WAEWAETUTUKI WETLAND

Sarah Beadel

Waewaetutuki Wetland is located on the Pongakawa Plains inland of Waihī Estuary, coastal central Bay of Plenty. In 1992 I briefly looked at the wetland from the far side of the Kaikokopu Canal, and thought it looked like an interesting place to explore, never contemplating that it would be 20 years before this occurred (see Beadel 1994). Over the last few years I have been finding various *Pterostylis* species in grey willow wetlands around the Bay of Plenty in late spring, so for 2012 spring I planned trips to various wetlands to see if there were more populations out there. One of these wetlands was Waewaetutuki, where a small group of members met on 17 November 2012.

The wetland covers about *c.*85 ha, extending inland south of the southern edge of Waihī Estuary, being separated from the Estuary by a drain and a causeway. It is dissected into several parts by drains and causeways, and the margins are grazed by cattle - there was a herd of bulls present when we visited. There are large areas of ti kouka/grey willow forest, raupo reedland, and small areas of *Azolla filiculoides*-duckweed herbfield, *Azolla filiculoides*-Mercer grass fernland. The understorey of the grey willow forest is very diverse, comprising predominantly indigenous species. Species which are common, or locally common, in the understorey include *Machaerina rubiginosa*, *Coprosma propinqua*, *Muehlenbeckia complexa*, *Hydrocotyle pterocarpa*, swamp kiokio, kiokio, and swamp millet.

On the north-eastern side there is ti kouka/raupo-*Baumea articulata-Coprosma propinqua* shrub-reedland and ti kouka/*Coprosma propinqua-Muehlenbeckia complexa*/raupo reedland, and mosaics of these in association with *Calystegia sepium*, *Carex dipsacea*, *Juncus edgeriae, Cyperus ustulatus,* and local Japanese honeysuckle and pampas. There are also small patches of Mercer grass and arrow grass. There are also areas of *Carex sinclairii* sedgeland, *Schoenoplectus tabernaemontani* reedland, small areas of *Baumea articulata* reedland, and a small open area of *Azolla filiculoides*-bachelor's button herbfield with local Mercer grass and raupo.

In the north-eastern corner there is a small area of *Mimulus repens*-bachelor's buttons-arrow grass-creeping bent-*Isolepis cernua* herbfield. Other species present here include buck's-horn plantain, duckweed, annual poa, *Lilaeopsis novae-zelandiae*, sea rush, celery-leaved buttercup, and New Zealand celery.

The flora of the wetland is very diverse, with some very special features; and some great finds were made including the following threatened or uncommon species: *Pterostylis micromega*, *Mimulus repens, Cyclosorus interruptus,* and *Ranunculus macropus.* These are discussed below, along with various other discoveries, and a species list is attached.

PTEROSTYLIS MICROMEGA

P. micromega was found beneath grey willow and ti kouka. It was often growing on the raised root mats of the grey willow, often in association with *Hydrocotyle pterocarpa*. *P. micromega* is an endemic ground orchid which is classed as Nationally Critical (de Lange *et al.* 2009). It has been sighted at three locations previously in the Bay of Plenty - Te Kopia Scenic Reserve (Cheeseman 1925), Kaituna Wetland (Miller 1983), and I found one plant in the Arawa Wetland at Maketu in 2010 (Wildland Consultants 2011). Over 250 plants were found at the Waewaetutuki Wetland, in three parts of the wetland, and it is likely that many more plants are present. This makes it easily the largest known population in the Bay of Plenty, and one of the largest populations known. About 25% of the plants seen were flowering.

A small area of the grey willow forest had been aerially sprayed with herbicide 2-3 years ago. Whilst the understorey here is still predominantly indigenous, the species composition is different from the unsprayed willow forest, and it is not known whether the habitat present following spraying would be suitable for *P. micromega*. Only a brief inspection was made of the sprayed area, and no *P. micromega* were seen here.

P. micromega was formerly widespread, however it has become locally and regionally extinct or has declined across most of its range following drainage of wetlands, habitat invasion by weeds (particularly royal fern), damage by stock and also browsing by pest animals, including possum, pigs, and deer. Plant collection has also resulted in local extinctions. Fencing to exclude stock has been undertaken at some sites (not in the Bay of Plenty) but this has resulted in loss of plants through changes to the understorey structure, composition, and density. Studies have confirmed that without frequent habitat disturbance, *P. micromega* will disappear from a site as it becomes densely vegetated. As well as the population at this site, several other large populations have been discovered elsewhere in New Zealand beneath dense willow forest within the mineralised zone of lowland peat bogs. (de Lange *et al.* 2010.)

MIMULUS REPENS

A small population of *Mimulus repens* was found in the north-eastern corner of the wetland. *M. repens* is classed as At Risk-Naturally Uncommon (de Lange *et al.* 2009). This is the first record of *M. repens* in the Bay of Plenty since the mid-1990s. There are previous records from Ōhiwa Harbour (L. Daniels, Lands and Survey Department, pers. comm. mid-1980s), Tauranga Harbour (K. Owen, Department of Conservation, pers. comm. mid-1990s), Arawa Wetland, Maketū (Beadel 1989), and Little Waihī Estuary (Beadel 1991 and Beadel *et al.* 1996). However it has not been seen at any of these locations in the last 10-20 years.

CYCLOSORUS INTERRUPTUS

Cyclosorus interruptus was found in two separate parts of the wetland. One site comprised *c.*20 plants spread over about 50 m^2 and the other comprised *c.*7 plants over *c.*6 m^2. *Cyclosorus interruptus* is classed as At Risk-Declining by de Lange *et al.* 2009.

Waewaetutuki is the first new population to be found in the coastal Bay of Plenty since the mid-1990s, and is one of only three in Tauranga Ecological District. It is likely that there are more plants present as new fronds were emerging after winter dieback, and were still relatively small.

RANUNCULUS MACROPUS

Two small areas of *R. macropus* were found, covering *c.*2 × 2 m and 3 × 2 m respectively. These areas were separated by *c.*5 m. Several *P. micromega* plants were present adjacent to one of the *R. macropus* sites. *Ranunculus macropus* is classed as Data Deficient (de Lange *et al.* 2009), and within the Bay of Plenty Region is known from several scattered sites.

OTHER PLANT SPECIES

Other interesting discoveries were *Carex fascicularis*, *Pterostylis* aff. *banksii* "Summer", and *Spergularia tasmanica*. *Carex fascicularis* is not common in the Bay of Plenty, being known from only a few sites. *Pterostylis* aff. *banksii* "Summer" has been recorded from only two other wetlands in the Bay of Plenty: Kopuatawhiti Wetland and Tumurau Wetland on the Rangitāiki Plains (Wildland Consultants 2012a and b). *Spergularia tasmanica* has only previously been recorded from one or two sites elsewhere in the Bay of Plenty.

AVIFAUNA

One bittern (Threatened-Nationally Endangered, classifications follow Miskelly *et al.* 2008) was seen, and fernbird (At Risk-Sparse) were heard. Six pied stilt (At Risk-Declining) were seen in the *Carex sinclairii* sedgeland and Mercer grass-*Persicaria decipiens* grassland on the mid-eastern side of the wetland.

PEST PLANT SPECIES

Four royal fern plants were present. Two of these were pulled out, but two were too large to remove - *c.*1 m tall × 1 m wide. A full survey of the wetland should be undertaken to determine the extent of this species, followed by control. Two small clumps of ginger were found and these were also removed. Arum lily was scattered beneath the area of grey willow that had been aerially sprayed, and one plant was seen in the grey willow forest further to the north. Pampas and Japanese honeysuckle were present locally, and a few plants of *Carex lurida*. Chinese privet is also present.

ECOLOGICAL VALUES

This wetland is of very high ecological value. It contains a large and highly significant population of a nationally critical plant species, along with three other threatened plant species, and more may be discovered in the future. Future management of the wetland needs careful consideration. Issues include pest plant management, grazing, and drainage. At least two small areas have been previously excavated to create an open water area in the northern end of the wetland, and one area in the southern end. The wetlands are used for duck shooting, and two maimai were seen.

As noted above, one area of willow has been aerially sprayed and this area appears to no longer provide habitat suitable for *Pterostylis micromega*. However, conditions currently elsewhere at Waewaetutuki are suitable for *P. micromega*, and it would be advisable to continue current levels of grazing to maintain habitat suitable for this species. This is consistent with observations of *P. micromega* at other sites (de Lange *et al.* 2010). Control of royal fern in the wetland is also important.

M. repens also requires low open habitat. Without some level of grazing it is likely that the site where it currently occurs would be invaded with taller-growing species which would displace the *M. repens*.

Only parts of the wetland were explored during the day, and it is likely that there are further populations of some of the known threatened species, and possibly other indigenous threatened species waiting to be discovered. A trip to other parts of the wetland is planned for next year.

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VASCULAR PLANT SPECIES LIST FOR WAEWAETUTUKI WETLAND

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November 2012

INDIGENOUS SPECIES

Gymnosperms	
Dacrycarpus dacrydioides (Warwick Tapsell pers. comm.)	kahikatea
Monocot. trees and shrubs	
Cordyline australis	tī kōuka, cabbage tree
Dicot. trees and shrubs	
Avicennia marina subsp. *australasica*	mānawa, mangrove
Coprosma ×*cunninghamii* (*Coprosma propinqua* × *C. robusta*)	
Coprosma propinqua var. *propinqua*	mingimingi
Coprosma robusta	karamū, kāramuramu
Geniostoma ligustrifolium var. *ligustrifolium*	hangehange
Macropiper excelsum subsp. *excelsum*	kawakawa
Melicytus ramiflorus subsp. *ramiflorus*	māhoe
Plagianthus divaricatus	marsh ribbonwood, mākaka
Dicot. lianes	
Calystegia sepium subsp. *roseata*	pōhue
Muehlenbeckia australis	puka
Muehlenbeckia complexa	pōhuehue
Ferns	
Asplenium oblongifolium	huruhuru whenua
Asplenium polyodon	petako
Azolla filiculoides	retoretore
Blechnum chambersii	rereti, nini
Blechnum minus	swamp kiokio
Blechnum novae-zelandiae	kiokio
Cyathea dealbata	ponga, silver fern
Cyathea medullaris	mamaku
Cyclosorus interruptus	
Deparia petersenii subsp. *congrua*	
Dicksonia squarrosa	whekī

Diplazium australe	
Doodia australis	pukupuku
Histiopteris incisa	mātātā, water fern
Hypolepis ambigua	
Microsorum pustulatum	kōwaowao, pāraharaha, hound's tongue fern
Microsorum scandens	mokimoki
Paesia scaberula	mātātā
Pneumatopteris pennigera	pākau
Pteris macilenta	titipo, sweet fern
Pteris tremula	turawera, shaking brake
Pyrrosia eleagnifolia	leather-leaf fern

Orchids

Pterostylis aff. *banksii* "Summer"	
Pterostylis micromega	

Grasses

Isachne globosa	swamp millet
Oplismenus hirtellus subsp. *imbecillis*	
Poa imbecilla	

Sedges

Bolboschoenus fluviatilis	pūrua grass, kukuraho
Bolboschoenus medianus	pūrua grass
Carex dipsacea	
Carex fascicularis	
Carex geminata agg.	rautahi
Carex maorica	
Carex secta	pūrei, makura, pūreirei, pūrekireki, pūkio
Carex sinclairii	
Carex virgata	pūrei
Cyperus ustulatus f. *ustulatus*	toetoe upoko-tangata
Eleocharis acuta	spike sedge
Eleocharis gracilis	
Isolepis cernua	
Isolepis prolifera	
Machaerina arthrophylla	
Machaerina articulata	
Machaerina juncea	
Machaerina rubiginosa	
Schoenoplectus tabernaemontani	kāpūngāwhā
Schoenus maschalinus	

Rushes

Apodasmia similis	oioi
Juncus edgariae	wi, wīwī
Juncus kraussii var. *australiensis*	wi, wīwī sea rush
Juncus pallidus	wi, wīwī
Juncus planifolius	
Juncus prismatocarpus	
Juncus sarophorus	wi, wīwī

Monocot. herbs (other than orchids, grasses, sedges, and rushes)

Lemna minor	karearea
Phormium tenax	harakeke, flax
Triglochin striata	arrow grass
Typha orientalis	raupō

Composite herbs

Cotula coronopifolia	bachelor's button
Senecio glomeratus	pukatea
Senecio minimus	

Dicot. herbs (other than composites)

Apium prostratum subsp. *prostratum* var. *filiforme*	tūtae-kōau, New Zealand celery
Callitriche stagnalis	starwort
Centella uniflora	
Galium propinquum	mawe
Hydrocotyle pterocarpa	
Lilaeopsis novae-zelandiae	
Lobelia anceps	punakura
Mimulus repens	
Persicaria decipiens	tutunawai
Ranunculus amphitrichus	kawariki
Ranunculus macropus	raoriki
Samolus repens var. *repens*	māakoako
Spergularia tasmanica	sea spurrey

NATURALISED AND EXOTIC SPECIES

Dicot. trees and shrubs

Ligustrum sinense	Chinese privet
Lupinus arboreus	lupin
Rubus sp. (*R. fruticosus* agg.)	blackberry
Salix cinerea	grey willow
Ulex europaeus	gorse

Dicot. lianes

Calystegia silvatica	greater bindweed
Lonicera japonica	Japanese honeysuckle

Ferns

Osmunda regalis	royal fern

Grasses

Agrostis capillaris	browntop
Agrostis stolonifera	creeping bent
Bromus willdenowii	prairie grass
Cortaderia selloana	pampas
Dactylis glomerata	cocksfoot
Elytrigia pycnantha	sea couch
Glyceria maxima	reed sweetgrass
Holcus lanatus	Yorkshire fog
Lolium perenne	rye grass
Paspalum distichum	Mercer grass
Poa annua	annual poa
Poa trivialis	rough stalked meadow grass

Sedges

Carex lurida	sallow sedge
Carex ovalis	oval sedge
Carex vulpinoidea	fox sedge
Cyperus congestus	purple umbrella sedge
Cyperus eragrostis	umbrella sedge
Isolepis sepulcralis	

Rushes

Juncus acuminatus	sharp-fruited rush
Juncus articulatus	jointed rush
Juncus bufonius var. *bufonius*	toad rush
Juncus effusus var. *effusus*	soft rush, leafless rush
Juncus microcephalus	South American rush
Juncus tenuis var. *tenuis*	track rush

Monocot. herbs (other than orchids, grasses, sedges, and rushes)

Hedychium gardnerianum	kahili ginger, wild ginger
Zantedeschia aethiopica	arum lily

Composite herbs

Aster subulatus	sea aster

Bidens frondosa	beggars' ticks
Cirsium vulgare	Scotch thistle
Conyza sumatrensis	broad-leaved fleabane
Hypochaeris radicata	catsear
Senecio bipinnatisectus	Australian fireweed
Sonchus asper	prickly puha

Dicot. herbs (other than composites)

Atriplex prostrata	orache
Ceratophyllum demersum	hornwort
Digitalis purpurea	foxglove
Fumaria muralis	scrambling fumitory
Galium aparine	cleavers
Galium palustre	marsh bedstraw
Lotus pedunculatus	lotus
Ludwigia palustris	water purslane
Lythrum hyssopifolia	hyssop loosestrife
Myosotis scorpioides	water forget-me-not
Nasturtium officinale	watercress
Persicaria maculosa	willow weed
Plantago australis	swamp plantain
Plantago coronopus	buck's-horn plantain
Plantago lanceolata	narrow-leaved plantain
Plantago major	broad-leaved plantain
Ranunculus flammula	spearwort
Ranunculus sardous	hairy buttercup
Ranunculus sceleratus	celery-leaved buttercup
Rumex conglomeratus	clustered dock
Rumex obtusifolius	broad-leaved dock
Scrophularia auriculata	water figwort
Spergula arvensis	spurrey
Trifolium repens	white clover
Veronica anagallis-aquatica	water speedwell

BIRDS

Botaurus poiciloptilus	matuku; Australasian bittern
Bowdleria punctata	fernbird
Himantopus himantopus leucocephalus	poaka; pied stilt