Lake Pauri, Wanganui
Wanganui Plant List No 156

C C Ogle, with help of members of Wanganui Museum Botanical group, Wanganui
5 April 2003; lake recovery group 4 Sept 03; community planting 7 Aug 04.

Until Sept 2003, much of the lake shore was grazed. Swampy margins with indigenous wetland plants remained where stock could not reach or reached only for short times during very low lake levels. In places, some native plants with low or creeping growth forms survived in short turfs. A revegetation programme was initiated in 2004 between the landowners and Horizons Regional Council, with the help of school children and other volunteers, and contractors. Plants were propagated from seed that was mostly sourced locally, of species already present around the lake or species likely to have been here in the past. In the latter cases, the nearest natural sources were used. As an example, seed of the kowhai, *Sophora godleyi*, were obtained from trees growing on dunes at Lake Alice. Before planting commenced, attempts were made to eliminate willows, especially grey willow (*Salix cinerea*), since their spread was being controlled by grazing, to some extent.

Removal of grazing has resulted in the loss of native turf plants through rank growth of wetland exotic plants, especially Mercer grass and floating sweet-grass. Raupo is becoming more common in shallow waters. Since 2004, some unwanted dryland shrubs and vines have invaded the areas planted in shrubs. Most common has been hawthorn, but on slopes in the north-east near Pauri Road some 20 evergreen buckthorn (*Rhamnus alaternus*) were removed in Feb 2011. Also removed was one multi-stemmed and rooting old man's beard and a seedling of climbing asparagus. Lush shrubs of Jerusalem cherry were found fruiting under the remnant grove of titoki nearby; the fruit were picked and taken away and the shrubs removed. One tussock of the invasive exotic sedge, *Carex divulsa*, was found here in Feb 2011, but was not removed (needed a spade).

By summer of 2011, seedlings of titoki were abundant under the natural titoki grove near Pauri Rd, and occasional seedlings were found among plantings of other shrubs up to 50 m distant, or more. Many ferns, including young mamaku tree ferns, were under the titoki and among planted shrubs on slopes too steep for swards of exotic grasses.

Species listed by Kelly (1978), and actual sightings (C&W) by Champion & Wells (2003) (P Champion pers. comm. to CCO 11.6.04) are indicated separately.

Last amended & updated 29 March 2013

Species with a national conservation status (de Lange et al. 2009):

Stuckenia pectinata (fennel-leaved pondweed): **national status = at risk – nationally uncommon.** Recorded in 7 of the 95 lakes of the Horizons Regional Council area surveyed by Champion and Wells (2003), mostly based on pre-2004 records.

Crassula ruamahanga **(**a tiny mat-forming succulent**), national status = at risk – nationally uncommon.** Rare at Lake Pauri (east end), on the bases of willow trees in or close to the water. Also known at L. Wiritoa, including shore of "Scoutlands", and L Kaitoke. These 3 locations are the only known ones in Wanganui Conservancy and, until a recent (2000) find in the Waikato, the furthest north in NZ (next nearest to Lakes Wiritoa, Pauri and Kaitoke is the type locality, near Carterton).

Leptinella dispersa **ssp. *dispersa*** **(**a button daisy**) national status = at risk – nationally uncommon.** Uncommon at eastern end of L Pauri in turf mat. New record in April 2003. Wanganui becomes the nearest that the two subspecies of *L. dispersa* grow – subsp. *rupestris* is at west end of Castlecliff Beach on dripping wet mudstone cliffs. The next-nearest sites for ssp.

dispersa to L Pauri are near Tongaporutu in the north and Waikawa (Levin) in the south. NB: this species may have gone from L Pauri, following fencing of its turf habitat.

Lobelia perpusilla (lake turf pratia)**: national status = at risk – nationally uncommon.** Sparse at L Pauri and may have gone following fencing of its turf habitat. Also sparse at Lakes Wiritoa, Kaitoke, Westmere, Waikato and Tunnel Hill (near Koitiata).

Regionally uncommon or declining species of the wetlands include *Isachne globosa* (swamp millet), *Centipeda elatinoides, Hydrocotyle hydrophila, H. sulcata, H. pterocarpa, Rorippa palustris* (yellow marsh cress), *Isolepis distigmatosa, Bolboschoenus fluviatilis* (kukuraho), *Potamogeton ochreatus* (blunt pondweed), *Ruppia polycarpa* (horse's mane weed).

Plants listed were all in water or on swampy fringes, unless marked 'D' (Dryland species)[1]
Planted species from Aug 2004 onwards indicated by P (if already present naturally as well, planted specimens indicated as P+)

Abundance Ratings

a = abundant; c = common; o = occasional; u = uncommon
l = local (species in small area, but can be common or abundant there)
x = present, but abundance not assessed
***** denotes adventive species
! denotes species added to list in 2011

Formal name	Common name	Abundance	Kelly 1978	C&W 2003
Gymnosperm tree				
* Pinus muricata	Bishop pine	u[2] D		
Dicot trees, shrubs and lianes				
**Acer negundo*	box elder	l + juv		
Alectryon excelsus	titoki	u D		
(?)Calystegia sepium* agg.	convolvulus	o		
** Chamaecytisus palmensis*	tree lucerne, tagasaste	P + sdlg[3]		
Coprosma propinqua		lc; DP+		
Coprosma rigida?		P		
Coprosma robusta	karamu	l; DP+		
Coprosma propinqua X C. robusta		u		
Coriaria arborea	tutu	u		
Corynocarpus laevigatus	karaka	u		
** Crataegus monogyna*	hawthorn	l D		
Hebe stricta	koromiko	P		
Melicytus ramiflorus	mahoe	u ; D P+		
Muehlenbeckia complexa	small-leaved pohuehue	u		
Myoporum laetum	ngaio	P		
Olearia solandri	a shrub daisy	P		
Olearia virgata	a shrub daisy	P		
** Rhamnus alaternus*[4]	evergreen buckthorn	u D		

[1] Several indigenous plants and woody weeds of dryland were listed only from a steep slope and bank above the extreme north-east corner of the lake
[2] Presumed to have been planted; felled 2003
[3] self-established seedlings seen Feb 2011

* *Rubus fruticosus* agg.		lc		
* *Salix babylonica*	weeping willow	la		
* *Salix fragilis*	crack willow	lc		
* *Salix cinerea*	grey willow[5]	c		
* *Solanum pseudocapsicum*	Jerusalem cherry	l D!		
**Ulex europaeus*	gorse	o		
Monocot trees and lianes				
**Asparagus asparagoides*	climbing asparagus	! (see text)		
Cordyline australis	cabbage tree, ti kouka	o; P+		
Dicot herbs				
* *Amaranthus lividus*	purple amaranth	la		
* *Bidens frondosa*	beggar's ticks	u		
Callitriche petriei	native starwort	l		
* *Callitriche stagnalis*	starwort	u		
Centella uniflora		o		
Centipeda elatinoides[6]	sneezewort	o		
* *Ceratophyllum demersum*	hornwort	x[7]		
Cotula coronopifolia	bachelor's button	u		
Crassula ruamahanga		la		
Epilobium nummulariifolium	creeping willow-herb	l D		
* *Galium palustre*	marsh bedstraw	c		
Glossostigma elatinoides		lc		
* *Gamochaeta (Gnaphalium)* sp. (unidentified)	cudweed	u		
Hydrocotyle hydrophila		lc		
Hydrocotyle novaeseelandiae		lc		
Hydrocotyle pterocarpa		lc		
Hydrocotyle sulcata		u		
Lobelia (Pratia) perpusilla		u		
* *Ludwigia palustris*		a	K	
* *Mentha pulegium*	pennyroyal	o		
* *Myosotis laxa*	water forget-me-not	u		
Myriophyllum propinquum	water milfoil	c		
Myriophyllum triphyllum (K, as *M. elatinoides*)			K	
* *Nasturtium microphyllum*	one-row watercress			C&W
* *Nasturtium officinale*	two-row watercress		K	
* *Nymphaea alba*	water-lily	la	K	C&W
* *Persicaria hydropiper* (K, as *P*. spp.)	water pepper	c	K	
* *Persicaria maculosa*		u		
Persicaria decipiens	native willow-weed	o		C&W

[4] Removed 2003 – none seen in same area Aug 04, but some 20 young shrubs removed Feb 2011, 1 of them with flower buds.

[5] Aerially sprayed early 2004

[6] Decumbent, some rooting at nodes; flower head with peduncle; fruits not thickened at tip but hairy on angles (see Walsh 2001).

[7] This and several other aquatic species were found only in drift on the shore – abundance in the water unknown

Potentilla anserinoides	silver-weed	u		
Pseudognaphalium luteo-album agg.	cudweed	u		
Ranunculus amphitrichus	waoriki	u		
* *Ranunculus sceleratus*	celery-leaved buttercup	o		
* *Ranunculus flammula*	spearwort	u		
* *Ranunculus trichophyllus*	water buttercup	x[3]	K	C&W
Rorippa palustris	yellow marsh cress	c		
* *Rumex crispus*	curled dock	o		
* *Senecio bipinnatisectus*	fireweed	u		
* *Stellaria graminea*	stitchwort	u		

Monocot herbs

Bolboschoenus fluviatilis	kukuraho	u		
Carex breviculmis		u?; D		
Carex comans?		P		
* *Carex divulsa*	!	D		
Carex flagellifera		P		
Carex lessoniana	cutty-grass	l		
Carex maorica		u		
Carex secta	purei	o & lc; P+?		
Carex virgata		o		
Cortaderia fulvida	dryland toetoe	P		
Cortaderia toetoe	wetland toetoe	u		
Cyperus ustulatus	mariscus	o		
* *Egeria densa*				C&W
* *Elodea canadensis*	Canadian pondweed			C&W
Eleocharis acuta	sharp spike-sedge	o	K	
Isachne globosa	swamp millet	lc		
Isolepis distigmatosa		u		
Isolepis reticularis		u		
* *Juncus bufonius*	toad rush	u		
Juncus edgariae		lc		
* *Juncus effusus*	soft rush	o		
Juncus pallidus		u		
Juncus sarophorus		lc		
Lemna disperma	purple-backed duckweed		K	
* *Landoltia (Spirodela) punctata*		la		
**Paspalum distichum*	Mercer grass	la		
Phormium tenax	harakeke, NZ flax	lc; P+	K	
Poa anceps		l D		
Potamogeton cheesemanii	pondweed		K	
* *Potamogeton crispus*	curled pondweed		K	C&W
Potamogeton ochreatus	blunt pondweed	x [6]	K	
Potamogeton pectinatus	fennel-leaved pondweed		K	
Ruppia polycarpa[8]	horse's mane weed		K	

[8] Note that Kelly recorded *P. megacarpa*, C&W recorded *R. polycarpa* and believe (P Champion pers. comm. June 2004) that *P. megacarpa* was an error.

Schoenus maschalinus		u		
Triglochin striatum	arrowgrass	u		
Typha orientalis	raupo	a	K	
Ferns				
Adiantum cunninghamii	maidenhair fern	u D		
Asplenium polyodon	sickle spleenwort	u D		
Azolla rubra	Pacific azolla	lc	K	
Blechnum minus	swamp kiokio	o		
Cyathea medullaris	mamaku	u D		
Dicksonia squarrosa	wheki	u		
Histiopteris incisa	water fern	u		
Hypolepis ambigua		lc		
Microsorum pustulatum	hound's tongue fern	u D		
Polystichum neozelandicum ssp. *zerophyllum*	shield fern	u D		
Pteridium esculentum	bracken	u D		
Pteris tremula	shaking brake	! D		
Pyrrosia eleagnifolia	leather-leaf fern	u D		
Liverwort				
Ricciocarpos natans		lc		
Characean algae				
Chara australis				C&W
C. corallina			K	
Nitella hookeri			K	C&W

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Extract (with one added sentence about *Leptinella dispersa* subsp. *dispersa*) from:

WANGANUI MUSEUM BOTANICAL GROUP Newsletter 35/2 (May 2003)

Lake Pauri: Sat 5 April, 2003. Recent rain seemed to suggest that our record drought might be at an end, but for the 12 of us on the trip, the lake margins could hardly have been easier to explore. The landowner had said the lake was at a record low level, and we were able to walk the normally submerged or swampy shores. A downside was that cattle had also penetrated further into the swamps than probably happens most summers. The morning was mild and cloudy but looming rain clouds chased the last of us home about 2 pm. In fact, we covered only the eastern and south-eastern shores of the lake, such was the variety of native and exotic wetland plants, many in flower or fruit. In a sheltered 'bay', drying mud had cracked into polygons leading Bob [Hay] to speculate about what controls their shapes and sizes. Tops of the polygons supported mat plants; batchelor's button, *Ludwigia palustris, Centipeda elatinoides, Amaranthus lividus*, to name a few. We could even walk across water lilies without getting our feet wet. The lake shore was variously silty, sandy or even gravelly and gave a range of habitats for more mat plants, including the native *Glossostigma elatinoides, Hydrocotyle hydrophila, Lilaeopsis* sp. and, more rarely, *Lobelia perpusilla, Callitriche petriei* and *H. sulcata*. There was one small patch of what is probably *Leptinella* ~~*tenella*~~ [later identified by Peter Heenan from fresh flowering material as *L. dispersa* ssp. *dispersa*] in only its second known site in DoC's Wanganui Conservancy, the other being on the coast ~~at Kakaramea near Patea~~ near Tongaporutu (Lloyd 1972). Grey willows grew throughout the marginal swamps, but sparse enough to have beds of harakeke and *Carex secta* and, sometimes, *Machaerina rubiginosa*, with scattered shrubs of *Coprosma propinqua.* These swamps had some of the region's rarer plants that the cattle tracks made for easier finding; swamp millet (*Isachne globosa*), *Hydrocotyle pterocarpa* and *Crassula ruamahanga*, this last growing on willow tree bases. Only a minority of the region's chain of dune lakes have some kind of reserve status. The lakes share a range of native species, but most have some that are not found or are rare around the others. Managing all the lakes to retain their collectively diverse native flora is a challenge for landowners and management agencies.
Colin Ogle