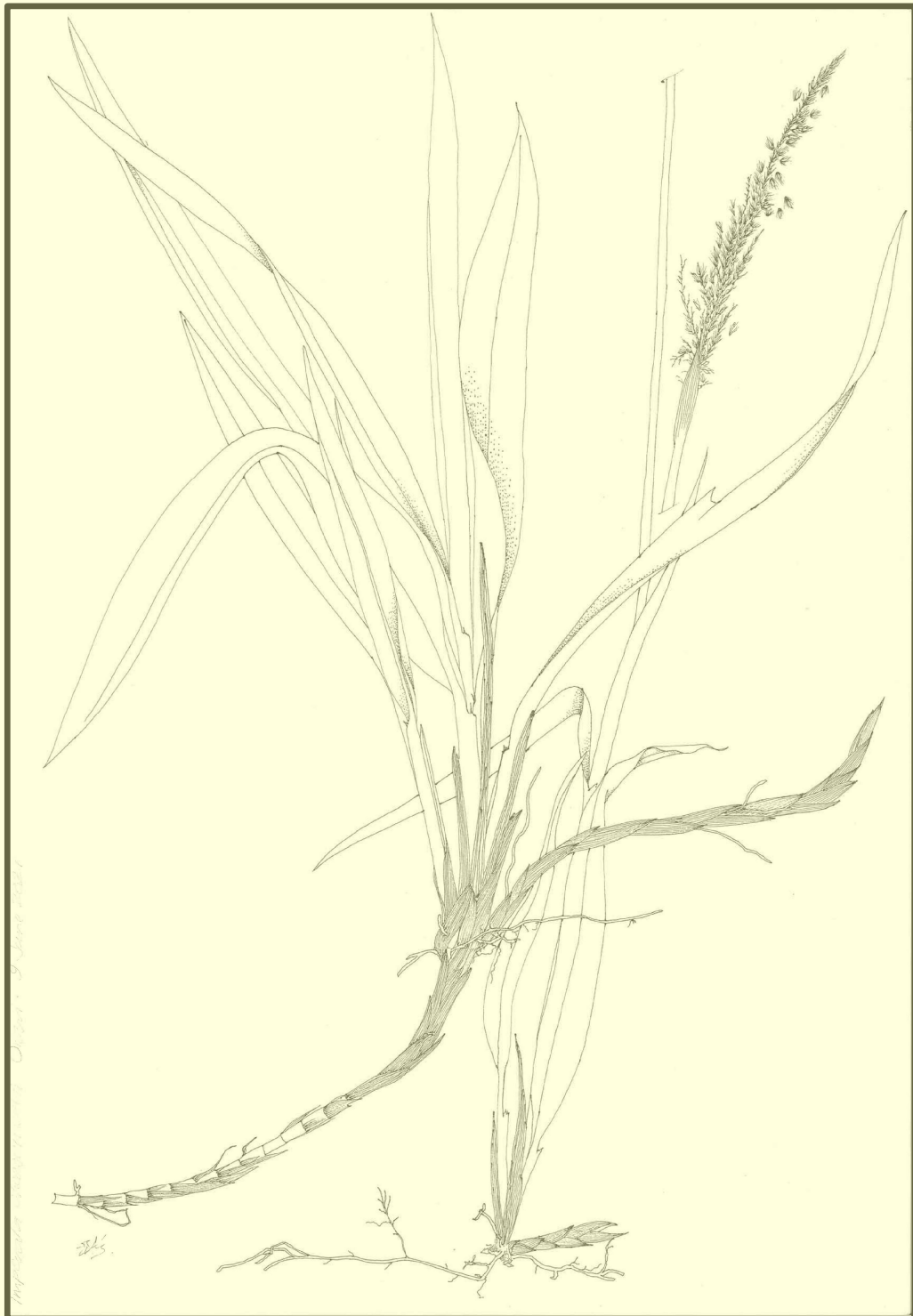


NEW ZEALAND BOTANICAL SOCIETY

NEWSLETTER

NUMBER 156

June 2024



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The 2024 ordinary and institutional subscriptions are \$28 (reduced to \$25 if paid by the due date on the subscription invoice). The 2023 student subscription, available to full-time students, is \$15 (reduced to \$10 if paid by the due date on the subscription invoice).

Back issues of the *Newsletter* are available at \$7.00 each. Since 1986 the Newsletter has appeared quarterly in March, June, September and December.

New subscriptions are always welcome and these, together with back issue orders, should be sent to the Secretary/Treasurer (address above).

Subscriptions are due by 30 April each year for that calendar year. Existing subscribers are sent an invoice with the March *Newsletter* for the next year's subscription which offers a reduction if this is paid by the due date. If you are in arrears with your subscription a reminder notice comes attached to each issue of the *Newsletter*.

Deadline for next issue

The deadline for the September 2024 issue is **10 August 2024**, not the usual 25 August, because the Editor will be on holiday overseas.

Please post contributions to:
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Send email contributions to lara.shepherd@tepapa.govt.nz Files are preferably in MS Word, as a Microsoft Word document. Graphics can be sent as TIF JPG, or BMP files; please do not embed images into documents. Alternatively, photos or line drawings can be posted and will be returned if required. Drawings and photos make an article more readable so please include them if possible.

Cover Illustration

Imperata cheesemanii by Eleanor Burton.

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Regional Botanical Society News

■ Auckland Botanical Society

March Meeting and AGM

Dan Blanchon, who is now in charge of the Auckland Museum Herbarium, is the new President of ABS, taking over from Bec Stanley. After the business of the AGM was concluded, Holly Cox, who is the Auckland Council's representative on the National Biocontrol Collective, spoke about the efforts made to control woolly nightshade in Aotearoa. The woolly nightshade lace bug (*Gargaphia decoris*) was released here in 2010 but has failed to make a dent in the population. Holly has recently visited Uruguay to look for more biocontrol agents to tackle this bothersome weed.

March field trip

The March 2024 field trip was to the Auckland Airport area in the upper reaches of the Oruarangi Creek, an inlet of the Manukau Harbour. We examined green infrastructure connected with stormwater management in The Landing industrial zone, where poplar trees, *Griselinia littoralis* hedges, *Carex secta*, and *Lomandra longifolia* are the dominant plants used in rain gardens in Maurice Wilson Avenue. We also investigated the plant life in a large, constructed wetland by the Percy Cafe, riparian native tree plantings (cabbage tree, ngaio, karo, taupata etc), mangroves, and several stormwater ponds in adjoining Montgomerie Road Reserve and in Pavilion Park in Pavilion Drive. Mangroves have rapidly established in the upper reaches of Oruarangi Creek after reconnection of the creek to the sea in 2005 following Watercare's decommissioning of the wastewater oxidation ponds constructed in 1959.

April meeting, the Lucy Cranwell Lecture

Our Lucy Cranwell lecturer this year was Professor Peter de Lange, speaking on some of his findings from over one hundred visits to Rekohu, the Chatham Islands. Peter is now on the Rekohu Conservation Board, and also takes Unitech students there on an annual visit. He began the talk with an outline of the earliest visits by botanists in the nineteenth century, and proceeded to outline some of the problems now affecting the vegetation there. In one case, the presence of myrtle rust, so feared for the damage it will do to our native plants in the Myrtaceae, can sometimes be beneficial, as in the case of it infesting the huge numbers of Chilean guava that have spread over a large area of the main island.

April field trip

As forecast, rain arrived with a vengeance in Auckland for this trip, but eleven hardy souls, in full wet-weather gear, met to explore Torbay Reserve on the North Shore. For those who had never visited before, it was a pleasant surprise to see such diversity of vegetation in the city, ranging from fernland (or gumland scrub), dense forest, and a small wetland. The forested area had swathes of kiekie and *Metrosideros fulgens*, the latter just past full flowering, but still showing enough red blossom for us to imagine the impact a week or two earlier. The highlight for many was the proliferation of *Dracophyllum sinclairii*, some with a few flowers showing. This is not a common shrub locally, so it was good to see a healthy population. The fernland was a perfect place for people to differentiate between *Gleichenia microphylla*, usually in slightly shaded sites, and *G. dicarpa* in the more open places. On leaving the reserve the rain increased in intensity, so it was decided to leave the planned afternoon visit to Awaruku Reserve for another time.

May meeting

Sophie Newmarch, one of our Lucy Cranwell recipients, is studying our only native iris group, *Libertia*, looking at the evolutionary history of this Southern Hemisphere genus. Their number of chromosome sets range from two to twelve, and the upper North Island is a hotspot. Sophie's fieldwork shows that what was a Mt Tamahunga (near Leigh) endemic, *Libertia flaccidifolia*, has now been found at another site some miles away at Kaipara Flats. More work will follow to check out the identity of the plants growing along the Mahurangi River. What started out as a MSc thesis, is developing into working towards a PhD.

May field trip

Twelve people arrived on the black sands of Kariotahi Beach, west of Waiuku, and met our leader for the day, Tricia Aspin. Tricia made the wise decision that we should walk southwards on the sand, avoiding the hooning motorcyclists, and do our botanising on the return walk. On the cliffs of consolidated, podzolised sand, grew enough unusual plants to keep us interested for the duration. The native sow thistle, *Sonchus kirkii*, was one of these, with large bluish-grey leaves. The nationally critical *Leptinella disperma* ssp. *rupestris* growing in patches on the cliffs had leaves so tiny that one needed to use magnification of some sort to see that the minute leaves were actually lobed as is typical of the genus. A discussion was held as to whether the *Ipomoea cairica* was planted, growing so far south, but the Australasian Virtual Herbarium shows even more southerly populations have been recorded.

Auckland Botanical Society PO Box 26391, Epsom, Auckland 1344

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Secretary: Kirsty Myron

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■ **Rotorua Botanical Society**

March 9 RBS 40th anniversary - Lake Okareka Walkway and function

Quite a large group of members, some not often seen on trips, met at Lake Okareka for the easy walk to the lake outlet. The first part of the walkway was through trees planted about 20 years ago. Here a brief stop was made to observe white mistletoe that had established on one of the trees. The planted stand opened out to a walkway fringed by scattered planted kahikatea and extensive areas of former wet pasture now in a variety of planted trees and shrubs and rushes and sedges. After the 400 m boardwalk ended plantings continued, often as a narrow fringe along the shore to the outlet.

The next major stop was to forage at the lake edge near the hide, where the receding lake revealed a wide variety of wetland herbs including *Limosella lineata*, *Hypericum pusillum*, *Gratiola sexdentata*, *Triglochin striata* and *Myriophyllum propinquum*. A late lunch under a shady silver poplar just after the first km marked a change in pace with a "no botanising" call to get to the rātā near the outlet to ensure all the ground was covered. The rātā provided much expert discussion, with a final decision that the two large trees were probably rātā x pohutukawa hybrids. From this point the walkway left the shore passing through young kānuka before descending to the shore at the outlet. Here the steep bank to the shore provided quite a few new species, including hangehange, mingimingi, *Wahlenbergia violacea* and terrestrial *Earina mucronata*. The more leisurely return along the walkway added a few more weedy species including narrow-leaved carpet grass and plume grass.

The evening social function at Sarah and Willie Shaw's place at Tikitere began with a guided walk around their garden (wild land) of native species, followed by a barbeque and slide show, particularly showing early trips and members.

FUTURE EVENTS

June 8	Okareka wetland walkway, Lake Okareka
July 7	Burt Farm, Matata Straight
August 4	Waitekohekohe Recreational Park, Katikati
September 1	Lake Rotoma Scenic Reserve, Whangaroa Inlet

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■ **Wellington Botanical Society**

Days Bay loop, East Harbour Regional Park – 4 November 2023

Twenty-five headed up the Korimako Track where our focus was orchids. Highlights were numerous, including *Thelymitra nervosa*, *Caladenia variegata*, both *Drymoanthus* species and several *Pterostylis* species including *P. montana* in flower.

Rātā walks, Lower Hutt 7 & 9 December 2023

These walks looped through the suburb of Waiwhetu, starting and ending at Woburn Railway Station. There were a dozen northern rātā en route at every stage of flowering from full bloom to not-at-all. The rātā at Our Lady of Compassion School, which is about 2m tall, was covered in blossoms and the majestic Leighton Ave rātā put on a spectacular show.

Erua, Ruapehu Summer Camp – 20-27 January 2024

Twenty-seven Te Whanganui-a-Tara BotSoc friends attended the summer field trip based at Taylor Lodge, Erua, on SH4 north of Ohakune.

Silica Rapids – 21 January 2024

Our first taste of Tongariro vegetation was along the Marton Sash and Door cycleway—a bog dominated by *Empodisma minus* and *Gleichenia alpina*. We moved on to the Silica Rapids track, a popular tourist walk on the north side of Ruapehu. The beginning of our walk meandered through grassland and shrubland dominated by red tussock / *Chionochloa rubra* subsp. *rubra* var. *rubra*, inaka / *Dracophyllum longifolium*, *D. recurvum* and hybrids thereof, hebes - *Veronica odora*, *V. tetragona*, *V. venustula* and snow tōtara / *Podocarpus nivalis*.

Taranaki Falls Track – 22 January 2024

The rather ubiquitous *Calluna vulgaris* / Scottish heather in full flower greeted us at the start of the track but it soon gave way to a scrub community dominated by *Coprosma pseudocuneata* and *Olearia nummulariifolia*. A wetter hollow on the track obviously held enough wetness for the edges to be a bank of *Pentachondra pumila* and a glossy bed of *Wahlenbergia albomarginata* subsp. *albomarginata* with no sign of flowers. Among the dominant red tussock, *Chionochloa rubra* subsp. *rubra*, was a surprising amount of *Anthoxanthum redolens* in full flower. On reaching a small forest remnant beside a stream we were greeted by large *Polystichum vestitum*. Here we had lunch surrounded by a suite of *Coprosma* species. The dominant species was *Coprosma foetidissima* but associated with it were *C. tenuifolia*, *C. microcarpa* and *C. cheesemanii* as we came out into the open again. Also within reach were beds of both *Lagenophora strangulata* and *L. pumila* within the shade. Further into the forest there was a stand of large *Pittosporum colensoi*. Along the stream where light entered the canopy *Rytidosperma gracile* lined the side of the path. Emerging from the forest onto freshly weathered volcanic ash there were both *Gentianella bellidifolia* and *Forstera tenella* within metres of one another. Near the end of the walk above the falls on a north-facing slope, a divaricate that had been puzzling us for some time, betrayed its identity by its fruit and pale red flowers: it was *Aristotelia fruticosa*.

Mangawhero Forest – 23 January 2024.

This track is in a reserve set aside in the logging days by the Scenic Preservation Society when the Main Trunk Line was being built and almost all the timber in the area was logged. Just a few patches of forest were being saved as examples of the ancient native bush. It is a beautifully maintained reserve of ancient podocarps and tawa, rich in ferns and mosses, on the outskirts of Ohakune. There are many light wells created naturally by falling trees. Here young potential forest giants are shooting up.

The Mangawhero walking track, formerly the Lions Wheelchair Walk, begins and ends beside the 15-minute Rātā Walk, which engaged five of our group for half a day. There were many, many magnificent podocarps, with huge rātā vines in their canopies, and layers of plants below them, as it is in ancient forest. At one place several vines of *Metrosideros colensoi*, were aligned, making an impressive curtain. Beside the track were many *Alseuosmia pusilla* mimicking *Pseudowintera colensoi* but lacking the peppery taste and white backs to the leaves. Close to the track was a gob-smacking group of five *Dicksonia fibrosa* d.b.h. c. 50 cm. People seeing the moss *Dawsonia superba* for the first time were suitably impressed.

Te Onetapu (Rangipo Desert) from Tukino Skifield access road – 24 January 2024

Our first stop was not far off SH1 where we ventured into the freezing cold, stiff southerly for our first look at the vegetation on the eastern and more arid side of Ruapehu. It's not called a Desert for nothing! Features of the landscape at this altitude, c. 1100 m, were plants growing in clumps on the otherwise bare substrate of sandy to gravely volcanic material. The clumps were mainly of individual species such as *Rytidosperma setifolium*, with their fluffy, mature seed heads bending with the wind, while a bit further

on there were mounds of more substantial plants like *Dracophyllum recurvum* and *Podocarpus nivalis*. It seems that plants accumulate windblown sand as they grow, which then allows them to grow wider and higher, and for more species to grow together. The grass *Anthosachne solandri* was one plant that almost always grew as an individual plant among a clump of other species, with just one seed head with its strikingly long awns sticking up on a long stem. Other plants were more mat forming e.g., *Carmichaelia nana*. Some of these had been browsed, and hare pellets indicated the likely culprits. The good news was that many plants bore fresh seed pods, buried amongst their low growing stems. Some mats of *Muehlenbeckia axillaris* were almost covered by their fleshy fruit, while others were still flowering.

Other highlights were flowering mats of *Raoulia albosericea*, *Styphelia nesophila*'s large orange fruits glowing against the desert, and the central North Island endemic *Pimelea microphylla* with its pointy white fruit that looked oversized for the size of the plants. Higher up, *Parahebe spathulata*, in flower, caused some excitement. On one of our stops we investigated one of the larger patches of vegetation, where we found ancient-looking trees of *Olearia nummulariifolia*, some with trunks likely exceeding 10 cm in diameter, and with exposed roots forming dramatic sculptures.

Turoa ski field and surrounds – 25 January 2024

The site comprised a typical alpine zone with loose boulders and gravels and most of the area was both high in elevation (1600 m above sea level) and steep in topography. As the site is annually covered in snow the vegetation was low in stature and of the 'rugged' nature. As such it was one of those botanising trips where heads were down, butts were up and hand lenses were out. One of the dominant species was the moss, *Racomitrium pruinosum*, which seemed to be the perfect site for many other species to grow including *Drosera arcturi* which I think shows the magic of water retention in a brutally exposed site! Botanical highlights included *Anisotome aromatica*, *Brachyglottis bidwillii*, *Celmisia gracilentia*, *C. incana*, *Dracophyllum recurvum*, *Podocarpus nivalis* and *Veronica tetragona*.

Rotokura Lake Walk – 25 January 2024

Our first marvel was a towering *Pteridium esculentum*, an extraordinary fern stretching to an impressive 3 metres. Beneath a canopy of *Pseudopanax arboreus*, the understorey was a patchwork of *Coprosma* species - *Coprosma autumnalis*, *C. tenuifolia*, *C. rhamnoides*, and *C. microcarpa*, and *Blechnum* ferns (*B. novae-zealandiae* and *B. discolor*) each playing their part in this verdant mosaic. The path then led us into a cathedral of beeches, where towering *Fuscospora fusca* / red beech and *Lophozonia menziesii* / silver beech imparted a spacious, serene aura. The first lakeside - Dry Lake, a realm of *Leptospermum scoparium* / mānuka and *Leucopogon fasciculatus* and *Leptecophylla juniperina*, welcomed water-birds into its tranquil embrace.

Horopito Track – 25 January 2024

Once we reached the regenerating mānuka and kānuka we discovered the understorey had a rich diversity of native flora. The edges and ditch along the farm track through this section of regeneration gave us rewarding sightings of wetland communities. In the ditch beside the road and under the mānuka scrub a wide range of leafy and rushy *Juncus* spp, *Carex* spp, *Potamogeton suboblongus*, *Myriophyllum triphyllum*, *Gonocarpus agregatus* and *Drosera binata* were common. Within the kānuka scrub we saw large *Elaeocarpus hookerianus* with juvenile and adult forms, fruiting *Aristotelia fruticosa*, flowering *Neomyrtus pendiculata* and *Clematis quadibracteolata*.

After two hours botanising and walking, we reached the Tongariro National Park boundary. Under a spreading *Fuscospora solandri* we had lunch. Then we crossed the fence and continued up the old logging road / Horopito Track which was gravelled, slightly overgrown in places, but still well defined. The mature beech / podocarp forest was a sharp contrast to the farmland: the main canopy species were *Fuscospora solandri*, *Libocedrus bidwillii*, *Dacrydium cupressinum*, *Podocarpus laetus* and *Pectinopitys ferruginea*. The understorey showed evidence of years of ungulate browsing and pigs. The dominant species we saw were *Sticherus cunninghamii*, *Gahnia pauciflora*, *Leucopogon fasciculatus*, *Pseudowintera colorata* and *Coprosma colensoi*. On the track where water had accumulated we saw patches of *Drosera spatulata* and *Gonocarpus micranthus* subsp. *micrathus*. In the wetter parts of the adjacent forest we saw large patches of *Astelia grandis*, *Microlaena avenacea* and *Blechnum minus*.

Tree Trunk Gorge Walk – east end – 26 January 2024

The track initially follows two little tributaries of the Tongariro River. Immediately we were enchanted by the beech forest, dominated by massive red beech, mingimingi, kāmahī and crown fern, glittering in dappled light. Mostly we saw a healthy understorey, often including five *Coprosma* spp, *Pseudopanax* spp, horopito, black maire and putaputawētā, with occasional tōtara, miro and mataī. We saw a shrub of *Helichrysum lanceolatum*. Below the giants we recorded numerous *Astelia fragrans* and some sixteen species of fern including the lovely *Leptolepia novae-zelandiae*. Of the *Hymenophyllum* spp. *H. multifidum* and *H. demissum* were easily identified. Tree ferns were well represented by *Dicksonia* spp., then two handsome specimens of *Leptopteris superba* surprised us as we turned a bend, as did a few unexpected *Austroblechnum colensoi* in a particularly shady, damp spot. At our feet we saw some common herbs, including *Ranunculus reflexus*, *Nertera depressa*, *Lobelia angulata* and *Urtica sykesii*. We saw the climbers *Clematis paniculata* and *Rubus schmidelioides*.

In one area of the forest, a storm had apparently created a small clearing where track-clearing of fallen trees had left freshly cut logs of mataī which Gavin determined to be about 300 years old. We returned after reaching the track's highest point, to allow time to visit the Pillars of Hercules bridge lookout and a section of that track. In the vicinity of the bridge, the numerous *Cordyline banksii* and *Lycopodium volubile*, not seen earlier in the day, were eye-catching. One little orchid, possibly a *Prasophyllum* remained unidentified.

White Rock Road and Tunanui, Wairapa – 10-11 February 2024

Linkwood Bush - This covenant covers a steep east-facing hill slope, a remnant of MF2 rimu, mataī, hīnau type forest in the valleys with MF5 black beech forest on the ridges and drier sites. The MF2 forest type is regionally endangered with 16% remaining. We traversed the base of the slope along the fence and in the adjacent farmland identified *Dacrycarpus dacrydioides*, *Podocarpus totara* var. *totara* and *Prumnopitys taxifolia*. Soon we made interesting finds: *Asplenium bulbiferum*, *Diplazium australe*, *Microlaena polynoda* and *Trisetum lepidum*, which were all either not seen before, or uncommon in eastern Wairapa. We did not see the mistletoes recorded during past visits. We botanised our way up the steep slope seeing *Nestegis cunninghamii*, *N. lanceolata* and *Streblus heterophyllus*. Along the bush edge at the top of the slope we saw divaricating shrubs, e.g., *Coprosma crassifolia*, *C. aerolata*, *C. rhamnoides*, *C. rigida*, *Raukahu anomalus*, *Melicytus micranthus*. Descending the slope we found *Carmichaelia australis*, *Alectryon excelsum*, *Cordyline banksii*, *Metrosideros colensoi* and *Sophora microphylla*. We saw several species of ferns including *Blechnum membranaceum*, *Parapolystichum microsorum* subsp. *pentangulare*, *Polystichum neozelandicum* and several species of *Asplenium*.

Awanui Bush - This covenant is a short drive from Linkwood Bush. As we crossed the dry riverbed with small native herb fields on the banks either side, the swamp forest of *Dacrycarpus dacrydioides* / kahikatea with wetland in the foreground and mature forest canopy looked inviting. The forest covers an east facing gully and hill slope, another remnant of MF2 rimu, mataī, hīnau type forest in the valleys with MF5 black beech forest on the ridges and drier sites. We crossed the river flats seeing *Dacrycarpus dacrydioides*, *Streblus heterophyllus*, *Raukahu anomalus*, *Melicytus micranthus*, *Pennantia corymbosa*, *Sophora microphylla* and *Myrsine divaricata*. Climbing the spur on our right we noted the different forms of *Sophora microphylla* amongst the *Hoheria sexstylosa*, *Coprosma rigida*, *Kunzea ericoides* agg. Further travel up the spur was barred by a fence so we followed this back to the gully, seeing *Clematis foetida*, *Muehlenbeckia complexa*, and *Parapolystichum glabellum*.

Back down in the gully we ventured up the dry stream bed. Though also browsed there was, like the river flats, a diverse shrub layer and the usual array of wetland-adapted *Carex* spp, *Juncus sarophorus* and *Typha orientalis* around the pond. The canopy comprised *Pittosporum tenuifolium*, *Sophora microphylla*, *Kunzea ericoides* agg., a large *Hoheria angustifolia*, *H. sexstylosa*, *Pennantia corymbosa* and *Nestegis cunninghamii* but the highlight for me was the largest *Nestegis montana* I have seen. Awanui Bush is close to other native-seed sources. It has a good canopy cover and diversity of native flora. Protection from grazing by all browsers would see it establish a good example of mataī - rimu - hīnau forest type.

Tunanui forest remnants – The Tunanui covenants are MR7 tawa, kamahī, podocarp forest type. About 22% of this forest type remains in the region - it is a regionally endangered forest type. Much of this forest type is found along the western edges of the Tararua Range in mild sub-humid to humid hill country. The two QE2- covenanted blocks are in adjacent gullies separated by a spur with isolated trees

over pasture. Once up the spur a distance the farmer was very keen to understand why some of the tawa in the paddocks were collapsing and the bark falling off. It is hard to know the cause of these events.

The canopy of the covenants was intact and dominated by *Dacrycarpus dacrydioides*, *Podocarpus totara*, *Alectryon excelsus* and *Beilschmiedia tawa*. There were also several *Nestegis lanceolata* and *Elaeocarpus dentatus*. The subcanopy included *Melicope simplex*, *Melicytus ramiflorus*, *Myrsine australis*, *Carpodetus serratus*, *Pennantia corymbosa*, some very tall *Piper excelsum*, *Pittosporum eugenoides*, *P. tenuifolium*, *Plagianthus regius*, *Pseudopanax arboreus*, *P. crassifolius*, *Pterophylla racemosa*, *Schefflera digitata* and *Streblus heterophyllus*. The shrub layer was diverse, including *Cyathea* spp., *Brachyglottis repanda*, the common *Coprosma* spp., *Geniostoma ligustrifolium* and *Leptospermum scoparium*. We saw the beautiful cascading *Metrosideros colensoi*. Amongst the many climbers present were *Metrosideros diffusa*, *Clematis foetida* and *Passiflora tetrandra*. In the ground cover were six species of *Asplenium*, five species of *Blechnum*, *Lecanopteris pustulatus* and *L. scandens*, *Paesia scaberula*, *Pakau pennigera*, *Parapolystichum glabellum*, *Pellaea rotundifolia*, *Polystichum neozelandicum*, *Pteridium esculentum* and *Pyrrhosia eleagnifolia*.

Paraparaumu Scenic Reserve – 2 March 2024

We planned to botanise the less visited section of Paraparaumu Scenic Reserve, which is on the floor of Nīkau Valley and heads east on one side of the gas pipeline and west on the other side. It is an area of regionally rare coastal and lowland kohekohe/tawa forest with kahikatea/pukatea, nīkau and tree ferns. Wayne Mitchell from the restoration group gave us the background to the reserve and outlined the work and plans the group has for continuing restoration. They maintain extensive bait lines through the area which provide access tracks.

We did forays on both sides of the pipeline. Each becomes steep quickly with many large trees, including the impressive roots of a *Griselinia lucida* / puka girdling the trunk of a kohekohe. There was an abundance of tree ferns and ground ferns, although not a large variety of species. We all got confused with naming *Microsorium* and thank Kate for sorting this out: *Microsorium* / *Lecanopteris* / *Dedroconche* / *Zealandia*. *Microsorium* has been renamed - but different things by different people. An overseas paper in 2019 split the three local *Microsorium* species into *Dendroconche scandens* and *Zealandia pustulata* and *Zealandia novae-zealandiae*. But a New Zealand paper in 2021 lumped all three into *Lecanopteris*. To make life more complicated the NZPCN website has accepted the 2019 paper and the NZ Flora website the 2021 paper. For our plant list, we have the NZ Flora names.

Ngā Manu Nature Reserve – 6 April 2024

We focused our efforts on the loop in the swamp forest, which was dominated by pukatea and kahikatea. We saw:

- carpets of pukatea seedlings and felt a constant rain of kahikatea seeds falling from the canopy.
- at least two species of mistletoe, propagated and cared for by mistletoe-whispering staff member Rhys Mills.
- *Dactylanthus taylorii* / wood rose / pua o te reinga flowering under cages and noted the strong musky aroma. One plant was also covered with an umbrella to prevent raindrops from dispersing the pollen before it could be used to fertilise other flowers.
- fine stands of *Syzygium maire* / swamp maire although we were concerned to see the amount of myrtle rust covering and killing seed heads. Thankfully some flowers appeared to be uninfected and producing viable seed. It was good to see some seedlings.

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■ **Nelson Botanical Society**

December Camp to Craigieburn Valley Ski Area – combined trip with the Canterbury Botanical Society Day One

On the first day of the camp, members of the Nelson and Canterbury Botanical Societies descended on Craigieburn Valley Skifield. Most of the group ambled slowly up the hill admiring the giant *Aciphylla scott-thomsonii* lining the fast-flowing streams. The Craigieburn basins have 12 species of *Celmisia*,

and the challenge was laid in the day to find them all. *C. spectabilis* subsp. *spectabilis* was found alongside *C. lyallii* and their hybrid, *Celmisia* x *pseudolyallii*. Further up the slope, *C. discolor* and *C. angustifolia* were encountered, the latter in full flower. Tucked away was *C. laricifolia*, with its small flower heads on slender stalks. Heading into a damp gully, we found *C. glandulosa* var. *glandulosa*. We also found some confusing *Celmisia* that we suspected were hybrids, including *C. x mollis*. Back in the drier tussocks we found *Celmisia sessiliflora* with flower-heads beginning to open. Scattered plants of *C. verbascifolia* subsp. *verbascifolia* were seen growing in between the tussocks. As we climbed higher, we began to find *C. viscosa* and were surprised to see a few plants of this species in flower on the edge of a rocky slip. A single plant of *C. walkeri* was found on the lower slopes. People who walked higher into the basin found snowbanks with *C. haastii* var. *haastii* growing alongside *Coprosma niphophila*, with the very similar looking *C. perpusilla* subsp. *perpusilla* being seen just off the skifield road. Dotted among the *Dracophyllum rosmarinifolium* were plants of *Brachyglottis cassinioides*, and *Phyllocladus alpinus*. *Veronica pauciramosa* was found in the boggy stream channels draining the higher slopes. Flowers were seen on some small herbs, including *Ourisia caespitosa*, *Euphrasia laingii*, *Ranunculus ensyii*, *Azorella pallida*, *Raoulia grandiflora* and *Geum uniflorum*. *Zotovia colensoi* was seen higher up the slopes. *Agrostis muelleriana*, with its red-purple inflorescences, was found along the edges of scree. And tucked into the turf plants lining the small streams cascading down the slopes was *Poa dipsacea*. Those who took the hill climb encountered *Veronica haastii* and *V. epacridea*. The dark reddish *Epilobium porphyrium* was seen on the screes with *Polystichum cystostegia*. And for a lucky few, *Haastia recurva* var. *recurva* was spotted near *Raoulia mammillaris*. At least one participant found an intergeneric hybrid between *R. mammillaris* and *Leucogenes grandiceps*. Both groups encountered *Notothlaspi rosulatum* in flower. The best find of the day was a flowering *Myosotis macrantha*.

Day Two - Hog's Back Track

We headed up through a beech forest and emerged above the treeline and were greeted by *Acrothamnus colensoi* hiding in the shade and some *Raoulia subsericea* that was thriving alongside the track. *Festuca novae-zelandiae* and *Chionochoa rubra* made our shoes slosh as we walked between matagouri bushes, mānuka trees, *Dracophyllum acerosum*, *Ozothamnus vauvilliersii* and colourful *O. 'fulvidus'*. *Celmisia gracilenta*, *Acaena caesiiglauca* and *Anisotome filifolia* blooms poked up between the blades. Then we headed over to some exposed limestone and found the Castle Hill forget-me-not and went down the rocks on the other side to see some plants in mountainous miniature: *Coriaria sarmentosa*, *C. plumosa*, *Aristotelia fruticosa* and *Aciphylla subflabellata*. We admired the fruiting *Clematis marata*. Shortly down the path, we saw the group ahead of us had created a stone arrow on the ground dotted with lupin flowers and pointing us straight towards a *Myosotis* 'australis yellow'. We saw some mountain toatoa, various filmy ferns and *Ranunculus ternatifolius*. We clambered up a limestone scree slope and looked at *Brachyglottis haastii*, *Veronica pinguifolia* and some cushion plants. We arrived back at the cars soggy but satisfied with what we saw.

January Field Trip to Rainbow Ski Field

Twenty-two members met at the Rainbow Ski Field lower carpark. On the drive up we stopped to look at a *Brachyglottis laxifolia* that was flowering well. We continued our drive up, yet again had to stop and appreciate some *Veronica lyallii* with its purple-tinted flowers. The carpark gravels at the base of the ski slopes made a good bed for the endangered *Crassula multicaulis*, quite endearing with its miniscule four-petalled flowers. Other plants close to the bottom were *Forstera tenella*, *Myosotis antarctica*,



Myosotis antarctica. Photo by Henry Hart

Lobelia macrodon, *Veronica cryptomorpha* and *V. lycopodioides*. We encountered several *Raoulia* and *Haastia* species, including the well-camouflaged scree specialist *Haastia sinclairii*. Other scree specialists included *Veronica cheesemanii*, which blended in well with its small greyish leaves. We noted the two *Raoulia* species present: *R. bryoides* and *R. eximia*. We also noticed some *Drosera arcturi* along the edge of the water, which excited us greatly. Traversing the ridge, we found *Veronica macrocalyx* subsp. *humilis*, then *Notothlaspi rosulatum* in

fruit, once obvious and beautiful, now hiding in plain sight. We continued along, spotting *Leptinella pyrethrifolia*, South Island edelweiss and hundreds of bright and wonderful *Epilobium*. We slid down the steep slopes on the spikey *Chionochloa australis*, B-lining towards the main group. We passed a smattering of *Myosotis traversii* before uniting with the large group.

Labour Weekend camp at St James Conservation area

Day One - Williams Valley Stream

We decided to botanise the low relief slopes on the true left of Williams Valley Stream just above its confluence west of the St James homestead. The tall tussocks, *Festuca novae-zelandiae* and *Chionochloa macra* are at home on this substrate as are the three species of native daphne we encountered: *Pimelea traversii*, *P. oreophila* and the very hairy *P. mesoa* subsp. *mesoa*. Other shrubs were also mostly low-statured, including *Leptospermum scoparium*, *Coprosma propinqua*, *Discaria toumatou*, *Olearia cymbifolia*, *Veronica rakaiensis* and *V. salicornioides*. The heaths were numerous here and included *Acrothamnus colensoi*, *Dracophyllum rosmarinifolium* and *D. pronum*, the snow berries *Gaultheria crassa* and *G. depressa* var. *novae-zelandiae*, and *Leucopogon fraseri*. *Celmisia* was moderately well represented, with both *C. allanii* and *C. durietzii* present, along with *C. semicordata*, *C. gracilentia* and *C. spectabilis*. Other daisies that were able to tolerate the dry open loess were *Brachyglottis bellidioides* and *Anaphalioides bellidioides*. This habitat was also home for several non-daisy herbs: *Anisotome aromatica*, *A. filifolia*, *Wahlenbergia albomarginata*, *Acaena caesiiglaucula*, the tall-flowered *Gentianella corymbifera*, *Kelleria dieffenbachii* and *Epilobium atriplicifolium*.

We continued up Williams Valley and encountered on rock outcrops the distinctive *Veronica decumbens*, with its red margined leaves, *Helichrysum parvifolium* with bright yellow flowers, and the larger statured and white flowered, *Helichrysum simpsonii*. We left the road and wandering up the streambed among mountain beech forest. The proximity to water allowed the survival of species that are absent from the surrounding dry landscape, such as *Ourisia macrophylla* subsp. *lactea*, *Veronica lyallii*, *Leptinella* 'mediana', *Schoenus pauciflorus*, and a few individuals of *Aciphylla* 'Mt St Patrick'. It is apparently confined to the upper Clarence and Wairau catchments. The find of the day, though, was a small population of *Pittosporum patulum*. This is a highly palatable species, hence its Nationally Endangered threat status.

Day two - Island Saddle and Serpentine Creek

A diverse selection of South Marlborough scree flora was on display for us. Most of the flowering was over for several species such as *Notothlaspi rosulatum*, *Myosotis traversii*, *Lignocarpa carnosula* and *Leptinella dendyi*. The most common plant by far was *Epilobium pycnostachyum*, both green and red-leaved forms. Growing with this were *Lobelia roughii*, *Wahlenbergia cartilaginea*, *Poa buehneri* and *Stellaria roughii*, with its striking sepals that are faint pink on the outside surface and yellow on the inside surface. Adjoining the scree were interesting shrubs including *Veronica pinguifolia*, *Myrsine nummularia*, and *Muehlenbeckia axillaris*. The main *Raoulia* was *R. tenuicaulis*, but *R. hookeri* was also present, and on the nearby stony terrace was *R. australis*. *Epilobium melanocaulon* was the main riverbed willow herb, which occurred with the more prostrate *E. microphyllum*, sporting its distinctive black and white-striped capsules. This branch of Serpentine Creek was fenced to exclude stock in the 1990s after a survey of Molesworth Station identified it as having high biological values.



Juvenile foliage of pitpat (*Pittosporum patulum*) highlighted by the sun, but usually highly camouflaged due to its sparse, dark narrow leaves with irregular tooting and whippy stem, making it easily overlooked. Photo by Shannel Courtney.

We were fascinated by the large amount of *Brachyglottis cassinioides* making up the shrublands, with its characteristic flaking bark and bright yellow clusters of flowers. The other main shrub species were *Podocarpus nivalis*, *Phyllocladus alpinus* s.s and three species of *Veronica*: *V. rakaiensis* in the lower valley, and in the upper part of the valley *V. venustula* and *V. cryptomorpha*, with its two-toned leaves – green on top and glaucous underneath. *V. rakaiensis* and *V. venustula*. Higher up on the scree we could see numerous large cushions of *Haastia pulvinaris*. Lower down on a rock face near the stream we also encountered a population of *Raoulia bryoides*. Other curiosities we found were the hebe-like, *Pimelea traversii* ssp. *traversii*, the divaricating *Pittosporum anomalum* and the rosette-forming *Brachyglottis lagopus*. We were delighted to discover that the snow tōtara was in heavy fruit and so spent a good while grazing on the plump red arils. One of the highlights of this valley was the small riparian population of *Aciphylla* 'Mt St Patrick'. Just before turning back down-valley, we chanced upon several patches of *Celmisia semicordata*.

Day Three - Edwards Flat



Left: Two species of *Leucopogon* growing together on the Edwards Flats terraces: the squat, small-leaved *L. fraseri* being surrounded by the even shorter, smaller-leaved *L. nanum*. Nationally, *L. nanum* is very localised, being confined to the super-dry intermontane basins of South Marlborough and Canterbury. Photo by Shannel Courtney.

We confined ourselves to the easy terrain of the nearby Edwards Flat. This is an extensive basin which is bisected by traces of the Clarence Fault. We started botanising on the well-drained terrace in the basin. The plants here were incredibly drought-stressed. But there were a select handful of natives that were handling the dry loess soils really well, including small patches of *Brachyglottis bellidioides*, mats of both *Raoulia parkii* and *R. subsericea*, the tight-headed *Luzula rufa*, *Acaena caesiiglauc*, *Coprosma petriei* and *Celmisia gracilent*

s.s. We were pleased to find two species of *Leucopogon* growing together: *L. fraseri* and *L. nanum*, which is smaller in all respects. *L. nanum* is confined to these large intermontane basins of the eastern South Island and has a national threat status of Declining. Adjoining the dry terrace was an extensive peaty wetland occupying a fault-induced depression. The contrasting floras between the two habitats was striking, with almost no overlap of species. The main species of stature were *Carex coriacea*, *C. diandra*, *C. sinclairii*, *Schoenus pauciflorus*, *Chionochloa rubra* and *Eleocharis acuta*. It was also of interest to find *Epilobium pallidiflorum* here. But it was the small-herbs that amazed us. The gems we encountered here were totally unexpected and highly significant, some of them being found in only one or few other locations in the northern South Island. The pretty purple and yellow flowers of *Utricularia dichotoma* were conspicuously evident. Mats of *Ranunculus brevis* (Nationally Endangered), with its highly divided linear leaf segments, occupied the wetter sites along with tiny threads of *Nertera balfouriana* and its signature large, light orange, pear-shaped drupes. Diminutive look-alikes growing close together were *Chaerophyllum colensoi* var. *delicatulum* (Nationally Endangered) and *Leptinella pusilla* (Declining). Perplexing was the discovery of a species of rhizomatous bittercress that none of us had encountered before. Unlike most *Cardamine*, it only had one terminal leaflet per leaf, the lateral leaflets being mostly absent, making it look superficially like a *Viola*. Time was spent also pondering over the two widespread, unnamed entities in the *Celmisia gracilent* complex, one of which was strongly rhizomatous and low-growing with short, narrow, shiny leaves (*Celmisia* 'gracilent rhizomatous') and the other forming single rosettes of long strappy leaves covered in spider web-like tomentum (*Celmisia* 'Tararua'). On its dry slopes below us we realised we were looking at the tell-tale ridiculously long, arched, silvery culms of the dryland grass *Rytidosperma merum* (Declining) – always a bonus species to find in these dry places. *Anthoxanthum redolens* revealed itself immediately with its strong strap-leaves that are shiny abaxially but dull adaxially, tall pendant inflorescences with shiny glumes, and dark red sheaths. While not threatened nationally, this is very uncommon in the northern

South Island. Starry drifts of one of *Euchiton lateralis*, adorned *Oreobolus pectinatus* and *Eleocharis gracilis* turf along with patches of *Luzula picta* var. *limosa*, small tussocks of the delicate wetland grasses *Lachnagrostis striata* and *Deschampsia tenella*, and *Epilobium komarovianum*, with its leaves obviously impressed below the higher-relief midrib and veins. In the limited time we had, we only managed to botanise a small fraction of this extensive fault basin and its wetland/dryland complexes.

Lake Rotoiti 18 February 2024

Our first stop was at a dried-up tarn at the entrance to West Bay. The tarn bed was a carpet of tiny flowers and plants. Species identified included: *Lobelia fatiscens*, *Gratiola concinna*, *Myriophyllum triphyllum*, *Lobelia angulata*, *Stylidium subulatum*, *Ranunculus amphitricus*, *Gonocarpus montanus* and a delightful little collection of *Stackhousia minima* that was in fruit on the roadside opposite the dry tarn. A short drive down the road took us to our second site at the source of the Buller/Kawatiri River. It was time to get wet feet and slip and slide over algae covered rocks in search of tiny water-loving plants. But before we dipped our toes, *Alepis flavida* was spied high above in the mountain beech that fringes the lake. *Microtis unifolia* was spotted on the lake margins, as were *Celmisia gracilentia*, *Viola lyallii* and *Microtis oligantha*. Further fossicking revealed little patches of *Hypericum rubicundulum*. After a refreshing swim, we continued to our third site just to the right of the West Bay jetty. Within a stone's throw of holidaymakers' camper vans, we found the minuscule *Pilularia novae-hollandiae*, no more than a couple of centimetres tall. *Glossostigma elatinoides* was also present and in flower, with delicate lilac blooms. Following the shore to the left of the jetty brought us an abundance of *Korthalsella salicornioides* on the mānuka. Having successfully found the tiny native fern and St. John's wort, we focussed on finding *Isoetes alpina*. This small, at-risk lycophyte was present in one spot along the shore.



Stackhousia minima in fruit.
Photo by Chris Ecroyd.

Brown River Scenic Reserve March 2024

Brown River Scenic Reserve is located on the Nelson side of Rai Valley settlement. The meandering and shallow Brown River bisecting the reserve has created numerous oxbows and permanently damp depressions, resulting in fertile conditions for this diverse lowland forest. Canopy species are predominantly mataī, kahikatea, tōtara, pōkākā and black beech with a dense understorey dominated by divaricating species such as *Lophomyrtus obcordata*, *Melicope simplex*, *Streblus heterophyllus* and *Melicytus micranthus*. Some particularly interesting hybrids are present, including black/red beech. Another species spotted by some eagle-eyed botanists is the *Elaeocarpus hookerianus* x *E. dentatus* hybrid, characterised by leaves without underside domatia and without an under-curved leaf margin. *Lophomyrtus bullata* x *L. obcordata* are common and lack the leaf wrinkles present on ramarama. Ramarama here are severely affected by myrtle rust, showing visible orange pustules and with an obvious lack of healthy leaves, which is of real concern. One area of seasonally flooded but currently still very damp oxbow is fringed with immature *Dacrycarpus dacrydioides* and is dominated by *Carex virgata*, *C. secta* and *Coprosma tenuicaulis*, all species that favour very damp conditions. On the margin of this oxbow in very damp ground, Rowan puzzled over a small tree, which, after much deliberation by many people, was finally identified as *Coprosma pedicellata* (At Risk, Declining) and which has been previously unknown from this region. Considerable



Coprosma pedicellata. Photo by Chris Ecroyd.

searching for any fruit to aid identification paid off and a few small violet berries were discovered on the ground, with others obvious in the canopy. It was known from previous visits that *Fuchsia perscandens* was somewhere in the general area, and a typically scrambling patch, still in leaf although with copious amounts of rust, was located. One of the most stunning colours in the forest at this time of year is the fruit of *Alseuosmia pusilla*.

FUTURE EVENTS

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■ Canterbury Botanical Society

February meeting Report: Monday 12th February Jaz Morris on Ahu Pātiki Mt Herbert

A record audience of over 60 people attended this talk. The number of people represented the huge community pride in the purchasing of the park by grants and a crowd-funding campaign ("Let's Buy a Hill") in 2021. It began with a conversation between the previous owners and the Rod Donald Trust CE Suky Thompson to secure access to the Te Ara Pātiki track through their farmland. Now vested in a Trust chaired by Te Hapū o Ngāti Wheke (Rāpaki) Rūnanga, it includes trustees from the Rod Donald Trust, Orton Bradley Park Trust, Te Rūnanga o Kōkourarata. Trust secretary Sarah Anderson was in attendance to provide real-time updates.

The park does not stand alone. It is at the heart of an impressive 2100 hectares of connected conservation land that includes Orton Bradley Park, Mt Herbert scenic reserve, Sign of the Packhorse scenic reserve, Mikimiki Conservation Trust, and private covenants, from sea to the highest summit, Whakaraupō to Waipuna Saddle to the valley floor in Kaituna.

The biodiversity survey provided an overview of the biodiversity values and distribution to help the new Te Ahu Patiki Trust draw up a management plan to support the ongoing indigenous regeneration. Lead by Di Robertson and Jaz, with funding from Environment Canterbury, plants, lizards, birds, lichens, and rock-climbing impacts were surveyed over 4 cold days in October 2022.

Jaz showed a series of aerial maps from 1990 to demonstrate that the massive mound of yellow gorse flowers in late winter is recent. The gorse threatens to overwhelm the summits to the detriment of natural grassland and rocky outcrop plants, while in the gullies it is facilitating the return of indigenous trees. Jaz outlined that only small, high conservation value areas will be defended from encroaching gorse. Jaz showed the drone photos he used to map the extent of the monocultural crop of gorse, regenerating indigenous forest, shrublands. He has set up repeatable drone photo points to map the slow recovery of green over gold.

While Te Ahu Pātiki is the highest point on Banks Peninsula at 919 metres, it has very little of the montane flora of the other high summits. In fact, a few tōtara on the Mt Bradley bluffs indicate that almost all the land would have been in forest. The most interesting plants were found on the original non-forest habitats of rocky bluffs, boulder fields, the spring-fed summit wetland, and an exposed, south-facing gully high up on Mt Bradley that is cold enough to support snow tussock (*Chionochloa rigida*), and inaka (*Dracophyllum acerosum*).

Jaz showed a selection of the 285 vascular plant species (half the Banks Peninsula total), seven Nationally Threatened or At-Risk species, and 65 uncommon plants (Hugh Wilson, 2013). The survey demonstrated that Te Ahu Patiki is a stronghold for the sun hebe (*Veronica lavaudiana*). Mark Parker and William Todhunter from Environment Canterbury found a montane buttercup (*Ranunculus cheesemanii*) in the summit wetland, a new record for Banks Peninsula. Melissa Hutchison logged 56 lichen taxa, including a distinctive foliose lichen *Tuckermannopsis chlorophylla* on old remnant lowland tōtara (*Podocarpus totara*) tree.

The value of a botanical eye was proven when Jaz found several hectares of Spanish heath amongst the Mt Bradley shrublands. Control is now underway. Pigs have spread into Te Ahu Pātiki and deer are constant. The good news is the Jobs for Nature crew from Orton Bradley Park who killed 2000 possums in 18 months is secure.

Jaz's attractive photos, especially the drone shots, made us all proud that the community have helped secure biodiversity and public recreation for the generations to come.

February field trip: February 10th "Sedges have edges, rushes are round"

The first field trip of the year was set aside to explore wetlands. This year the Society visited the wetlands along the Ōtukaikino track and the Isaac Conservation Park walkway to search out rushes and sedges to identify.

On the outskirts of Christchurch the popular recreation area, The Groynes is much more than a place to picnic, bike and walk. The wetlands along the Otukaikino stream retain a rich wetland flora, for the Canterbury Plains. 50 metres from the car we were into a wetland, boots and all. This small puddle of plants and water kept us happy for an hour.

We all encountered something we had not seen before, whether the aquatic chara *Nitella hyalina*, weedy duckweed *Landoltia punctata*, bladderwort in flower, leafy rushes (*Juncus caespiticius*, *J. planifolius*), giant rushes (*J. sarophorus* and *J. pallidus*), bog rushes (*Schoenus pauciflorus*, *S. maschalinus*), spike sedges (*Eleocharis acuta* and *E. gracilis*), or common sedges (*Carex secta*, *C. virgata*, *C. maorica*, *C. flaviformis*, *C. leporina*). A specimen of *Crassula helmsii* went out to the Allan Herbarium to help track the spread of this West Coast wetland succulent now popping up in wetlands around Christchurch. The value of the botanical society multi-sensory learning was demonstrated when Miles Giller passed on Kevin Platts's trick to differentiate *Carex maorica* by the cross veins on the leaf sheath and Jason had us chewing on *Persicaria hydropiper* (hot) and *P. maculosa* (not).

The wetlands are all threatened by grey willow, silver birch, alder, blackberry, and long grass. A wet lawn is full of swamp hypericum (*Hypericum pusillum*), rushes and sedges, albeit truncated from regular mowing, which is a high-maintenance strategy to keep grey willow in check. We were puzzled that naturally low stature wetlands were planted with kahikatea, especially as the young kahikatea were not thriving. In one area the Water and Wildlife Trust had drilled willows and filled the holes with glyphosate to slowly kill the trees. Once light was returned a dense layer of purei (*Carex secta*) and kiokio fern (*Blechnum minus*), grew back, hopefully dense enough to reduce willow reinvasion.

A highlight was lunch with Botanical Society member Raviv Carasuk, supervising a team on Corrections Community Work. The growth of the trees planted upstream from the Isaac Walkway Bridge in nine years is a testament to their regular planting and weeding work. Interestingly, they use lawn mowers to cut the grass between young trees and under the canopy. The infestation of old man's beard is ongoing, waiting for the widespread release of the new biocontrol agent.

We returned to the site where BOTSOC saw the Nationally Endangered dwarf mazus (*Mazus novae-zeelandiae* var. *impolitus* f. *impolitus*) in 2015 to find no mazus and no suitable habitat. No matter how well-intentioned the land managers, holding onto a small herb in a busy landscape has proved impossible.

Meeting Report: The genetic structure and conservation of *Veronica armstrongii*. By Pieter Pelser (Pieter presented this talk on behalf of Ben Gibbons who completed his masters on the topic).

Veronica armstrongii is one of a group of whipcord hebes that includes *V. lycopodioides* and *V. cupressoides*. The leaves are small and pressed against the branches giving a cord-like appearance. A healthy mature plant can grow up to 1.5 m in diameter in a flattened ball shape. They are a very slow-growing species often taking 20 years to begin flowering but under good conditions they can survive 80 years. *Veronica armstrongii* is a habitat specialist growing only on infertile poorly drained leached ecosystems generally in association with bog pine (*Halocarpus bidwillii*).

In 1869 John Armstrong was the first to record *V. armstrongii* in the Upper Rangitata and in the Mackenzie country. His son Joseph cultivated the species between 1869 and 1879. In 1879 Joseph formally described the species and gave it his father's name. Between 1869 and 1926 the population was considered extinct in the wild. In 1974 Peter Wardle discovered a population of 6 plants in Enys Scientific Reserve. Brian Molloy cultivated some of these plants and added them to the reserve. In a 2023 survey of the same sites only 83 adult plants and 279 juveniles plus occasional seedlings were found indicating limited successful recruitment.

In 1984 *V. armstrongii* was discovered at Mt White Station in a number of localities. A later study in 2001 found 1730 plants at the 4 sites. The 2022 survey by Pieter et al. found only 716 remaining plants again mostly in poor condition but they also visited a new site where some large healthy plants remained, which was relatively unbrowsed and unmodified compared to other Mt White sites. At some of the previously populated sites, no *V. armstrongii* were found in the 2001 survey. At most sites the plants were in poor condition, with mostly dead branches and some leafy areas at the bottom. An exception was on an island in a small tarn where there was a relatively healthy regenerating population.

The relatively small and separated populations generated a number of questions that Ben decided to address in his thesis.

- a) With the small population is there a loss of genetic diversity through inbreeding?
- B) is there evidence of gene flow (via pollen or seed with the Mt White Station population)?
- c) What is the genetic structure and connectivity between *V. armstrongii* at the Mt White sites?
- d) What is the relative genetic diversity?
- e) Should the sites be managed as 1 or more than 1 conservation unit?

Using 17 plants from Enys Scientific Reserve and 63 plants from all sites at Mt White Ben, attempted to answer the above questions using three main methods. First, he did genotyping by sequencing (GBS) to generate single nucleotide polymorphism (SNP). This produces data for 9213 SNP loci - a lot of data! He then looked at patterns of genetic structure using unweighted pair group method with arithmetic mean (UPGMA), Principal components analysis (PCA), Discriminant analysis of principle components (DAPC) and Analysis of molecular variance (AMOVA) to produce clusters of similar genotypes. Finally, he looked at genetic diversity, observed heterozygosity and percentage of polymorphic loci.

Results:

The UPGMA phylogenetic tree produced 4 distinct groups corresponding to different sites or clusters of sites. Four areas in Mt White were one cluster. The island population at Mt White another, and the remaining two were from Enys Reserve. On the PCA chart the two Mt White clusters were closer to each other than the two Enys Reserve clusters. The two Enys clusters (group 3 and 4) were distant from each other in the PCA chart. Group 3 was the cultivated plants introduced to the site. While group 4 was the wild population at Enys Reserve. Indicating Enys Scientific Reserve has two populations of genetically isolated but sympatric populations. This may be due to the group 4 population at Enys Reserve having a lower chromosome number- this would have taxonomic implications.

Conclusions:

With the Mt White population declining by 395 plants in just one generation, it would only take three generations for *V. armstrongii* to become extinct. Dave Kelly and Debra Wotton are campaigning to have the species classified as nationally critical rather than nationally endangered.

Other outcomes of this research are that there seems to be genetic diversity within and between populations indicating the four main populations need to be managed as four separate conservation sites. Good record-keeping before and during this research helped to provide some clear-cut answers to the questions posed by Ben in his master's thesis. However some questions still remain on the taxonomy of the group three plants at Enys Reserve and what are the causes of the rapid population decline in many of the study areas.

March 25th Meeting report: The impacts of climate change on New Zealand native orchids, focusing on flowering times and distributions. By Joe Dillon, MSc student, Victoria University
Joe Dillon is testing whether the impact of climate change can be detected in orchid species distributions and life-cycles. In general, a higher temperature results in earlier flowering and earlier fruiting, a correlation backed up by data on peak cherry blossom data recorded in Kyoto from 812 AD to 2012. (<https://www.bbc.com/news/world-asia-56574142>).

Orchids are a good subject to discern climate change. First of all, people like orchids so they collect them or take photographs. The NZ Native Orchid Society members have over 50 years of meticulous data, with herbarium orchid collections starting in 1769, and now iNaturalist has over 5000 observations since 2012, with Joe personally checking and adding phenology attributes to all 5000 iNaturalist records. Secondly, orchids have short flowering times, most New Zealand orchids only have one pollinator, and they rely on fungal partners that are also susceptible to a warming climate.

Joe hypothesized that orchid species would respond to higher temperatures, raised snowlines, and more or less rainfall by moving south and to higher altitudes, changing their flowering times, or just giving up if their habitat or pollinators are fatally disrupted. He is modelling species distributions for 25 orchids, their flowering times, and data from site climates using World Climate. Even at this early stage in his research he has detected shifts in flowering times. For example, the Aotearoa climate mean annual temperatures have increased approximately 1 degree C since 1924, and at the same time the flowering time of odd-leaved orchid (*Aporostylis bifolia*) has shifted 9 days earlier since 1923.

Joe has considered recommending intensive intervention such as moving species south and to higher altitudes, protecting and restoring refugia sites and supplementing South Island populations with North Island genes. Joe concluded that shifting orchids to new optimal habitats, along with their fungus gnat pollinator species, and fungal partners is so complex that it would be easier to solve climate change.

April Field trip: Whakamaru lake Coleridge Island

On Saturday the 13th of April, the Canterbury Botanical Society got together for an early start so we could reach the island in the middle of Lake Coleridge while the weather was still calm. The aim of the day was to investigate the suitability of the island for ecological restoration.

Expert skippers Rasmus and Steve from Fish and Game ferried us across the 3.3 kilometres of open lake while those waiting for a ride botanised the lake shore at Ryton Bay beach, where we found the tiny button daisy *Leptinella pusilla* (which is classified as At Risk-Declining). We landed on the rocky northern shore of the island and found several stunted southern rātā (*Metrosideros umbellata*) surviving where the montane temperatures were moderated by the lake and north-facing rock. The island was dominated by kānuka (*Kunzea ericoides* s.l.) with a thick cover of pōhuehue vine (*Muehlenbeckia australis*). Keen eyes spotted the Threatened – Nationally Critical pygmy mistletoe (*Korthalsella salicornioides*) parasitising its usual host of kānuka but also on exotic Scotch broom (*Cytisus scoparius*) on the edge of the kānuka - a new host record for the species. The exotic broom had been battered by herbicide, wind, and the broom gall mite, giving the mistletoe the right conditions to survive. Another interesting find was a lone mountain beech (*Fuscospora cliffortioides*) on the southern end of the island.

A few exotic weeds such as a lone rowan (*Sorbus aucuparia*) and several elder (*Sambucus nigra*) were present, as well as plenty of rock pigeons (*Columba livia*). Another interesting feature of the island was the diversity of invertebrates, especially large beetles. The group attempted to put as many observations of flora and fauna as they could onto iNaturalist, in order to create a publicly available list of species for the island. After visiting the island, we set off by boat to a peninsula that jutted out into Lake Coleridge. The peninsula had a similar vegetation composition to the island, with a few more mountain beech and southern rātā. As the weather started to turn from a picture-perfect sunny day, we were ferried back to Ryton Bay beach by Rasmus and Steve from Fish and Game. We would like to thank Rasmus and Steve, as well as Fish and Game and Environment Canterbury for the opportunity to botanise this rarely visited and special place.

FUTURE EVENTS

8th June AGM

5th August Talk by Paul Maurice on Flora of the Dolomites

President: Tom Ferguson 027 4716 563 president@canterburybotanicalsociety.org.nz
Secretary: Fay Farrant 027 332 7482 secretary@canterburybotanicalsociety.org.nz
General contact: info@canterburybotanicalsociety.org.nz

■ Other Botanical Society Contacts

Waikato Botanical Society

President: Kerry Jones

Secretary: Wyne Johns

General contact: secretary@waikatobotsoc.org.nz

Website: <http://waikatobotsoc.org.nz>

Taranaki Botanical Society

Contacts: Barbara Hammonds 06 7597077; Email: barbara_ha@outlook.com

Janica Amooore 06 7520830. Email: waiongona@clear.co.nz

Hawke's Bay Botanical Group

<https://www.facebook.com/Hawkes-Bay-Botanical-Group-590670161140095/>

Manawatu Botanical Society

Jill Rapson: Massey University. Ph (06) 350 5799 Ext 7963; [G. Rapson@massey.ac.nz](mailto:G.Rapson@massey.ac.nz)

Whanganui Museum Botanical Group

Our meetings are held every two months on the second Tuesday, alternating with 'Nature Talks' (where the Whanganui Botanical Group has merged with Birding Whanganui and the Whanganui branch of Forest and Bird), which are held on the third Tuesday in even-numbered months. It is intended to continue with monthly botanical field trips to which members of the other two groups are invited.

President: Clive Higgie (06) 342 7857 clive.nicki@xtra.co.nz

Secretary: Margi Keys 0274 481 581 wbotgp@gmail.com

Wakatipu Botanical Group

Chair: Neill Simpson (03) 442 2035

Secretary: Rebecca Teele 027 314 2610 wakatipubotanicalgroup@gmail.com

Botanical Society of Otago

Chair: Gretchen Brownstein, BrownsteinG@landcareresearch.co.nz www.bso.org.nz

Secretary: Angela Brandt, c/- Department of Botany, University of Otago, PO Box 56, Dunedin. bsotago.ac.nz

NOTES AND REPORTS

- The weedy fern *Osmunda regalis* at Farewell Spit: first record for the South Island.

Leon Perrie¹ and Greg Napp²

¹Museum of New Zealand Te Papa Tongarewa, Wellington. leon.perrie@tepapa.govt.nz

²Department of Conservation, Takaka.

The royal fern, *Osmunda regalis*, is a problematically weedy species in New Zealand. It is indigenous to Europe, western Asia, Africa, India, and North and South America (Brownsey & Perrie 2014). It has a long history in New Zealand, and is widespread through the northern North Island. It is especially common in the northern Waikato. It invades wetlands and other areas of wet ground.

In a report prepared for the Department of Conservation, Bayer & Singers (2022) detailed the distribution and history of *Osmunda regalis* in New Zealand. They also noted that *O. regalis* appeared to be a transformer weed of fertile and moderately fertile wetlands, becoming dominant within communities (including over 25% cover through large areas) and displacing indigenous species. *Osmunda regalis* is officially both an Unwanted Organism and on the National Pest Plant Accord in New Zealand.

Within New Zealand, *Osmunda regalis* is easily distinguished by its two-pinnate fronds that have



Osmunda regalis from Farewell Spit. Photo by treekeeper_arb via iNaturalist, CC-BY-NC.

dimorphic pinnae when fertile (Brownsey & Perrie 2014). On fertile fronds, the laminae of the upper pinnae are replaced by clusters of sporangia. The fronds are tufted, with the rhizomes sometimes forming trunks, up to 1.5 m tall. The fronds themselves can be c. 2 m long, and die back over winter.

On 14 March 2024, Bert Harris from Pest Free Onetahua uploaded to www.inaturalist.nz an observation of a fern from Farewell Spit, in the north-western South Island:

<https://inaturalist.nz/observations/202380994>.

The iNaturalist community quickly identified it as *Osmunda regalis* and recognised the significance of the find as the first record for the South Island, with a message passed to the local Department of Conservation office.

A visit to the site on 25 March 2024 by Greg Napp, Ruth Murray, and Millie Bryant-Murray found a population of 20 individuals of *Osmunda regalis* within an area of about 0.5 ha. These plants were growing among *Apodasmia similis* with scattered *Coprosma tenuicaulis* and *Phormium tenax*, in areas that flood during winter. The population was vouchered by Greg Napp with a collection for Te Papa's herbarium (WELT P032939/A-D).

On 16 April 2024 Darren Foxwell (Department of Conservation, Takaka) and Mitch Seek (Tasman District Council Biosecurity Officer) undertook a drone survey of 60ha including the original site and wetland to the north and west. From the aerial drone imagery, Greg Napp identified an additional 24 possible individuals. The Department of Conservation will investigate these along with the original population when they go to the area in spring to undertake control work.

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The origin of the Farewell Spit population is unknown. The spores of *Osmunda regalis* are windborne. Its dispersal may also be aided by birds moving between wetlands. Concerningly, Bayer and Singers (2022) noted some examples of possible anthropological dispersal. Anyone moving from a site with *O. regalis* should take measures to mitigate spreading its spores.

As recommended by Bayer and Singers (2022), surveillance for and elimination of *Osmunda regalis* in the central North Island and southwards is required. They noted other instances of recent spread. The need for continued vigilance is exemplified by the similarly recent (23 March 2024) first report of the species within the area of the Greater Wellington Regional Council, from a wetland within Queen Elizabeth Park near Paekākāriki: <https://inaturalist.nz/observations/203549242>

Acknowledgements

Lloyd Esler and John Barraclough were the first on iNaturalist to respectively identify the Farewell Spit observation and note its significance. Nick Singers is thanked for sharing the report he co-authored for the Department of Conservation.

References

Bayler C, Singer N. 2022. Royal fern (*Osmunda regalis*): national population distribution and management options. Singers Ecological Solutions Ltd.

Brownsey PJ, Perrie LR. 2014. Osmundaceae. In: Breitwieser I, Heenan PB, Wilton AD. Flora of New Zealand – Ferns and Lycophytes. Fascicle 4. Manaaki Whenua Press, Lincoln.

BIOGRAPHY / BIBLIOGRAPHY

Editor's note – The biographical sketch below is Val Smith's last contribution to the newsletter. I would like to thank Val for her regular contributions of biographical sketches to the New Zealand Botanical Society Newsletter since 2009.

■ Biographical Sketch – William Smith Hamilton (1824-1903)

Val Smith, valdsmith@xtra.co

The fourth son of farmers John and Janet Hamilton (née Alexander), and the fifth of their nine children, William Smith Hamilton was born at West Calder, near Edinburgh, Scotland. He studied mathematics and classics at Edinburgh Training College and later taught at a number of schools before following siblings to Australasia. He is reputed to have taught under canvas at Ballarat during the gold rush there, and later taught mathematics at Geelong High School, Victoria. He married Mary Milne, the daughter

of an Aberdeen architect and builder then working in Melbourne, but soon after her death during childbirth in 1861, Hamilton sailed with his son William Milne Hamilton (Willie) for New Zealand.

In Wellington, when Premier George Grey suggested the establishment of a new grammar school, a private forerunner of Wellington College, Hamilton became one of its first two teachers. Eight pupils enrolled and began lessons on 5 February 1867 in a Woodward Street building; by the end of the year there were forty, with classes held in barrack rooms on the Thorndon reserve. The number of students increased



Gunnera hamiltonii by Val Smith.

rapidly, and in November 1868 the school was transferred to a purpose-built building near what is now Clifton Terrace – and a new headmaster appointed! Hamilton's immediate resignation was not accepted, and eventually he was persuaded to stay on as mathematics master. In 1872 the college affiliated with the University of New Zealand and extended the subjects offered, and during this period botanist Thomas Kirk gave natural science lectures. The next year (1873), when arrangements were made to move the school to its current site (on town belt land) and appoint yet another new headmaster, Hamilton's resignation was accepted.

With siblings in Southland and property in Invercargill, he headed south and continued his teaching activities, initially as arithmetic examiner for two local boys seeking scholarships. He then attempted to establish a superior school for boys but was thwarted by the introduction of a new educational bill aimed at establishing a uniform state educational system. Hamilton was a nominee but failed to get elected for one of the nine seats available on the Southland Education Board. He was overlooked in 1878 when Peter Goyen, a teacher from Victoria, Australia, was appointed Inspector of Schools, Southland, and in 1881 George Blanchflower, an assistant master at Geelong Grammar School in Victoria, became headmaster of the new Southland Boys High School. Meanwhile, Hamilton's son Willie completed his secondary school education at Otago Boys High School before becoming a law clerk and later practising lawyer in Invercargill.

Hamilton had given lectures to members of the Wellington Philosophical Society but seems to have had little (if any) involvement with the short-lived Southland Institute "devoted to the promotion of Science, Philosophy, Literature and Art" during the 1880s, with Goyen as secretary and a mysterious William Stewart Hamilton "interested in geology and botany" as president. At the May 1884 meeting, names suggested by Thomas Kirk for plants found by Hamilton (*Tillaea hamiltonii* and *Gunnera hamiltonii*) were published but were not formally described and the names validated until much later.

Hamilton's son Willie was still in Invercargill when Janet Smart, his future wife, began teaching music there. He later established a legal practice in Waimate, and from about 1890 until his death on 12 May 1903, William Smith Hamilton lived with them and their four children: "... a worthy gentleman and erudite scholar who, until about 18 years ago made Invercargill his home and was highly esteemed by the older generation. He was a man of simple tastes, an ardent student of literature, and a keen critic."

Gunnera hamiltonii

Gunnera (named after Johann Ernst Gunnerus, an 18th century Swedish theologian and botanist) is a small genus of about 30 species of South and Central America, Hawaii, Australia and New Zealand. *Gunnera tinctoria* (Chilean rhubarb), a garden escape in New Zealand, invades coastal areas, wetlands

and slip faces, its large rhubarb-like leaves shading out native species, whilst our four native *Gunnera* species form ground-hugging mats or patches with leaves just a few centimetres across.

One of the rarest plants in New Zealand, *Gunnera hamiltonii* is found only on the coasts of Southland and Stewart Island/Rakiura, with six plants growing naturally at four locations, each extending over a large area and maintaining itself vegetatively. Only one wild location is known with both male and female plants, but apparently not growing close enough together to enable fruit set.

Unfortunately, in the 1960s the population growing beside the Oreti River at Sandy Point was decimated by a combination of weeds, grazing and gravel extraction. However, a piece of the plant was rescued, replanted and is surviving.

Gunnera hamiltonii

The *Gunnera* genus contains about 40 species found mainly in the Southern Hemisphere, but also in Hawaii and Central America. *Gunnera hamiltonii* is the largest and rarest of the six New Zealand species, with only a few known colonies in Stewart Island/Rakiura and near Invercargill. It forms patches of overlapping rosettes reaching 10 cm in diameter. The tough, triangular leaves on wide reddish petioles are bronze-green tinged with red and have regularly toothed margins. Numerous tiny flowers on erect stems up to 12 cm tall, male and female on separate plants, appear in spring. It grows in sand dune hollows near the sea and is an attractive rock garden plant in a few public and private gardens.

REFERENCES

- Godley, E.J. 1993. Biographical notes (9) Thomas Waugh 1832-1896. NZBS Newsletter 31:10-11. *Gunnera hamiltonii*. <https://southlandcommunitynursery.org.nz> (accessed 9 March 2004).
- Pullon, D.H. 1990. A Hamilton pedigree: an account of how family members from Scotland settled in New Zealand. David Henry Hamilton Pullon.
- Stace, M.V. 1990. A Hamilton family tree.
- William Smith Hamilton. <https://gardenhistoryresearchfoundation.com/2023/05/17/invercargills-first-borough-gardener/> (accessed 3 February 2024).
- Wilson, H. More on *Gunnera hamiltonii*. <https://bts.nzpcn.org.nz> (accessed 9 March 2024).

PUBLICATIONS

■ Publications Received

Auckland Botanical Society Newssheet April 2024 Upcoming talks and trips, update from Auckland Council on 'low incidence pest plant program review', Bot Soc health and safety guide, books for sale.

Auckland Botanical Society Newssheet May 2024 Upcoming talks and trips, Bot Soc health and safety guide, books for sale.

Wellington Botanical Society Newsletter April 2024 Upcoming talks and trips, publications received, awards available, QEII National Trust update, Greater Wellington Pest Plant Update, Percy Scenic reserve news, Ōtari update, trip reports for Days Bay loop, Lower Hutt rātā walks, Ruapehu Summer Camp Erua, White Rock Road and Tunanui, Paraparaumu Scenic Reserve and Ngā Manu Nature Reserve.

Nelson Botanical Society Newsletter Summer 2023-24 Trip reports for Cragieburn Valley Ski Area, Rainbow Ski Field, St James Conservation Area, Lake Rotoiti, Brown River Scenic Reserve.

Botanical Society of Otago Newsletter 101 March 2024 Upcoming meetings and trips, report on the John Child Bryophyte and Lichen workshop 2023, article on the Tin Range, article on mycological knowledge and Facebook, trip reports on Burns Reserve and Tautuku, talk reports on lichen and modelling fungal populations.

New Zealand Native Orchid Journal Number 172 March 2024 Articles on *Caladenia nothofageti* and *C. chlorostyla*, 2023 AGM and tagalong, a surprise find of *Pterostylis paludosa*, a southern coastal form of *Corybas macranthus*, mystery *Corybas* at Arthur's Pass, *Caladenia* 'Bacon Creek' and the type locality of *Earina aestivalis*.