Waikato Botanical Society Newsletter No. 47 December 2020

Presidents Report

Hi Everyone,

It has been a busy few months since the last newsletter in June. I have managed to get to most of our events and they have been well attended. Linda has done a fantastic job of getting our speakers lined up each month. Monique arranged that the last few talks are broadcast and we have had people viewing from as far afield as Whitianga and Nelson. The fields trips have been varied in flora, terrain, geography. For me there is always something new to see on these trips.

These photos are from the Dickies flat trip in September and I hadn't seen either of these before.

Thomas and Catherine ran a bryophyte workshop in September up at the University in which much time was spent peering down a microscope into the mysterious world of mosses.

Mida salicifolia flowers

Cyrtostylis oblonga

The committee has been working behind the scenes to keep things ticking along. If you haven't renewed your subscription then please do so.

The highlight of the year for me was the recent trip to Driving Creek where we were invited by the Driving Creek Railway to do a Botanical Survey of their QE II covenant which included a trip up to the top of the property on the train.

We are in the process of organising next years events so please contact Linda for ideas on speakers and Thomas for field trip ideas.

Kerry

Elected Committee Members 2020

President:	Kerry Jones	km8j1s@gmail.com
Secretary & Night Talks:	Linda Watson	watsonlinda092@gmail.com
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	Monique Hall	- see above

Committee members: Catherine Beard, Thomas Emmitt, Monique Hall, Rebecca Yeates, Kerry Jones, Linda Watson, Mike Clearwater, Antoinette van der Weerden, Wyne Johns

Contents

UPCOMING EVENTS

UPCOMING NIGHT TALKS

Our popular night talks will continue to take place every third Monday of each month.
Venue: The Link Centre, on the corner of Te Aroha street and River Rd, Hamilton East
Time: 6 pm to 7:30 pm

February 15	Dr. David Pattemore	Science Team Leader for Pollination and Apiculture at Crop and Food Research
March 15	Catherine Beard	DOC Topic: history of botanical illustration and historical artists of note
April 19 (AGM)	Dr Carlos Lehnebach	Te Papa Museum Topic: NZ orchids

Please keep a look out on our website waikatobotsoc.org.nz
Facebook Page: https://www.facebook.com/WaikatoBotSoc
and email updates to our members for further information.

UPCOMING TRIPS

January 30 – February 1	Led by Thomas Emmitt (027 540 5762) Weekend trip to Mokau, visiting Tainui Scenic Reserve, Mohokatino wetland, Tongapurutu and the Three sisters area.
February 28	Led by Antoinette van der Weerden & Monique Hall (monique.hall@waikato.ac.nz, 027 542 3584) Te Toto Gorge, Raglan
March 13/14 or 27/28 (TBC)	Led by Lucy Roberts (027 586 2547, lroberts@doc.govt.nz) Nikau Caves
April 11	Led by Graeme Jane & Gael Donaghy (07 5703123, gtjane@kinect.co.nz) Homunga Bay, Waihi (combined with Rotorua Botanical Society)
May	TBC
June	TBC

Waikato Regional Council Pest Management Plant

Sinead Spedding Monday, July 20 2020

The Waikato Regional Council Biosecurity team are responsible for implementing rules within the Regional Pest Management Plan 2014- 2024 (RPMP). The council can do this with the support of the Biosecurity Act 1993. This Biosecurity Act has two main purposes, one is the prevention of new pests or unwanted organisms from entering the country, the other is the management of already established unwanted organisms or pests. This Act provides legislative support for the management of any organism capable of forming a self-sustaining population with the potential to cause adverse effects on environmental, economic, or social values. The Act also enables each council to tailor their regional pest management plan, this allows each council to carefully consider each pest species for their climatic tolerances, management needs and expectations from the community.

The seven areas of the Waikato that are covered by the Waikato Regional Council's pest plant officers

The Waikato Regional Council (the council) have seven biosecurity pest plant officers operating over the region. The primary responsibility of these officers includes monitoring, advisory, surveillance and enforcement.

The purpose of the plan is to set out the strategic and statutory framework for the effective management of pest plants and pest animals in the Waikato region:

1. Minimise the actual or potential adverse effects of pest plants and pest animals on the environment; and

2. Maximise the effectiveness of individual pest plant and animal management action by way of a regionally coordinated approach (Waikato Regional Council 2014).

Pest plants can adversely affect the health and yield of production animals, plantation forests and/or crops. Long term management of pest of this nature is needed to ensure that these pests do not adversely affect the economic base of the region.

The council have several methods that are utilised to carry out the duties required of them under the RPMP. These include enforcement of landowner control species such as woolly nightshade (*Solanum mauritianum*), moth plant (*Araujia sericifera*) and mignonette vine (*Anredera cordifolia*). These species are predominantly reported to us from members of the community.

Direct control work is organised by the pest plant officers, the species that are directly controlled by this are listed under an 'eradication' category, some examples are evergreen buckthorn (*Rhamnus alaternus*), cathedral bells (*Cobaea scandens*) and rough and field horsetail (*Equistetum hyemale* and *Equisetum arvense*, retrospectively).

Direct control work being undertaken by staff (photo credit: Sinead Spedding)

Aerial work being undertaken (Photo credit: Sinead Spedding)

The council also contributes to the National Biocontrol Collective group run by Manaaki Whenua Landcare Research. This group financially funds the research, experiments, and initial release of biocontrol agents. Councils are then able to purchase releases of more biocontrol agents from Manaaki Whenua Landcare Research. The most recent biocontrol released by the council is the moth plant beetle (*Freudeita cf. cupripennis*), initially released in February 2020. The council will be receiving another release in February 2021 of this beetle.

Biocontrol agent for woolly nightshade with frass on the edge of the leaf (Photo credit: Hamish Hodgson)

The council also undertakes surveillance of low incident and high threat species. To undertake the surveillance the council employs several techniques including on the ground grid searching, drone or helicopter footage and the use of detector dogs.
If you want to report a pest plant the best way to do this is by using the online forum available on our website or by calling 0800 800 401 to speak to a biosecurity officer.

References:

Waikato Regional Council. 2014. *Waikato Regional Pest Management Plan 2014- 2024.* Plan, Hamilton: Waikato Regional Council.

https://bps.waikatoregion.govt.nz/online-services/new/RequestForService/step/1?Subject=Biosecurity

Meat lovers – New Zealand plants with an appetite for meat

Lucy Roberts Monday, 21 September 2020

My talk for Waikato Botanical Society in September was about plants in New Zealand, native and exotic, which have an appetite for meat.

As David Hansford (2015) said in his NZ geographic article, “There’s a ghoulish appeal in the paradox of plants that eat animals.” I was inspired to choose this topic for several reasons: I read David Hansford New Zealand Geographic magazine entitled Meat Lovers. Secondly, I had early childhood recollections of John Wyndham's ‘Day of the Triffids’ TV series. Thirdly, there is a bit of an overlap with my Weed Technical Advisors role with the Department of Conservation.

“Carnivorous plants are those that derive some or most of their nutrients (but not energy which they derive from photosynthesis) from trapping and consuming animal, typically insects and other arthropods.” (NZPCN).

There are approximately 583 true carnivorous plants represented by 16 genera worldwide, found on all the continents, except Antarctica and some Pacific Islands. Only 2 of the most common genera occur in New Zealand: *Drosera* (Sundews) and *Utricularia* (Bladderworts). There are 7 native and 2 naturalised species of *Drosera* (Sundews) and *Utricularia* (Bladderworts) there are 3 native and 5 naturalised species (NZPCN).

Native sundew *Drosera binata*, Opuatia wetland, Waikato (photograph by Kerry Jones)

Naturalised Bladderwort *Utricularia sandersonii*, Coromandel (photograph by Thomas Emmitt)

Seepages, peatlands, bogs and lakes, roadsides and clay banks are the habitats in which carnivorous plants can be found in New Zealand.

Habitat loss, climate change and introduced exotic carnivorous plants species are some of the threats to carnivorous plants in New Zealand. Several carnivorous plants appear to have been deliberately planted into natural areas in New Zealand.

For more information about New Zealand's wonderful carnivorous plants: read David Hansford's article with photographs by George Novak, Bruce Salmons Carnivorous Plants of New Zealand and check out the NZPCN website.

Lucy's talk was the first time we live-streamed our talk via Zoom and recorded it.
We're going online!
We will continue to try this for each night talk, with the presenters' permission. The way we do it may change, but at this stage, the Zoom link will be shared via Facebook and emailed to the Waikato Botanical Society members before the night talk.

Flora of from the Sydney Region

Presented by Nathan Smith Monday, 19 October 2020
Written by Antoinette van der Weerden

Nathan is an Australian working as an ecologist here in Kirikiriroa, Hamilton.

Nathan gave a very in-depth presentation about the Sydney Basin Bioregion (SBB), which included looking at the geology, geomorphology, soils and associated botany, both threatened and common of the area. He grew up in Sydney but continues to work on Australian stuff.

The SBB is predominantly an ancient river basin dominated by Triassic sedimentary rock. Sydney Harbour itself and also Broken Bay to the north are rias (drowned river valley) of the Parramatta and Hawkesbury Rivers respectively.

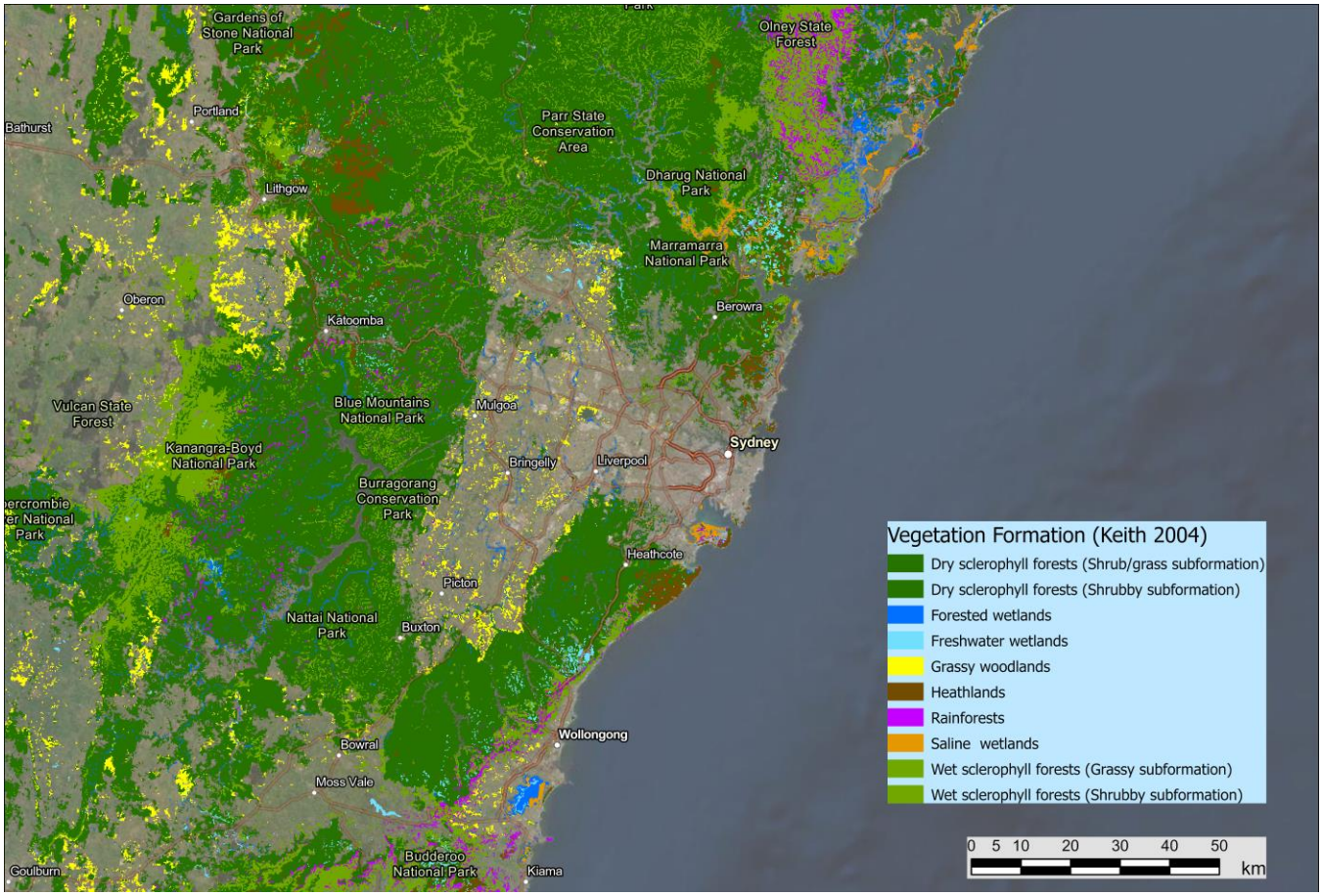
The Sydney Basin bioregion covers 400 km from north to south and 200 km wide at its widest. The southern-most part of the SBB sits 70 km north of Cape Reinga and is roughly the southern limit of subtropical climates on the east coast (hot moist summers and dryer winters).

Catchments including the Hawkesbury, the Hunter and Shoalhaven rivers, and the Parramatta River catchment (Sydney Harbour) slices through Sydney, bringing the bush very close to the city through a network of steep-sided sandstone gorges and creeks. The Laptsone monocline buckles the Sandstone plateau, benching and colluvial slopes to create the Blue Mountains to the West, then dipping down into the Cumberland Plain that is Western Sydney (see map). The Wianamatta Shale and associated weathered clay soils are the dominant substrates of the Cumberland Plain Woodland (CPW). CPW is the characteristic though critically endangered grassy woodland ecosystem that is currently under significant threat from urban expansion in Western Sydney.

Hawkesbury sandstone country features columnar tors and benching where plants seem to grow out of nothing. Dominant species and groups include *Angophora costata*, *Casuarina spp.* and *Xanthoreaea spp*.

The main formations of the Sydney Basin bioregion included in the talk are listed below.

- The Rainforests,
- wet sclerophyll,
- dry sclerophyll,
- grassy woodlands (Nathans favourite),
- forested wetlands,
- freshwater wetlands,
- saline wetlands,
- heathlands.



Three quarters (¾) of all plant community types defined by a Eucalyptus association for example the Cumberland Plain is a Grey box – Forest red gum grassy woodland. It was noted that fire was part of indigenous forest pattern management in many parts however burning rainforest will kill it.

All Australian States have a different system for listing threatened biodiversity and the federal government also lists species, which can make biodiversity assessment complex. Thankfully in recent years, bilateral agreements between State and federal agencies have stream-lined assessment processes for dually listed species (the vast majority).

<u>Grassy woodlands</u>

Grassy woodlands are the most endangered vegetation formation, occurring in the western Sydney, extending into the Southern Highlands, with historical land use and urban expansion posing the greatest threats. The Cumberland Plain Woodland is the most characteristic grassy woodland in Sydney but Box-Gum Woodland is another critically endangered and prominent grassy woodland vegetation type (a once extensive vegetation type, west of the Great Divide and from Victoria, north to Central Queensland).

Some great images of grassy woodlands in western Sydney, Cumberland grassy woodland included here. High pressure from farming and grazing with exotic grasses invading also taking its toll.

Dry sclerophyll forests

Bloodwood, angophora, smooth barked apple, peppermint gums dominant. The density of trees increased compared to grassy woodlands, scribbly gum occurs here. Evidence of aboriginal use with grinding groves in the rocky river edges.

Upland swamps run through, similar to Whangamarino, occurs in the upper reaches of most of the creeks, with teatree and associated species along the waterway and framing the highly acidic sponge.

Swamp banksia occurs here, has a lignotuber allowing it to survive after a fire season. The occurrence of last fire can be identified by counting back each seasons growth, as a flower is produced at the terminal end each year.

Coastal Heath

Banksia ericifolia, *Leptospermum trinervium*, *Hakea spp*. and *Allocasuarina distyla* are the common association and, like all of the drier ecosystem types, heavily reliant on a suitable fire regime for regeneration.

Lomandra longifolia plays the same role as our flax and is used when revegetating. Extensive planting of it in Hamilton has been noted.

Forested and Freshwater Wetlands

Plant range includes *Typha orientalis*, Baumea/Machaerinas, Melaleucas or paperbarks love the wet, freshwater herb fields developing around then.

Coastal swamp sclerophyll forest includes swamp mahogany, *Eucalyptus robusta, Livistona australis* the cabbage tree palm.

The vegetation type is mostly swamp oak forest: swamp oak country *Causuarina glauca*.

Rainforest

Rainforests in NSW are where a kiwi will find most similarity with NZ forests. The Gondwana Rainforests of Australia is a UNESCO World Heritage Site and incorporates all of these rainforest types on the east coast from Newcastle to Brisbane. They are split into seven sub-formations:

1. Sub-tropical rainforest – mostly north of the SBB but with an outlier in the Illawarra district (south of Sydney). Higher rainfall and rich, mafic soils determine these occurrences and would be most familiar to a kiwi with their complexity of lifeforms (epiphytes, climbers and scramblers) and species richness. The sub-tropical rainforests develop more species richness in a latitudinal gradient, north from the Illawarra (relatively simple) towards the wet tropics of northern QLDs (extremely complex in both life-form and species richness).
2. Littoral rainforest – coastal versions of sub-tropical rainforest that sit protected in hind-dune areas and around coastal lagoons.
3. Warm-temperate rainforest – the most dominant formation found around the sandstone gullies and creek-lines of the SBB. Humid micro-climates with decent annual rainfall help the development of these, at times quite narrow occurrences (perhaps no more than five metres either side of a creek-line), but the depauperate soils dictate low species richness and limited lifeform complexity. Coachwood (*Ceratopetalum apetalum*) and sassafras (*Doryphora sassafras*) dominate these forests, coachwood being related to kamahi (Cunoniaceae) and sassafras to pukatea (Atherospermataceae).
4. Cool-temperate rainforest – these are the grand Antarctic beech (*Nothofagus moorei*) forests at altitude (up to 1500 metres), well north of the SBB in Barrington Tops and the MacPherson Range (e.g. Lamington National Park, west of the Gold Coast).
5. Dry rainforest – seemingly anathema, the dry rainforests occur on richer soil types but with lower rainfall and south-facing or, at least, protected aspects. Combined with a localised absence of fire, just enough of a humid micro-climate is created to enable the development of mesophyllic species (soft-leaved species). Dry rainforests are quite extensive throughout NSW.
6. Western vine thickets – are the driest rainforests of NSW and occur on the north-western slopes on richer substrates (basalts and trachytes) and, similar to the dry rainforests further east, they are reliant on localised topography and protected aspects. Vine thickets are typically dominated low scrubby forests dominated by a range of figs (*Ficus spp*.) and vines, western rosewood (*Alectryon oleifolius*) and wilga (*Geijera parviflora*).
7. Oceanic rainforests and cloud forests – these occur exclusively on Lord Howe Island, are highly endemic and have a significant cross-over with NZ and Zealandia/Pacific flora.

The Flora of Sydney Basin Bioregion (SBB)

Stealing plants from the bush is as common in NZ as it is in Oz. Waratahs, *Telopea speciosissima*, are a popular choice for enthusiasts. Individuals are sprayed with colour by the National Park wardens reduces the commercial incentive!

Top ten dicots families were identified with Myrtaceae topping the list, then the Asteraceae family, Fabaceae (Bush Peas), Proteaceae, Fabaceae (Acacia), Ericaceae (Leucopogons, Epacris etc), Rutaceae (Boronias, Phebaliums, Eriostemons), Lamiaceae (mint bushes), Chenopodiaceae (salt bushes) and Goodeniaceae. Many others are prominent in the bush that are not listed here.

An excellent range of images was presented with flower form and colour highlighted but what was most interesting was the root associations between plants, where mycorrhiza was essential for successful establishment.

Boronia ledifolia
(Rutaceae)

Persoonia pinifolia
(Fabaceae)

Scaevola ramossisima
(Goodeniaceae)

Actinotus helianthi
(Apiaceae)

Top ten monocot families for Sydney Basin Bioregion include the Poaceae Orchidaceae (both epiphytic and ground orchids), Cyperaceae, Juncaceae, Anthericaceae, Restionaceae, Lomandraceae, Phormiaceae, Xanthorrhoeaceae, and Potamogetonaceae.

Again an excellent range of flora images showed the diverse range of representation from these families. Stealing of Xanthorrhoea was discussed, large specimens would for certain have been stolen, with the practice of torching them to stimulate flowering, guaranteeing a sale.

Xanthorrhoea arborea
(Xanthorrhaceae)

Dipodium punctatum
(Orchidaceae)

Patersonia glabrata
(Iridaceae)

Ferns and fern allies include the families below, but with a much lower number of species occurring in each family compared to the dicots and monocots.

Blechnaceae, Adiantaceae, Hymenophylaceae, Aspleniaceae, Gleicheniaceae, Davalliaceae, Dennstaedtiaceae, Marsileaceae, Schizaeaceae, Cyatheaceae, Dicksoniaceae, Ophioglossaceae

Marsileaceae covers the Nardoo, a commonly known bush food being the underground tubers.

Podocarps and cycads also exist, with hoop pine, Wollemi pine, plum pine included here. *Macrozamia*'s occurr in spotted gum ironbark country with the nuts providing good bush food.

Links across the Tasman

Proteaceae family images clearly showed a resemblance with our rewarewa. Elaeocarpaceae family images linking clearly to our hinau and cousins of kāmahi are dominant in certain forest types (the Cunoniaceae).

Lauraceae family occurrence in Australia come as Jackwood (*Cryptocarya glauescens*), corkwood (*Endiandra sieberi*), and bolly gum (*Litsea reticulata*) cousins of our own mangeao, taraire and tawa.

Camphor laurel, *Cinnamomun camphora* (also Lauraceae), was noted as a very bad weed.

Sassafras, such as *Sassafras doryphore*, are related to pukatea.

Meliaceae (the true mahoganies) are represented by dominant species such as red cedar (*Toona ciliata*) a major timber tree of the 19th century, white cedar (*Melia azedarach*) which is common in Hamilton as a street tree and the rose mahoganies (*Dysoxylum spp.)* the same genus as our kohekohe.

Threatened Plants

Amongst many others, these were included:

Pimelea spicata, spiked rice flower – a high profile threatened plant of Western Sydney and strongly associated with the critically endangered Cumberland Plain Woodland.

Grevillea parviflora grows in transitional zones, in ironstone landscape where water leaches a layer of iron, this plant loves this environment.

Tetratheca juncea grows on the Central Coast between Sydney and Newcastle, in the hinterland. It has grass-like leaves and is difficult to spot without the flowers.

Wollemia nobilis, the Wollemi Pine, was saved from extinction in 1994, found in coachwood - sassafras warm-temperate rainforest. They coppice quite readily and have a corky bark.

Key threats

Humans, weeds, animal pests, overgrazing, inappropriate fire regimes and climate change

Weeds:

Exotic perennial grasses especially in grassy woodland ecosystems. Originally introduced for cattle rearing. Grow taller, burn hotter.

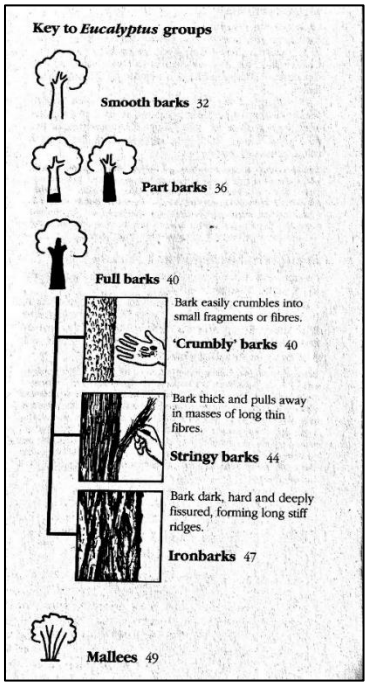
Opuntia, controlled with the Cochineal insect. Massive issues in the 1950 and 60s.

Lantanas, the world's worst weed, from South America.

Pests: Foxes eat everything including all ground fauna and they spread blackberry, so 1080 is used. A trial re-introduction of Tasmanian Devils back to the mainland, after a 5,000 year absence, is being conducted in Barrington Tops National Park (also home to Antarctic beech forests).

Fire management: A stark difference to NZ forests lies in the necessarily open, dry sclerophyll forests and woodlands dominated by eucalypts. To restore a dry Aussie forest type, you have to open it up, not close it up (what the?!). In the suburbs, fire exclusion in the dry forest types results in a shift to a closed condition (mesic shift) and mesic species such as sweet pittosporum (*Pittosporum undulatum*) invade the understorey, substantially altering the micro-climate through shading and resulting in a subsequent influx of bird-dispersed weed species (camphor laurel, lantana, privet and asparagus fern). Following weed management, many suburban forest reserves are burnt to reverse this trend.

Alternatively, many parts of Australia burn too hot too often, thus creating simplified forest ecosystems and in isolated patches, 'fauna deserts'. A lot of fires favour long-lived resprouters and perennials, over shorter-lived, obligate seeders and annuals. Each dry forest, woodland and heathland ecosystem is reliant on a specific fire interval, season and intensity and the key to fire management is to get the right mix.



How to identify a eucalypt

There are 600 - 1200 eucalypts, with gums taking the genus name *Eucalyptus*, bloodwoods are *Corymbia* and the Apples are the *Angophora*. The Angophora group are known as the 'apples' because the first settlers who looked down on large groves on valley floors thought they looked like apple orchards), clearly they are not apple trees!

Typically, the bloodwoods have urn-shaped fruits sometimes lipped, with venation square to the mid vein. Angophoras have opposite leaves and ribbed fruit.

Eucalypt taxonomic classification can be extremely tedious and complex, but identification is actually quite simple and is based on habit, distribution bark type and fruit. Bark type is smooth, part bark part smooth, or full bark, and the full barked species are further divided into crumbly, stringy or ironbarks. This then is matched with a fruit type and Bob's your uncle!

If you ever intend to go on a bushwalk in Sydney, the field botanical bible is Field Guide to the Native Plants of Sydney by Les Robinson (typically Australian, the book is affectionately known as 'Robbo' in the bush regeneration fraternity!), there is an online database of eucalypts called Euclid and the PlantNet – The Flora of NSW Online. The Royal Botanic Gardens in Farm Cove is one of the oldest botanic gardens on the planet and great place to start exploring (the bookshop is second to none…if you ask for a copy of Robbo, they'll know what you're talking about!).

Thank you, Nathan, for such an intriguing and stimulating presentation. If only we get there!! My interest has been peaked, as I am sure is the case for many other BotSoc members.

Nathan's presentation was recorded via Zoom. If you would like to watch it and haven't got access, email Monique (email address found at the beginning of the newsletter).

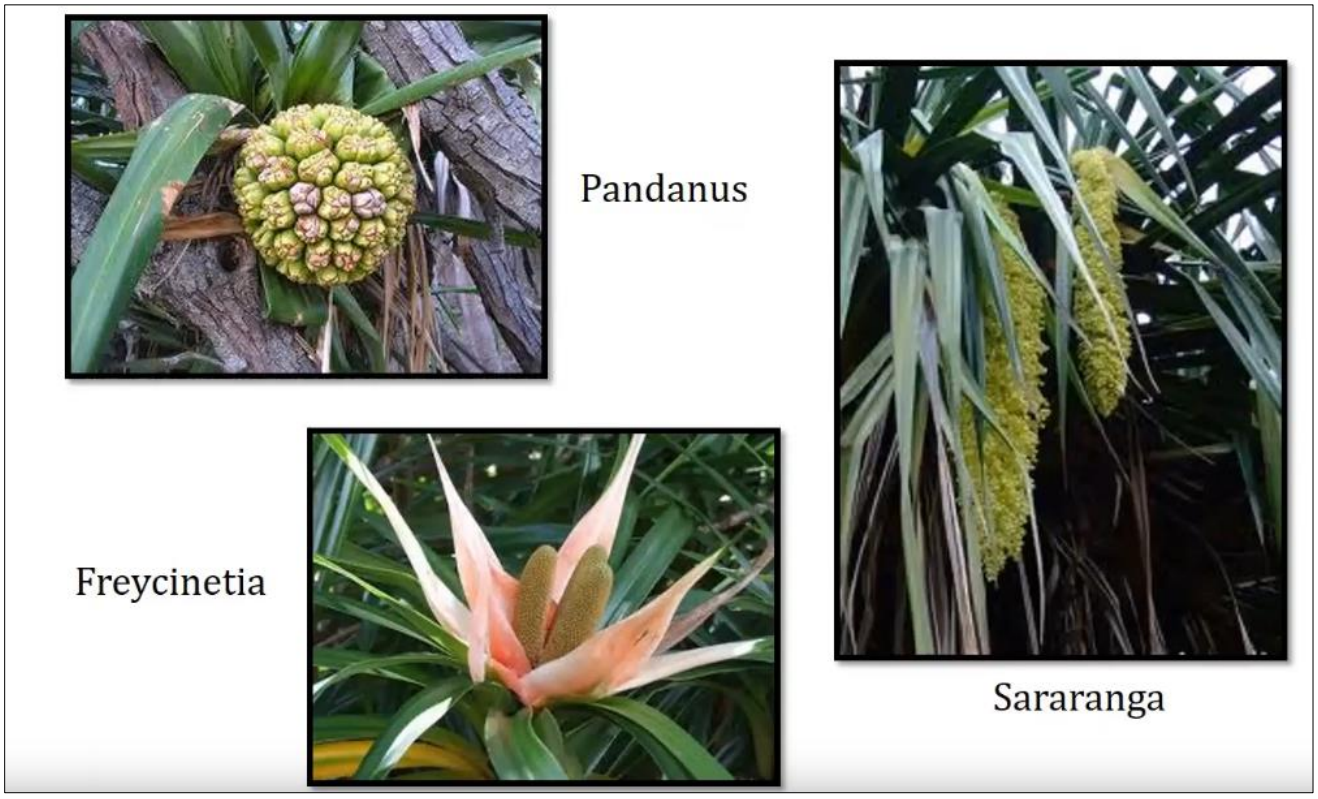
Frecinetia banksia – Kiekie

Presented by Cheri van Scravandijk-Goodman Monday, 16 November 2020
Written by Antoinette van der Weerden

Cheri completed her Masters on *Freycinetia banksii* in through the University of Canterbury, specifically an investigation into the sustainable harvest of kiekie. We had the pleasure of hearing about the kiekie within its connections in land and people.
A gathering of knowledge from weavers across the motu was acknowledged, as was the guidance of Wayne Bennet, who introduced Cheri to the plants of the Lower Waikato River system. Cheri being a South Islander acknowledges the challenge here, with many plants being new to southern eyes!!

Ko Aotea te Waka
Ko Ruapehu te maunga
Ko Whanganui te awa
Ko te Ati Haunui a Pāpārangi, Ngāti Apa, Ngāti Rangi ngā iwi
Ko Cheri van Schravendijk Goodman ahau

<u>Whakapapa of the Pandanaceae</u>
The Pandanaceae family is dominated by the *Pandanus* genus with over 500 species, *Freycinetia* has 200 species, and the *Sararanga* only has three species which are all contained in Malaysia.
Pandanaceae are known as the screw pine due to the whorling pattern of the leaves. The fruit is pineapple-like, with *Sararanga* having drooping fruit, the *Pandanus* with rounded fruit and the *Freycinetia* with longer erect fruit. The fruit in the *Freycinetia* and *Pandanus* has an evolutionary relationship with bats as pollinators. Erect fruits are easy for the bat sonar system to pick up.



There is another split in the *Pandanus*, now we have the *Benstonea* (Indonesia India region) and the *Martellidendron* dominant in Madagascar region, both with only about seven species, so quite a small group. This split occurred in 2003 for *Martellidendron*, and 2013 for *Benstonea*, making up five genera in Pandanaceae family.

This family is paleo tropical meaning it hangs around in Asia; Pacific region; with *Freycinetia* specifically, occurring in Australia; the North Island of NZ, top of the South as far as Kaikōura, and down the West coast of the South Island; part of the Pacific, and Indonesia and Malaysia.
New Zealand being the coolest temperate of these climates, poses challenges especially around germination of seed. These slow-growing plants flower every seven to 10 years, and take a long time to build the multi stem, and is possibly an evolutionary response to the cooler, more temperate climate.

<u>Weaving</u>
Kiekie is a very important weaving plant, weaving being more than a piece of artwork, but a narrative with every move, every pattern, twist and turn, each leaf that's folded over, all telling a story, and as a weaver the story is clear.

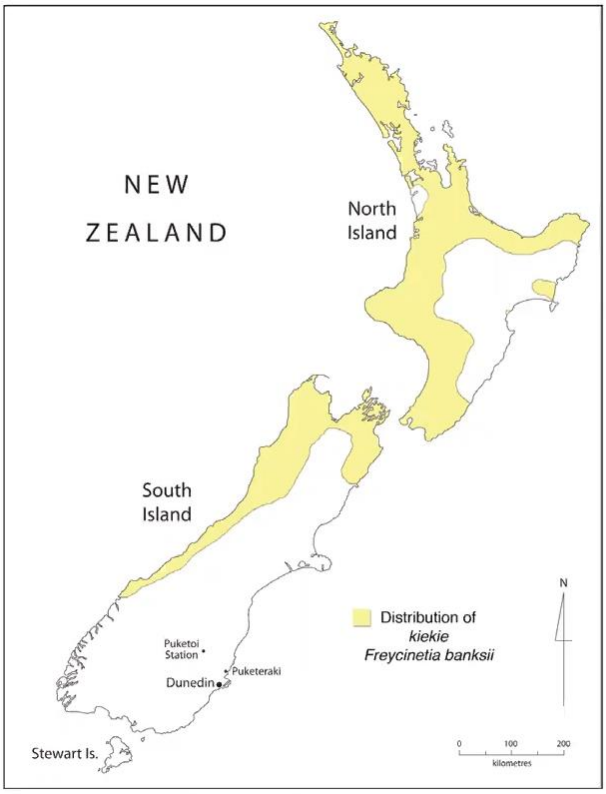
Photographer: M Pehi

Weaver: Bana Paul; Photographer: S. Scheele

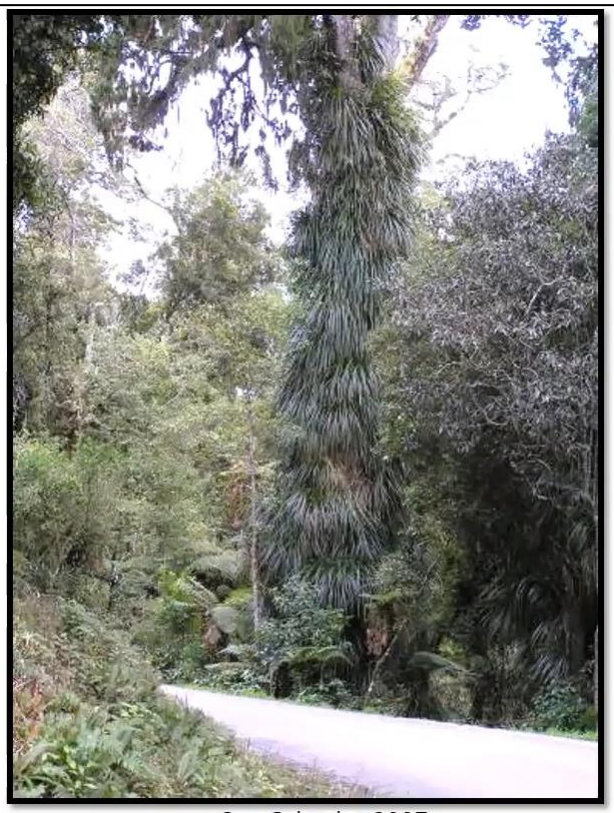
Patterns tell stories, and the kiekie is the main plant in the weaving of the tukutuku panels in Marae.
Examples of Pandanus weaving from Suva Fiji, and an Aboriginal tribe in Australia. An image of a kete woven by Bana Paul shows very fine work. The fine small strands are the bright yellow strips of the leaf which are painstakingly removed. The centre of the leaf is an extremely strong bundle of fibres, water-resistant and colour is from the part selected from the plant. Examples of kiekie have been found in museums around the world that are over a hundred years old and look like they have been woven yesterday. Kiekie holds its structure, is incredibly strong and water-resistant.
Known as kiekie here in the North Island, but also known as 'ie'ie, or gigi in the South Island.

Distribution

Indicated to be common in its key habitat across NZ, but the conservation status is disagreed by Cheri. Where it looks very common in both South and North Island, places where it was common in the past where weavers could access this material easily, is now not present. In other words, where it used to be found, is now locally extinct, and weavers have to ask neighbouring hapū.



SOURCE: Smith et al, 2011



Sue Scheele; 2007

More beautiful pieces are shown, one includes a piece called Aoraki, a tukutuku panel held in the Christchurch library with pingao and kakahao, the culms of toitoi woven through.

Kiekie is the second most important weaving plant, with a long time practising in order before kiekie is used, particularly because of the preparation, removing the strip, and good dexterity in the hands as the pieces are so fine.

A Pukoro Kete is shown, found in 1895 in Otago, ground-truthed with the Marae on Otago Peninsula, possibly used to strain the tutu berry. Pre-contact is the age, possibly a few hundred years old. The kiekie for this piece would have been gathered from the West coast, crossing on one of the trails through the Southern Alps.

Food

Colenso recorded that kiekie was the only plant that could feed people twice a year, the first part being the inflorescence, the bracts were harvested in the spring, tasting like a pear. The second is the fruit. As these ripened the leaves are tied over the top to protect them from the rats, and once they're ripe they taste like banana, an amazing plant.

Plant associations

Insects and other ecosystem dwellers associated with the kiekie include the kōkako, the wētā and pseudo-scorpion all appeared on the kiekie, the holder of all this life. Soil can also be captured in the heads of the kiekie where podocarps and *Coprosma* found growing there highlighting kiekie as an important nursery.

Post colonisation

Impact on the Māori relationship with kiekie…the land wars, then multiple pieces of legislation removed land from Māori ownership and control, removing the economic base of Māori.
Forest cover also disappears at the same time as land ownership changed. Māori land blocks reduced to approximately 8% by 1920.

Other legislation further removed Māori from their plants, including the Tohunga Suppression Act 1908, Native Plants Protection Act 1935, the Reserves Act 1977, the National Parks Act 1980, RMA 1991, etc, so removing plants was basically illegal; Māori were not allowed to access plants without the risk of being arrested. As a result, practices were at threat of being lost, and knowledge was being lost as kiekie populations also began to dwindle. Cheri believes that anything less than one hectare is not enough to sustain this plant in the condition and at the volumes preferred for sustainable harvest.

Cheri's Masters project

This joint research project was with Te Roopu Raranga Whatu o Aotearoa, looking at sustainable harvesting techniques. This organisation wanted science to back up the traditional practices of the kiekie harvest as a result of questions being raised about the sustainability of harvesting practices in conservation management areas.

Traditional harvest technique includes the removal of leaves from the head of the kiekie at a natural breaking point, removal is this way was difficult to see, you needed to know what to look for. Not only is experience required to harvest in this manner, but also fitness. As weavers became aged, young mokopuna were sent out, harvesting with machetes, removing heads with the blade, rather than carefully removing. Methods of removal were tested through the study as well.

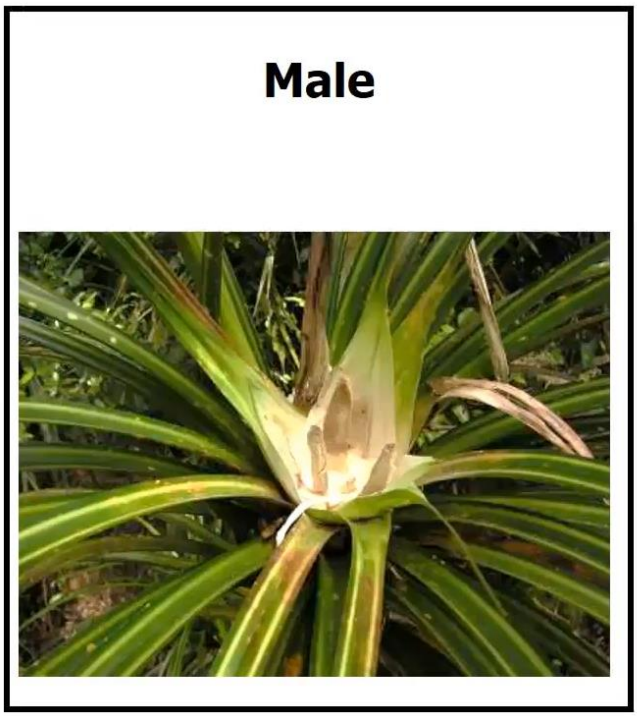
Reproduction of the plant

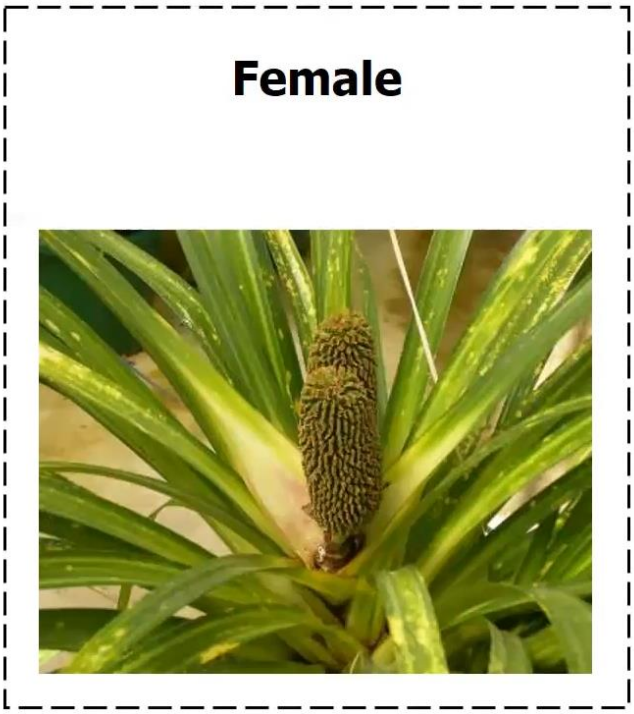
Regular sexual reproduction, with male and female plants on different parts of the plant, or different plants.

Males flower first, giving off an amazing perfume, triggers moths and bats, bats transferring pollen from male to female, with the shape of the parts easy to find for the bats.

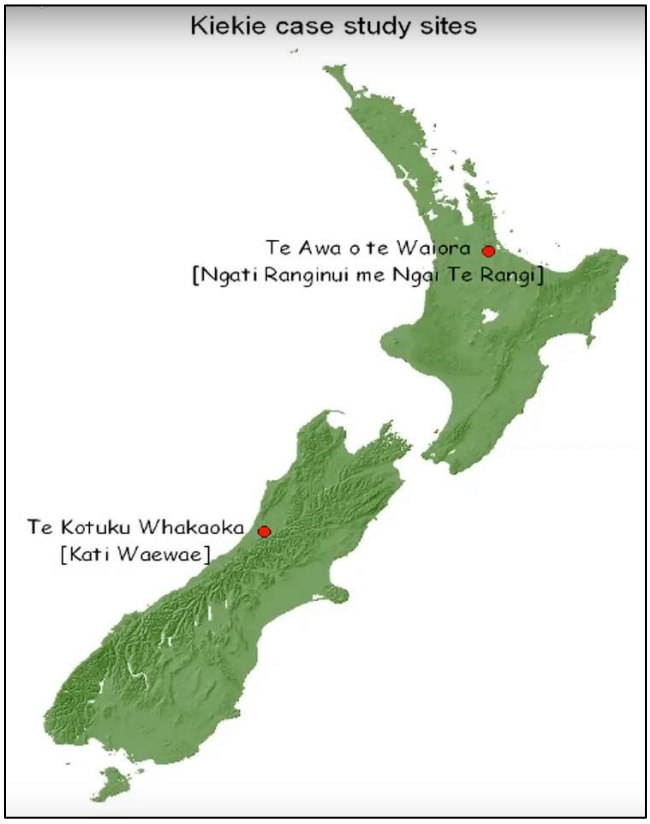
In NZ, the long-tailed bat, pekapeka, pollinates kiekie.

Vegetative reproduction also occurs, where new shoots or heads are produced along the stem from the nodes. The research looked at vegetative reproduction as this was the effect of traditional harvesting, snapping off the head. This is seen to be the strategy they rely on the most.





Two sites of Cheri's masters were utilised, Lake Brunner in the South Island, and a stream in the Kaimai ranges. Stems were selected, thinking through the eyes of a weaver, selecting stems with no blemishes, at a pickable height, big heads, and not flowering or fruiting.



A harvest patch and a control patch were identified in the kiekie patch. Harvesting techniques were applied. The tikanga approach of snapping the heads was undertaken in both the spring and autumn. The chopping method was also undertaken. Goats were seen to eat some of the kiekie so mimicking the goats browse was also undertaken.
Changes in the number of leaves and average leaf length were measured; new shoots were counted with the autumn harvest producing the most shoots.

South Island versus North Island

Leaf length was measured in both autumn and spring. In autumn, the longest leaves occurred in the Kaimais, but in springtime the longest leaves occurred at the Lake Brunner site, growing to 1.4 m long. Longer leaves in the south, but skinny leaves in the north. Sooty mould covered the plant in South Island, sitting under kamahi, didn't affect weave-ability, just needed to be cleaned.

Challenges and Findings

Traditional harvest encouraged growth and negated the dominant thinking that this harvest method reduced the overall population. Traditional harvest techniques encouraged more growth, with spring and autumn harvest being not too different but spring produced the longer leaves, which were preferred for tukutuku panels.

Most individuals that had their stems chopped eventually died. The stems that were cut to mimic goat browse didn't show significant results and requires more research although if the goat were to browse the whole head off, the stem would die.

Localised extinction, requiring weavers to move into other areas to harvest kiekie. Although local permission may be given, permits were still required from DOC or the local council. As a result, people are bypassing the locals, getting legal authority from DOC, then turning up in other weavers zones without them knowing. The legislation then needs to be linked to mana whenua, local weavers, otherwise, the question remains that who decides what and who is important.

Edge effects of remnants affect kiekie populations. Bush remnants need to be over one hectare (at least) to support healthy kiekie populations. Hunters find them to be pests, slashing through them to chase pigs. In the past, researchers from the Universities of Otago and Canterbury held races on Goat Island, where they would race across the heads of kiekie, and this didn't go down so well with local weavers.
Some beautiful images of Northland forest were shown with abundant kiekie growth. Shots of the walk through the top of the Hakirimata ranges also indicated good populations, however, access for older weavers would make access and harvest impossible.

Photos from Phillipa and Maia Pehi: 'Kia Manawanui' (2020)

This talk was dedicated to Cheri's mum who passed away two days before Cheri's thesis was due in.

Thank you from the Waikato Botanical Society, Cheri, for sharing your deep love of kiekie.

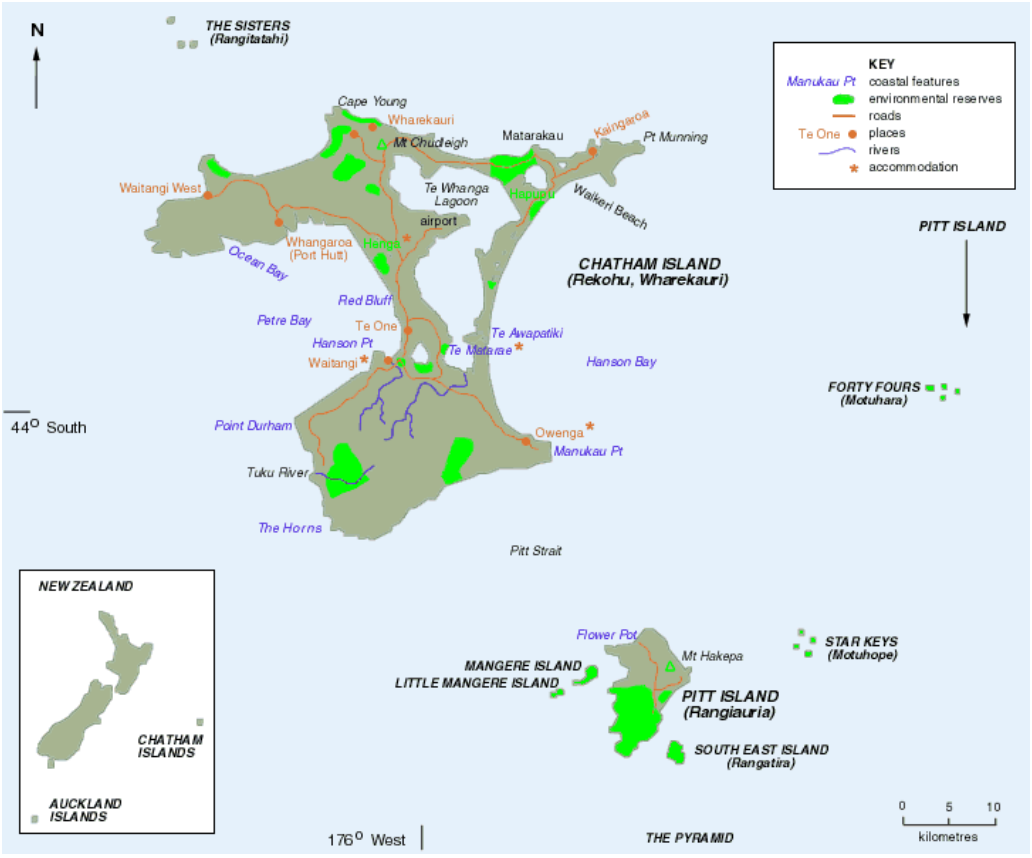
Cheri's presentation was recorded via Zoom. If you would like to watch it and haven't got access, email Monique (email address found at the beginning of the newsletter).

Mangere/Maung're Island – One of the Chatham Islands

Presented by Thomas Emmitt Monday, 7 December 2020
Written by Monique Hall

Thomas Emmitt went with a team of seven (including our own Catherine Beard) to Mangere Island for several weeks in November 2020. They were on a mission to monitor threatened plants, conduct invertebrate surveys, ground-truth the ecosystem restoration plan and make vascular and non-vascular plant collections.

There were ~25 people at Thomas' presentation and the end of year catch up, plus three people joining via Zoom. For those of us who haven't been to the Chatham Islands, we needed bringing up to speed about what is like there.



Ten islands make up the Chatham Islands and one of them is the ~113 ha, Mangere Island. On the Chatham Islands there are 47 endemic plants, 11 remaining endemic birds (including, on Mangere 34 Chatham Island black robins, the critically endangered Forbes parakeet, the Chatham Island snipe and some sooty shearwaters which would come crashing down from the skies every night) and a heap of invertebrates (20% of these are endemic). Interestingly, there are no Podocarps, beech trees or any plants from the Myrtaceae family. The remnant forests on the island contain a lot of Asteraceae including Chatham Island akeake, *Olearia traversiorium*. Mangere Island has no cats or rabbits anymore (they were the only pests to have been introduced), making it a haven for many bird and invertebrate species.

Thomas highlighted that, although there are no native Myrtaceae on the Island, there are many species which are affected by rust. *Lepidium panniforme* commonly is affected by rust but it isn't critical. The

Chatham Island forget-me-not is also affected by rust but there is little known on its impact. Unfortunately, the *Linum monogynum* var. *chathamicum* is also affected and the impact is fatal.

Lepidium panniforme only grows on Mangere and Tapuaenuku Island's

The Chatham Island forget-me-not is found across Mangere Island but threatened by loss of habitat from encroaching flax

Linum monogynum var. *chathamicum* has a limited distribution on Mangere Island and the population is in decline

Previous restoration planting of *Phormium tenax* has resulted in the species altering the ecosystem

Previously on Mangere Island, there have been forest restoration efforts that haven't become a success. The planting of harakeke/flax (*Phormium tenax*) has resulted in it taking over a lot of the regenerating area. For this ecosystem it means the continued succession of forests doesn't occur as the strong winds blow the leaves against the stems of tree seedlings, basically ring-barking them. Also, the burrowing birds aren't able to land easily, nor take off with ease as the structure isn't stable enough.

Thomas' favourite part was the opportunity he had to search for Bryophytes for seven uninterrupted days (but it did also mean that he came back with a collection of 190 specimens to identify). What Thomas did find was that there were altitudinal changes in the present species of Bryophytes across the Island.

Thomas spent a majority of his time searching for Bryophytes (Photo courtesy of Catherine Beard)

Thank you for sharing our experience with us, Thomas! I was ready to book my tickets and pack my bags until there was mention of the skua that would dive-bomb them while they were doing their re-search.

Jim Barnett Reserve

Linda Watson (Led by Kerry Jones) Sunday, 5 July 2020

The trip was combined with the Rotorua Botanical Society and it was great to have 21 botanists turn up for the day coming from Rotorua, Pureora, Te Awamutu, Kawhia and Hamilton.
The Jim Barnett Reserve in Waotu is administered by the South Waikato District Council and managed by a committee of a dedicated, passionate team of individuals who have put in countless volunteer hours at the reserve, clearing tracks, building amenities, pest control, planting and managing work crews to maintain the tracks. A few of these members were there on the day to accompany us and talk about the project.
The Lake Taupō eruption in 186 AD eradicated most of the bush in the area but at Waotu a low hill diverted the destruction and a narrow strip of the bush, 1000 acres, was left standing alone in regenerating tussock and shrubs. The Māori people named this forest Te Waotu tahi nga rakau (the tall forest that stood by itself). The area was densely populated by Ngati Kahupungapunga at first and then by Raukawa. The early European settlers arrived and by the end of the 19th Century, much of the shrubland had been cleared for farming.
Logging began in the Waotu Forest in the 1890s. About 90% (900 ha) of Waotu bush was gone by the 1920s. Massive tōtara and rimu were cut down, loaded onto wagons and pulled out by horses and bullocks along purpose-built tramways.
We found evidence of the logging tracks and large stumps of huge tōtara trees remaining.

Old purpose-built tramway logging track, littered with rewarewa leaves

A stump from a large tōtara cut down for logging

The Waotu forest, which spans 25 ha, has regenerated well since then. It was purchased from the Barnett family and opened to the public as the Jim Barnett Reserve in 1991 (with the 25 ha incorporating the small Walter Barnett Reserve, a patch of trees still in private hands, and six hectares of QE11 covenant, all in the neighbourhood).
Tawa (*Beilschmiedia tawa*), mangeao (*Litsea calicaris*) and rewarewa (*Knightia excelsa*) dominate the canopy but stands of tōtara (*Podocarpus totara*), rimu (*Dacrydium cupressinum*), kahikatea (*Dacrycarpus dacrydioides*), mataī (*Prumnopitys taxifolia*) and miro (*Prumnopitys ferruginea*) can also be found.
Māhoe (*Melicytus ramiflorus*), pate (*Schefflera digitata*) and five finger (*Pseudopanax arboreus*) are common in the understorey.

Kerry and Dell in front of a large *Schefflera digitata*, Pate, seven finger or umbrella tree

Lovely examples of *Asplenium oblongifolium*, *Asplenium flaccidum* and *Asplenium polyodon* growing together

We started on the Tane track and had lunch in the sun in a destined camping site which had been cleared for the purpose and replanted around the edges with native plants such as kōwhai (*Sophora tetrapata*), corokia species, tree lucerne (*Cytisus palmensis*), native broom (*Carmichaelia australis*). These 'immigrants' had been specifically planted as feed for birds and we managed to hear tui and kereru swooped over our heads.

After lunch, we explored more of the 10 tracks and checked out the towering tōtara, still standing after at least 1000 years. Further along from the tōtara there was an impressive, solitary ancient Radiata pine, possibly one of the biggest in New Zealand. It has now been cut down and lying across the track.

We were back at the cars mid-afternoon just as the day deteriorated weather-wise and the rain started. Another interesting botanical walk with easy walking tracks and great company.

Tracks in the Reserve

Information Centre at the start of the Reserve

Lunch in the sun at the campsite

Radius St Joan's Planting Day

Linda Watson & Dell Hood Saturday, August 1 2020

Last year, one of our Waikato Botanical Society learner members had an unfortunate accident, breaking not one arm but two arms, and shortly after had to spend a brief time in Radius St Joan's care when her partner was away. Despite her injuries, Dell and her partner had managed to get to the Botanical Society evening talk in September 2019 when Colin Meurk spoke.

Colin is a landscape ecologist working for Manaaki Whenua Landcare Research, in Lincoln. He has been active in community research with community groups for more than 30 years and his current activities include the study of vegetation patterns and processes in cultural landscapes and community based ecological restoration. The theme of the talk was how to enhance nature into our urban neighbourhoods.

Looking back, it seems the stay was fortuitous (in a certain way). Bored, armless but not legless, Dell walked around the grounds at St Joan's Radius Care where she noticed an area of unloved garden at the rear suitable for an urban island of native vegetation to encourage birds and other wildlife and provide interest for the residents, their families, visitors and staff. Colin Meurk's presentation was the inspiration.

With Colin's encouragement, Dell raised the possibility with the hospital's manager, Mrs Ash Singh. Ash was immediately supportive, although the Radius organisation took some time to agree. Our grateful thanks to Ash for keeping it on the agenda.

With the help of Linda Watson and Catherine Smith, a planting plan was devised and suitable plants sourced.

Area to be planted

August 1st proved to be a great working day. The ground had been prepared, rotary hoed and mulched. With the help of seven volunteers we managed to plant an area of about 40 m with *Sophora tetraptera, Pseudopanax arboreus, Clianthus puniceus, Dianella nigra* and *Arthropodium cirratum*.

In the corner we planted a focal point of 3x *Cordyline australis*, *Entelea arborescens*, and a *Knightia excelsa.*

Radius St Joan's were thrilled and put on a delicious morning tea for us.

Staking kōwhai trees. Note: invasive weed over fence

Plants laid out ready to be planted

Although the ground had been well prepared we are still concerned about weeds. Couch and other invasive grasses are still evident under the mulch and will need to be carefully monitored.

In several places along the fence there are large-sized moth plants, privet plants and other invasive weeds. Dell has been in touch with Sinead Spedding, the Biosecurity Officer of Pest Plants at Waikato Regional Council/ e Kaunihera ā Rohe o Waikato, another recent speaker at our Bot.Soc. Night Talks, with the idea of control by a biocontrol agent.

This planting, of course, is only a start and we hope to be able to enhance the grounds with more native trees and shrubs. However, strict COVID-19 precautions in aged residential care have since prevented us from returning to check on progress and weed the garden, but we hope this can soon be relaxed.

Special thanks to Colin Meurk for the inspiration, to Ash Singh for her continuing enthusiasm and support, to Sinead Spedding, Catherine Smith and to the volunteers who helped with the planting.

Midwinter in the Mamakus – Glover Farm

Jacqui Bond Sunday, August 2 2020

SPECIES LIST INSERTED AT THE END OF THE NEWSLETTER

Originally written for the Rotorua Botanical Society newsletter

Last year's trip to the Glover farm had been cancelled due to a weather bomb so this year I was excited to get a solemn winters morning with no wind or rain.

I found this spot a few years back while I was sniffing out Myrtaceae seed for the Department of Conservation's seed collection project in response to Myrtle Rust. It was suggested the edges of Selwyn Reserve off SH5 just before Fitzgerald Glade (Western edge of the Mamaku plateau) may be somewhere to try for climbing rata. I hadn't been to this reclusive reserve so thought I would take a look. While pulled over on the edge of Waiohotu Rd staring at a climbing rata, a tractor came past with the local farmer wanting to know what I was up to. Expecting to have to defend myself I muttered something about saving the world from Myrtle Rust by collecting seed. "Come to the farm," he said, "and meet my mother, Rosie".

The Glovers drystock farm is sandwiched between Selwyn Reserve to the south and the Kamai Mamaku Forest Park to the north, a hole of pasture grass within a large native forest just at the western edge of the park. The farm is broken up by a large gully system (approx. 28ha) of remnant native bush which has just been fenced and is in the process of becoming a QE2 covenant.

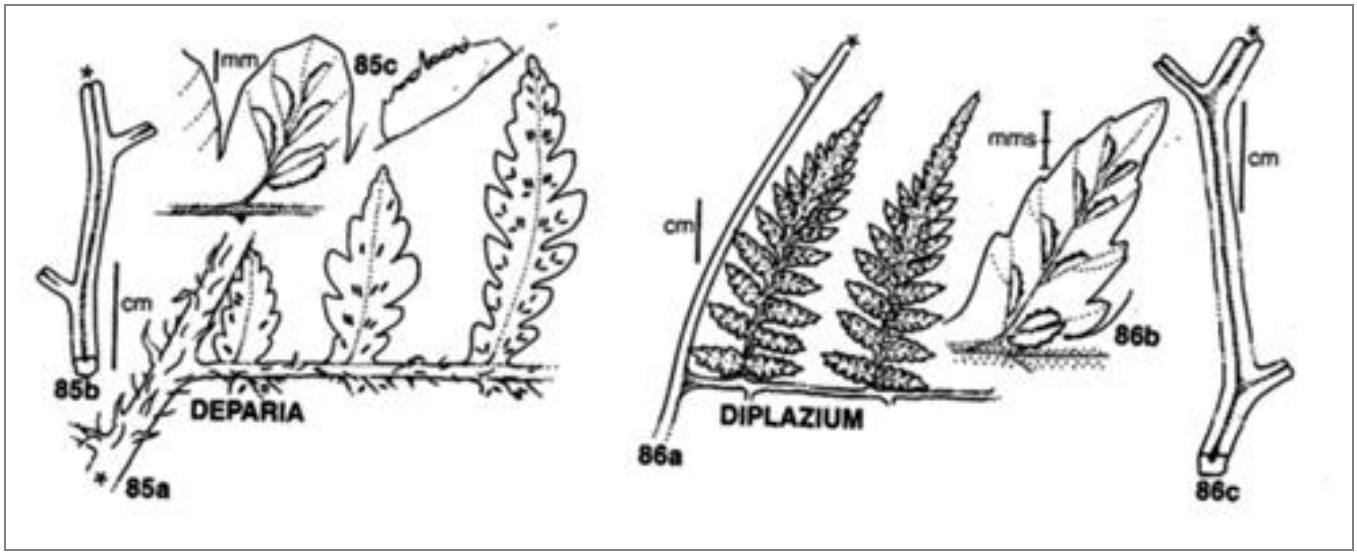
The purpose of the trip on this winters day was to explore the edges of this gully system from the farmland. Parts of this gully had been grazed in the past, making access easy to this forest edge and its regenerating native species.

Map of the Glover farm and route we took around the gulley-white line

This was a joint Waikato/Rotorua Botanical society trip, attended by 27 botanists and plant enthusiasts from Te Awamutu, Hamilton, Tauranga, and Rotorua. We started the day with a briefing and a laminated map from Rosie Glover, then we walked down the back of the house, past the sheds and began our journey through and around the farm gullies.

The area had been selectively logged for native timber in the past, but there was still a diverse range of native plant species, with many types of *Hymenophyllum*, rata, orchids and ground ferns. The predominant canopy species were tawa (*Beilschmiedia tawa*) and rewarewa (*Knightia excelsa*) with minor species of miro (*Prumnopitys ferruginea*), mataī (*Prumnopitys taxifolia*), kahikatea (*Dacrycarpus dacrydioides*), tioki (*Alectryon excelsus*) hīnau (*Elaeocarpus dentatus*) mangaeo (*Litsea calicaris*), porokaiwhiri (*Hedycarya arborea*) and pukatea *(Laurelia novae-zelandiae*) (see attached species list). Some of the notable understory species were tauhinu (*Pomaderris amoena*), kānuka (*Kunzea robusta)* and the fern genus *Deparia* and *Diplazium*. My project for this trip (along with making sure everyone had fun and no one got lost, eaten or electrocuted) was to learn some new plant species. All those understory ferns look the same (don't they?) and we had some of the best botanists in the country, now was the time to learn how to identify them!

Deparia vs *Diplazium*? Despite some members of the trip saying the differences were obvious, the two ARE closely related! Both have an almost identical herringbone sori pattern but *Deparia* is a smaller fern with 2-3 pinnae, as opposed to 3 for *Diplazium*! If in doubt, for *Deparia* species, the groove of the rachis does not open at the junction into the groove of the pinna midrib.



The Image on the far left shows the diagnostic groove pattern for Deparia. Taken from: Brownsey, P.J and Galloway,T.N.H. 1987. A key to the genera of NZ ferns and allied plants

At the start of our walk was a regenerating clump of kānuka. With kānuka recently separated into 10 species, the debate was… what *Kunzea* were we looking at? Without examining microscopic hairs on branchlets the answer is simple, what species would be found there? Only 1, *Kunzea robusta,* debate over!

Mangeao, common to the central North Island was regenerating on the edges of the track. This commonly overlooked species, shouldn't be. It is a spreading medium-sized tree with smooth dark bark with distinctive shiny veined alternate leaves which have a thin white powdery coating on the underside. This genus comes from the tropics, however, in NZ its stronghold is in the south of its range: Te Kuiti to Mokau and the Kaimai Range and Rotorua lakes. For at least 50 years mangaeo dieback has been documented, however, despite researching this phenomenon, its cause is still unknown.

Improbably attached colony of epiphytes-admired by Paul Cashmore

As we arrived at the top of the gully the sun came out highlighting the spectacular epiphytes and climbers on the cattle chewed understory. While this forest had been recently fenced, cattle in the past had removed low vegetation letting light in, leading to the growth of colonies of clinging epiphytes on stems just above the chew line! In close quarters were: two species of bamboo orchid (*Earina autumnalis* and *Earina mucronata*), hounds tongue fern (*Microsorum pustulatum*), a flowering winter rata (*Metrosideros fulgens*) and *Astelia* sp. The microscopic *Bulbophyllum pygmaeum* was found on the ground, a potential "widow maker"... in 500-years time. This was also a perfect place to have lunch.

Scouting by the children found unusual grey feathers with white spots and massive piles of poo…. The debate was on, was it a ruru roost? And then a screech and ID of the feather… Guinea fowls.

We returned through a deep gully, where a track dove off down to a reputedly spectacular waterfall and bridge (not to be crossed), however, we were running out of time. In an old clearing we needed to send the scouts to find our way out, they discovered a scrubby track pointing in the right direction.

The botanical crew, lunching in a retired grazing site on the edge of the bush

Tauhinu on track margins

As we crawled up, the track margins had tauhinu a species commonly seen in open scrublands but one I hadn't seen for a while. Wood from this species was reputed to make the best fishhooks (after bone), being moulded to the right shape while it was young and flexible.

This track was a hot spot for forest regeneration, with native *Carex* and rewarewa winning out over exotic weed species. At the top, we crossed the farm paddocks and headed for our last destination, old clearings in Selwyn reserve still used as a forest campsite.

Taking some overgrown tracks we found a small and large clearing with the surrounding forest making the most of these open spaces (presumably kept open by wild grazing animals) There were winter rata in flower and a variety of forest trees to be examined, followed by a short walk across paddocks to return to the house.

Exploring old clearings in Selwyn reserve

I can see why the Glovers farm is a popular spot for ramblers, pony clubs, weddings and school camps. The great hospitality of the Glovers in combination with old native forest with a long history of human use means a diverse flora which is tracked and easily accessible. There is a lot of regeneration of the bush in areas which have now been fenced off from cattle allowing large trees, climbers and epiphytes to be seen up close.

A big thanks to the generosity of the Glovers: Rosie and Lindsay for being so welcoming and letting us access the bush through their farmland.

The remaining trekkers at the end of the day surrounding Rosie Glover-lady with the map

Native Endangered Plant Garden Working Bee

Linda Watson (Photographs by Liz Overdyck) Saturday, August 8 2020

After a very wet night, the sun appeared and made possible a great working bee at the University.

Nine of us turned up - a great turnout, armed with trowels, spades and pruning saws.

We all set to work weeding and pruning shrubs and trees. Luckily, we had a teenager with us that could shimmy up the tree and carefully eliminate certain branches to let light through.

Liz supervising tree pruning

Cooks Scurvy Grass

Then the most exciting part…. the planting. The following were all planted:

Sporadanthus ferrugineus (Bamboo or Giant Wire Rush)
Hebe speciosa
Fuchsia procumbens (creeping fuchsia)
Euphorbia glauca (shore spurge)
Lepidium oleraceum (Cook's Scurvy Grass)
Carmichaelia williamsii (cutting from a plant in Endangered Plant Garden)

We also added some plants to the adjacent native garden.

Pennantia corymbosa (kaikōmako) plants grown by Full Bloom Nursery from seed gathered from Pokemokemoke and *Hibiscus richardsonii* (seeds from Maketu).

Some of us rescued many of the numerous kōwhai and *Pseudopanax* seedlings and took them home to grow on. Others took cuttings of plants and seeds to propagate.
Liz and I have made an up to date inventory of all plants and labels are being made.

Just the mulch to go!

Before the working bee

After the working bee

Carmichaelia williamsii in flower

Sporadanthus ferrugineus newly planted

A big thank you to Wayne Bennett/Forest Flora, Ngaruawahia, for donating the *Sporadanthus ferrugineus* and *Hebe speciosa* plants.
And many thanks to the dedicated volunteers who helped on the day.

Several weeks later ……

Finally, we were able to locate some suitable mulch from Jeremy Thomas and on Saturday 12 September an enthusiastic group of members unloaded and spread it around the endangered garden.
We also put up some wooden signs to, at last, identify our cherished plants.
On Thursday 24 September, we finished mulching the garden opposite the Endangered Plant Garden. We have a collection of plants in this garden we are now calling the Plants of Interest Garden.
Both gardens are in good shape thanks to the efforts of the willing, enthusiastic volunteers who have given up their time.

Endangered Plant Garden Working Bee

Written by Antoinette van der Weerden Saturday, 17 October 2020

A small group of dedicated garden types gathered outside D block at Waikato university to tend the endangered plants garden.
The garden sits in raised concrete planters outside somewhat monolithic modernist architecture, with a northerly aspect.
Dave and Linda Watson organised a truckload of mulch to spread after some initial weeding. The milkweed (*Euphorbia peplus*) was a little out of hand; getting on top of weeds at this early spring moment is essential if curbing weed populations is desired.
The Cooks Scurvy Grass (*Lepidium oleraceum*) was looking good after having been planted some months earlier, the *Dianella nigra* was in full bloom, and the kumerahou or Golden Tainui (*Pomaderris kumeraho*) had finished.
Thanks to all the volunteers, including Dave and Linda Watson, Dell Hood, Michael Clearwater, Linda McCarter, and myself.

Waikato Botanical Society Bryophyte Workshop

Written by Antoinette van der Weerden Sunday, October 18 2020

After the 2019 Fern workshop, this year's Bryophyte workshop proved to be another popular event for Botanical Society members. Fifteen members pitched up on a sunny Sunday morning to investigate the details of Moss's and Liverwort's reproductive structures, enabling the successful keying out of several genus and species. Moari West and I managed to key out the mosses *Leucobryum candidum*, *Breutelia pendula*, *Ptychomnion aciculare*, and a liverwort genus *Allisonia*.

Thanks to Thomas Emmitt, Catherine Beard and Michael Clearwater for making this event such a fun and educational event.

Dickies Flat, up the river to Mangakino Stream crossing

Graeme Jane Sunday, 6 September 2020

SPECIES LIST INSERTED AT THE END OF THE NEWSLETTER

Also written for the Rotorua Botanical Society newsletter

A good-sized group from Waikato Bot Soc and just three from Rotorua met at Dickeys Flat. After some discussion about the threatening weather and other options headed up the river towards Mangakino Stream crossing to soon be greeted by the first of several light showers.

The first 10 minute section was across the pasture on a stream terrace to where we entered the forest through a kahikatea pole stand. Here, the understorey was limited as expected in the dense stand. Plants of interest included patches of parataniwha with young nikau along with a small seepage and the odd *Streblus heterophyllus* or native passion fruit straggling into the canopy. From there, the track was squeezed between the river and a steep 200-250 m tall scarp face. The forest consisted of a narrow patch of tawa forest with ricker kauri on the spurs and some of the east-facing cliffs and areas of slump scrub from slips off the scarp.

The track soon led high above the river through tawa forest with māhoe and tree ferns. It was not long before we spotted our first lot of orchids - *Corybas trilobus* and soon a few flowers with the typical red stripes on the broad labellum face. Ferns of interest here included the common maidenhair: *Adiantum cunninghanii, A. viridescens* with its hairy rhachis and *A. diaphanum* with usually unforked frond with fine hairs beneath the pinnules. Large rocks nearby were also clothed in *Trichomanes enderlicherianum*.

On a recent slip, there was a mass of weeds including poroporo, foxglove, inkweed, toatoa, *Cotoneaster glaucophyllus* and buddelia. On the descent back to the river the occasional kohehohe, titoki and puriri were present in the tawa forest with a rather bare and rocky substrate and little understorey.

After the track descended to the river bank, we were greeted by swathes of crocosmia three-cornered garlic and *Selaginella kraussiana* lining the track and views of pasture across the river. Perhaps the main redeeming feature here was *Rhabdothamnus solandri* with scattered flowers and the odd scent of *Alseuosmia macrophylla*. Fortunately, the track soon entered alleys wheki, as the river narrowed into a gorge with vistas of kauri on the steep faces across the river. In wet areas *Carex secta* and the invasive *C. divulsa* were present.

As the track wandered away from the river the *Alseuosmia* became quite common and we began to see orchids along the track banks, including *Corybas oblongus* and *Pterostylis banksii* or the odd *P. trulifolia* and *P. alobula*, all in flower. Here was a rich array of filmy ferns with *Hymenophyllum demissum* common on the ground and *H. flabellatum* or *Trichomanes venosum* clothing the older tree ferns.

After lunch by the river, sheltering under a high track bank we finally reached a few large kauri that marked the start of the ricker kauri. Here we began to see some typical kauri associates, toru, *Mida*

salicifolia (in flower), *Pseudopanax discolor* and typical kauri orchids including *Cyrtostylis oblongus, Pterostylis agathicola,* and *Corybas acuminatus. Hebe corriganii* and *Brachyglottis kirkii var. angustifolia,* both in flower were of particular interest.

Further up the gorge cooler plants began to appear including tawari and *Dracophyllum latifolium*. At a rocky section *Pterostylis trullifolia* was particularly common, along with *Macheriana sinclairii*. Finally, just after a couple of huge old kauri we reached the old river crossing and headed back.

Driving Creek Railway (380 Driving Creek Railway Road, Coromandel)

Led by Elaine Iddon & Kerry Jones — Saturday, 31 October 2020
Written by Linda Watson
Photographs from L. Watson & E. Iddon

The train was leaving at 10.30 AM. A group of 20 keen botanists from Waikato and Rotorua Botanical Societies were ready to board. We knew our trip was only one way as from the Eyefull Tower we were walking back through the bush reserve botanising and compiling a species list. Kate James and Saskia were there to guide us for the day.

The narrow gauge Driving Creek Railway climbs 2.7 km from Base Station (55 m above sea level) to EyeFull Tower (167 m above sea level) a total climb of 115 m. It was a wonderful way to get an overview of the reserve and bush, not to mention the amazing views of Coromandel and beyond.

Reaching the highest point we disembarked and our train driver enlightened us with some history of Driving Creek.

In 1973, Barry Brickell O.B.E, (the very well-known New Zealand potter, writer and conservationist) purchased 60 acres of land, paying a sum of $8,000. There was virtually nothing growing on the land apart from pine trees and assorted scrub consisting mainly of kānuka.

The railway was built to obtain clay from the land which Barry used for his pottery. As the railway grew so did the interest in tourists and in 1990 the railway was opened to the public.

Barry had a keen interest in native trees and over the years planted 27,000 trees. Nine-thousand of these were kauri (*Agathis australis*). The pine trees were poisoned, cut down and used to fire the kilns. Some of the pines still in existence have proved useful to build the new adventure zip line.

Our arrival at the top of the track and Eyefull tower

Looking down from the tower onto the narrow gauge railway track

The main vegetation types in the regenerating bush

The canopy consisted of kauri (*Agathis australis*), rimu (*Dacrydium cupressinum*), tanekaha (*Phyllocladus trichomanoides*), rewarewa (*Knightia excelsa*) in flower, kānuka (*Kunzea ericoides*) and mānuka (*Leptospermum scoparium*) in flower.

Tree ferns, *Pseudopanax arboreus, P.lessonii, P.crassifolius*, *Olearia* and *Coprosma* species were predominant under the canopy.

Of note, were some nice examples of *Brachyglottis myrianthos* growing.
Photo to the right.

Another find was what I thought was an endangered native *Hibiscus richardsonii* (see left) but I found a beautiful example growing in a little narrow space by the Eyefull tower. Hopefully, the plant we have put in our endangered garden will do as well.

Thanks go to Elaine Iddon who organised the trip for us and Kerry Jones and Liz Overdyck who compiled the species list (with a little help from some botanical friends).

We wandered down the railway and bush tracks savouring the regenerating bush dotted with ceramic sculptures created by Barry.

We were so lucky the rain held off and our guides were able to take us through the recently opened new bush track where king ferns and parataniwha were growing.

Matarangi Bluff Scenic Reserve

Led and written by Kerry Jones Sunday, 1 November 2020

For day two of our Coromandel Peninsula trip, we visited Matarangi Bluff Scenic Reserve. The reserve is 253 hectares in size. The Matarangi Bluff track and was built by a keen group of locals 10-years-ago. The track is advertised on the DOC website as a 3-hour loop walk but being botanists we knew that we wouldn't be completing the loop on the day.

Fourteen botanists turned up at the track entrance at 9:30 AM and proceeded slowly up the track.

We didn't get far before the group slowed to a complete halt to discuss the *Gahnia* which turned out to be *Gahnia lacera* growing on the bank and then passed through a grove of silver fern.

Lindsaea linearis was seen on the side of the track. We turned right at the track junction and headed south along the ridge.

The vegetation along the first part of the ridge was karo (*Pittosporum crassifolium*), mānuka (*Leptospermum scoparium),* mapau *(Myrsine australis)* and pōhutukawa (*Metrosideros excelsa*).

The mānuka was flowering well and there had been some impressive wilding pine control done.

Mānuka

Pine control

A bit further along Liz spotted long-hair plume grass (*Dichelachne crinita*) growing very tall.

Long-hair plume grass (*Dichelachne crinita*) (about as tall as Ron)

I saw this moth on a mapau (*Myrsine australis*) leaf and posted my first observation to iNaturalist when I got home. I was surprised how quickly I got people identifying this for me. It is quite common but I had never heard of it and am not sure why it is called the Native Cranberry Moth.

Native Cranberry Moth (*Poecilasthena pulchraria*)

Gonocarpus aggregatus

We stopped to have a look at the track edge covering of Mercury Bay weed (*Dichondra repens*) which on closer inspection was in flower

The stragglers then caught up with the main group who were waiting at a seat that had a great view west of Matarangi and Whangapoua harbour.

A bit further along we came to a second high point that had another seat. Here, we found *Hebe/Veronica macrocarpa* with its large fruits (see below).

The other vegetation around this high point was mānuka (*Leptospermum scoprium*), felled pines (*Pinus radiata*), mapau (*Myrsine australis*) and five finger *(Pseudopanax arboreus).*

It was downhill from here through flowering kumeraho (*Pomaderris kumeraho) and* towai (*Weinmannia sylvicola)* – note the spelling change of the species– it was *silvicola.*

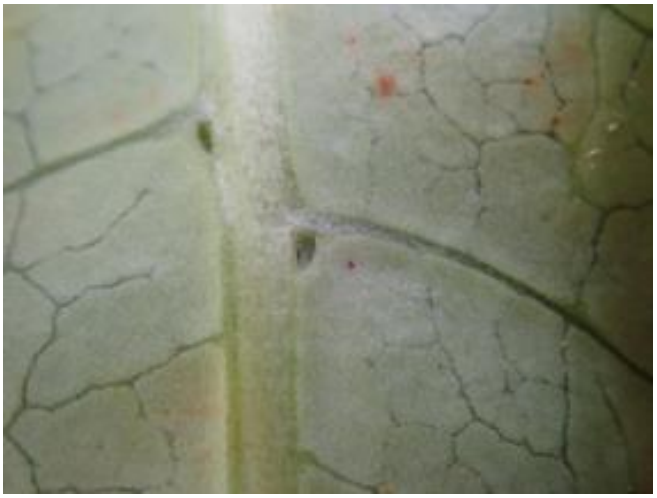
Kumeraho

Towai

A small patch of the fern, *Loxsoma cunninghamii,* was seen beside track and we were starting to see toro (*Toronia toru*).

We stopped at a *Coprosma* and had a long discussion and finally agreed that it was probably *Coprosma dodonaeifolia* (see below).

Leaf top side showing strongly raised mid vein



Leaf underside showing vein network and domatia

Fruit

Stipule showing fine hairs

We were getting hungry so we were on the lookout for a suitable lunch spot. *Pimelea tomentosa* was seen flowering which was a great find (status: Threatened: Nationally vulnerable). This wasn't on Graeme's species list.

At the lunch stop we saw *Thelymitra longifolia* and *Schizaea bifida*

Thelymitra longifolia

Schizaea bifida (a fern)

After lunch, Dell and Ron were feeling energetic and didn't have far to drive back as we did so they went on to finish the loop. The rest of us headed back up the hill in the heat and back to the cars. Not far from the cars our eagle-eyed accountant spotted another *Pimelea tomentosa* which we had all walked past on the way in.

A few of us stopped at Kuaotunu for a well-deserved ice cream before heading over the hill to Whitianga.

Waitoa Wetlands

Led by Norm Mason Sunday, 22 November 2020

Written by Linda Watson & Dell Hood

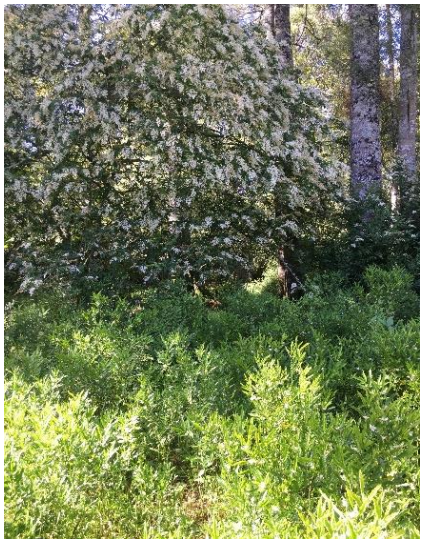
SPECIES LISTS INSERTED AT THE END OF THE NEWSLETTER – Houghton's North & Pakarau Pa

We met at the rest area where SH 27 crosses the Waitoa River. Norm welcomed us and armed us with print outs of the Waikato Regional Council's Kahikatea Green Wheel Assessment Tool.

Our first site was on a private farm.
We decidedly unanimously to stay together for the first remnant of bush and complete the assessment tool as a group as well as compile a species list. A sensible decision! It was a great opportunity for WBS members to contribute towards the ecological assessment of forests in the Waitoa and trial the tool provided.

The Waitoa catchment contains many kahikatea forest remnants. Connecting the Waitoa is a long-term community-led project aiming to protect and enhance the remaining native vegetation of the Waitoa catchment.
"See what we've got, protect what we've got, link neighbours together and maybe plant more," Norm tells us.
We were impressed with the many plant pest species both indigenous and exotic (see species list attached).
Notable were luxurious examples of Chinese privet in full bloom.

Norm Mason introducing us to the Green Wheel Assessment Tool



Ligustrum sinense in flower

A variety of plant pest species

On higher places, along the remnant patches, the mid-canopy plants proved interesting with many species of small-leaved shrubs. It was great to have time for discussion and expertise to identify them closely.
Melicytus micranthus, swamp mahoe, was one example.

Another was *Passiflora tetranda* (kohia), NZ passionfruit.
We looked closely at the leaves of *Melicope simplex* (poataniwha), and found the small rounded rough-edged leaves had a joint where they were attached to a flattened stalk.
Neomyrtus peduculata (rohutu), classified as nationally critical, was in full flower.

Passiflora tetrandra in flower

Neomyrtus pedunculata (Rohutu)

Bev Clarkson, Graeme Jane and Norm Mason identifying Fuchsia perscandens

Coprosma arborea, Coprosma propinqua as well as other coprosmas were present.
It was mentioned we should perhaps hold a workshop on identifying small-leaved shrubs of New Zealand!

On a drier bank in one spot *Fuchsia perscandens* was growing, although no flowers were visible.
Alongside was the delicate, small *Adiantum diaphanum* (tuberous maidenhair) growing.

Adiantum diaphanum

Elaeocarpus hookerianus (Pokaka)

Dominant trees in the canopy consisted of kahikatea, tōtara, cordyline, kōwhai and pokaka. This remnant is of particular note due to the combination of kahikatea and pokaka growing together.

We emerged from the first site at 12:30 PM to have our lunch together by our cars. Together we filled in the assessment tool. It was interesting to reflect on the soil type, pest plant presence, drainage, human damage, evidence of predators, and botanical attributes.

And a write up from Dell Hood about 2 more kahikatea stands visited on the same day. Thanks Dell.

The afternoon's first walk was quite a contrast. Outwardly the second forest remnant visited looked similar. A rim of tall tōtara enclosed the equally tall kahikatea trees which fringed the river within the block but the understorey was completely different. Although stock are now excluded, this piece of the forest must have been extensively grazed over many years or the understorey intentionally removed by some other means. The result is a clear view for long distances through the large trunks with *Tradescantia* knee-deep as the main vegetation at ground level. In places, a few ferns had managed to push a frond or two through this deep layer of green, but the only areas of significant biodiversity were in a few small flood channels, most of which had no standing water at the time of the visit.
(Please refer to species list attached)

Tradescantia knee deep

There were scattered mature pokaka trees *(Elaeocarpus hookerianus*) and some of the more usual understorey shrubs, principally kōwhai *and Melicytus micranthus*, along with a good few hawthorns *(Crataegus monogyna)* and occasional cabbage trees in light wells, one of which was choked with Japanese honeysuckle. Altogether a rather depressing sight.
The final site visited provided a real contrast. Hawes Bush, a 2.2 ha remnant of kahikatea forest is located within the township of Waharoa. It was purchased by the District Council in 1980 as a surviving example of the forest that once covered the surrounding lands. Surrounded by farmland on three sides and a residential street on the fourth it has been colonised with all the usual weedy species such as cherries and privet but despite this, the more natural state of a kahikatea dominated forest remains. A very active volunteer group has cleared most of the established weed species and replanting has been underway for some years. Ferns cover the forest floor and a diverse range of species from low growing shrubs, epiphytes to the taller species still visible in the two remnants visited earlier in the day fills the understorey below equally tall kahikatea. No long views through tree trunks here.
A big thank you to Norm Mason for organising the trip, to Graeme Jane, Gail Donaghy and Bev Clarkson for compiling the species list, and Dell Hood and Linda Watson for the write-up.
And a thank you to the landowners.

SPECIES LISTS

Glovers Farm - Waiohtu QEII

Author(s) G Jane & G Donaghy, RBS
Date: 02-08-2020 **Map:** BE36 1857025 5790545

Gymnosperm trees and shrubs

Dacrycarpus dacrydioides (Podocarpus)	kahikatea, white pine
Dacrydium cupressinum	rimu, red pine
Phyllocladus trichomanoides	tanekaha; celery pine
* *Pinus pinaster ssp. pinaster*	maritime pine
* *Pinus radiata (P. insignis)*	Monterey pine; radiata
Podocarpus laetus (P. hallii, P. cunninghamii)	Hall's tōtara; thin bark tōtara
Prumnopitys ferruginea (Podocarpus ferrugineus, Stachypitys, Pectinopitys ferruginea)	miro; brown pine
Prumnopitys taxifolia (Podocarpus spicatus)	matai; black pine

Monocotyledonous trees and shrubs

Cordyline banksii	forest cabbage tree; ti ngahere

Dicotyledonous trees and shrubs

Alectryon excelsus ssp. Excelsus	tītoki
Alseuosmia macrophylla	toropapa; shrubby honeysuckle
Aristotelia serrata	wineberry; makomako
Beilschmiedia tawa	tawa
* *Berberis glaucocarpa (B. aristata)*	barberry
Brachyglottis repanda	rangiora; bushmans friend
Coprosma grandifolia (C. australis)	raurekau; kanono; mamono
Coprosma lucida	karamu; shining karamu
Coprosma rhamnoides agg (C. polymorpha)	thorny coprosma
Coprosma robusta	karamu
* *Cytisus scoparius (Sarothamnus; Spartium)*	broom
Dodonaea viscosa	akeake
Elaeocarpus dentatus var dentatus	hīnau
* *Erica lusitanica*	Spanish heath
Fuchsia excorticata	fuchsia; kōtukutuku
Fuscospora truncata (Nothofagus)	hard beech; tawhairaunui
Gaultheria antipoda	snowberry; tawiniwini
Geniostoma ligustrifolium var. ligustrifolium (G. rupestre)	hangehange; privet
Griselinia lucida	puka
Hedycarya arborea	pigeonwood; porokaiwhiri
Knightia excelsa	rewarewa; NZ honeysuckle
Kunzea robusta	kānuka
Laurelia novae-zelandiae	pukatea
Leptecophylla juniperina ssp. juniperina (Cyathodes)	
Leptospermum scoparium var. Scoparium	mānuka; red teatree
Leucopogon fasciculatus (Styphelia; Cyathodes fasciculata)	mingimingi; kaikaitau
* *Leycesteria formosa*	himalayan honeysuckle
Litsea calicaris	mangeo
Melicytus ramiflorus ssp.ramiflorus	māhoe

Metrosideros robusta	northern rata
Myrsine australis	red matipo; mapou
Olearia rani var. Colorata	heketara
Piper excelsum ssp excelsum (Macropiper)	kawakawa; pepper tree
Pittosporum cornifolium	tawhirikaro; perching kohukohu
Pomaderris amoena (P. phylicifolia auct., P. ericifolia auct.)	tauhinu
** Populus canadensis X*	grey poplar
Pseudopanax arboreus agg. (Neopanax arboreum, N. kermadecensis)	five finger; puhou; whaupaku
Pseudopanax crassifolius	lancewood; horoeka
Schefflera digitata	pate; patae; kotete
Solanum laciniatum	poroporo
Sophora microphylla ss	kōwhai
Toronia toru (Persoonia)	Toru
Urtica ferox	tree nettle; ongaonga
Veronica stricta var. Stricta ss (Hebe stricta)	koromiko
Weinmannia racemosa	kāmahi; tōwai; tawhero

Monocotyledonous lianes

Freycinetia banksii (F. baueriana var.)	kiekie
Ripogonum scandens	supplejack; kareao

Dicotyledonous lianes and related trailing plants

Metrosideros colensoi	
Metrosideros diffusa	white climbing rata; akatea
Metrosideros fulgens	scarlet rata; winter rata
Metrosideros perforata	aka; small white rata; torotoro
Muehlenbeckia australis	poheuheu
Parsonsia capsularis var. Capsularis	small flowered jasmine; akakiore
Passiflora tetrandra (Tetrapathaea)	passionfruit; kohia
Rubus cissoides	bush lawyer; tataramoa

Psilopsids, Lycopods & Quillworts

Lycopodium deuterodensum (Lycopodium)	puakarimu
Lycopodium volubile	waewae-koukou; climbing clubmoss
Phlegmariurus varius (Huperzia, Lycopodium)	hanging clubmoss; iwituna
** Selaginella kraussiana*	

Ferns

Adiantum cunninghamii	maiden hair fern
Asplenium appendiculatum ssp. appendiculatum (A. terrestre)	ground spleenwort
Asplenium bulbiferum	hen and chickens fern; moku
Asplenium flaccidum ss	hanging spleenwort; makawe
Asplenium oblongifolium (A. lucidum)	shining spleenwort
Asplenium polyodon (A. falcatum)	sickle spleenwort; petako
Blechnum chambersii (B. lanceolatum, Austroblechnum)	nini; lance fern
Blechnum discolor (Lomaria)	crown fern; piupiu; petipeti
Blechnum filiforme (Icarus)	Climbing hard fern; thread fern
Blechnum fluviatile (Cranfillia)	kiwakiwa; kiwikiwi
Blechnum molle (Doodia)	mokimoki
	Kiokio

Blechnum novae-zelandiae (pp B. capense; "black spot low-land", Parablechnum)	ponga; silver fern
Cyathea dealbata (Alsophila tricolor)	mamaku; korau; black tree fern
Cyathea medullaris (Sphaeropteris)	soft-leaved tree fern; katote
Cyathea smithii (Alsophila)	
Deparia petersenii ssp. congrua	wheki-ponga; kuripaka
Dicksonia fibrosa	wheki; harsh tree fern
Dicksonia squarrosa	
Diplazium australe (Athyrium)	water fern
Histiopteris incisa	
Hymenophyllum bivalve (Meringium)	piripiri; irirangi
Hymenophyllum demissum (Mecodium)	lop-sided filmy fern
Hymenophyllum dilatatum (Mecodium)	fan fern
Hymenophyllum flabellatum (Mecodium)	wire-stemmed filmy fern
Hymenophyllum rarum (Mecodium, reduced to aff.)	
Hymenophyllum revolutum	blood-scented filmy fern
Hymenophyllum sanguinolentum	
Hypolepis ambigua (agg H. punctata; pp H. tenuifolia)	felted fern
Lastreopsis glabella (Ctenitis)	
Lastreopsis microsora ssp. Pentangularis	lacey fern
Leptolepia novae-zelandiae	single crepe fern; heruheru
Leptopteris hymenophylloides (Todea)	sexy fern
Loxogramme dictyopteris (Anarthropteris lanceolata)	mangemange; bushmans mattress
Lygodium articulatum	hounds tongue; kowaowao
Microsorum pustulatum ssp. pustulatum (Phymatosorus, M. diversifolium)	mokimoki; fragrant fern
Microsorum scandens (Phymatosorus, Phymatodes)	hairy strap fern
Notogrammitis ciliata (Grammitis)	scented fern; matata; ring fern
Paesia scaberula	tarawera; button fern
Pellaea rotundifolia	gully fern; pakau; pakauroharoha
Pneumatopteris pennigera (Thelypteris; Cyclosorus)	bracken; rauaruhe
Pteridium esculentum (P. aquilinum var. esculentum)	turawera
Pteris tremula	leather-leaf fern
Pyrrosia elaegnifolia (P. serpens)	butcher's fern
Rumohra adiantiformis	veined bristle fern
Trichomanes venosum	

Orchids

Bulbophyllum pygmaeum (Ichthyostomum)	
Dendrobium cunninghamii (Winika)	bamboo orchid
Drymoanthus adversus (Sarchochilus)	Easter orchid; raupeka
Earina autumnalis	spring orchid; peka-a-waka
Earina mucronata	onion orchid
Microtis unifolia	white sun orchid
Thelymitra longifolia	

Grasses

* *Agrostis capillaris (A. tenuis)*	browntop
* *Anthoxanthum odoratum*	sweet vernal
	pampas

** Cortaderia selloana (ssp selloana C. argentea; Gynerium argenteum)*	cocksfoot
** Dactylis glomerata*	Yorkshire fog
** Holcus lanatus*	perennial ryegrass
** Lolium perenne (L. italicum)*	forest rice grass
Microlaena stipoides (Ehrharta)	Himalayan fairy grass
** Miscanthus nepalensis*	paspalum
** Paspalum dilatatum*	annual poa
** Poa annua*	forest fairy grass
Rytidosperma gracile (Notodanthonia semiannularis var; Danthonia)	

Sedges

Carex breviculmis	
Carex megalepis (Uncinia ferruginea)	
Carex solandri	
Carex uncinata (Uncinia)	watu
Gahnia setifolia	
Morelotia affinis	
Schoenus tendo	

Rushes and allied plants

** Luzula campestris*	

Remaining Monocotyledonous herbs

Astelia microsperma (Collospermum)	
Astelia solandri	kowharawhara
Astelia trinervia	
Dianella nigra	blueberry; turutu

Daisy-like herbs

** Bellis perennis*	lawn daisy
** Cirsium vulgare (C. lanceolatum)*	Scotch thistle
** Crepis capillaris*	hawkesbeard
** Erigeron sumatrensis*	broad-leaved fleabane
Euchiton audax (Gnaphalium, pp G. collinum)	
Euchiton japonicus (E. collinus, E. gymnocephalus)	
** Gamochaeta coarctata (G. spicata, Gnaphalium)*	
** Hypochaeris radicata (Hypochoeris)*	catsear
** Jacobaea vulgaris (Senecio jacobaea)*	ragwort
** Leontodon saxatilis (L. taraxacoides, L.hispidus)*	hawkbit
** Mycelis muralis*	wall lettuce
Senecio bipinnatisectus (Erechtites atkinsoniae)	Australian fireweed
** Sonchus oleraceus*	sow thistle; puha; puka

Dicotyledonous herbs other than Daisies

Acaena anserinifolia agg (A. pusilla; A. viridior)	bidibid
* *Acaena novae-zelandiae*	red bidibid; piripiri
* *Aphanes arvensis (Alchemilla)*	parsley piert
* *Cardamine hirsuta agg. (C. hirta var.)*	bitter cress; spitting Jenny
* *Cerastium fontanum ssp. vulgare (C. vulgatum; C. caespitosum)*	mouse-eared chickweed
Crassula sieberiana (Tillaea)	
* *Digitalis purpurea*	foxglove
Drosera auriculata	
Epilobium nerteroides	
* *Euphorbia peplus*	milkweed
* *Geranium dissectum*	cut-leaved geranium
Haloragis erecta ssp. erecta agg (H. colenoi)	toatoa
Hydrocotyle dissecta	
Hydrocotyle microphylla	hydrocotyle
Hydrocotyle moschata var. moschata (H. sibthorpioides)	
* *Lotus pedunculatus (L. major; L. uliginosus)*	lotus major
Nertera depressa agg (N. cunninghamii; Coprosma)	common nertera
Nertera dichondrifolia (Coprosma; corrected orthography)	hairy nertera
* *Orobanche minor*	broomrape
* *Oxalis corniculata*	horned oxalis
* *Phytolacca octandra*	Inkweed
* *Plantago lanceolata*	ribwort; narrow-leaved plantain
* *Potentilla indica (Duchesnia)*	Indian strawberry
* *Prunella vulgaris*	selfheal
* *Ranunculus parviflorus*	small-flowered buttercup
Ranunculus reflexus (pp R. hirtus)	maruru; hairy buttercup
* *Ranunculus repens*	creeping buttercup
* *Ranunculus sceleratus*	celery-leaved buttercup
* *Scrophularia auriculata (S. aquatica)*	water figwort
* *Solanum nigrum (S. nigrum var. chlorocarpum; var. humile auct.)*	black nightshade
* *Stellaria media ssp. media (S. pallida auct.)*	Chickweed
* *Trifolium pratense*	red clover
* *Trifolium repens*	white clover
Wahlenbergia violacea (W. trichogyna; W. gracilis)	blue harebell; rimu-roa

Dickies Flat upriver to first crossing

Author: G Jane; RBS
Visit Date: 02-11-2006; 06-09-2020

Psilopsids, Lycopods & Quillworts

Lycopodiella cernua (Lycopodium cernuum)	
Lycopodium deuterodensum (Lycopodium)	puakarimu
Lycopodium volubile	waewae-koukou; climbing clubmoss
Phlegmariurus varius (Huperzia, Lycopodium)	hanging clubmoss; iwituna
** Selaginella kraussiana*	

Ferns

Adiantum cunninghamii	maiden hair fern
Adiantum diaphanum	small maidenhair
Adiantum viridescens (A. fulvum; fn)	
Asplenium bulbiferum	hen and chickens fern; moku
Asplenium flaccidum ss	hanging spleenwort; makawe
Asplenium oblongifolium (A. lucidum)	shining spleenwort
Asplenium polyodon (A. falcatum)	sickle spleenwort; petako
Blechnum chambersii (Austroblechnum)	nini; lance fern
Blechnum discolor (Lomaria)	crown fern; piupiu; petipeti
Blechnum filiforme (Icarus)	Climbing hard fern; thread fern
Blechnum fluviatile (Cranfillia)	kiwakiwa; kiwikiwi
Blechnum minus (Parablechnum)	swamp kiokio
Blechnum novae-zelandiae (Parablechnum)	kiokio
Blechnum parrisiae (Doodia australis, D. media var)	pukupuku; rasp fern
Cyathea dealbata (Alsophila tricolor)	ponga; silver fern
Cyathea medullaris (Sphaeropteris)	mamaku; korau; black tree fern
Cyathea smithii (Alsophila)	soft-leaved tree fern; katote
Deparia petersenii ssp. congrua	
Dicksonia fibrosa	wheki-ponga; kuripaka
Dicksonia squarrosa	wheki; harsh tree fern
Diplazium australe (Athyrium)	
Hymenophyllum demissum (Mecodium)	piripiri; irirangi
Hymenophyllum dilatatum (Mecodium)	lop-sided filmy fern
Hymenophyllum flabellatum (Mecodium)	fan fern
Hymenophyllum nephrophyllum (Cardiomanes reniforme, Trichomanes)	kidney fern; raurenga
Hymenophyllum revolutum	
Hymenophyllum sanguinolentum	blood-scented filmy fern
Lastreopsis glabella (Ctenitis)	felted fern
Lastreopsis hispida (Rumohra)	hairy fern, hairy legs
Lastreopsis microsora ssp. pentangularis	
Leptopteris hymenophylloides (Todea)	single crepe fern; heruheru
Loxogramme dictyopteris (Anarthropteris lanceolata)	sexy fern
Lygodium articulatum	Mangemange
Microsorum pustulatum ssp (Phymatosorus)	hounds tongue; kowaowao

Microsorum scandens (Phymatosorus, Phymatodes)	mokimoki; fragrant fern
Notogrammitis ciliata (Grammitis)	hairy strap fern
Notogrammitis heterophylla (Ctenopteris heterophylla)	
Paesia scaberula	scented fern, ring fern
Pellaea falcata	
Pellaea rotundifolia	tarawera; button fern
Pneumatopteris pennigera (Thelypteris; Cyclosorus)	gully fern; pakauroharoha
Polystichum wawranum (pp. P. richardii)	common shield fern
Pteris macilenta	sweet fern
Pyrrosia elaegnifolia (P. serpens)	leather-leaf fern
Rumohra adiantiformis	butcher's fern
Tmesipteris elongata (pp T. tannensis)	
Tmesipteris lanceolata (pp T. tannensis)	
Tmesipteris sigmatifolia (pp T. tannensis)	
Tmesipteris tannensis	chain fern; fork fern
Trichomanes elongatum (Selenodesmium)	bristle fern
Trichomanes endlicherianum (Crepidopteris)	rock mat fern
Trichomanes venosum	veined bristle fern

Gymnosperm trees and shrubs

Agathis australis	Kauri
** Chamaecyparis lawsoniana*	Lawson's cypress
Dacrycarpus dacrydioides (Podocarpus)	kahikatea, white pine
Dacrydium cupressinum	rimu, red pine
Phyllocladus trichomanoides	tanekaha; celery pine
** Pinus radiata (P. insignis)*	Monterey pine; radiata
Podocarpus laetus (P. hallii, P. cunninghamii)	Hall's tōtara
Podocarpus totara var. totara	tōtara
Prumnopitys ferruginea (Pectinopitys ferruginea)	miro; brown pine
Prumnopitys taxifolia (Podocarpus spicatus)	mataī; black pine

Dicotyledonous trees and shrubs

** Acacia melanoxylon (Racosperma)*	Tasmanian blackwood
Alectryon excelsus ssp. Excelsus	titoki
Alseuosmia macrophylla	toropapa
Aristotelia serrata	wineberry; makomako
Beilschmiedia tawa	Tawa
Brachyglottis kirkii var. angustior (Urostemon)	
Brachyglottis repanda	rangiora; bushmans friend
Carmichaelia australis agg)	whip broom; maukoro
Carpodetus serratus	putaputaweta; marbleleaf
Coprosma arborea	mamangi; tree coprosma
Coprosma autumnalis	raurekau; kanono; mamono
Coprosma lucida	karamu; shining karamu
Coprosma rhamnoides agg (C. polymorpha)	thorny coprosma
Coprosma robusta	karamu
Coriaria arborea var. Arborea	tree tutu
** Cotoneaster glaucophyllus*	
Dracophyllum latifolium agg (D. mathewsii)	needle-leaved neinei
Dysoxylum spectabile	kohekohe

Fuchsia excorticata	fuchsia; kōtukutuku
Fuscospora truncata (Nothofagus)	hard beech; tawhairaunui
Gaultheria antipoda	snowberry; tawiniwini
Geniostoma ligustrifolium	hangehange; privet
Griselinia lucida	puka
* *Hakea salicifolia (H. saligna)*	willow-leaved hakea
Hebe corriganii	purple-flowered hebe
Hedycarya arborea	pigeonwood; porokaiwhiri
Ixerba brexioides	Tawari
Knightia excelsa	rewarewa; NZ honeysuckle
Kunzea robusta	kānuka; white teatree
Laurelia novae-zelandiae	Pukatea
Leptecophylla juniperina ssp. juniperina (Cyathodes)	
Leptospermum scoparium var. scoparium	manuka; red teatree
Leucopogon fasciculatus	mingimingi; kaikaitau
* *Ligustrum sinense*	Chinese privet
Litsea calicaris	mangeo
Lophomyrtus bullata (L. aotearoana)	ramarama
Melicytus ramiflorus ssp.ramiflorus	māhoe
Mida salicifolia	willow-leaved maire
Myrsine australis	red matipo; mapou
Nestegis lanceolata (Gymnelaea)	white maire
Olearia rani var. colorata	Heketara
Pennantia corymbosa	kaikōmako
Piper excelsum ssp excelsum (Macropiper)	kawakawa; pepper tree
Pittosporum tenuifolium	black matipo; kohuhu
Pseudopanax crassifolius	lancewood; horoeka
Pseudopanax discolor	
Quintinia serrata agg (Q. acutifolia; Q. elliptica)	tawheowheo
Rhabdothamnus solandri	taurepo; kaikai aruhe
* *Rhaphiolepis bibas*	Loquat
Schefflera digitata	pate; patae; kotete
Streblus heterophyllus (Paratrophis microphylla)	turepo; milk tree
Toronia toru (Persoonia)	Toru
* *Ulex europaeus*	gorse
Vitex lucens	pururi; kauere
Weinmannia racemosa	kāmahi; tōwai; tawhero

Dicotyledonous lianes and related trailing plants

Clematis paniculata	clematis; puawhananga
* *Lonicera japonica*	Japanese honeysuckle
Metrosideros colensoi	
Metrosideros diffusa	white climbing rata; akatea
Metrosideros fulgens	scarlet rata; winter rata
Metrosideros perforata	aka; small white rata; torotoro
Muehlenbeckia australis	poheuheu
Parsonsia heterophylla	maori jasmine; kaihu; kaiwhiria
Passiflora tetrandra (Tetrapathaea)	passionfruit; kohia
Rubus cissoides	bush lawyer; tataramoa
* *Rubus fruticosus agg.*	blackberry

Daisy-like herbs

Anaphalioides trinervis (Gnaphalium, Anaphalis)	puatea
* *Bellis perennis*	lawn daisy
* *Cirsium vulgare (C. lanceolatum)*	Scotch thistle
* *Crepis capillaris*	hawkesbeard
* *Erigeron karvinskianus (E. mucronatus)*	Mexican daisy
* *Erigeron sumatrensis*	broad-leaved fleabane
Euchiton involucratus	creeping cudweed
* *Gamochaeta coarctata (G. spicata, Gnaphalium)*	
* *Hypochaeris radicata (Hypochoeris)*	catsear
* *Jacobaea vulgaris (Senecio jacobaea)*	Ragwort
* *Leucanthemum vulgare (Chrysanthemum leucanthemum)*	oxeye daisy
* *Mycelis muralis*	wall lettuce
Senecio bipinnatisectus	Australian fireweed
* *Sonchus asper*	prickly sow thistle; puha
* *Sonchus oleraceus*	sow thistle; puha; puka

Dicotyledonous herbs other than Daisies

* *Callitriche stagnalis*	starwort
Cardamine forsteri	
* *Digitalis purpurea*	foxglove
Drosera auriculata	
Elatostema rugosum	parataniwha
Epilobium pedunculare ss (E. caespitosum, E. linnaeoides)	
* *Galium aparine*	cleavers
* *Galium palustre*	marsh bedstraw
* *Geranium robertianum*	herb Robert
Haloragis erecta ssp. erecta agg (H. colenoi)	toatoa
Hydrocotyle dissecta	
Hydrocotyle elongata	
Lobelia angulata (Pratia)	panakenake
* *Lotus pedunculatus (L. major; L. uliginosus)*	lotus major
* *Ludwigia palustris*	water purslane
* *Myosotis laxa ssp. caespitosa (M. subvernicosa)*	water forget-me-not
* *Nasturtium officinale (Rorippa nasturtium-aquaticum)*	watercress
Nertera depressa agg (N. cunninghamii; Coprosma)	common nertera
Nertera dichondrifolia (Coprosma)	hairy nertera
* *Oxalis incarnata*	pale oxalis; lilac oxalis
Oxalis magellanica (O. lactea)	white oxalis
Peperomia urvilleana	wharanui
* *Phytolacca octandra*	inkweed
* *Plantago lanceolata*	narrow-leaved plantain
* *Potentilla indica (Duchesnia)*	Indian strawberry
* *Prunella vulgaris*	selfheal
* *Ranunculus flammula*	spearwort
Ranunculus reflexus (pp R. hirtus)	maruru; hairy buttercup
Stellaria parviflora	
* *Trifolium repens*	white clover
Urtica sykesii (pp. U. incisa)	stinging nettle
Wahlenbergia violacea (W. trichogyna; W. gracilis)	blue harebell; rimu-roa

Monocotyledonous trees and shrubs

Cordyline australis	cabbage tree; ti-kouka
Cordyline banksii	ti ngahere
Cordyline pumilio	dwarf cabbage tree
Rhopalostylis sapida	nikau

Monocotyledonous lianes

Freycinetia banksii (F. baueriana var.)	Kiekie
Ripogonum scandens	supplejack; kareao

Sedges

Carex "geminata large"	
Carex banksiana (Uncinia banksii)	
Carex dipsacea	
Carex dissita	
** Carex divulsa*	
Carex forsteri	
Carex secta	niggerhead; pukio
Carex uncinata (Uncinia)	watu
** Cyperus eragrostis*	
Gahnia lacera	
Gahnia setifolia	
Isolepis inundata (Scirpus)	
Isolepis subtilissima (Scirpus)	
Machaerina sinclairii (Vincentia)	broad-leaved sedge
Morelotia affinis	
Schoenus maschalinus	
Schoenus tendo	

Rushes and allied plants

** Juncus articulatus (J. lampocarpus)*	jointed rush
Juncus planifolius	
Luzula subclavata (L. picta var. pallida)	

Grasses

** Agrostis capillaris (A. tenuis)*	browntop
** Anthoxanthum odoratum*	sweet vernal
Austroderia fulvida	kakaho; toetoe
** Dactylis glomerata*	cocksfoot
** Glyceria declinata*	glaucous sweet grass
** Holcus lanatus*	Yorkshire fog
** Lolium arundinaceum (Festuca, Schedenorus)*	tall fescue
Microlaena avenacea (Ehrharta diplax)	bush rice grass; oat grass
Microlaena stipoides (Ehrharta)	forest rice grass
** Miscanthus nepalensis*	Himalayan fairy grass
Oplismenus hirtellus ssp. Imbecillis	oat grass
** Poa annua*	annual poa
Rytidosperma gracile	forest fairy grass

Remaining Monocotyledonous herbs

** Allium triquetrum*	three-cornered garlic

Astelia fragrans	bushflax; kakaha
Astelia hastata (Collospermum)	kahakaha
Astelia solandri	kowharawhara
Astelia trinervia	
** Crocosmia crocosmiiflora X (C. aurea X)*	Montbretia
Dianella nigra	blueberry; turutu
Libertia grandiflora	
Phormium cookianum ssp. cookianum (P. colensoi)	mountain flax; whaririki
Phormium tenax	Flax
** Tradescantia fluminensis*	wandering dew

Orchids

Acianthus sinclairii (A. fornicatus var.)	heart-leaf orchid
Bulbophyllum pygmaeum (Ichthyostomum)	
Caladenia chlorostyla (Petalochilus, C. "green column")	
Corybas "Kaimai" (C. aff. rivularis)	
Corybas acuminatus (Nematoceras)	
Corybas oblongus (Corybas "quadriplex")	
Corybas trilobus (Nematoceras)	
Corybas trilobus	
Cyrtostylis oblonga (Acianthus reniformis var. oblongus)	
Dendrobium cunninghamii (Winika)	bamboo orchid
Drymoanthus adversus (Sarchochilus)	
Earina autumnalis	Easter orchid; raupeka
Earina mucronata	spring orchid; peka-a-waka
Pterostylis agathicola (P. rubricaulis; P. graminea var. rubricaulis)	
Pterostylis banksii	tutukiwi
Pterostylis graminea (P. "Aniseed")	grassy hooded orchid
Pterostylis trullifolia (Diplodium trullifolium)	trowel-leaved orchid
Thelymitra longifolia	white sun orchid
Thelymitra pauciflora (T. intermedia ss non Moore; T. "pseudopauciflora")	

Driving Creek Railway

380 Driving Creek Railway Road, Coromandel
31.10.2020
Kerry Jones, Elizabeth Overdyck, Elizabeht Miller, Elaine Iddon

Gymnosperms

Agathis australis	kauri
Cupressus macrocarpa	macrocarpa
Dacrycarpus dacrydioides	kahikatea
Dacrydium cupressinum	rimu
Phyllocladus trichomanoides	tanekaha
* *Pinus radiata*	radiata pine
Podocarpus totara	totara
Prumnopitys ferruginea	miro
Prumnopitys taxifolia	matai

Monocot Tree/Shrubs

Cordyline australis	cabbage tree
Cordyline banksii	cabbage tree
Cordyline pumilio	dwarf cabbage tree
Phormium tenax	flax, harakeke
Rhopalostylis sapida	nikau

Dicot Tree/Shrubs

Aristotelia serrata	wineberry, makomako
Beilschmiedia tarairi	taraire
Beilschmiedia tawa	tawa
Brachyglottis kirkii var angustior	Kirk's tree daisy
Brachyglottis repanda	rangiora
Carpodetus serratus	putaputaweta
Coprosma arborea	
Coprosma grandifolia	kanono
Coprosma lucida	
Coprosma macrocarpa	
Coprosma rhamnoides	
Coprosma robusta	karamu
Coriaria arborea	tutu
Corynocarpus laevigatus	karaka
Dodonea viscosa	akeake
Dysoxylum spectabile	kohekohe
**Elaeagnus x reflexa*	elaeagnus
Fuchsia excorticata	tree fuchsia
Geniostoma ligustrifolium var. ligustrifolium	hangehange
Hedycarya arborea	porokaiwhiri, pigeonwood
**Homalanthus populifolius*	Queensland poplar
Knightia excelsa	rewarewa

Kunzea robusta	kānuka
Laurelia novae-zelandiae	pukatea
Leptospermum scoparium	mānuka
Leucopogon fasciculatus	soft mingimingi
**Ligustrum lucidum*	tree privet
Mida salicifolia	
Myrsine australis	mapau
Myrsine salicina	toro
Nestegis cunninghamii	black maire
Olearia albida	
Olearia furfuracea	akepiro
Olearia rani	heketara
Pittosporum eugenioides	
Pittosporum tenufolium	
Pittosporum huttonianum	
Pomaderris kumeraho	kumerahou
**Prunus sp.*	cherry
Pseudopanax arboreus	five finger, whauwhaupaku
Pseudopanax crassifolius	lancewood
Pseudopanax lessonii	houpara
Quintinia serrata	
Schefflera digitata	pate
Solanum mauritianum	woolly nightshade
Sophora chathamica	kowhai
Sophora sp.	kowhai
Syzygium maire	swamp maire, maire tawake
Toronia toru	toro
**Ulex europaeus*	gorse
Veronica stricta	koromiko
Weinmannia silvicola	towai

Monocot Lianes

Freycinetia banksii	kiekie
Ripogonum scandens	supplejack, kareao
**Asparagus scandens*	climbing asparagus

Dicot Lianes

Clematis paniculata	
**Hedera helix*	ivy
Metrosideros diffusa	
Metrosideros fulgens	
Metrosideros perforata	
**Passiflora edulis*	passionfruit
Passiflora tetranda	
Rubus cissoides	bush lawyer
**Rubus fruticosus agg.*	blackberry

Psilopsids, Lycopods and Quillworts

Lycopodiella cernua	
Lycopodium deuterodensum	
Lycopodium volubile	
Phlegmariurus varius	
Tmesipteris tannensis	

Ferns

Asplenium flaccidum	
Asplenium oblongifolium	
Blechnum fraseri	
Blechnum novae-zelandiae	kiokio
Cyathea dealbata	silver fern, ponga
Cyathea medullaris	mamaku
Dicksonia squarrosa	wheki
Doodia australis	
Lygodium articulatum	mangemange
Microsorum pustulatum	hound's tongue
Paesia scaberula	ring fern
Pneumatopteris pennigera	gully fern
Pteridium esculentum	bracken
Ptisana salicina	king fern
Pyrrosia elaeagnifolia	leather-leaf fern, pyrrosia
**Selaginella kraussiana*	selaginella

Orchids

Earina mucronata	
Pterostylis banksia	
Thelymitra sp.	

Sedges

Gahnia setafolia	
Uncinia unciniata	

Grasses

**Entolasia marginata*	bordered panic grass
Microlaena stipoides	
Oplismenus hirtellus subsp. Imbecillis	

Monocot Herbs

**Allium triquetrum*	onion weed
**Aristea ecklonii*	
Arthropodium cirratum	rengarenga
Astelia fragrans	
Astelia hastata	
Dianella nigra	turutu, new zealand blueberry
**Hedychium gardnerianum*	kahili ginger
**Lilium formosanum*	Formosan lily

Dicot Herbs

**Ageratina adenophora*	Mexican devil
Callitriche muelleri	
Centella uniflora	
**Cirsium vulgare*	
Drosera auriculata	sundew
Elatostema rugosum	parataniwha
**Erigeron sumatrensis*	broad-leaved flea-bane
Hibiscus trionum	hibicus
**Hypochaeris radicata*	
**Leontodon taraxicoides*	
Lobelia anceps	
**Lotus pedunculatus*	lotus
Nertera depressa	
Nertera dichondradioides	
**Pseudognaphalium sp.*	cudweed
**Senecio bipinnatisectus*	Australian fireweed
**Senecio wairauensis*	
**Sonchus oleraceus*	

Houghton's North

Maungakawa Road, Ngarua
22 November 2020
Norm Mason – Waikato Regional Council

Native species

Alectryon excelsus subsp. excelsus	tītoki
Coprosma areolate	thin-leaved coprosma
Coprosma propinqua	mingimingi
Coprosma propinqua x C. robusta	mingimingi
Coprosma rhamnoides	coprosma
Coprosma rigida	coprosma
Coprosma rotundifolia	round leaved coprosma
Coprosma tenuicaulis	swamp coprosma
Cordyline australis	tī, cabbage tree
Dacrycarpus dacrydioides	kahikatea
Elaeocarpus hookerianus	pokaka
Fuchsia perscandens	scrambling fuchsia
Leucopogon fasciculatus	mingimingi
Melicope simplex	poataniwha
Melicytus micranthus	swamp mahoe
Melicytus ramiflorus subsp. ramiflorus	mahoe
Metrosideros diffusa	white rata
Metrosideros perforata	white rata
Muehlenbeckia australis	pohuehue
Myrsine australis	mapou
Neomyrtus pedunculata	rohutu
Parsonsia heterophylla	new zealand jasmine
Passiflora tetrandra	native passionfruit
Pittosporum tenuifolium	kohuhu
Podocarpus totara var. totara	lowland tōtara
Prumnopitys taxifolia	matai
Ripogonum scandens	supplejack
Rubus australis	bush lawyer
Sophora microphylla	kōwhai
Streblus heterophyllus	turepo
Asplenium flaccidum	hanging spleenwort
Blechnum filiforme (now Icarus filiformis)	thread fern
Blechnum membranaceum (now Austroblechnum membranaceum)	fern
Blechnum novae-zelandiae (now Parablechnum novae-zelandiae)	kiokio
Callitriche stagnalis	starwort
Calystegia sepium subsp. roseata	bindweed
Carex dissita	sedge
Carex geminata	sedge
Carex lambertiana	sedge
Carex lessoniana	sedge
Carex secta	sedge
Carex solandri	sedge
Carex virgata	sedge
Cyathea dealbata	ponga, silver fern
Deparia petersenii subsp. congrua (incl. D. tenuifolia)	fern
Diplazium australe	fern
Doodia australis (syn D. media, Blechnum parrisiae)	rasp fern
Earina mucronate	bamboo orchid
Isolepis reticularis	clubrush
Kunzea ericoides var ericoides	kānuka
Lastreopsis glabella	fern
Microlaena stipoides	bush rice grass
Microsorum pustulatum subsp. pustulatum	hounds tonge fern

Microsorum scandens	hounds tonge fern
Myriophyllum propinquum	water milfoil
Oplismenus hirtellus subsp. imbecillis	panic grass
Pellaea rotundifolia	fern
Phyllocladus trichomanoides	tanekaha
Pteris tremula	fern
Pyrrosia eleagnifolia	fern
Adiantum diaphanum	
Cardamine forsterii	
Podocarpus laetus	
Lastreopteris microsora ssp. pentancgularis	
Leucopogon fasciculatus	
Oxalis exilis	

Exotic species

Glyceria maxima	reed sweet grass
Jacobaea vulgaris	ragwort
Ligustrum sinense	Chinese privet
Osmunda regalis	royal fern
Prunus serrulate	Japanese cherry/ Taiwanese cherry
Salix cinereal	grey willow
Agrostis stolonifera	creeping bent
Berberis glaucocarpa	barberry
Bidens frondosa	beggars' ticks
Carex divulsa	grey sedge
Carex ovalis	oval sedge
Carex scoparia	broom sedge
Carex vulpinoidea	fox sedge
Cirsium arvense	California thistle
Crataegus monogyna	hawthorn
Cyperus eragrostis	umbrella sedge
Duchesnia indica (syn Potentilla indica)	wild strawberry
Erigeron sumatrensis (syn Conyza)	broadleaved fleabane
Galium aparine	
Galium palustre	marsh bedstraw
Holcus lanatus	
Juncus articulates	jointed rush
Lonicera japonica	Japanese honeysuckle
Lycopus europaeus	gypsy wort
Myosotis laxa subsp. caespitosa	forget-me-not
Paspalum dilatatum	paspalum
Persicaria hydropiper	water pepper
Ranunculus flammula	spearwort
Ranunculus repens	creeping buttercup
Rubus sp. (R. fruticosus agg.)	blackberry
Rumex obtusifolius	broad-leaved dock
Solanum pseudocapsicum	Jerusalem cherry
Stellaria media	
Tradescantia fluminensis	wandering dew
Azolla pinnata	
Cardamine flexuosa	
Carex lurida	
Crepis capillaris	
Critesion murinum ssp. murinum	
Euphorbia peplus	
Gamochaeta coarctata	
Juncus tenuis	
Lapsana communis	
Leucanthemum vulgare	

Pararau Pa

Kereone Road
22 November 2020
Norm Mason – Waikato Regional council

Native species

Alectryon excelsus subsp. excelsus	tītoki
Coprosma arborea	mamangi
Coprosma areolate	thin-leaved coprosma
Coprosma propinqua x C. robusta	mingimingi
Coprosma rigida	coprosma
Coprosma rotundifolia	round leaved coprosma
Coprosma tenuicaulis	swamp coprosma
Cordyline australis	tī, cabbage tree
Dacrycarpus dacrydioides	kahikatea
Elaeocarpus hookerianus	pokaka
Melicope simplex	poataniwha
Melicytus micranthus	swamp mahoe
Melicytus ramiflorus subsp. ramiflorus	mahoe
Muehlenbeckia australis	pohuehue
Myrsine australis	mapou
Parsonsia heterophylla	new zealand jasmine
Passiflora tetrandra	native passionfruit
Podocarpus totara var. totara	lowland tōtara
Prumnopitys taxifolia	matai
Sophora microphylla	kōwhai
Streblus heterophyllus	turepo
Blechnum filiforme (now Icarus filiformis)	thread fern
Callitriche petriei subsp. petriei	starwort
Callitriche stagnalis	starwort
Calystegia sepium subsp. roseate	bindweed
Carex solandri	sedge
Carex virgate	purei
Centella uniflora	centella
Diplazium australe	fern
Earina mucronate	bamboo orchid
Hydrocotyle pterocarpa	pennywort
Hypolepis ambigua	fern
Isolepis reticularis	clubrush
Lemna aff. disperma	duckweed
Lobelia angulata	lobelia
Microlaena stipoides	bush rice grass
Myriophyllum propinquum	water milfoil
Oplismenus hirtellus subsp. imbecillis	panic grass
Ranunculus glabrifolius	buttercup
Glossostigma elatinoides	

Exotic species

Ligustrum sinense	Chinese privet
Salix cinerea	grey willow
Berberis glaucocarpa	barberry
Carex ovalis	oval sedge
Carex vulpinoidea	fox sedge
Cirsium vulgare	Scotch thistle
Crataegus monogyna	hawthorn
Cyperus eragrostis	umbrella sedge

Galium palustre	marsh bedstraw
Holcus lanatus	
Lonicera japonica	Japanese honeysuckle
Ludwigia palustris	water purslane
Lycopus europaeus	gypsy wort
Myosotis laxa subsp. caespitosa	forget-me-not
Persicaria hydropiper	water pepper
Ranunculus flammula	spearwort
Solanum pseudocapsicum	Jerusalem cherry
Tradescantia fluminensis	wandering dew
Carex lurida	
Juncus acutus	
Rumex pulcher	
Solanum nigrum	
Poa trivialis	
Barbarea intermedia	