

## Lake Rotongata and Patotara (Bullring), Okataina field trip

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On 2<sup>nd</sup> April 2023 a group of nine botanists and a child headed to Okataina to visit an area not botanised since 1989 by Rotorua Botanical Society (Shaw and Beadel 1989). This was planned as a survey of wetlands around the crater lakes. There are three craters in this area, namely Lake Rotongata and the larger Lake Rotoatua to the east of Okataina Road in Waione Block Scenic Reserve and the Patotara (Bullring) in Lake Okataina Scenic Reserve, which is a dry crater to the immediate west of the road. Our original intention was to visit the former two lakes and associated wetlands, but this plan was changed at the last minute as it was decided that due to the very wet summer we had had, water levels would be very high at Lake Rotoatua, which would make a trip around the lake very wet and difficult.

Our first visit was to the Patotara (Bullring) – a much drier if not weedier option for the day. This presented a good opportunity to reassess the lowland ribbonwood (*Plagianthus regius* subsp. *regius*) population which is the largest known ribbonwood population in the Rotorua Ecological District, where it is a very rare species. We walked down the track from the road into the bottom of the crater.

Luckily, we had a slasher with us, which was necessary for cutting through the blackberry (*Rubus fruticosus* agg.) and bindweed (*Calystegia sepium* subsp. *roseata*) that was abundant amongst the exotic pasture grasses – cocksfoot (*Dactylis glomerata*), Yorkshire Fog (*Holcus lanatus*) and tall fescue (*Lolium arundinaceum*) – that were common in the bottom of the crater. Lotus (*Lotus pedunculatus*), foxglove (*Digitalis purpurea*), fleabane (*Erigeron sumatrensis*) and Californian thistle (*Cirsium arvense*) were also common. The highly modified exotic-dominated vegetation in the crater bottom reflects a long history of pastoral grazing. The crater was grazed up until the 1950s or 1960s (J. Hobbs *pers. comm.*). Clear animal tracking, probably mostly from wallabies, could be seen throughout the clearing. Regeneration of indigenous vegetation appeared to be slow with only an occasional kohuhu (*Pittosporum tenuifolium*) or manuka (*Leptospermum scoparium*) present. However, the crater margins on steeper slopes showed more abundant regeneration with kohuhu-koromiko (*Hebe stricta*)-dominated scrub abundant along the southern side of crater wall adjoining the margin of the more open grassland described above.

Eventually we had cut our way through the blackberry to the north-eastern corner of the clearing below the Okataina Road. Occasional scattered grey willow (*Salix cinerea*) trees were present through the clearing which the author spent quality time removing as we made our way through the clearing. In the north-eastern corner we admired the large wheki-ponga (*Dicksonia fibrosa*) which dominated the understorey of the tawa (*Beilschmiedia tawa*) and kahikatea (*Dacrycarpus dacrydioides*)-dominated forest on the crater edge. Apart from some occasional

ground ferns, mainly heruheru (*Leptopteris hymenophylloides*), there were little other understory species, reflecting the ongoing grazing from wallabies and deer whose tracking was noted through the clearing.

Also of concern, we noted an extensive infestation of African clubmoss (*Selaginella kraussiana*) which is present in the understory here along with a small patch of heavily browsed montbretia (*Crocasmia × crocosmiiflora*) and some occasional male fern (*Dryopteris filix-mas*).

We noted a small number of very large, mature lowland ribbonwood present. It was also pleasing to note a face of regenerating ribbonwood with many younger regenerating trees ranging from about 6 to 8 metres in height. Also noted were two saplings further out in the clearing amongst the blackberry, at about two metres in height. We could also see a larger ribbonwood tree, alone, towards the middle of the clearing. It was good to see some level of regeneration of the ribbonwood population. We then scrambled up the steep bank back to the road where we decided to take an early lunch.

In the afternoon we crossed the road and walked down the gully through tawa-dominated forest with occasional large emergent rimu (*Dacrydium cupressinum*) and kahikatea present. The subcanopy was dominated by abundant supplejack, ponga (*Cyathea dealbata*), wheki-ponga and wheki (*Dicksonia squarrosa*). The understorey was dominated by fern species, in particular *Hymenophyllum demissum* and some *Lastreopsis velutina* were noted.

Eventually we reached the edge of the wetland. The margins were dominated by dense swamp coprosma (*Coprosma tenuicaulis*) shrubland with manuka pretty much as described previously by King (1985) and Shaw and Beadel (1989). In the understory *Carex maorica*, *C. virgata* and *C. secta*, *Juncus effusus*, *J. edgariae* and raupo (*Typha orientalis*) were present. The ground cover was mostly sphagnum (*Sphagnum cristatum*) with scattered *Ranunculus amphitricus* and *Lobelia angulata* common in shallow water. Occasional kahikatea and also rimu saplings were noted growing in the wetland amongst swamp coprosma in various places. The orchid *Drymoanthus adversus* was noted on swamp coprosma in the wetland in one location as well. Maru (*Sparganium subglobosum*) was sparsely present throughout this vegetation type. This is an uncommon species in wetlands in the Bay of Plenty. Unfortunately, the vast majority of it was floating dead in the water having been pulled out, presumably by waterfowl or pukekos. Very few intact plants were noted.

The author ventured further out into the wetland over his gumboots. Here the vegetation comprised occasional clumps of manuka amongst areas of raupo reedland, *Eleocharis acuta* sedgeland, *Machaerina arthrophylla* and *M. rubiginosa* reedland with abundant sphagnum throughout. Occasional grey willow saplings

were noted amongst vegetation along the SW edge, mostly less than 1 metre high. It was more than 10 years since DOC had last undertaken willow control in this wetland, therefore it was good to see that the rate of grey willow reinvasion had been very slow. All willows found were hand-pulled or cut and treated with herbicide gel. Towards edge of the open water *Eleocharis sphacelata* sedgeland became more dominant.

We made our way around the wetland in a clockwise direction, most of the botanists staying close to the forest-wetland margin. Water levels were above average for April. Most of the forest margin along the north side was dominated by kahikatea of varying sizes with saplings occasionally present further out in the wetland. Other species noted included gypsywort (*Lycopus europaeus*), which was common on the margins with water purslane (*Ludwigia palustris*) further out. Further around the eastern side of the wetland manuka was more dominant on wetland margins with still plenty of kahikatea saplings and small stunted trees present scattered throughout the margin. *Machaerina tenax* was also sighted along with *Potamogeton cheesemanii*. No willows were seen on this side of the wetland. Occasional gorse (*Ulex europaeus*) plants were noted on the wetland margin in places, but most were dead as a result of high water levels.

The group completed the circumnavigation of the entire wetland. Upon re-joining our previous track, a single individual of toetoe (*Austroderia fulvida*) was noted on the wetland margin, the only one seen in the entire wetland. The group decided to take the short, steep shortcut up the slope to the vehicles, getting back to the cars about 3 pm.

In summary, this visit to Lake Rotongata reconfirmed that this is still a very significant wetland in the Rotorua Ecological District, being in a relatively unmodified state with its original vegetation still mostly intact, and minimal weed issues. It was also good to reconfirm that the lowland ribbonwood population in Patotara was still present and is slowly expanding with good regeneration noted.

## References

King, D.R. 1985. Botanical survey of Waione Block Scenic Reserve. *Unpublished report*. D.S.I.R., Rotorua. 9 p.

Shaw, W,B., Beadel, S.M. 1989. Three notable Rotorua wetlands. *Rotorua Botanical Society Newsletter* 16:18-20.



Figure 1, 2: Wetland margin vegetation alongside Lake Rotongata.

# Rotongata (Mirror Lake) and surrounds; Bull Ring (Patotara)

Graeme Jane & Gael Donaghy

Visit Date: 02-04-2023

Map: BE38 Grid Ref: -38.073 176.42

## Key

\* = exotic or introduced species

x\_\_ = Beadel and Shaw (1989) for Lake Rotongata

\_x\_ = this visit for Lake Rotongata

\_\_x = this visit for Patotara (Bullring)

H = additions by John Hobbs this visit.

## Gymnosperm trees and shrubs

xxH	<i>Dacrycarpus dacrydioides</i> ( <i>Podocarpus</i> )	kahikatea, white pine
xx_	<i>Dacrydium cupressinum</i>	rimu, red pine
__H	<i>Podocarpus totara</i> var. <i>totara</i>	totara
_x_	<i>Prumnopitys taxifolia</i> ( <i>Podocarpus spicatus</i> )	matai; black pine

## Monocotyledonous trees and shrubs

_x_	<i>Cordyline australis</i>	cabbage tree; ti-kouka
_x_	<i>Cordyline banksii</i>	forest cabbage tree; ti ngahere
_x_	<i>Rhopalostylis sapida</i>	nikau

## Dicotyledonous trees and shrubs

_x_	<i>Alectryon excelsus</i> ssp. <i>excelsus</i>	titoki
_x_	<i>Alseuosmia macrophylla</i>	toropapa; shrubby honeysuckle
__x	<i>Aristotelia serrata</i>	wineberry; makomako
xx_	<i>Beilschmiedia tawa</i>	tawa
_x_	<i>Brachyglottis repanda</i>	rangiora; bushman's friend
_xx	<i>Carpodetus serratus</i>	putaputaweta; marbleleaf
_x_	<i>Coprosma autumnalis</i>	raurekau; kanono; mamono
_Hx	<i>Coprosma robusta</i>	karamu
_Hx	<i>Coprosma rotundifolia</i>	round-leaved coprosma
xxx	<i>Coprosma tenuicaulis</i>	
_x_	<i>Elaeocarpus dentatus</i> var. <i>dentatus</i>	hinau
xx_	<i>Elaeocarpus hookerianus</i>	pokaka
__x	* <i>Erica lusitanica</i>	Spanish heath
__x	<i>Fuchsia excorticata</i>	fuchsia; kotukutuku
_x_	<i>Geniostoma ligustrifolium</i> var. <i>ligustrifolium</i>	hangehange; privet
_x_	<i>Griselinia lucida</i>	puka
__x	<i>Hebe stricta</i> var. <i>stricta</i> ss.	koromiko
_x_	<i>Hedycarya arborea</i>	pigeonwood; porokaiwhiri
_x_	<i>Knightia excelsa</i>	rewarewa; NZ honeysuckle
_x_	<i>Laurelia novae-zelandiae</i>	pukatea
xx_	<i>Leptospermum scoparium</i> var. <i>scoparium</i>	manuka; red teatree
_x_	<i>Litsea calicaris</i>	mangeo

_x_	<i>Melicytus ramiflorus</i> ssp. <i>ramiflorus</i>	mahoe
xx_	<i>Myrsine australis</i>	red matipo; mapou
_x_	<i>Olearia rani</i> var. <i>colorata</i>	heketara
_Hx	<i>Pennantia corymbosa</i>	kaikomako
_x_	<i>Piper excelsum</i> ssp. <i>excelsum</i> ( <i>Macropiper</i> )	kawakawa; pepper tree
_x_	<i>Pittosporum eugeniioides</i>	lemonwood; tarata
_xx	<i>Pittosporum tenuifolium</i> agg.	black matipo; kohuhu
__x	<i>Plagianthus regius</i> ssp. <i>regius</i> ( <i>P. betulinus</i> )	lowland ribbonwood; manatu
_H_	<i>Pseudopanax arboreus</i> agg.	five finger; puhou; whaupaku
x_x	<i>Pseudopanax crassifolius</i>	lancewood; horoeka
xx_	<i>Pterophylla racemosa</i> ( <i>Weinmannia</i> )	kamahi; towai; tawhero
__x	* <i>Rosa rubiginosa</i>	sweet briar
xxx	* <i>Salix cinerea</i>	grey willow
x__	* <i>Salix</i> × <i>fragilis</i>	crack willow
_x_	<i>Schefflera digitata</i>	pate; patae; kotete
_x_	<i>Solanum laciniatum</i>	poroporo
_x_	<i>Streblus heterophyllus</i> ( <i>Paratrophis microphylla</i> )	turepo; milk tree
_xx	* <i>Ulex europaeus</i>	gorse
_xx	<i>Urtica ferox</i>	tree nettle; ongaonga

### Monocotyledonous lianes

_x_	<i>Freycinetia banksii</i> ( <i>F. baueriana</i> var.)	kiekie
_x_	<i>Ripogonum scandens</i>	supplejack; kareao

### Dicotyledonous lianes and related trailing plants

__x	<i>Calystegia sepium</i> subsp. <i>roseata</i>	NZ bindweed; powhiwhi
_xx	<i>Clematis cunninghamii</i> ( <i>C. parviflora</i> )	scented clematis; pokopoko
_H_	<i>Metrosideros diffusa</i>	white climbing rata; akatea
_x_	<i>Metrosideros fulgens</i>	scarlet rata; winter rata
_xH	<i>Metrosideros perforata</i>	aka; small white rata; torotoro
_x_	<i>Muehlenbeckia australis</i>	pohuehue
__x	<i>Muehlenbeckia complexa</i>	pohuehue; wire vine
_HH	<i>Parsonsia capsularis</i> var. <i>capsularis</i>	small-flowered jasmine; akakiore
_x_	<i>Parsonsia heterophylla</i>	Maori jasmine; kaihu; kaiwhiria
_xH	<i>Passiflora tetrandra</i> ( <i>Tetrapathaea</i> )	passionfruit; kohia
_x_	<i>Rubus cissoides</i>	bush lawyer; tataramoa
__x	* <i>Rubus fruticosus</i> agg.	blackberry
_xx	<i>Rubus schmidelioides</i> var. <i>schmidelioides</i>	bush lawyer; tataramoa

### Psilopsids, Lycopods & Quillworts

_x_	<i>Phlegmariurus billardierei</i>	
_xx	* <i>Selaginella kraussiana</i>	African clubmoss

### Ferns

_x_	<i>Asplenium bulbiferum</i>	hen and chickens fern; moku
_xx	<i>Asplenium flaccidum</i> ss.	hanging spleenwort; makawe

_x_	<i>Asplenium oblongifolium</i> ( <i>A. lucidum</i> )	shining spleenwort
xx_	<i>Asplenium polyodon</i> ( <i>A. falcatum</i> )	sickle spleenwort; petako
_x_	<i>Blechnum chambersii</i> ( <i>B. lanceolatum</i> )	nini; lance fern
_x_	<i>Blechnum discolor</i> ( <i>Lomaria</i> )	crown fern; piupiu; petipeti
_x_	<i>Blechnum filiforme</i> ( <i>Icarus</i> )	climbing hard fern; thread fern
_x_	<i>Blechnum fluviatile</i> ( <i>Cranfillia</i> )	kiwakiwa; kiwikiwi
xx_	<i>Blechnum minus</i>	swamp kiokio
_x_	<i>Blechnum novae-zelandiae</i>	kiokio
_x_	<i>Cyathea dealbata</i>	ponga; silver fern
_x_	<i>Cyathea medullaris</i>	mamaku; korau; black tree fern
_x_	<i>Cyathea smithii</i>	soft-leaved tree fern; katote
_xx	<i>Dicksonia fibrosa</i>	wheki-ponga; kuripaka
_x_	<i>Dicksonia squarrosa</i>	wheki; harsh tree fern
_x_	<i>Diplazium australe</i> ( <i>Athyrium</i> )	
_x_	* <i>Dryopteris filix-mas</i>	male fern
_x_	<i>Histiopteris incisa</i>	water fern
_x_	<i>Hymenophyllum demissum</i>	piripiri; irirangi
_x_	<i>Hymenophyllum dilatatum</i>	lop-sided filmy fern
_xx	<i>Hymenophyllum flabellatum</i>	fan fern
_x_	<i>Hymenophyllum sanguinolentum</i>	blood-scented filmy fern
_x_	<i>Lastreopsis hispida</i> ( <i>Rumohra</i> )	hairy fern, hairy legs
_H_	<i>Lastreopsis velutina</i> ( <i>Ctenitis</i> )	velvet fern
_H_	<i>Lecanopteris pustulata</i> ssp. <i>pustulata</i> ( <i>Microsorium</i> )	hound's tongue; kowaowao
_x_	<i>Lecanopteris scandens</i> ( <i>Microsorium</i> )	mokimoki; fragrant fern
_x_	<i>Leptolepia novae-zelandiae</i>	lacey fern
_H_	<i>Leptopteris hymenophylloides</i> ( <i>Todea</i> )	single crepe fern; heruheru
_x_	<i>Loxogramme dictyopteris</i> ( <i>Anarthropteris lanceolata</i> )	sexy fern
_x_	<i>Notogrammitis heterophylla</i> ( <i>Ctenopteris</i> )	
_x_	<i>Paesia scaberula</i>	scented fern; matata; ring fern
_x_	<i>Pakau pennigera</i> ( <i>Pneumatopteris</i> )	gully fern; pakau; pakauroraro
_H_	<i>Parapolystichum glabellum</i> ( <i>Lasteropsis</i> )	felted fern
_x_	<i>Polystichum vestitum</i>	prickly shield fern; punui
_x_	<i>Polystichum wawranum</i>	common shield fern; pikopiko
_x_	<i>Pteridium esculentum</i>	bracken; rauaruhe
_x_	<i>Pteris macilenta</i>	sweet fern
_H_	<i>Pteris tremula</i>	turawera
xHx	<i>Pyrrosia elaeagnifolia</i>	leather-leaf fern
_x_	<i>Rumohra adiantiformis</i>	butcher's fern
_x_	<i>Tmesipteris elongata</i>	
_x_	<i>Tmesipteris sigmatifolia</i>	
_x_	<i>Tmesipteris tannensis</i>	chain fern; fork fern
_x_	<i>Trichomanes venosum</i>	veined bristle fern

## Orchids

_x_	<i>Drymoanthus adversus</i>	
_x_	<i>Earina autumnalis</i>	Easter orchid; raupeka
xx_	<i>Earina mucronata</i>	spring orchid; peka-a-waka

## Grasses

_x_	* <i>Agrostis capillaris</i>	browntop
xx_	<i>Austroderia fulvida</i>	kakaho; toetoe
_x_	* <i>Dactylis glomerata</i>	cocksfoot
x_x	* <i>Holcus lanatus</i>	Yorkshire fog
xx_	<i>Isachne globosa</i>	swamp millet
_x_	* <i>Lolium arundinaceum</i> ( <i>Festuca</i> , <i>Schedonorus</i> )	
_x_	<i>Microlaena avenacea</i>	bush rice grass; oat grass
_x_	* <i>Poa annua</i>	annual poa

## Sedges

_x_	<i>Carex dissita</i>	
x_	<i>Carex fascicularis</i>	
xHx	<i>Carex geminata</i>	
_x_	<i>Carex lessoniana</i>	
_xx	<i>Carex maorica</i>	
x_x	<i>Carex secta</i>	pukio
_x_	<i>Carex solandri</i>	
_xx	<i>Carex uncinata</i> ( <i>Uncinia</i> )	watu
xxx	<i>Carex virgata</i>	
xx_	<i>Eleocharis acuta</i>	spike rush
x_	<i>Eleocharis gracilis</i>	
xx_	<i>Eleocharis sphacelata</i>	
x_	<i>Isolepis distigmata</i>	
x_	<i>Machaerina arthropphylla</i> ( <i>Baumea</i> )	
_x_	<i>Machaerina articulata</i> ( <i>Baumea</i> )	
xx_	<i>Machaerina rubiginosa</i> ( <i>Baumea</i> )	
xx_	<i>Machaerina tenax</i> ( <i>Baumea</i> )	
xx_	<i>Schoenus maschalinus</i>	

## Rushes and allied plants

_x_	* <i>Juncus articulatus</i>	jointed rush
x_	* <i>Juncus bulbosus</i>	bulbous rush
_x_	<i>Juncus edgariae</i>	wiwi
_xx	* <i>Juncus effusus</i> var. <i>effusus</i>	soft rush
x_	<i>Juncus prismatocarpus</i>	
_x_	* <i>Juncus tenuis</i> ssp. <i>tenuis</i>	track rush

## Remaining Monocotyledonous herbs

xx_	<i>Astelia hastata</i> ( <i>Collospermum</i> )	kahakaha
x_	<i>Astelia microsperma</i> ( <i>Collospermum</i> )	

_x_	<i>Astelia solandri</i>	kowharawhara
__x	* <i>Crocasmia × crocosmiiflora</i>	montbretia
_x_	<i>Potamogeton cheesemanii</i>	red pondweed
x__	<i>Potamogeton suboblongus</i>	
xx_	<i>Sparganium subglobosum</i>	
xx_	<i>Typha orientalis</i>	raupo

### Daisy-like herbs

xx_	* <i>Bidens frondosa</i>	beggar's ticks
__x	* <i>Cirsium arvense</i>	Californian thistle
__x	* <i>Cirsium vulgare</i>	Scotch thistle
__x	* <i>Crepis capillaris</i>	hawksbeard
__x	* <i>Erechtites hieraciifolius</i>	american fireweed
__x	* <i>Erigeron sumatrensis (Conyza)</i>	broad-leaved fleabane
__x	* <i>Hypochaeris radicata</i>	catsear
__x	* <i>Jacobaea vulgaris (Senecio jacobaea)</i>	ragwort
__x	* <i>Lactuca serriola</i>	prickly lettuce
__x	* <i>Mycelis muralis</i>	wall lettuce
__x	<i>Senecio bipinnatisectus</i>	Australian fireweed
__x	* <i>Sonchus asper</i>	prickly sow thistle; puha

### Dicotyledonous herbs other than Daisies

__x	<i>Acaena anserinifolia</i> agg.	bidibid
__x	* <i>Acaena novae-zelandiae</i>	red bidibid; piripiri
_x_	<i>Callitriche muelleri</i>	starwort
__x	* <i>Cerastium fontanum</i> ssp. <i>vulgare</i>	mouse-eared chickweed
__x	* <i>Conium maculatum</i>	hemlock
__H	* <i>Daucus carota</i>	carrot
__Hx	* <i>Digitalis purpurea</i>	foxglove
x__	* <i>Epilobium ciliatum</i>	tall willow-herb
x__	<i>Epilobium pallidiflorum</i>	
__x	<i>Epilobium pedunculare</i> ss.	
_x_	<i>Galium perpusillum</i> ss.	bedstraw
__H	<i>Galium propinquum</i>	
__x	* <i>Geranium gardneri</i> (G. "coarse hairs")	
__x	* <i>Geranium molle</i>	dove's foot cranesbill
__x	* <i>Geranium robertianum</i>	herb Robert
__x	* <i>Geum urbanum</i>	kopata
__xx	<i>Hydrocotyle dissecta</i>	
xx_	<i>Hydrocotyle pterocarpa</i>	
_x_	<i>Lobelia angulata (Pratia)</i>	panakenake
__xx	* <i>Lotus pedunculatus (L. major; L. uliginosus)</i>	lotus major
__x	* <i>Lotus suaveolens</i>	hairy birdsfoot-trefoil
xx_	* <i>Ludwigia palustris</i>	water purslane
_x_	* <i>Lycopus europaeus</i>	gipsywort

__x	* <i>Lysimachia arvensis</i> ssp. <i>arvensis</i> var. <i>arvensis</i> ( <i>Anagallis</i> )	scarlet pimpernel
__x	* <i>Myosotis arvensis</i>	field forget-me-not
xx_	<i>Myriophyllum propinquum</i>	
__x	* <i>Pastinaca sativa</i>	wild parsnip
__x	* <i>Phytolacca octandra</i>	inkweed
__x	* <i>Potentilla indica</i> ( <i>Duchesnia</i> )	Indian strawberry
__x	* <i>Prunella vulgaris</i>	selfheal
_x_	<i>Ranunculus amphitrichus</i>	waoriki
xx_	* <i>Ranunculus flammula</i>	spearwort
x__	<i>Ranunculus glabrifolius</i>	
__x	* <i>Ranunculus repens</i>	creeping buttercup
__x	* <i>Rumex pulcher</i>	fiddle dock
__x	* <i>Sagina apetala</i>	pearlwort
__x	* <i>Sison amomum</i>	stone parsley
__x	* <i>Solanum nigrum</i>	black nightshade
__x	* <i>Stellaria graminea</i>	stitchwort
__x	<i>Stellaria parviflora</i>	



Figure 3: Looking east across Patotara (Bullring).