

FURTHER NEWS FROM MT WELLINGTON

Wendy Patterson

With our appetites whetted by the very enjoyable Botanical Society trip last year, on 20 August, three of us mounted an expedition, on 14 September this year, to find Anogramma with its frond fully uncurled and to hunt for Cheilanthes.

Instant success! We entered (on foot) at the down-traffic gate. Shortly after the pohutukawas on the left, there were some likely-looking rocks just below the road - one sported Cheilanthes distans. At the top of the quarry where we found it last year, there was Anogramma leptophylla fully uncurled and looking very healthy. In the crater we found all the plants listed from the previous trip (October 1988 News-sheet) except two common ones, and no doubt they were just eluding us. The aspleniums were a little puzzling. We couldn't find Asplenium oblongifolium, but we found A. flaccidum which was not on the list.

Next, as we walked down through the up-traffic gate, the idea was born of going to the Winifred Huggins Park. A few yards down Mountain Road towards the Panmure Roundabout there was a stile over into the cow paddock. We could see a similar stile at the other side of the paddock into the Winifred Huggins Park. As we approached it we saw, on the left, a pit with rocky walls and a small cave. And what was on the rocky walls but Anogramma! a dozen plants on one rock alone. A few yards closer to Winifred Huggins Park there was another pit with not only plentiful Anogramma but also Cheilanthes. Access is just as easy from Winifred Huggins Park official entrance gate - turn left, go over the stile and the pits are quite soon on the right.

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FLORA AND VEGETATION OF MOTUMANAWA (POLLEN) ISLAND - WAITEMATA HARBOUR, AUCKLAND

E.K. Cameron

INTRODUCTION

Situated in Auckland's upper Waitemata Harbour on the eastern margin of the Whau River mouth, Motumanawa is a vegetated, off-shore shell bar, 1.5 km long x 5-110 m wide (long axis NW-SE) adjoining a relic saltmarsh surface. The island's exposed eastern side is steeply banked, less than 1 m a.s.l. and is being actively eroded. The sheltered western side is contiguous with an extensive saltmarsh of glasswort (see Appendix for scientific and common plant names) and low mangrove (manawa). Motumanawa shellbank and associated shrubland covers some 13 ha (mostly above sea level); the saltmarsh and small vegetated islets between Motumanawa and the motorway cover about 50 ha. Wood and plastic rubbish (flotsam and jetsam) is common, especially along the exposed side of the island.

Biologically the island and its associated shell bars and saltmarsh are extremely important because it is the largest remaining area of this type of vegetation in the upper Waitemata Harbour. Two native plants present, glaucous goosefoot and Ranunculus acaulis, are now rare in the upper Waitemata. The Auckland Regional Authority zoned Motumanawa and the adjacent Traherne Island (Te Kou) as nationally significant in their

Regional Planning Scheme (Anon. 1988). This habitat supports: a species of Bactra moth known only from Motumanawa (P. Maddison pers.comm.); a good breeding population of fernbirds; a major roost for waders (including banded dotterel, wrybill, N.Z. dotterel, golden plover); and a nesting colony of black-backed gulls. On 12 November 1989 I saw a banded rail with 3 chicks under the mangroves by the south-east corner of the island. Norway rats (Rattus norvegicus) have been recorded on the island (Craig 1983) and I have seen ship rat (R. rattus) excrement on the wattle branches.

Motumanawa is often in the news because there is no legal protection for its high conservation values which are currently threatened. In October 1988 the Government vested the island in the new Auckland Port Company as a possible site for a future port expansion. The Minister of Conservation has asked the Minister of Transport to review this decision. In October 1989 the Royal Forest and Bird Protection Society proposed a 800 ha marine reserve which includes Motumanawa and Traherne Islands. The Minister of Conservation will consider this proposal along with public comment in 1990. Currently design options are being discussed for the motorway on and off ramps (for city bound traffic) for the north-western motorway at the end of Rosebank Peninsula. The cheapest but environmentally unacceptable option would swing out onto the southern tip of Motumanawa. Expansion to 6 lanes is also proposed for this motorway section.

My observations are based on seven field trips to the island during April-December 1989. This is the first full account of the island's flora; only the major species have been commented on in the past.

HISTORY

From bores on Motumanawa, Chapman and Ronaldson (1958) found at varying depths (6"-5'-?) a freshwater peat deposit (at least 160-170 thousand years old) laid down when the sea level was lower. Above the peat is an older saltmarsh (800-2,300 years old) which was submerged by an increase in sea level, eroded then exposed 300-400 years ago which allowed the present saltmarsh to form (the second at this locality).

The aerial photographs (1940 and 1980) clearly show a straight line going out to the northern part of Motumanawa from Rosebank Peninsula. After a 115° turn the line stops by the eastern side of some old concrete foundations. These are remnants of a pre-1940 (built during the Depression?) hand trolley-tramline to take shell for agricultural lime, the square foundations were possibly the site for a crusher (K. Brehmer pers.comm.).

VEGETATION

The vegetation of the island and associated saltmarsh was mapped in the 1950s (field work undated) by Chapman and Ronaldson (1958) showing that Motumanawa consisted of scrub with flax, including marsh ribbonwood, oi oi, sea rush and Stipa stipoides associated with extensive saltmarsh of mangrove and glasswort. Changes since Chapman and Ronaldson's fieldwork include: construction of the north-western motorway across the end of Rosebank Peninsula (2 lanes opened in December 1955, widened to 4 lanes 1960-63); extension and connection of a shellbank some 100 m long, running north from the south-east corner of the island; extension and almost connection of a branching shellbank off the north-east corner of Motumanawa (each branch c. 90 m long). The apparent major change in the vegetation is the abundance of a native coastal shrub, Olearia solandri, which was unmentioned by Chapman and

Ronaldson. Although O. solandri can grow rapidly (G. Platt pers.comm.), these Motumanawa plants look old and well established. Chapman and Ronaldson (p. 19) recorded Cassinia retorta in the Motumanawa shrubland with marsh ribbonwood and manuka: I cannot find C. retorta on the island. Therefore I believe Chapman and Ronaldson mistook O. solandri for C. retorta.

Marsh ribbonwood and oioi, mainly 1-1.3 m tall, form the main vegetation of the island. Associated with this is flax (up to 2 m tall) and Olearia solandri (up to 3 m tall) which vary in their frequency from scattered individuals to locally dominant. The tallest plant is a Sydney golden wattle, 4.5 m tall with a basal diameter of c. 25 cm, which is in the widest part of the island, below the centre. Four other plants (1.5, 3x2, and 4 m tall; c. 1.5, 12 and 13x2 cm basal diameter respectively) of this species were within 150 m (the smallest was uprooted, and three were ring-barked, November 1989). Just by the largest wattle are 3 m tall Olearia solandri and just north of here on the eastern side is a small stand of some ten manuka also about 3 m tall. Because of the erosion the two most exposed (north-eastern) manuka are dead. The only other manuka were shrubs up to 4 m tall, which were locally common near the north-east corner (the other area with the best developed vegetation) and these were associated with at least 9 mapou plants up to 3.5 m tall. Both the manuka and mapou were scattered here through thick vegetation of oioi and Olearia solandri. Away from the north-east corner only one other mapou (2 m tall) was seen (near the wattles). Only three plants of karumu were seen, all almost 2 m tall (female x2, male x1) and also near the wattles. The only other woody species were: brush wattle, c. 1 m tall, near the south-east corner (uprooted); a seedling boneseed on the bare shellbank (uprooted); and gorse which is uncommon.

Along the exposed eastern face of the island flax frequently dominates, and usually oioi and coastal ribbonwood are dense behind the flax. An eroding, soft clay bank is exposed along this shore which is the only locality for: tiny plants of Triglochin striata; the annual glaucous goosefoot; and a sedge (Isolepis nodosa). At a single locality, just opposite the expanding northern shellbank ('Motumanawaiti') a small native buttercup, Ranunculus acaulis, grows on the exposed clay in two areas (10 m apart), over areas $\leq 1.5 \times 0.5$ m. It is associated with Samolus repens and small amounts of Isolepis cernua, Maori celery and glasswort; the tall sedge Bolboschoenus is restricted to a small area on this clay by the buttercup.

Motumanawa is being actively eroded all along its outer exposed shores, mangroves with exposed roots are present, on the northern and to a lesser extent the southern edges. Based on the 1940 aerial photograph and the present day situation, the shell bank by the old foundations on northern Motumanawa has moved southwards some 18 m in 50 years (0.36 m/yr). Along the main north-east facing beach, shells (mainly cockle) are piled up into the vegetation which frequently has clumps of plants about to be washed away with varying amounts of roots exposed. Although the amount of erosion could only be measured at one locality I believe this rate to be similar along the entire outer margin of Motumanawa, based on aerial photographs and present erosion.

At the narrowest point of the island (about two thirds up) the vegetation is low and open. Unlike the shrublands on either side, this area (c. 25 m long) is dominated by herbaceous weeds: narrow-leaved plantain, black medick and hawkbit. Commonly associated with them are King Island melilot, pink bindweed, gravel groundsel, sow thistle, a moss (Bryum), and scarlet pimpernel. The reason for the lack of the shrub-oioi cover here is because there is no slightly raised, relic

saltmarsh surface joining the shellbank, like there is to either side.

The island's sheltered margin is fringed with a zone of sea rush, which is usually narrow but can be locally extensive. Stipa stipoides and tall fescue are also common here. The extensive sheltered flats between the motorway and Motumanawa are almost entirely covered in low, open vegetation of mangrove and glasswort. The slightly higher land near the island drains towards the motorway and collects into two channels, one flows out to the south-east and the other to the north-west and both become quite deep. Tall mangroves are associated with the deeper part of the channels (better drainage and nutrient supply), these mangroves abruptly change into low spreading plants (≤ 40 cm tall) and extend out in a continuous cover virtually right out to the island. Bare mud is rare. Close to the island there is a strip of glasswort of variable width. By the centre of the island the extent of the glasswort is greatly increased and extends about one third out towards the motorway. This pure cover of rather open glasswort is up to 25 cm tall, red-brown in colour and covers several hectares. On the 12 November 1989 this area had not been inundated by the previous tide(s) and was quite dry. The tide had only reached up to the mangrove-glasswort interface which clearly demonstrated the slightly higher level of the glasswort flats. This ecotone of mangrove and glasswort is usually quite narrow (about 50 m wide), except at the northern end where it is quite extensive.

Close to this sheltered side of Motumanawa there are numerous small islets (1-20-(40) m across) of mixed vegetation separated by a matrix of glasswort which is usually associated with Samolus repens. The closest islets adjacent to Motumanawa may be connected to it by cover of sea rush rather than glasswort. Typically these islets are dominated by marsh ribbonwood with oioi up to 1-(1.5) m tall; usually present is Stipa stipoides and tall fescue; occasionally flax, Olearia solandri and wild gladiolus are also present; the margin is fringed with sea rush and the occasional low, thick-trunked mangrove (old aged?) and creeping Samolus repens. The very small islets, 1-3 m diameter, frequently have pure Stipa stipoides, lack the fringing sea rush, and have steep eroding banks up to 15-(35) cm tall. A few of the larger islets were banked as well but most appeared to be almost level with the surrounding glasswort. I agree with Chapman and Ronaldson (1958) that these small oioi-marsh ribbonwood islets are relics of an earlier saltmarsh, most of which has been eroded away. The shrubland areas on Motumanawa are also on the slightly higher, saltmarsh relic surfaces bounded by the shellbank on the exposed side.

THE FLORA

The specialised habitat of either wet mud or loose shell, which is all exposed by some degree to saltwater, allows only a narrow range of species to establish. Eighty-five vascular plant species were recorded for the island in 1989 (see Appendix); this excludes one previously recorded annual, oxeye daisy which now appears extinct on the island. Although a large percentage (62.4%) of the flora is of introduced species, these play a very minor role in the vegetation of the area. Apart from the occasional gorse plant the few other introduced woody species have either been uprooted or ring-barked by me (see Appendix). Most of the other introduced species are annuals and much of the year these are scarcely visible. They are virtually all confined to the open shell bank areas on the exposed sides of Motumanawa. Many of the species were only seen in areas less than 1 m² e.g. batchelor's button, ivy-leaved toadflax, broomrape and lilac oxalis. The tufted perennial

grass, tall fescue was the only widespread, common weed on the island.

Since the survey by Chapman and Ronaldson (1958) there have been several changes to the flora and vegetation, although they mainly mentioned only the more common species. The apparent addition of Olearia solandri I have already discussed. From Chapman and Ronaldson (p. 17) the creeping native herbs Selliera radicans and Samolus repens were occasional on the sheltered oioi-marsh ribbonwood islets; and flax was not recorded here. In 1989 Selliera radicans was restricted to a single patch at the southern end of Motumanawa and rare in the saltmarsh by the islets, Samolus repens was abundant in and by these islets, and flax was frequent on many of the islets.

Amongst the non-vascular plants, lichens are very common and usually attached to the twigs of marsh ribbonwood. Due to the absence of rocks the usual crustose marine lichens are absent. Of the mosses only Bryum billardierei (det. J.E. Beever) is widespread growing on the open shellbank of the exposed shores. The other two moss species (see Appendix) are more typical of soil and were restricted to small areas by the wattles near the centre of the island. These lower plants are under-recorded by me as they were not systematically searched for.

The brown alga Hormosira banksii occasionally washed up along the shores of Motumanawa has the largest bladders I have ever seen for this species; they are frequently 15-20-(27) mm across. This may be an unattached form of sheltered mangrove areas (F.I. Dromgoole pers.comm.).

CONCLUSIONS

The vegetation of Motumanawa and associated salt-marsh is dominated by native species, though its integrity was beginning to be threatened by the establishment of five Sydney golden wattles on the island. The largest tree had fallen over (but continued to grow) and had obviously been on the island for many years (> 20 yrs). This tree had produced large amounts of seed yet only four other wattles had managed to establish near the original tree (this illustrates that the island is currently not very suitable for wattle establishment). Therefore monitoring and removal of potentially dominating weeds from this native shrubland should occasionally be carried out; probably once every 5 years would be adequate at the moment. Plantings of golden wattle by the margin of the motorway were probably the seed source for this weed. Cotoneaster, another potential weed, is also planted here. This type of planting must be avoided in the future.

The shellbank of Motumanawa is actively moving towards the motorway (c. 1 m/3 yrs). The eroding clay-peat base of the former swamp is providing fine sediment which is slowly building up the level of the saltmarsh. Chapman and Ronaldson (1958) calculated at Motumanawa that the rate of accretion under mangrove is 16.6 cm and under glasswort 10.0 cm per century (based on 14 months accumulation). The main vegetation pathway at Motumanawa is: mangrove → glasswort → sea rush → marsh ribbonwood/oioi/Stipa → flax/Olearia solandri/oioi/marsh ribbonwood. To date, on the new saltmarsh surface this process has only proceeded as far as the sea rush. Comparing the 1940 and 1980 aerial photographs of the area the vegetation patterns are remarkably similar except for the erosion along the outer margin. Also the outer shell banks have extended. These 'boundary' changes are possibly enhanced by the construction of the motorway, even though the main drainage channels behind the island were only partially altered. Though the large channel to the west of Traherne Island and the smaller channel in the middle of the Motumanawa saltmarsh (by the motorway) were both blocked off. Today, remnant, tall mangrove mark this latter channel.

Around Auckland, for bare mud to pass from the first colonisation by mangrove, to reach the sea rush-oioi vegetation stage would take c. 1776 years (Chapman and Ronaldson 1958, Table 3). On Motumanawa the shrubby-oioi vegetation is confined to the higher relic saltmarsh surfaces. Therefore the current shrubland area of Motumanawa is decreasing in size because of the erosion along the island's margin and the young age of the saltmarsh (300-400 yrs) which has not allowed shrubland development yet on the new saltmarsh. The whole system is very dynamic and is altered by storms (north-east gales), currents and physical interference (motorway construction). Possibly there is a new Motumanawa forming by the building up of shellbanks on the exposed side of Motumanawa. These shellbanks have already sheltered the exposed side of Motumanawa enough over the last decade to allow mangrove formation there by the northern shellbank. These mangroves are over 1 m tall, wider than high and extend along for over 150 m. The northern shellbank supports 13 species of higher plants; the shellbank from the southern end of Motumanawa only has mangrove associated with it. The extent and shape of these outer shellbanks will effect the amount of erosion on the island.

Motumanawa has virtually no humus layer and is therefore currently an unsuitable habitat for most plant species, but if given enough time the island should become more suitable for plant establishment (weeds and natives) as the plant succession continues. The weeds on the island all have had the ability to disperse out to the island themselves. Potentially there are existing aggressive weeds along the Motumanawa margin of the motorway waiting for an easy way to get across onto the island e.g. pines, other wattle species, Hakea salicifolia and Watsonia bulbifera. The construction of the motorway onto the neighbouring Traherne Island appears to have allowed woody weeds easy access to the island where they now dominate the native vegetation. Therefore the sea moat between the motorway and Motumanawa is important not only to deter cats and dogs which would threaten the island's birdlife, but also to restrict weed access. This sea gap should not be reduced by the proposed motorway ramps. Also the channels draining the lee of Motumanawa are near the motorway, particularly at the south end; if these channels are restricted the accumulation of sediment is likely to increase. This would lead to increased infilling which would artificially speed up the progression of saltmarsh to oioi-marsh ribbonwood shrubland. This is occurring naturally, but very, very slowly - no obvious change in vegetation patterns from 1940 to 1980 (based on aerial photographs).

The whole natural dynamic system of the shell bar, shellbanks, erosion, accretion, saltmarsh, native vegetation, plant succession is unequalled in the upper Waitemata Harbour and is most worthy of legal protection. If erosion continues at its present rate Motumanawa could be washed away over the next 300 years, on the other hand with the building up of the outer shellbanks there may be two Motumanawa in the future.

REFERENCES

- Anon. 1988 Auckland regional planning scheme. Auckland Regional Authority.
- Chapman, V.J. and Ronaldson, J.W. 1958 The Mangrove and Salt-Marsh flats of the Auckland Isthmus. DSIR Bulletin 125: 0-79.
- Craig, J.L. 1983 Rodents of the Greater Auckland Region. Tane 29: 215-222.

Appendix:

Flora of Motumanawa (Pollen) Island 1989, earlier records are included

am = abundant on the island's margin

* = adventive species

a = abundant

f = frequent

o = occasional

l = local

r = rare (< 5 plants seen)

AKU = University of Auckland herbarium's voucher number

VC = V.J. Chapman voucher (1963)

JC = ? J.P. Crosher voucher (1963)

CR = Chapman and Ronaldson (1958)

GL = G. Lindsay voucher (1979-80)

Dicotyledons (64)

<i>Acacia longifolia</i> *	Sydney golden wattle	r (AKU 21527, 21840) (ring-barked, Nov. '89)
<i>Anagallis arvensis</i> s.s. *	scarlet pimpernel	f, CR
<i>Apium prostratum</i>	Maori celery	f
<i>A.</i> sp.	"white denticle"	l (AKU 21854)
<i>Aster subulatus</i> *	sea aster	f, CR
<i>Atriplex prostrata</i> *	orache	f, VC (AKU 3263, 21524)
<i>Avicennia marina</i>	manawa, mangrove	am, CR
<i>Brassica nigra</i> *	black mustard	o (AKU 21835-36, 21848)
<i>Calystegia sepium</i>	pink bindweed	f
<i>Cerastium glomeratum</i> *	annual mouse-ear chickweed	o (AKU 21658)
<i>Chenopodium glaucum</i>	glaucous goosefoot	o, VC (AKU 3268)
<i>Chrysanthemoides monilifera</i> *	boneseed	r (uprooted)
<i>Cirsium vulgare</i> *	Scotch thistle	o
<i>Conyza albida</i> *	broad-leaved fleabane	f
<i>Coprosma robusta</i>	karamu	r
<i>Coronopus didymus</i> *	twin cress	l
<i>Cotula coronopifolia</i>	bachelor's button	r
<i>Crepis capillaris</i> *	hawksbeard	l
<i>Cymbalaria muralis</i> *	ivy-leaved toadflax	r (AKU 21841)
<i>Foeniculum vulgare</i> *	fennel	r
<i>Fumaria bastardii</i> *	Bastard's fumitory	f, GL (AKU 8391, 21657)
<i>Galium aparine</i> *	cleavers	o
<i>Geranium purpureum</i> *	small herb Robert	f (AKU 21832)
<i>Haloragis erecta</i>	shrubby haloragis	o
<i>Leontodon taraxacoides</i> *	hawkbit	f-a
<i>Leptospermum scoparium</i>	manuka	l, CR
<i>Leucanthemum vulgare</i> *	oxeye daisy	GL (AKU 8392)
<i>Lobelia aniceps</i>		o
<i>Lotus suaveolens</i> *	hairy birdsfoot trefoil	l
<i>Lycopersicon esculentum</i> *	tomato	r
<i>Medicago lupulina</i> *	black medick	f
<i>M. polymorpha</i> *	bur medick	l
<i>Melilotus indicus</i> *	King Island melilot	f (AKU 21838)
<i>Muehlenbeckia complexa</i>	wire vine	l
<i>Myrsine australis</i>	mapou	l
<i>Olearia solandri</i>	coastal tree daisy	a
<i>Orobanche minor</i> *	broomrape	l
<i>Oxalis incarnata</i> *	lilac oxalis	r
<i>Paraserianthes lophantha</i> *	brush wattle	r (uprooted)
<i>Picris echioides</i> *	oxtongue	f
<i>Plagianthus divaricatus</i>	marsh ribbonwood	a, JC (AKU 3835, 21839))
<i>Plantago australis</i> *	swamp plantain	r (AKU 21851)
<i>P. coronopus</i> *	buck's-horn plantain	o, CR, GL (AKU 8393)
<i>P. lanceolata</i> *	narrow-leaved plantain	f, CR
<i>Ranunculus acaulis</i>		l (AKU 21656)
<i>R. repens</i> *	creeping buttercup	r

<i>Raphanus raphanistrum</i> *	sea radish	o, GL (AKU 8390)
<i>Rumex conglomeratus</i> *	clustered dock	o
<i>R. crispus</i> *	curled dock	f
<i>R. pulcher</i> *	fiddle dock	l (AKU 21525)
<i>Samolus repens</i>		a, CR
<i>Sarcocornia quinqueflora</i>	glasswort	am, JC (AKU 3279)
<i>Selliera radicans</i>		l, CR
<i>Senecio bipinnatisectus</i> *	Australian fireweed	o
<i>S. glomeratus</i>	fireweed	o
<i>S. lautus</i>	shore groundsel	l
<i>S. skirrhodon</i> *	gravel groundsel	o
<i>S. vulgaris</i> *	groundsel	l
<i>Solanum nigrum</i> *	black nightshade	r
<i>Sonchus oleraceus</i> *	sow thistle	f
<i>Stellaria media</i> *	chickweed	o
<i>Suaeda novae-zelandiae</i>		lf, (AKU 21526)
<i>Ulex europaeus</i> *	gorse	o
<i>Vicia hirsuta</i> *	hairy vetch	f, GL (AKU 8394, 21834)

Monocotyledons (22)

<i>Baumea juncea</i>		o, CR
<i>Bolboschoenus fluviatilis/medianus</i>		l (sterile)
<i>Carex divisa</i> *		l (AKU 21837)
<i>C. flagellifera</i>		l (AKU 21833)
<i>Cortaderia jubata</i> *	purple pampas grass	r
<i>C. selloana</i> *	pampas grass	o
<i>Deyeuxia billardierei</i>	sand wind grass	l (AKU 21842)
<i>Festuca arundinacea</i> *	tall fescue	a, CR
<i>Gladiolus undulatus</i> *	wild gladiolus	o (AKU 21831)
<i>Isolepis cernua</i>		o
<i>I. nodosa</i>		o
<i>Juncus maritimus</i>	sea rush	a, JC (AKU 6401)
<i>Leptocarpus similis</i>	oioi	a, CR
<i>Parapholis incurva</i> *	sickle grass	lf, GL (AKU 8803, 21853)
<i>P. strigosa</i> *		lf (AKU 21834, 21852))
<i>Pennisetum clandestinum</i> *	kikuyu	r (uprooted)
<i>Phormium tenax</i>	N.Z. flax	a, CR
<i>Poa annua</i> *	annual poa	o
<i>Polypogon monspeliensis</i> *	beard grass	o (AKU 21849 - 50)
<i>Stenotaphrum secundatum</i> *	buffalo grass	l
<i>Stipa stipoides</i>		a, CR
<i>Triglochin striata</i>		o

Mosses (3)

<i>Bryum billardierei</i> var. <i>platyloma</i>		o (AKU 72022)
<i>Ptychomnion aciculare</i>		l (AKU 72144)
<i>Thuidium furfurosum</i>		l (AKU 72145)

Lichens (4)

<i>Parmotrema reticulatum</i>		f (AKU 81647)
<i>Ramalina celastri</i>		a
<i>Teloschistes chrysophthalmus</i>		a
<i>Usnea</i> sp. or spp.		a

Note - the *Cortaderia conspicua* and *Cassinia retorta* records of Chapman & Ronaldson (1958) are omitted as believed to be in error for pampas grass and *Olearia solandri* respectively.

E.K. Cameron (December 1989)



Pterostylis cardiostigma D. Cooper
ridge descending to the west of
Donald McLean Track
Whatipu
Waitakere Ranges
S. Jones / D. Hatch
28.10.1989
twig debris under windswept
manuka

PTEROSTYLIS CARDIOSTIGMA D. COOPER
- A NEW RECORD FOR THE WAITAKERES

E.D. Hatch

On 21.10.1989, on a Bot. Soc. field trip to Mount Donald McLean, Maureen Young found several plants of what appeared to be Pterostylis cardiostigma, not previously recorded north of Kawhia. On 28.10.1989, by the kindness of Bryn and Sandra Jones, I was able to look over the area and confirm Maureen Young's determination. Undoubtedly cardiostigma. Flowerless plants, or plants in early bud are easily confused with P. banksii, but when the flower is open there is no mistaking it. Very erect and compact, not unlike a swamp bittern with its beak pointed to the sky. The main points of identification are the lobed, heart-shaped, protruding stigma, usually smothered in pollen (the flowers are self-fertile), and the short 'tails' to the sepals.

The plants occurred in several colonies spread along a quarter of a kilometre, down a broad ridge to the west of the Donald McLean Track. The plant association was dominated by open, windswept manuka about 5 m high, with occasional rewarewa, several Coprosma spp., Olearia furfuracea and Pseudopanax crassifolius. The ground cover consisted largely of Gahnia sp., Blechnum 'black spot' and B. fraseri; the ubiquitous Schoenus tendo and the moss Leucobryum.

P. cardiostigma grew in twig debris among the manuka. 21 plants were observed, of which 9 were in flower or late bud. A voucher specimen has been deposited in AK.

P. cardiostigma is illustrated in -

Cooper, D. N.Z. Journal of Botany 21:97 (1983) - drawings - reprinted in N.Z. Native Orchid Group Newsletter 6:8 June 1983 and again in 31:10 September 1989.

Johns, J. and Molloy, B.P.J. Native Orchids of N.Z. 51 t74 (1983) over the name Pterostylis 'Day's Bay' - a particularly good photograph.

Irwin, J.B. N.Z. Native Orchid Group Newsletter 20:4 December 1986 - drawing of a plant from Iwitahi.

Other orchids noted in the area were P. banksii and P. graminea in flower; P. alobula and P. trullifolia dying back; Chiloglottis cornuta in flower (one plant with 3 leaves); plentiful Corybas oblongus and a single plant of C. macranthus.

Also a colony of Caladenia catenata with 7 plants in seed and one with a single late flower. C. catenata, with red-purple flowers, appears in the Waitakeres to be confined to the Manukau breccia along the west coast.

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