoides</i> *		lc		lc			Open rocky ledges. AK 318465



Fig. 4. Wooded Island viewed from the west: N stack to left; SW stack in front of main island on right. Photo from boat: EKC, 7 Nov 2010.



Fig. 5. Basal Waitemata conglomerate exposed on the upper face of the SW stack, and foliose lichens. Photo looking west: EKC, 13 Jun 2010.



Fig. 6. Taupata canopy 1.5-2.5m tall on NE face of main island. Photo: EKC, 7 Nov 2010.

increase (Table 1): eleven recent additions (5 native, 6 exotic), one historical addition (*Sicyos mawhai*) and one correction – the previous *Pelargonium inodorum* record I now believe to be a mis-identification of juvenile *Malva parviflora* (annual small-flowered mallow). All the additions are species widespread on Hauraki Gulf islands (pers. obs.) except for the hybrid ngaio (*Myoporum insulare* × *M. laetum*) which I believe was planted in error for *M. laetum* after the boxthorn removal. Five previously recorded “scarce” species (3 exotic, 2 native) were not seen during the present survey: *Einadia triandra*, *Holcus lanatus*, *Stellaria media*, *Verbena bonariensis* and *Wahlenbergia vernicosa*. They are possibly still present, although the *V. bonariensis*, being more obvious, has possibly been weeded by the follow-up boxthorn weeders. The ecological niche of the *Malva parviflora* was novel to me: in June the species was present as carpets of seedlings and dead erect stems (reminiscent of juvenile *Pelargonium inodorum*); by November it was locally common, flowering and fruiting to 1.6 m high, colonising the canopy gaps (Figs. 10 & 11) among 1-2 m tall taupata.

The historical addition of mawhai (*Sicyos mawhai*) is based on a collection by Anders Hansen in 1906-09 (Fig. 12), Cheeseman's Tiritiri list (1908) and a letter by Hansen to Cheeseman (held in the Auckland

Museum library) saying that the vines on Goat Rock attain great length, nearly 30 feet [9.1m]. The loss of mawhai from much of its previous distribution (Cameron 1992) is possibly attributable to its susceptibility to cucumber mosaic virus (Delmiglio & Pearson 2006). Apart from the historical mawhai



Fig. 7. Taupata c.3m tall, part of the summit canopy of main island, with low local epiphyte of *Pyrrosia eleagnifolia*. Photo: EKC, 7 Nov 2010.



Fig. 8. Just after the boxthorn removal on Wooded Island, looking SW. Note the severed boxthorn plants in foreground. Photo: Shelley Heiss-Dunlop, Feb 2005.



Fig. 9. After nearly six years taupata is rapidly filling in the gaps (cf. Fig. 8). Note the rich guano ooze (white) around the base of the island. Photo from boat: EKC, 7 Nov 2010.



Fig. 10. *Malva parviflora* reaching 1.6m tall in the taupata canopy gaps seems well-suited to the high avian nutrients. Photo: EKC, 7 Nov 2010.

record, all the species recorded on Wooded Island have also been recorded on the adjacent Tiritiri Matangi Island (cf. Cameron & Davies, *in press*).

As is typical on these small, dry Hauraki Gulf islands, bryophytes were scarce. There was a single bryophyte mat observed on the south-facing slope of the SW stack containing the ubiquitous islet leafy liverwort, *Chiloscyphus semiteres* (AK 313744), and a moss, *Bryum billardierei* var. *platyloma* (AK 313745). In contrast there was a good lichen flora, especially on the exposed rocks (Fig. 5), but they were not collected.

Birds

The main island was heavily burrowed presumably by northern diving petrels (1000-10,000 pairs), with fluttering shearwaters (up to 200 pairs) and occasional blue penguins – as recorded by Taylor & Tennyson (1999). Birds seen during the two 2010 surveys: pied shag (few on outer reef in Nov), pukeko (single bird on northern lower fringe of bush in Nov – a possible predator of diving petrels?), variable oystercatcher (a pair on N stack in Nov – aggressive behaviour, presumed nesting), black-backed gull (nest, 2 eggs, SW stack in Nov), red-billed gull (a few birds, both trips), red-crowned parakeet (present in bush, both trips), welcome swallow (flying overhead in Nov), tui (many in Nov), house sparrow (few in Jun), goldfinch (few in Jun), starling (present both trips), and myna (a group of at least 8 on NW stack in Nov). Pied shag, pukeko, oystercatcher, goldfinch and myna were additions to the birds recorded by Taylor & Tennyson (1999).



Fig. 11. Small-flowered mallow fruiting. Photo: EKC, 7 Nov 2010.

There was no evidence of the white-fronted terns breeding as previously reported.

Three translocations of northern diving petrels from Wooded Island to Motuora Island (visited by Auckland Bot Soc in 2010, see Cameron et al. 2011) took place during 2007-09 with the aim to establish a self-sustaining diving petrel population on Motuora (Gardner-Gee & Gummer 2009). A total of 190 chicks were transferred and 178 of these chicks have fledged from Motuora (24 in 2007, 62 in 2008, and 92 in 2009) (Gardner-Gee & Gummer 2009). So far 1-2 breeding pairs have been located near the release site on Motuora (G.A. Taylor pers. comm.).

Conclusions

Despite over twenty-one years between the two botanical surveys and major human impacts on the island by the removal of boxthorn and the translocation of diving petrel chicks, no major new weed species appear to have established and the island is quickly healing over the open sites. Planting was not required in such a fertile site with an abundant local seed source.

Removal of the planted hybrid ngaio from Wooded Island, and the adjacent Tiritiri Matangi Island, while it's still possible to contain, is recommended. Continued 2-yearly monitoring for aggressive weed species is also recommended.

Acknowledgements

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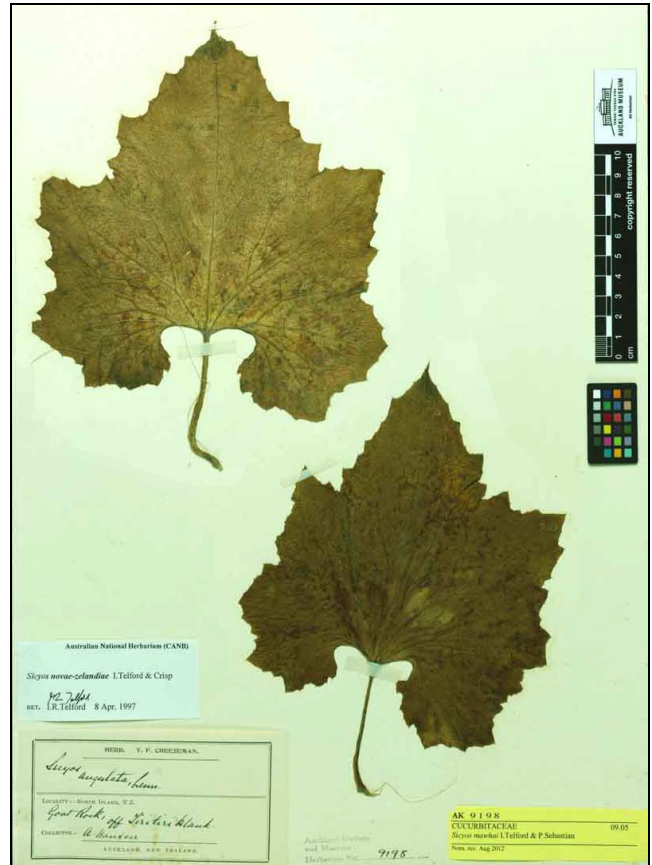


Fig. 12a. Mawhai (*Sicyos angulata*, now *S. mawhai*), herbarium sheet AK 9198, collected from Goat Rock [Wooded Island] by Tiritiri Matangi lighthouse keeper Anders Hansen, 1906-09, and sent to TF Cheeseman.



Fig. 12b. Details of Cheeseman's herbarium label (on AK 9198) (label in Cheeseman's hand).