

Vascular flora of Motuora Island, Hauraki Gulf

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Introduction

Motuora Island lies in the Hauraki Gulf southwest of Kawau Island, approximately 3km from Mahurangi Heads, and 5km from Wenderholm Regional Park, Waiwera. This 80ha island is long and narrow (approximately 2km x c. 600m at its widest) with a relatively flat top, reaching 75m asl. The land rises abruptly, in places precipitously, from the shoreline so that the area of the undulating 'level' top is comparatively extensive. Composed of sedimentary strata from the Pakiri formation of the Waitemata Group (Lower Miocene age, approximately 20 million years old), Motuora is geologically similar to other inner Hauraki gulf islands such as Tiritiri Matangi, Kawau, Waiheke and Motuihe Islands (Ballance 1977; Edbrooke 2001).

History

Motuora Island was farmed, from as early as 1853 (Hawley and Buckton 1987). The Hauraki Gulf Maritime Park Board purchased the island in 1966, and it has been administered by the Department of Conservation (DoC) since 1987. By 1988 Motuora Island's future as an open sanctuary was gaining favour (Dowding 1988). The island was free of mammalian pests, but the natural habitat was severely depleted. In 1990 members of the local community led by the Mid-North Branch of the Royal Forest and Bird Protection Society and supported by DoC began replanting the island. Today the island is jointly managed by DoC and the Motuora Restoration Society (Inc) which was formed in 1995.

Past vegetation

There are few records on the vegetation history of Motuora Island. Much of the original vegetation was most likely burnt during Maori occupation or visitation, as with most northern offshore islands (Atkinson 2004; Wright 1988). During the early 1900's the remaining vegetation was cleared back to the cliff edges and replaced with pasture by European farmers. Stock evaded the cliff top fences, and invasive species such as climbing asparagus (*Asparagus scandens*) and boneseed (*Chrysanthemoides monilifera*) began out-competing native plants on the cliffs. So even the cliff faces represent a significantly modified environment where regeneration patterns have been disrupted and species composition altered, and in some areas the remaining vegetation is so minimal that it reveals little about the vegetation that existed before human settlement.

Previous vascular flora surveys

The first vascular flora listing for Motuora Island was incorporated in an ornithological survey report compiled during three visits to the island in August 1987, October 1987, and April 1988, by members of the Ornithological Society of New Zealand (Dowding

1988). A total of 141 species (including 14 ferns) were recorded. Exotic plants confined to the gardens around the buildings at Home Bay were not included in Dowding's (1988) list. Dowding (1988) commented on four adventive species that were "well-established" and that "may present problems" (presumably for a future restoration project). These species were boneseed (*Chrysanthemoides monilifera*), boxthorn (*Lycium ferocissimum*), gorse (*Ulex europaeus*) and kikuyu grass (*Pennisetum clandestinum*). All four species still require ongoing control. However, as a result of ongoing weed eradication endeavours, boxthorn has been reduced to a few isolated sites, and boneseed once widespread on the island is considerably reduced also, occurring in high densities now only on the northern end of the island (Lindsay 2006). Gorse and kikuyu are controlled where these species inhibit revegetation plantings.

Dowding (1988) noted that some native species were represented by only a few specimens and in the case of kohekohe (*Dysoxylum spectabile*), puriri (*Vitex lucens*) and karaka by only a single specimen. The puriri has since died, and although the mature kohekohe has not been seen to produce fruit there are juvenile kohekohe present on the island (Helen Lindsay pers. comm.).

The vascular flora list for the island was updated in 1997 as part of the Motuora Restoration Working Plan document. Twenty-nine species were added to Dowding's 1988 listing (Hawley and Buckton 1997).

Vascular flora survey 2006

A further update of the list was required this year for the development of the Motuora Species Translocation Plan 2006-2017 (Gardner-Gee et al. 2006). Early in the year (31/01/06-04/02/06 and 30/04/06) we undertook a survey of the island's vascular flora. Species found during that survey are recorded in Appendix 1, including an additional ten species identified during weed survey work later in the year (06/11/06-11/11/06). A total of 288 taxa have been recorded, of which 123 (43%) species are native, 165 (57%) are exotic, and of which 138 taxa are additions to previous listings (Table 1). 'Exotic' additions are comparatively high (88 taxa) because garden relics growing around Home Bay have been included in a floral survey for the first time.

Twenty-two taxa recorded by Dowding (1988) and Hawley and Buckton (1997) were not located during our survey. Of these, ten are native. With further searching five of these natives; coprosma hybrid (*Coprosma macrocarpa* x *C. propinqua*), *Geranium solanderi*, native fireweed (*Senecio hispidulus*), nertera (*Nertera* sp.) and true maidenhair (*Adiantum aethiopicum*) may possibly be located. The other five

species; dwarf cabbage tree (*Cordyline pumilo*), Glen Murray tussock (*Carex flagellifera*), pigweed (*Einadia trigonos*), tawapou (*Pouteria costata*) and thin-leaved coprosma (*Coprosma areolata*) are most likely now extinct on Motuora and are to be considered for future re-introduction.

Ten introduced species recorded in previous listings (Dowding 1988; Hawley and Buckton 1997) can also be considered extinct from Motuora. These include hedge privet (*Ligustrum ovalifolium*), cotoneaster (*Cotoneaster franchetii*), false acacia (*Robinia pseudoacacia*), hemlock (*Conium maculatum*), ivy (*Hedera helix*), juniper (*Juniperus* sp.), lemon scented jasmine (*Jasminum azoricum*), purple guava (*Psidium cattleianum*), purple nut sedge (*Cyperus rotundas*) and tamarisk (*Tamarix* sp.).

Of all the exotics with 'new-listing' status only two stand out as almost certain recent arrivals (since 1997); the invasive holly fern (*Cyrtomium falcatum*) and Chinese privet (*Ligustrum sinense*). The other exotics in this category were either deliberately ignored (garden plants) in earlier surveys or could have possibly been missed.

We identified sixteen more indigenous fern species than previously recorded. Some of these might be recent arrivals, but most could well have been present on the island in 1997 in low numbers in remote locations. As revegetation has advanced suitable fern habitat has increased (particularly in the earliest planted areas such as Macrocarpa Bay), and ferns are becoming more widely established.

Current vegetation

Native forest remnants (mainly pohutukawa) are scattered around the outer perimeter of the island comprising approximately 20 ha. A remnant on the east-facing slopes of Pohutukawa Bay provides the best representation of naturally regenerating coastal forest on the island. Typical coastal species are present, dominated by pohutukawa (*Metrosideros excelsa*), karo (*Pittosporum crassifolium*), houpara (*Pseudopanax lessonii*), coastal karamu (*Coprosma macrocarpa*), kawakawa (*Macropiper excelsum*), coastal astelia (*Astelia banksii*) and rengarenga (*Arthropodium cirratum*).

On the western side of the island a mature stand of macrocarpa (*Cupressus macrocarpa*) lines Macrocarpa Bay reminiscent of European farming practices. Pine trees (*Pinus* spp.) once common on the island have been felled, with a few remaining in difficult locations on cliff faces.

Cattle were maintained on the island up until February 2006 to manage pasture not yet retired for planting. Approximately 30ha of retired pasture have now been planted by early successional species and it is anticipated another 25ha will be planted by 2010 (Gardner-Gee et al. 2006).

Revegetation

Over 205,000 trees have been propagated and planted since 1990. Initially seed was sourced from the island where sufficient genetic diversity remained. Local seed sources included akeake (*Dodonea viscosa*), broom (*Carmichaelia australis*), hangehange (*Geniostoma ligustrifolium*), houpara, karamu (*Coprosma robusta*), karo, mahoe (*Melicactus ramiflorus*), ngaio (*Myoporum laetum*), pohutukawa, puriri, taupata (*Coprosma repens*) and whau (*Entelea arborescens*). However there were, initially, only a few akeake, cabbage tree, coastal kowhai (*Sophora chathamica*), flax (*Phormium tenax*), five-finger (*Pseudopanax arboreus*), hebe (*Hebe stricta* and *H. macrocarpa*), manuka (*Leptospermum scoparium*), and a single mature karaka (*Corynocarpus laevigatus*) remaining on the island. Some seed was collected from these specimens but much of the seed for these species was sourced from Tiritiri Matangi during the early years of restoration. Kanuka (*Kunzea ericoides*) and wharangi (*Melicope ternata*) being absent from the island were also sourced from Tiritiri Matangi. It is intended in the future to source additional seed from Mahurangi East and West, and Wenderholm (Gardner-Gee et al. 2006).

There have been very few natural introductions of woody plant species (native or exotic) since the outset of the project suggesting there is very little bird movement between Motuora, the mainland and nearby islands. The introduction of a wider range of late-successional trees is planned to provide the variety and quantity of food sources that will attract and maintain populations of birds like kereru, bellbird and kakariki.

The restoration goal of Motuora Island is to re-establish self-sustaining ecosystems and to create a sanctuary for endangered flora and fauna. As a measure of progress Motuora has operated as a 'kiwi creche' for the Operation Nest Egg programme since 1999, currently maintaining a population of around 50 Brown kiwi (*Apteryx australis*) (Dave Jenkins pers. comm.). Planned introductions, of both flora and fauna, by the Motuora Restoration Society over the next ten years will make this island an interesting place to visit and to study.

Table 1. Vascular plant species totals recorded for Motuora Island (2006), divided into plant groupings indicating additions (ζ) to previous listings (Hawley and Buckton 1997; Dowding 1988).

Plant groupings	Native	Exotic	Total	Additions
Ferns	32 (ζ16)	2 (ζ1)	34	17
Gymnosperms	1	4	5	-
Dicotyledons	63 (ζ18)	117 (ζ 63)	180	81
Monocotyledons	27 (ζ16)	42 (ζ24)	69	40
Total	123 (43%)	165 (57%)	288	138

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Appendix 1. Motuora Island vascular plant species list.

* = exotic species (either naturalised or planted)

p = planted species (either exotic or native)

= previously listed but not found in 2006 survey (22 spp. N:10 E:12)

ζ Addition to Hawley and Buckton (1997) listing (138 spp. N:50 E:88)

N = native (123 spp.)

E = exotic (165 spp.)

HB = Home Bay

MB = Macrocarpa Bay

PB = Pohutukawa Bay

RB = Rocky Bay

SB = Still Bay

TD = Twin Dams

Botanical name	P	Common name	Location
Ferns (34) (N:32 E:2)			
# <i>Adiantum aethiopicum</i>		true maidenhair	
<i>A. cunninghamii</i>		common maidenhair	SB/MB
ζ <i>A. diaphanum</i>		small maidenhair	SB/MB
<i>A. hispidulum</i>		rosy maidenhair	SB/MB
ζ <i>Asplenium flaccidum</i>		hanging spleenwort	SB
<i>A. haurakiense</i>		shore spleenwort	SB/PB
<i>A. oblongifolium</i>		shining spleenwort	PB
ζ <i>A. polyodon</i>		sickle spleenwort	MB
ζ <i>Blechnum chambersii</i>		lance fern	MB/SB
ζ <i>B. filiforme</i>		climbing hard fern	MB
<i>B. novae-zelandiae</i>		kiokio	MB
ζ <i>Cyathea dealbata</i>		silver fern, ponga	MB/SB
<i>C. medullaris</i>		black tree fern, mamaku	MB/SB
*ζ <i>Cyrtomium falcatum</i>		holly fern	SB
<i>Deparia petersenii</i>			MB/SB
ζ <i>Dicksonia squarrosa</i>		rough tree fern	HB/MB
ζ <i>Diplazium australe</i>			MB

<i>Doodia australis</i>		rasp fern	MB/SB
ζ <i>Histiopteris incisa</i>		water fern, mata	MB/TD
ζ <i>Hymenophyllum</i> sp.		filmy fern	SB
ζ <i>Hypolepis ambigua</i>			TD
ζ <i>H. dicksonioides</i>		giant hypolepis	MB
ζ <i>Lastreopsis glabella</i>		smooth shield fern	MB/SB
ζ <i>L. microsora</i>			
<i>Microsorium pustulatum</i>		hound's tongue	PB
* <i>Nephrolepis cordifolia</i>	p	tuber ladder fern	HB
ζ <i>Paesia scaberula</i>		lace fern, ring fern	MB
<i>Pellaea rotundifolia</i>		button fern, round-leaved fern	SB
<i>Pneumatopteris pennigera</i>		gully fern	MB/PB
<i>Polystichum neozelandicum</i>		shield fern	RB/SB
<i>Pteridium esculentum</i>		bracken	
<i>Pteris comans</i>		coastal brake	RB/SB/PB
ζ <i>P. macilenta</i>		sweet fern	MB
<i>P. tremula</i>		shaking brake	
<i>Pyrrosia eleagnifolia</i>		leather-leaf fern	

Gymnosperms (5) (N:1 E:4)

* <i>Araucaria heterophylla</i>	p	Norfolk Island pine	HB
* <i>Cupressus macrocarpa</i>	p	macrocarpa, Monterey cypress	MB
# * <i>Juniperus</i> sp.	p	juniper	
* <i>Pinus pinaster</i>	p	maritime pine	
* <i>P. radiata</i>	p	radiata pine, Monterey pine	
<i>Podocarpus totara</i>		totara	

Dicotyledonous Trees and Shrubs (65) (N:39 E:26)

* <i>Acacia mearnsii</i>	p	black wattle	HB
ζ <i>Avicennia marina</i>		mangrove	
<i>Brachyglottis repanda</i>		rangiora	
<i>Carmichaelia australis</i>		tree broom	
* <i>Cestrum nocturnum</i>		queen of the night	HB
* <i>Chrysanthemoides monilifera</i>		boneseed	
ζ <i>Clianthus puniceus</i>	p	kowhai ngutukaka, kakabeak	HB
# <i>Coprosma areolata</i>		thin-leaved coprosma	
<i>C. macrocarpa</i>		coastal karamu	
# <i>C. macrocarpa</i> x <i>C. propinqua</i>			
<i>C. macrocarpa</i> x <i>C. robusta</i>		coprosma hybrid	
<i>C. repens</i>		taupata	
<i>C. rhamnoides</i>		twiggy coprosma	
ζ <i>C. repens</i> x <i>C. rhamnoides</i>		coprosma hybrid	
<i>C. robusta</i>		karamu	
<i>Coriaria arborea</i>		tutu	
<i>Corynocarpus laevigatus</i>		karaka	
# * <i>Cotoneaster franchetii</i>		cotoneaster	
* <i>Cydonia oblonga</i>	p	quince	HB
<i>Dodonaea viscosa</i>		akeake	
<i>Dysoxylum spectabile</i>		kohekohe	
ζ <i>Elingamita johnsonii</i>	p		HB
<i>Entelea arborescens</i>		whau	
* <i>Erythrina crista-galli</i>	p	Cockspur coral tree	HB
* <i>Erythrina Xsykesii</i>	p	coral tree	HB
* <i>Eucalyptus macarthurii</i>	p	Camden woollybutt	HB
* <i>Eucalyptus</i> sp.	p	gum (<i>E. tereticorimus</i> or <i>E. cunuldulanthus</i>)	HB
*ζ <i>Feijoa sellowiana</i>	p	feijoa	HB
*ζ <i>Ficus benjamina</i>	p	weeping fig	HB
* <i>F. carica</i>	p	edible fig	HB
* <i>F. elastica</i>	p	rubber plant	HB
<i>Geniostoma ligustrifolium</i>		hangehange	
<i>Hebe macrocarpa</i>		hebe	
<i>H. stricta</i>		koromiko	
*ζ <i>Hibiscus rosa-sinensis</i>	p	hibiscus	HB
<i>Hoheria populnea</i>		lacebark	

*ζ <i>Hymenosporum flavum</i>	p	Australian frangipani	HB
ζ <i>Kunzea ericoides</i>	p	kanuka	
* <i>Lantana camara</i>		lantana	
* <i>Laurus nobilis</i>	p	bay laurel	HB
<i>Leptospermum scoparium</i>		manuka, tea tree	
ζ <i>Leucopogon fasciculatus</i>	p	mingimingi	
*ζ <i>Ligustrum sinense</i>		Chinese privet	
# * <i>Ligustrum ovalifolium</i>		hedge privet	
* <i>Lycium ferocissimum</i>		boxthorn	
<i>Macropiper excelsum</i>		kawakawa	
*ζ <i>Malus Xdomestica</i> 'Golden Delicious'	p	common apple	HB
ζ <i>Melicope ternata</i>	p	wharangi	
ζ <i>Melicytus novae-zelandiae</i>		coastal mahoe	
<i>M. ramiflorus</i>		mahoe	
<i>Metrosideros excelsa</i>		pohutukawa	
<i>Myoporum laetum</i>		ngaio	
<i>Myrsine australis</i>		mapou	
* <i>Nerium oleander</i>	p	oleander	HB
<i>Olearia furfuracea</i>		akepiro	
<i>Pittosporum crassifolium</i>		karo	
ζ <i>P. crassifolium</i> x <i>P. ralphii</i>	p		HB
# <i>Pouteria costata</i>		tawapou	
*ζ <i>Prunus xdomestica</i>	p	plum	HB
ζ <i>Pseudopanax crassifolius</i> x <i>P. lessonii</i>		pseudopanax hybrid	
<i>P. lessonii</i>		houpara	
ζ <i>P. arboreus</i>	p	five-finger	
# * <i>Psidium cattleianum</i>	p	purple guava	
*ζ <i>Radermachera sinica</i>	p	Asian bell-flower	HB
*ζ <i>Ricinus communis</i>	p	castor oil plant	HB
# * <i>Robinia pseudoacacia</i>		false acacia	
* <i>Salix cinerea</i>	p	grey willow	
* <i>S. fragilis</i>	p	crack willow	
ζ <i>Sophora chathamica</i>		coastal kowhai	
ζ <i>S. microphylla</i>	p	kowhai	
# * <i>Tamarix ?anglica</i>		tamarisk	
* <i>Ulex europaeus</i>	p	gorse	
<i>Vitex lucens</i>		puriri	

Dicotyledonous Lianes and Scrambling Plants (8) (N:3 E:5)

* <i>Anredera cordifolia</i>	p	Madeira vine	
* <i>Calystegia sepium</i>		pink bindweed	
<i>C. soldanella</i>		shore bindweed	
<i>Clematis paniculata</i>		clematis, puawhananga	
# * <i>Hedera helix</i>		ivy	
# * <i>Jasminum azoricum</i>		lemon scented jasmine	
<i>Muehlenbeckia complexa</i>		pohuehue	
*ζ <i>Rubus fruticosus</i> agg.		blackberry	
* <i>Vinca major</i>	p	periwinkle	HB
*ζ <i>Vitis vinifera</i>	p	ornamental grape	HB

Dicotyledonous Herbs (107) (N:21 E:86)

<i>Acaena novae-zelandiae</i>		red bidibid	
*ζ <i>Acetosa acetosella</i>		sheep's sorrel	
ζ <i>Alternanthera sessilis</i>		nahui	
*ζ <i>Amaranthus powellii</i>		redroot	
* <i>Anagallis arvensis</i> var. <i>arvensis</i>		scarlet pimpernel	
*ζ <i>Anthemis cotula</i>		stinking mayweed	
<i>Apium prostratum</i>		NZ celery	
*ζ <i>Aster subulatus</i>		sea aster	
* <i>Atriplex prostrata</i>		orache	
*ζ <i>Bellis perennis</i>		lawn daisy	
* <i>Cakile edentula</i>		sea rocket	
* <i>C. maritima</i>		sea rocket	
*ζ <i>Callitriche stagnalis</i>		starwort	

*ζ <i>Capsella bursa-pastoris</i>	shepherd's purse
*ζ <i>Cardamine hirsuta</i>	bitter cress
<i>Centella uniflora</i>	centella
*ζ <i>Centaureum erythraea</i>	centaury
*ζ <i>Cerastium fontanum</i>	mouse-ear chickweed
*ζ <i>Chenopodium album</i>	fat-hen
*ζ <i>Cirsium arvense</i>	Californian thistle
* <i>C. vulgare</i>	Scotch thistle
# * <i>Conium maculatum</i>	hemlock
* <i>Conyza albida</i>	broad-leaved fleabane
*ζ <i>Coronopus didymus</i>	twin cress
* <i>Crepis capillaris</i>	hawksbeard
* <i>Daucus carota</i>	wild carrot
<i>Dichondra repens</i>	native Mercury Bay weed
<i>Disphyma australe</i>	NZ ice plant
# <i>Einadia trigonos</i>	pigweed
*ζ <i>Epilobium ciliatum</i>	tall willow-herb
*ζ <i>Erigeron karvinskianus</i>	Mexican daisy
*ζ <i>Erechtites hieraciifolia</i>	American fireweed
*ζ <i>E. valerianifolia</i>	Brazilian fireweed
<i>Euchiton sphaericus</i>	Japanese cudweed
*ζ <i>Euphorbia peplus</i>	milkweed
* <i>Galium aparine</i>	cleavers
*ζ <i>G. divaricatum</i>	slender bedstraw
*ζ <i>Geranium dissectum</i>	cut-leaved geranium
* <i>G. gardneri</i>	
<i>G. molle</i>	dove's foot cranesbill
# <i>G. solanderi</i>	
<i>Haloragis erecta</i>	shrubby haloragis
* <i>Helminthotheca echioides</i>	oxtongue
*ζ <i>Hypochaeris radicata</i>	catsear
*ζ <i>Lapsana communis</i>	nipplewort
*ζ <i>Leontodon taraxacoides</i>	hawkbit
*ζ <i>Linum bienne</i>	pale flax
# * <i>L. trigynum</i>	yellow flax
<i>Lobelia anceps</i>	NZ lobelia, shore lobelia
*ζ <i>Lotus angustissimus</i>	slender birdsfoot trefoil
* <i>L. pedunculatus</i>	lotus
*ζ <i>L. suaveolens</i>	hairy birdsfoot trefoil
*ζ <i>Ludwigia palustris</i>	water purslane
*ζ <i>Lythrum hyssopifolia</i>	hyssop loosestrife
* <i>Malva parviflora</i>	small-flowered mallow
* <i>Medicago arabica</i>	spotted bur medick
*ζ <i>M. lupulina</i>	black medick
* <i>M. nigra</i>	bur medick
* <i>Melilotus indicus</i>	King Island melilot
*ζ <i>Mentha pulegium</i>	pennyroyal
* <i>Modiola caroliniana</i>	creeping mallow
*ζ <i>Myosotis arvensis</i>	field forget-me-not
* <i>Nasturtium officinale</i>	watercress
# <i>Nertera</i> sp.	nertera
*ζ <i>Nicandra physalodes</i>	apple of Peru
* <i>Orobanche minor</i>	broomrape
*ζ <i>Oxalis corniculata</i>	horned oxalis
ζ <i>O. exilis</i>	creeping oxalis
ζ <i>Pelargonium inodorum</i>	native storksbill, kopata
ζ <i>Persicaria decipiens</i>	swamp willow weed
* <i>Physalis peruviana</i>	Cape gooseberry
* <i>Phytolacca octandra</i>	inkweed
<i>Pimelea</i> aff. <i>urvilleana</i>	NZ daphne
* <i>Plantago lanceolata</i>	narrow-leaved plantain
* <i>P. major</i>	broad-leaved plantain
*ζ <i>Polycarpon tetraphyllum</i>	allseed
*ζ <i>Polygonum aviculare</i>	wireweed

*ζ <i>Portulaca oleracea</i>	purslane
* <i>Prunella vulgaris</i>	selfheal
<i>Pseudognaphalium luteoalbum</i>	Jersey cudweed
*ζ <i>Ranunculus parviflorus</i>	small-flowered buttercup
<i>R. reflexus</i>	native buttercup
* <i>R. repens</i>	creeping buttercup
*ζ <i>R. sardous</i>	hairy buttercup
# * <i>Rumex brownii</i>	hooked dock
*ζ <i>R. conglomeratus</i>	clustered dock
*ζ <i>R. obtusifolius</i>	broad-leaved dock
*ζ <i>R. pulcher</i>	fiddle dock
<i>Samolus repens</i>	sea primrose
<i>Sarcocornia quinqueflora</i>	glasswort
* <i>Scabiosa atropurpurea</i>	annual scabious
*ζ <i>Senecio bipinnatisectus</i>	Australian fireweed
# <i>S. hispidulus</i>	native fireweed
<i>S. lautus</i>	shore groundsel
*ζ <i>S. skirrhodon</i>	gravel groundsel
* <i>S. vulgaris</i>	groundsel
*ζ <i>Sherardia arvensis</i>	field madder
*ζ <i>Sisymbrium officinale</i>	hedge mustard
<i>Solanum americanum</i>	small-flowered nightshade
*ζ <i>Sonchus asper</i>	prickly sow thistle
* <i>S. oleraceus</i>	sow thistle, puha
*ζ <i>Stachys arvensis</i>	staggerweed
* <i>Taraxacum officinale</i>	dandelion
* <i>Trifolium repens</i>	white clover
* <i>Verbascum creticum</i>	cretan mullein
*ζ <i>V. thapsus</i>	woolly mullein
* <i>Verbena litoralis</i>	blue vervain
*ζ <i>Veronica arvensis</i>	field speedwell
*ζ <i>V. persica</i>	scrambling speedwell
*ζ <i>V. serpyllifolia</i>	turf speedwell
* <i>Vicia hirsuta</i>	hairy vetch
* <i>V. sativa</i>	common vetch
*ζ <i>V. tetrasperma</i>	smooth tare
ζ <i>Wahlenbergia violacea</i>	NZ harebell

Monocotyledons (other than Rushes and Sedges) (46) (N:10 E:36)

*ζ <i>Aloe arborescens</i>		candelabra aloe	
*ζ <i>Agrostis capillaris</i>		browntop	
*ζ <i>A. stolonifera</i>		creeping bent	
* <i>Allium triquetrum</i>		three-cornered garlic, onion weed	
*ζ <i>Anthoxanthum odoratum</i>		sweet vernal	
<i>Arthropodium cirratum</i>		rengarenga, rock lily	
* <i>Arum italicum</i>	p	Italian arum	HB
* <i>Asparagus scandens</i>		climbing asparagus	
<i>Astelia banksii</i>		coastal astelia	
* <i>Bambusa balcooa</i>	p	borak bamboo	HB
*ζ <i>Bromus diandrus</i>		ripgut brome	
*ζ <i>B. willdenowii</i>		prairie grass	
*ζ <i>Clivia miniata</i>	p	clivia, bush lily	HB
<i>Cordyline australis</i>		cabbage tree, ti kouka	
# <i>C. pumilio</i>		dwarf cabbage tree, ti rauriki	
*ζ <i>C. rubra</i>	p		HB
* <i>Cortaderia selloana</i>		pampas grass	
ζ <i>C. splendens</i>		coastal toetoe	
*ζ <i>Critesion murinum</i>		barley grass	
*ζ <i>Cynodon dactylon</i>		Indian doab	
* <i>Dactylis glomerata</i>		cocksfoot	
ζ <i>Dianella nigra</i>		NZ blueberry	
*ζ <i>Eleusine indica</i>		crowsfoot	
*ζ <i>Eucomis comosa</i>	p	pineapple lily	HB
*ζ <i>Holcus lanatus</i>		Yorkshire fog	

* <i>Kniphofia uvaria</i>	p	red hot poker	HB
* ζ <i>Lagurus ovatus</i>		haretail	
* <i>Lolium perenne</i>		perennial ryegrass	
ζ <i>Microlaena stipoides</i>		rice grass	
* <i>Monstera deliciosa</i>	p	fruit salad plant	HB
*ζ <i>Musa Xparadisiaca</i> 'Lady Fingers'	p	banana	HB
<i>Oplismenus hirtellus</i>		bush panic grass	
*ζ <i>Parapholis incurva</i>		sickle grass	SB
* <i>Paspalum dilatatum</i>		paspalum	
*ζ <i>P. distichum</i>		mercer grass	
* <i>Pennisetum clandestinum</i>		kikuyu	
* <i>Phyllostachys aurea</i>	p	walking stick bamboo, fishpole bamboo	HB
<i>Phormium tenax</i>		flax, harakeke	
<i>Poa anceps</i>		broad-leaved poa	
*ζ <i>P. annua</i>		annual poa	
* <i>Pseudosasa japonica</i>	p	arrow bamboo	HB
* <i>Rytidosperma racemosum</i>		danthonia	
ζ <i>Spinifex sericeus</i>		hairy spinifex	
* <i>Sporobolus africanus</i>		ratstail	
* <i>Stenotaphrum secundatum</i>		buffalo grass	
*ζ <i>Vulpia bromoides</i>		brome fescue	
* <i>Yucca gloriosa</i>	p	Spanish dagger	HB

Rushes (11) (N:7 E:4)

<i>Apodasmia similis</i>		oioi, jointed wire rush
*ζ <i>Juncus articulatus</i>		jointed rush
ζ <i>J. australis</i>		leafless rush
*ζ <i>J. bufonius</i>		toad rush
<i>J. edgariae</i>		wiwi
*ζ <i>J. effusus</i>		soft rush
*ζ <i>J. flavidus</i>		rush
ζ <i>J. pallidus</i>		giant rush, leafless rush
ζ <i>J. planifolius</i>		grass-leaved rush
ζ <i>J. sarophorus</i>		rush
ζ <i>Triglochin striata</i>		arrow-grass

Sedges (12) (N:10 E:2)

ζ <i>Carex dissita</i>		carex bush sedge
# <i>C. flagellifera</i>		Glen Murray tussock
ζ <i>C. lambertiana</i>		
ζ <i>C. lessoniana</i>		rautahi
ζ <i>C. pumila</i>		sand sedge
ζ <i>C. virgata</i>		swamp sedge
* <i>Cyperus eragrostis</i>		umbrella sedge
# * <i>C. rotundus</i>		purple nut sedge, nut grass
<i>C. ustulatus</i>		giant umbrella sedge, coastal cutty grass
<i>Ficinia nodosa</i> (syn. <i>Isolepis nodosa</i>)		knobby clubrush
ζ <i>Gahnia lacera</i>		cutty grass
<i>Isolepis cernua</i>		slender clubrush
ζ <i>I. prolifera</i>		three square
*ζ <i>I. sepulcralis</i>		

A trip to Totara North, Whangaroa Harbour

Maureen Young

In January 1992 Anthony Wright led one of his inimitable Bot Soc camps at Lanes Cove, Whangaroa Harbour. The aluminium dinghy belonging to Auckland Museum was used to ferry supplies to the cove, and to ferry people to islands and bays for botanising purposes. This area of Northland is a

botanist's delight, but unfortunately a camp report was not written up in the Journal.

On the weekend of 2-3 September 2006 three participants on that trip, Helen Cogle, Anne Fraser and myself, were hosted by Michael Winch with the