Vascular flora and vertebrate fauna of Saddle Island, Grey Group Islands, western Great Barrier Island

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Introduction

Saddle Island is part of the Grey Group Islands, which lie on the mid-western side of Great Barrier Island, just west of Motu Kaikoura, and 1.1 km off the closest part of Great Barrier itself (Fig. 1). Saddle Island comprises two islets joined by a low rocky platform. The northern islet is 2.5 times larger than the southern one (2.15 ha vs. 0.85 ha, Taylor 1989) although they are both around the same height of c.35 m asl. Both islets are flat-topped, and mainly with sea cliffs, except where the island slopes down to the connecting platform which would be wave-washed during stormy weather (Figs. 2 & 3). The islets are part of the eroded remains of a Miocene andesitic strato volcano (Bruce Hayward pers. comm.).

This article is mainly based on observations made during a short landing on 7 Jan 1989 by EKC, GAT, SPC and Mark Bellingham while returning from the Offshore Islands Research Group OIRG camp at Miners Head, northwestern Great Barrier Island. GAT visited the island again on 14-15 Apr 1990, to assess the breeding seabirds and spread rat poison on the island. Plant specimens collected by Peter and Mark Bellingham (including a few species not observed by us), and vertebrate fauna observations recorded by John McCallum (1985) during OIRG trip to the Broken (Pig) Islands from 28 Dec 1984 to 5 Jan 1985, are also included.

Although mosses were collected from some of the Grey Group Islands during the OIRG trip Dec 1984 – Jan 1985 (Beever et al. 1986), none appear to have been collected from Saddle Island.

Vegetation

The southern islet of Saddle Island was crowned with a small patch of pohutukawa(*Metrosideros excelsa*) ≤8 m tall – the tallest vegetation on the island. Shrubs of poroporo (*Solanum aviculare*) were present under the pohutukawa. Otherwise the southern islet's easier slopes were clothed with patches of taupata (*Coprosma repens*) and coastal mahoe (*Melicytus novae-zelandiae*) shrubland 2–4 m tall, intermingled with open grassy areas and bare rocky cliffs.

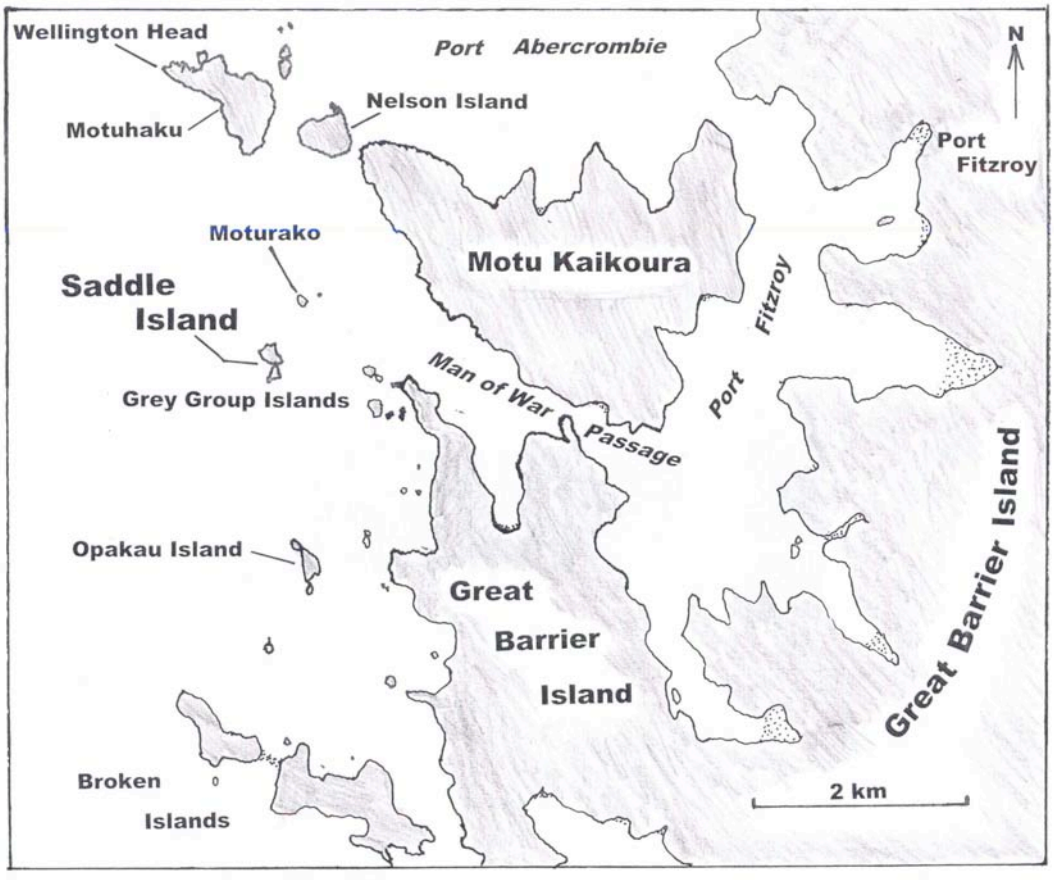


Fig. 1. Location and place names of Saddle Island and adjacent land, western Great Barrier Island (drawn by EKC).

The northern islet summit had scattered trees of karo (*Pittosporum crassifolium*) ≤6 m tall, mixed with lower stature coastal mahoe, and locally mapou (*Myrsine australis*) and houpara (*Pseudopanax lessonii*). Wind-shorn taupata and coastal mahoe dominated the southern slopes. The single milk-tree (*Streblus banksii*) was nearly prostrate on the steep southwest slope. The open cliff-tops and coastal ledges of the islets locally supported native herbs, including shore groundsel (*Senecio lautus*), *Einadia trigonos*, ice-plant (*Disphyma australe*), sea-spurry (*Spergularia tasmanica*), *Dichondra repens*, glasswort (*Sarcocornia quinqueflora*), as well as a mix of native and exotic grasses. The open nature of the vegetation (i.e. mainly a broken canopy with emergent individuals), and the lack of any mature trees, suggest that the island was recovering from fire, perhaps occurring around 1900.

Vascular flora

The combined vascular flora recorded from the two trips totalled 70 species, 73% being native (Table 1). An annotated species list is included (Appendix 1). Several northern New Zealand "island species" were present, i.e. species that today are much more common on islands than the mainland, possibly because they are susceptible to rodents eating plant parts (especially seeds), or requiring the high nutrient inputs today only present on seabird islands (see Cameron 2006). These species include: coastal mahoe, milk-tree, *Parietaria debilis, Einadia trigonos*, taupata, poroporo, karo, and *Asplenium haurakiense*. All the naturalised species were herbaceous and only inkweed (*Phytolacca octandra*) would be considered an environmental weed.

Fauna

Birds & reptiles

Fluttering shearwater and diving petrel eggs were collected by Buddle on Saddle Island in Sep 1904 and a fluttering shearwater egg in Dec 1936 (collections in the Auckland Museum). Fluttering shearwaters, diving petrels and grey-faced petrels were recorded breeding there in the 1930s and as recently as 1960 (Falla 1934, Bell & Braithwaite 1964). Also Falla (1934) recorded that Sladden (in lit.) found well grown fairy prion chicks at the end of January (year unstated) on Saddle Island, and Fleming (1934) found fairy prion feathers there in Jan 1934. There was no sign of fairy prions on 8 Dec 1960 (Bell & Braithwaite 1964). In northern New Zealand, fairy prions are only known to breed on the Poor Knights Islands so the fairy prion record from Saddle Island is an anomaly for small northern offshore islands. Fluttering shearwater chicks would be present in burrows in late January, so possibly the fairy prion report is a case of mistaken identity or some confusion happened with the records. Brian Bell (pers. comm. to GAT, 2009) recalled that fluttering shearwaters were very common on the island in 1960. He also stated that the presence of a dense colony of burrowing petrels was unusual for islands offshore from Great Barrier Island at that time. A number of grey-faced petrel burrows were also present on Saddle Island in 1960.

Fig. 2. Oblique aerial view of Saddle Island, looking northwest. Photo: Jo Richie, 30 Jan 2007.

McCallum (1985) recorded a few empty seabird burrows in Jan 1985 but no breeding seabirds or reptiles were located. On 14-15 Apr 1990 GAT caught and banded three adult fluttering shearwaters including one occupying a burrow but very few small burrows remained on the island. At night several fluttering shearwaters were also heard calling in flight over the island. GAT and his colleagues also caught and banded 35 grey-faced petrels during visits by day and night to Saddle Island. In 1990 there were estimated 30-50 grey-faced petrel burrows on the southern islet and a similar number on the northern islet. Miscellaneous bird records for the island include: a flock of >20 starlings feeding on flowering pohutukawa on 8 Dec 1960 (Bell & Braithwaite 1964) a dead song thrush and evidence of a harrier (Fleming 1934, *in*: Bell & Braithwaite 1964).

Ship rats

McCallum (1985) documented trapping ship rats on the island during the OIRG Dec 1984 – Jan 1985 trip. In Jan 1989 the presence of cache of chewed karo fruit and chewed taupata bark indicated the presence of rats. GAT and his colleagues hand broadcast 10 kg of Storm baits (flocoumafen) on both parts of the island on 14 Apr 1990 to kill ship rats with unknown results. In Jan 2000 Will Scarlet trapped 3 ship rats on the island for a genetic study (Will Scarlet & Rachel Fewster, pers. comm.). As part of a wider scale animal pest eradication initiative two aerial bait drops of brodifacoum (*Pestoff 20R*) were carried on 28 Aug 2008 and 13 Sept 2008, both at 7 kg/ha for all the Grey Group Islands (Jo Richie pers. comm.).

Conclusions

Saddle Island in the 1980s was mainly dominated by patchy, wind-shorn native shrubland on the easier slopes and contained many special northern "island" plant species. From recent aerial photographs (see

Fig. 2) there has been no recent fires on the island, and Harry Walker (pers. comm. to Will Scarlet, 2009) said "the old people never talked about it [Saddle] being burnt off". The island is still recovering from earlier modification (probably fire?) although

Fig. 3. Saddle Island from Motu Kaikoura, looking west-southwest. Photo: EKC, 17 Dec 2006.

regeneration has been in the presence of ship rats for the last 23-?50 years. Saddle Island has the potential to easily return to a more natural state, i.e. with a continuous woody canopy on the easier slopes. There is still a good native seed source on the island, on the adjacent peninsula of Great Barrier Island, and on several adjacent islands. For example, there are 259 native vascular plant species recorded on Motu Kaikoura (Cameron 2007) 1.5 km distant, and 89 species on Nelsen Island recorded by Peter and Mark Bellingham in 1985 (see Cameron 1995), only 1.8 km away.

As pointed out by McCallum (1985), from an island with three to four breeding species of petrel and shearwaters in the 1930s, and three in 1960, there appeared to be none breeding by Jan 1985 and it is thus presumed that ship rats invaded during this period. However, GAT's observation of three fluttering shearwaters ashore in 1990 was either a remnant group from the days in the 1960s when the island had a breeding colony of fluttering shearwaters (Bell & Brathwaite 1964) or this species is still prospecting on the island, possibly as an overflow from the large colony on the stack SW of Opakau Island (2.5 km to the south of Saddle Island). With the recent aerial bait drop, it is hoped the ship rats will be eradicated from the island and all adjacent islands, and that the seabird species and populations will now return to their former glory along with the native flora and vegetation. The status of reptiles on the island should be checked in 5-10 years time to see if any survived the rat infestation period.

Acknowledgements

Aotea Maori Committee for permission to survey Saddle Island; Jo Richie (information and photographs of the island), Will Scarlet and Rachel Fewster (for recent rat information on the island) and Will for enquiring about possible fires in living memory; Brian Gill for checking bird records held in Auckland Museum; Mark Bellingham for assisting the plant survey in Jan 1989; Tim Lovegrove (who provided transport on his yacht *Derwent*), plus Alan Tennyson and Sandra Anderson who helped with bird captures and spreading rat poison in 1990.

References

Baylis, G.T.S. 1985: A cytogenetical study of the *Solanum aviculare* species complex. *Australian Journal of Botany 11*: 168-177.

Beever, J.E.; Wright, A.E.; Whitehead, M.D.; Barnes, F.; Scofield, R.P. 1986: Mosses of the Broken (Pig) Islands, northern New Zealand. *Tane 31*: 105–110.

Bell, B.D.; Braithwaite, D.H. 1964: The birds of Great Barrier and Arid Islands. *Notornis 10*: 363–383.

Buddle, G.A. 1936: "Field Notes, November – December 1936" Unpublished, held by Auckland Museum, Land Vertebrate Department.

Cameron, E.K. 1995: Notes on the vegetation and flora of Kaikoura Island. *Auckland Botanical Society Journal 50*: 71–77.

Cameron. E.K. 2006: Vascular flora and fauna of twelve small northern New Zealand islands. *Auckland Botanical Society Journal 61*: 99–108.

Cameron, E.K. 2007: The vascular flora of Motu Kaikoura, Fitzroy Harbour, Great Barrier Island. *Auckland Botanical Society Journal 62*: 78–95.

Falla, R.A. 1934: The distribution and breeding habits of petrels in northern New Zealand. *Records of the Auckland Institute Museum 1*: 245–260.

Fleming, C.A. 1934: "Field Notes, January 1934". Unpublished.

McCallum, J. 1985: Report to the Secretary for Internal Affairs on the status of seabirds and lizards of the islands lying off the south-western coast of Great Barrier Island. Unpublished. 8p.

Taylor, G.A. 1989: A register of northern offshore islands and a management strategy for island resources. Department of Conservation, Auckland. Northern Region Technical Report Series 13.

Table 1. Totals of the vascular flora of Saddle Island in the different plant groupings, and with native and naturalised status.

Plant group	Native	Naturalised	Totals
Ferns	**7**	**-**	**7**
Dicotyledons	**29**	**13**	**42**
Monocotyledons	**15**	**6**	**21**
Totals	**51 (73%)**	**19 (27%)**	**70**

Appendix 1. Vascular flora of Saddle Island as recorded in the 1980s.

a = abundant
c = common
o = occasional
l = local
s = scarce (<5 plants seen)
x = collected by Mark &/or Peter Bellingham in Jan 1985 (not seen in Jan 1989)

Ferns (7 + 0)(= natives + naturalised)		**Notes, and where present a voucher specimen number**
Asplenium haurakiense	o	cliff tops and under taupata, S islet. AK 208645
Asplenium oblongifolium	l	by N summit
Doodia australis	l	by N summit
Histiopteris incisa	l	by N summit
Hypolepis ambigua	l	scrub area at summit of N islet. AK 171174 & 208643
Pteridium esculentum	l	by S summit
Pyrrosia eleagnifolia	l	on rock
Dicots (29 + 13)		
Apium prostratum	l	
*Cirsium vulgare**	o	
*Conyza sumatrensis**	o	
Coprosma repens	a	scrub, very dense; low to 4 m tall on summit
Crassula sieberiana	l	rocky western shore, with ice-plant. AK 171205
Dichondra repens	o	
Disphyma australis	o-lc	patches on rock bluffs
Einadia trigonos	lc	AK 171159
*Gamochaeta calviceps**	l	there is a specimen from the adjacent Broken Is (AK 171051, *A.E. Wright 6876*, Jan 1985)
Hydrocotyle heteromeria	x	scarce under karo canopy, N islet. AK 171068
*Hypochaeris glabra**	o	open areas above coastal cliffs. AK 208646
*Hypochaeris radicata**	o	open areas above coastal cliffs
*Lepidium africanum**	l	in a cliff herbfield with *Einadia*, *Senecio lautus*, *Disphyma* and *Spergula*, N islet. AK 206897
Leucopogon fasciculatus	s	single shrub, S islet
Linum monogynum	l	a few plants on top of western cliffs, S islet. AK 171083
Lobelia anceps	lc	N islet
Melicope ternata	x	Specimen fruiting. AK 275251
Melicytus novae-zelandiae	a	mainly amongst taupata. AK 208647
Melicytus ramiflorus	l	only by N summit
Metrosideros excelsa	l	≤8m tall by top of S islet
Muehlenbeckia complexa	o	S islet
Myrsine australis	s	2-3 plants, N islet
Parietaria debilis	l	under pohutukawa, N summit. AK 171066 & 171201
Peperomia urvilleana	l	
*Phytolacca octandra**	o	
Pittosporum crassifolium	o	up to 6m tall
*Polycarpon tetraphyllum**	o	
Pseudognaphalium luteoalbum agg.	o	
Pseudopanax lessonii	l	in karo forest on top of N islet. AK 275252
Sarcocornia quinqueflora	c	on rock bluffs
Senecio lautus	o	
*Senecio sylvaticus**	lc	
Solanum aviculare var. *latifolium*	o	under pohutukawa on S summit; adult plants with unlobed leaves 17-21cm long x 3-5.2cm across fits within Baylis' (1963) concept of this wide-leaved form of *S. aviculare, although not as wide as the Three Kings Islands plants*. AK 171051
*Solanum nigrum**	l	
Solanum nodiflorum	o	
*Sonchus asper**	s	
*Sonchus oleraceus**	o	amongst low taupata. AK 171082
Spergularia tasmanica	l	
*Stellaria media**	o	
Stellaria parviflora	l	fleshy large plants, under windshorn taupata. AK 171069
Streblus banksii	s	single low plant c. 3 x 6m, above SW cliffs of N islet. AK 208642
Wahlenbergia sp.	o	

Monocots (15 + 6)		
*Aira caryophyllea**	o	
*Bromus willdenowii**	o	
Carex flagellifera	l	growing with *C. testacea*
Carex testacea	lc	AK 171175
Cordyline australis	s	a single tree, S islet
Cortaderia splendens	o	S islet
Cyperus ustulatus	o	sedgeland in seepages and on rock faces
Dianella nigra	l	only by S summit
Dichelachne crinita	o	
Elymus multiflorus	o	
Isolepis cernua	lc	
Ficinia nodosa	o	
Lachnagrostis littoralis	o	on exposed eastern slopes, S islet. AK 171070 & 171204
Microlaena stipoides	l	single small sward, N islet
Oplismenus hirtellus	lc	only by N summit. AK 171067
*Paspalum dilatatum**	o	
Phormium tenax	o	
Rytidosperma unarede	o	AK 171033 & 278506
*Sporobolus africanus**	o	
*Vulpia bromoides**	x	AK 171203
Vulpia myuros var. *megalura**	x	amongst low taupata, S islet. AK 171071

Historical Reprint

This article appeared in the 3 November 1965 issue of the *NZ Weekly News.*Article sourced by Maureen Young

Some living fossils

By Kathleen Wood

Among the most remarkable of our native plants are some which have been described as living fossils, for somehow they have survived from ancient times and no clue in fossil records has been left to prove their origin.

One of these is the fernlike *Tmesipteris tannensis,* a distant relative of the club mosses, which commonly grows on the trunks of tree ferns. Rather like the English butcher's broom, it has thick, triangular leaves and hard little two-lobed spore capsules.

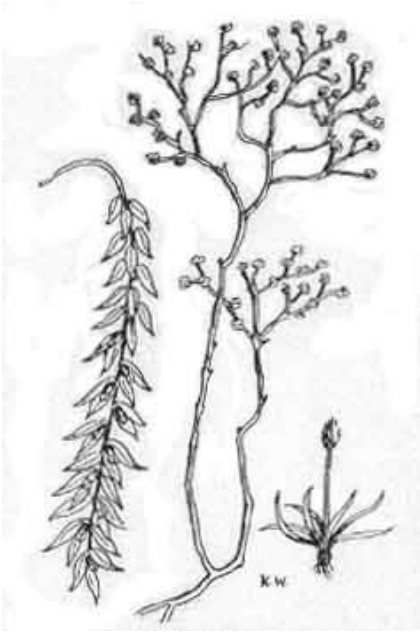
Rarer than this is a rootless plant called *Psilotum nudum* (sorry, no common name) which is one of the plant wonders of Rangitoto Island. There it grows from crevices in the lava rock, a broomlike shrub up to 18 inches high, with triangular stems and scale-like leaves. In the axils of the branches are knobbly spore cases and the whole plant is greenish yellow.

Sometimes these strange plants are found among lava rocks in Mt Eden gardens and stunted specimens at Waimangu Valley in Roturua.

Simplest and perhaps rarest of all is the diminutive *Phylloglossum drummondii*, a large name for a tiny plant. It is tuberous, growing only one or two inches high and has a tuft of fleshy leaves from which rises a single spore-bearing spike which turns yellow when ripe. An annual, it appears in April and dies down again in the spring.

The most remarkable thing about it is its very simplicity which excites great wonder in the botanical world where it is described as "a permanently embryonic form of lycapod".

When I first saw this nondescript little item it was growing near a cemetery. Liking the poorest of soils, it was in this instance found in the white gumlands clay at Waikumete, but sad to relate the growth of the cemetery has now ousted this rare little plant.Knowing that it was doomed I once tried to rescue some by digging up a patch and inserting it in the only place I had available, on a bank of red clay. The plants in the sod appeared annually for about four years, then as the trace elements which they preferred were leached out they disappeared.



***Tmesipteris tannensis, Psilotum nudum* and *Phylloglossum drummondii*.**

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