

Pukerimu Ecological Area Field Trip

Paul Cashmore

On 10 April 2022 14 members of Rotorua Botanical Society and Waikato Botanical Society met up at the end of Key Road on the southern end of the Mamaku Plateau between Rotorua and Tokoroa. The purpose was to visit a small but significant 113 ha block of virgin podocarp forest remnant on the edge of Pukerimu Stream. This small reserve was set aside in the 1980s along with the nearby and much larger Mokaihaha Ecological Area to the east, to preserve some representative examples of the once extensive rimu- dominated forests of the Mamaku Plateau which at the time were being rapidly clear-felled for radiata pine (*Pinus radiata*) conversion on a large scale. These two Ecological Areas were eventually transferred to DOC upon its creation in 1987 for protection in perpetuity.

Today, ironically, the radiata pine forest, which was planted around the reserve when the native forest was cleared, is now itself partly gone, at least along the southern boundary of the reserve. This was quickly converted into productive dairy farmland in very late 1999 with the breaking up of Carter Holt Harvey Forests and the subsequent selling off of large areas of former radiata pine forest on flatter landforms on the southern part of the Mamaku Plateau for dairy conversion.

So today this reserve is very much land-locked with forestry land on its northern boundary and a large dairy farm to the south, from where we accessed the block. The reserve is an arrow shape on the map lying on both sides of the Pukerimu Stream, which in this section is a deep ignimbrite gorge. The reserve has very different vegetation on both sides of the stream. The smaller part on the northern side has been cleared in the past and is a mixture of regenerating grassland and secondary indigenous scrub and shrubland. The southern side of the stream which is larger is dominated by tall kamahi-(rewarewa) forest along the stream margins and some areas along the southern boundary. The remainder is the more interesting vegetation, being a remnant of virgin podocarp forest and an area of frost-flat shrubland, which is where we concentrated our botanical survey for the day. It was this forest sequence resulting from pre-European fires that was the reason John Nicholls identified this particular area as an Ecological Area (Nicholls 1978).

We entered the forest in the SW corner into tall kamahi (*Weinmannia racemosa*) dominated forest. Mahoe (*Melicactus ramiflorus*) and putaputaweta (*Carpodetus serratus*) were also common with wheki-ponga (*Dicksonia fibrosa*) dominant in the subcanopy. Further into the forest we came across a population of dactylanthus

(*Dactylanthus taylorii*) which is one of several subpopulations in the reserve. This threatened root parasite has been managed for over 25 years in Pukerimu by DOC following on from some of Chris Ecroyd's original dactylanthus research work in the 1980s and early 1990s, which took place at the site. As it was the end of the flowering season, we were able to search for and find a few remaining flowers to photograph as a treat for those who hadn't seen this unique plant before.

We continued in a NE direction until we ended up amongst large straight rimu (*Dacrydium cupressinum*) dominated forest with large miro (*Prumnopitys ferruginea*), matai (*Prumnopitys taxifolia*) and tanekaha (*Phyllocladus trichomanoides*) on some open ridges. The understorey was relatively sparse with occasional tree ferns and tawa (*Beilschmiedia tawa*) in the subcanopy. It is a good example of the once great forests of the Mamaku Plateau.



Figure 1: Tall rimu, matai and miro in canopy with tawa. Photo: Paul Cashmore

Our party continued on scrambling across a few small gullies and streams avoiding the worst of the supplejack (*Ripogonum scandens*). Overall, the going was fairly easy as the understorey was not dense with the exception of unpalatable tree ferns, especially wheki ponga, heruheru (*Leptopteris hymenophylloides*) and Prince of Wales fern (*Leptopteris superba*) in damper areas. All this time we were listening to two stags roaring continuously to each other not too far away.



Figure 2: Lunch on a ridge amongst emergent rimu and tawa canopy. *Photo: Paul Cashmore*

We stopped for lunch on a ridge under a canopy of tall rimu/tawa forest with an open understorey before heading further east into areas of secondary forest with kanuka (*Kunzea robusta*) and tanekaha (*Phyllocladus trichomanoides*) dominant. A few toatoa (*Phyllocladus toatoa*) were noted in one spot also.

From here we traversed more tawa-dominated forest before skirting through more secondary forest with kanuka and kohuhu (*Pittosporum tenuifolium*), lancewood (*Pseudopanax crassifolius*) and broadleaf (*Griselinia littoralis*) on the edge of Dead Dog Clearing in the eastern corner of the reserve. In this area we noted some epiphytes we hadn't previously seen in the reserve including *Pittosporum cornifolium*, and Kirk's daisy (*Brachylgottis kirkii*). We noted a large kanuka with tall, straight trunk, unbranched till in the canopy, that there were discussions about, until we eventually found a fallen branchlet of capsules, to confirm the identification. The groundcover in this area is still dominated by dense ferns, mainly heruheru, kiwakiwa (*Blechnum fluviatile*) and Prince of Wales fern which thrive in these wet conditions.

As we approached the edge of this frost flat ecotone, we encountered a range of small-leaved shrubs typical of this type of habitat including rohutu (*Neomyrtus pedunculatus*), *Raukaua anomalus*, *Melicope simplex*, a large pokaka (*Elaeocarpus hookerianus*) and kaikomako (*Pennantia corymbosa*) growing in close proximity.

After observing and debating the small-leaved shrubs we eventually made our way out into the shrubland proper. The frost-flat scrub and shrubland is dominated by manuka (*Leptospermum scoparium*)-*Coprosma taylorae*-Spanish heath (*Erica lusitanica*) scrub with monoao (*Dracophyllum subulatum*) and koromiko (*Hebe stricta*) still present. A few wilding Douglas fir (*Pseudotsuga menziesii*) saplings were still present. These have spread from the neighbouring plantation before it was harvested and turned into a dairy farm. We inspected some of the small remaining clearings which are not as extensive as they used to be. Here, four-square sedge (*Lepidosperma australe*) persists along with Yorkshire fog (*Holcus lanatus*) and *Leucopogon fraseri*. Silver tussock (*Poa cita*) is now hard to find as clearings have grown over with some *Hierochloe redolens* still persisting. Under the denser scrub *Blechnum penna-marina* ssp. *alpina* is common with some bush rice grass (*Microlaena avenacea*) on the edges.



Figure 3: Inspecting the frost-flat shrubland of Dead Dog Clearing. *Photo: Paul Cashmore*

We soon broke out onto the dairy farm and followed the fenceline around the southern boundary back to the cars. We noted a few toru (*Toronia toru*) on a warm face and some larger scattered old radiata pine amongst the native forest which DOC hadn't treated yet. A few more stands of tanekaha were noted along with the usual mix of adventives that are found on edges including Himalayan honeysuckle (*Leycesteria formosa*), buddleia (*Buddleja davidii*) and Spanish heath. When viewed from the farmland on high points it provided some good views north over the reserve

across the pole tanekaha and kamahi-dominated forest areas back towards the large rimu-dominated forest we had walked through earlier towering over it.

In summary, this was a good opportunity for the Botanical Society to gain an appreciation of what the virgin podocarp forest on the Mamaku Plateau looked like and some of the unique threatened plants present within it. Although the understorey is modified by deer browsing in recent decades the reserve has received few visitors other than DOC staff and hence has minimal weed issues and recent human impacts. The reserve has future potential with kokako numbers building in the nearby Mokaihaha Reserve. This may enable Pukerimu to receive ongoing animal pest control and may one day support kokako again as the population spreads out from Mokaihaha.

While we had a successful trip with a good turnout the day was somewhat dampened by a post-trip COVID-19 mini-outbreak with a range of participants contracting COVID on the trip. Thankfully everyone made a full recovery.

Maybe we need to be more vigilant in future! Editors.

Reference

Nicholls, J.L. 1978a: New Zealand Forest Service ecological area proposals in the Mamaku-Rotorua area. *Unpublished report*. Forest Research Institute, Rotorua.

Pukerimu, Mamaku Plateau –species list

Graeme Jane

Key to Authors:

x : AP Druce

1: P Cashmore & J Hobbs

2: Rotorua Botanical Society

3: CE Ecroyd NZFRI herbarium specimens

* = exotic or introduced species

Visit dates:

12-10-1978

2006

10-4-2022

1985—1991

Map: BE36

Grid Ref: 1864325 5767328

2	* <i>Agrostis capillaris</i>	browntop
x	<i>Alseuosmia macrophylla</i>	toropapa; shrubby honeysuckle
2	* <i>Anthoxanthum odoratum</i>	sweet vernal
x	<i>Aristotelia serrata</i>	wineberry; makomako
x	<i>Asplenium bulbiferum</i>	hen and chickens fern; moku
x	<i>Asplenium flaccidum</i>	hanging spleenwort; makawe
x	<i>Asplenium oblongifolium</i>	shining spleenwort
x	<i>Asplenium polyodon</i>	sickle spleenwort; petako
1	<i>Astelia fragrans</i>	bushflax; kakaha
x	<i>Astelia microsperma</i>	
2	<i>Astelia solandri</i>	kowharawhara

x	<i>Austroderia fulvida</i>	kakaho; toetoe
x	<i>Beilschmiedia tawa</i>	tawa
2	* <i>Bellardia viscosa</i>	tarweed
1	* <i>Betula pendula</i>	birch
x	<i>Blechnum chambersii</i>	nini; lance fern
x	<i>Blechnum deltooides</i>	
x	<i>Blechnum discolor</i>	crown fern; piupiu; petipeti
1	<i>Blechnum filiforme</i>	Climbing hard fern; thread fern
x	<i>Blechnum fluviatile</i>	kiwakiwa; kiwikiwi
x	<i>Blechnum novae-zelandiae</i>	kiokio
x	<i>Blechnum penna-marina</i> ssp. <i>alpina</i>	alpine blechnum
2	<i>Brachyglottis kirkii</i> var. <i>kirkii</i>	Kirks daisy
x	<i>Brachyglottis repanda</i>	rangiora; bushmans friend
2	* <i>Buddleja davidii</i>	summer lilac; buddleia
x	<i>Cardamine forsteri</i>	
2	<i>Carex banksiana</i>	
x	<i>Carex breviculmis</i>	
x	<i>Carex healyi</i>	
x	<i>Carex horizontalis</i>	
2	<i>Carex megalepis</i>	
x	<i>Carex testacea</i>	
x	<i>Carex uncinata</i>	watu
2	<i>Carex virgata</i>	
x	<i>Carex zotovii</i>	
x	<i>Carpodetus serratus</i>	putaputaweta; marbleleaf
2	* <i>Cerastium glomeratum</i>	annual mouse-eared chickweed
1	* <i>Cirsium arvense</i>	Californian thistle
1	* <i>Cirsium vulgare</i>	Scotch thistle
x	<i>Clematis paniculata</i>	clematis; puawhananga
x	<i>Coprosma autumnalis</i>	raurekau; kanono; mamono
x	<i>Coprosma lucida</i>	karamu; shining karamu
2	<i>Coprosma propinqua</i> x <i>C. tayloriae</i>	
x	<i>Coprosma rhamnoides</i>	thorny coprosma
x	<i>Coprosma robusta</i>	karamu
x	<i>Coprosma tayloriae</i>	
x	<i>Cordyline australis</i>	cabbage tree; ti-kouka
x	<i>Coriaria arborea</i> var. <i>arborea</i>	tree tutu
2	* <i>Cortaderia selloana</i>	pampas
x	<i>Corybas oblongus</i>	
3	<i>Corybas trilobus</i>	
2	* <i>Crepis capillaris</i>	hawksbeard
2	<i>Cyathea cunninghamii</i>	slender tree fern; gully tree fern
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
2	* <i>Cytisus scoparius</i>	broom
x	<i>Dacrycarpus dacrydioides</i>	kahikatea, white pine
x	<i>Dacrydium cupressinum</i>	rimu, red pine
3;1	<i>Dactylanthus taylorii</i>	wood rose
x	<i>Dendrobium cunninghamii</i>	bamboo orchid
x	<i>Deyeuxia avenoides</i>	mountain oatgrass
x	<i>Dianella nigra</i>	blueberry; turutu
x	<i>Dichondra repens</i>	Mercury Bay weed
x	<i>Dicksonia fibrosa</i>	wheki-ponga; kuripaka
x	<i>Dicksonia squarrosa</i>	wheki; harsh tree fern
2	* <i>Digitalis purpurea</i>	foxglove
2	<i>Diplazium australe</i>	
x	<i>Dracophyllum strictum</i>	totorwhiti; grass tree
x	<i>Dracophyllum subulatum</i>	monoao
1	<i>Drosera auriculata</i>	
2	* <i>Dryopteris filix-mas</i>	male fern
x	<i>Earina autumnalis</i>	Easter orchid; raupeka
x	<i>Earina mucronata</i>	spring orchid; peka-a-waka
x	<i>Elaeocarpus dentatus</i> var. <i>dentatus</i>	hinau
x	<i>Elaeocarpus hookerianus</i>	pokaka
x	<i>Epilobium alsinoides</i>	
x	<i>Epilobium tenuipes</i>	
1	* <i>Erica lusitanica</i>	Spanish heath
2	* <i>Erigeron sumatrensis</i>	broad-leaved fleabane
2	<i>Fuchsia excorticata</i>	fuchsia; kotukutuku
2	<i>Gahnia pauciflora</i>	
2	* <i>Gamochaeta coarctata</i>	
x	<i>Gaultheria antipoda</i>	snowberry; tawiniwini
x	<i>Gaultheria antipoda</i> x <i>G. paniculata</i>	
2	<i>Gaultheria oppositifolia</i> x <i>G. paniculata</i>	
2	<i>Gaultheria paniculata</i>	
x	<i>Geniostoma ligustrifolium</i> var. <i>ligustrifolium</i>	hangehange; privet
x	<i>Geranium brevicaule</i>	
1	<i>Geranium microphyllum</i> "mainland"	small-leaved crane's bill
x	<i>Geranium potentilloides</i>	
x	<i>Gonocarpus micranthus</i>	
x	<i>Griselinia littoralis</i>	broadleaf; kapuka
2	<i>Griselinia lucida</i>	puka
x	<i>Hebe stricta</i> var. <i>stricta</i>	koromiko
x	<i>Hedycarya arborea</i>	pigeonwood; porokaiwhiri
x	<i>Helichrysum filicaule</i>	slender everlasting
x	<i>Hierochloa redolens</i>	sweet-scented holy grass
x	<i>Histiopteris incisa</i>	water fern

2	*	<i>Holcus lanatus</i>	Yorkshire fog
x		<i>Hymenophyllum demissum</i>	piripiri; irirangi
x		<i>Hymenophyllum dilatatum</i>	lop-sided filmy fern
x		<i>Hymenophyllum flabellatum</i>	fan fern
1		<i>Hymenophyllum flexuosum</i>	
x		<i>Hymenophyllum frankliniae</i>	
2		<i>Hymenophyllum multifidum</i>	
2		<i>Hymenophyllum nephrophyllum</i>	kidney fern; raurenga
x		<i>Hymenophyllum rarum</i>	wire-stemmed filmy fern
x		<i>Hymenophyllum revolutum</i>	
x		<i>Hymenophyllum sanguinolentum</i>	blood-scented filmy fern
x		<i>Hymenophyllum scabrum</i>	coarse-haired filmy fern
2	*	<i>Hypochaeris radicata</i>	catsear
x		<i>Isolepis reticularis</i>	
x		<i>Ixerba brexioides</i>	tawari
2	*	<i>Jacobaea vulgaris</i>	ragwort
2	*	<i>Juncus tenuis</i> ssp. <i>tenuis</i>	track rush
x		<i>Knightia excelsa</i>	rewarewa; NZ honeysuckle
x		<i>Kunzea robusta</i> (as <i>Kunzea ericoides</i>)	kanuka; white teatree
x		<i>Lagenophora pumila</i>	
x		<i>Lepidosperma australe</i>	four square; square sedge
1		<i>Leptecophylla juniperina</i> ssp. <i>juniperina</i>	
x		<i>Leptopteris hymenophylloides</i>	single crepe fern; heruheru
x		<i>Leptopteris hymenophylloides</i> x <i>L. superba</i>	
x		<i>Leptopteris superba</i>	Prince of Wales feather
x		<i>Leptospermum scoparium</i> var. <i>scoparium</i>	manuka; red teatree
2	*	<i>Leucanthemum vulgare</i>	oxeye daisy
x		<i>Leucopogon fasciculatus</i>	mingimingi; kaikaitau
x		<i>Leucopogon fraseri</i>	patotara
1	*	<i>Leycesteria formosa</i>	Himalayan honeysuckle
x		<i>Lindsaea trichomanoides</i>	
2		<i>Lobelia angulata</i>	panakenake
x		<i>Loxogramme dictyopteris</i>	sexy fern
3		<i>Luzula congesta</i>	
2		<i>Luzula decipiens</i>	
3		<i>Luzula picta</i>	
1		<i>Lycopodium deuterodensum</i>	puakarimu
x		<i>Lycopodium fastigiatum</i>	mountain clubmoss
x		<i>Lycopodium volubile</i>	waewae-koukou; climbing clubmoss
x		<i>Melicope simplex</i>	poataniwha
1		<i>Melicytus lanceolatus</i> var. <i>lancelolatus</i>	narrow-leaved mahoe; mahoe-wao
x		<i>Melicytus ramiflorus</i> ssp. <i>ramiflorus</i>	mahoe
1		<i>Metrosideros colensoi</i>	
x		<i>Metrosideros diffusa</i>	white climbing rata; akatea

x	<i>Microlaena avenacea</i>	bush rice grass; oat grass
2	<i>Microlaena stipoides</i>	forest rice grass
x	<i>Microsorium pustulatum</i> ssp. <i>pustulatum</i>	hound's tongue; kowaowao
2	<i>Microsorium scandens</i>	mokimoki; fragrant fern
x	<i>Microtis unifolia</i>	onion orchid
2	<i>Muehlenbeckia australis</i>	poheuhue
1	* <i>Mycelis muralis</i>	wall lettuce
x	<i>Myrsine australis</i>	red matipo; mapou
x	<i>Myrsine salicina</i>	toro
x	<i>Neomyrtus pedunculata</i>	rohutu
x	<i>Nestegis lanceolata</i>	white maire
x	<i>Notogrammitis billardierei</i>	common strap fern
x	<i>Notogrammitis heterophylla</i>	
x	<i>Oxalis exilis</i>	yellow oxalis; creeping oxalis
2	<i>Paesia scaberula</i>	scented fern; matata; ring fern
2	<i>Parsonsia capsularis</i> var. <i>capsularis</i>	Small-flowered jasmine; akakiore
x	<i>Pellaea rotundifolia</i>	tarawera; button fern
x	<i>Pennantia corymbosa</i>	kaikomako
2	<i>Phlegmariurus billardioreanum</i>	
x	<i>Phlegmariurus varius</i>	hanging clubmoss; iwituna
x	<i>Phyllocladus toatoa</i>	toatoa
x	<i>Phyllocladus trichomanoides</i>	tanekaha
1	* <i>Pinus contorta</i> var. <i>contorta</i>	lodgepole pine; contorta pine
1	* <i>Pinus pinaster</i> ssp. <i>pinaster</i>	maritime pine
1	* <i>Pinus radiata</i>	Monterey pine; radiata
1	<i>Pittosporum colensoi</i>	
x	<i>Pittosporum tenuifolium</i>	black matipo; kohuhu
x	<i>Pakau (Pneumatopteris) pennigera</i>	gully fern; pakau; pakauroharoha
x	<i>Poa cita</i>	silver tussock
x	<i>Podocarpus laetus</i>	Hall's totara; thin bark totara
x	<i>Podocarpus totara</i> var. <i>totara</i>	totara
1	<i>Polystichum vestitum</i>	prickly shield fern; punui
1	<i>Polystichum wawranum</i>	common shield fern; pikopiko
1	* <i>Populus yunnanensis</i>	Yunnan poplar
3	<i>Prasophyllum colensoi</i>	Leek orchid
x	<i>Prumnopitys ferruginea</i>	miro; brown pine
x	<i>Prumnopitys taxifolia</i>	matai; black pine
2	* <i>Prunella vulgaris</i>	selfheal
x	<i>Pseudopanax arboreus</i>	five finger; puhou; whaupaku
x	<i>Pseudopanax crassifolius</i>	lancewood; horoeka
1	* <i>Pseudotsuga menziesii</i> var. <i>menzesii</i>	Douglas-fir
x	<i>Pseudowintera axillaris</i>	horopito
x	<i>Pseudowintera colorata</i>	pepperwood; mountain horopito
x	<i>Pteridium esculentum</i>	bracken; rauaruhe

3	<i>Pterostylis banksii</i>	Greenhood; tutukiwi
x	<i>Pyrrhosia elaeagnifolia</i>	leather-leaf fern
x	<i>Ranunculus reflexus</i>	maruru; hairy buttercup
x	<i>Raukaua anomalus</i>	whauwhaupaku
2	<i>Raukaua edgerleyi</i>	rauakawa
x	<i>Ripogonum scandens</i>	supplejack; kareao
x	<i>Rubus australis</i>	bush lawyer
x	<i>Rubus cissoides</i>	bush lawyer; tataramoa
2	<i>Rubus schmidelioides</i> var. <i>schmidelioides</i>	bush lawyer; tataramoa
x	<i>Rumohra adiantiformis</i>	butcher's fern
x	<i>Rytidosperma gracile</i>	forest fairy grass
x	<i>Schefflera digitata</i>	pate; patae; kotete
2	<i>Senecio bipinnatisectus</i>	Australian fireweed
1	<i>Solanum americanum</i>	small-flowered nightshade
1	<i>Solanum aviculare</i> var. <i>aviculare</i>	poroporo
2	* <i>Sonchus oleraceus</i>	sow thistle; puha; puka
2	<i>Streblus heterophyllus</i>	turepo; milk tree
x	<i>Thelymitra longifolia</i>	white sun orchid
x	<i>Tmesipteris elongata</i>	
1	<i>Tmesipteris tannensis</i>	chain fern; fork fern
1	<i>Toronia toru</i>	toru
x	<i>Trichomanes venosum</i>	veined bristle fern
2	* <i>Trifolium pratense</i>	red clover
2	* <i>Trifolium repens</i>	white clover
x	<i>Urtica sykesii</i>	stinging nettle
x	<i>Weinmannia racemosa</i>	kamahi; towai; tawhero