

NEW ZEALAND BOTANICAL SOCIETY

NEWSLETTER

NUMBER 147

March 2022



President:	Anthony Wright
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Subscriptions

The 2022 ordinary and institutional subscriptions are \$25 (reduced to \$18 if paid by the due date on the subscription invoice). The 2022 student subscription, available to full-time students, is \$12 (reduced to \$9 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 years 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 June 2022 issue is 25 May 2022.

Please post contributions to:
Lara Shepherd
Museum of New Zealand Te Papa Tongarewa
169 Tory St Wellington 6021

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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NEWSLETTER
NUMBER 147 March 2022

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NEWS

New Zealand Botanical Society News

- **From the President: Annual General Meeting – Approval of Financial Statement for the year ended 31 December 2021**

Below is the Society's Financial Statement for 2021, which has been reviewed by the committee, who recommend it for adoption by the members via postal/email ballot.

Society Name: New Zealand Botanical Society

Society Number: 426877

Financial Statement for year ended: 31 December 2021

	2021	2020
INCOME		
Donations	\$0.00	\$36.00
Interest	\$2.86	\$5.03
2020 Subscriptions	\$133.00	\$3,402.00
2021 Subscriptions	\$2,912.00	\$43.00
Total Income	\$3,047.86	\$3,486.03
EXPENSES		
Postage costs	\$2,448.28	\$2,092.64
Printing costs	\$1,622.78	\$1,493.29
Stationery	\$39.68	\$0.00
Calligraphy costs (Allan Mere)	\$0.00	\$126.50
Bank fees	\$0.90	\$25.00
Total Expenses	\$4,111.64	\$3,737.43
Total income	\$3,047.86	\$3,486.03
Less total expenses	(\$4,111.64)	(\$3,737.43)
Net surplus/(deficit)	(\$1,063.78)	(\$251.40)
ASSETS		
Cash in bank - current account	\$7,611.86	\$8,018.63
Cash in bank - Achiever Savings	\$996.15	\$2,075.61
Stock on hand	\$1,083.50	\$0.00
Total Assets	\$9,691.55	\$10,094.24
LIABILITIES		
Printing costs	\$0.00	\$416.30
Calligraphy costs	\$0.00	\$126.50
Postage costs	\$1,203.89	\$0.00
Total Liabilities	\$1,203.89	\$542.80
Total Assets	\$9,691.55	\$10,094.24
Less Total Liabilities	(\$1,203.89)	(\$542.80)
NET ASSETS	\$8,487.66	\$9,551.44

Represented by		
Retained earnings c/fwd from previous year	\$9,551.44	\$9,802.84
Profit (loss) for year	(\$1,063.78)	(\$251.40)
TOTAL FUNDS AS AT 31 DECEMBER 2021	\$8,487.66	\$9,551.44

While a small loss on the year's operations is posted, the Society has an accumulated surplus which can cover it for the 2021 financial year. Whilst there was no increase in subscriptions in 2021, the committee has agreed an increase for 2022 to cover the increasing costs the Society is facing, particularly in relation to postage.

In 2022, subscriptions will be as follows:

- \$28 per individual (\$25 if paid by the early payment date)
- \$38 per family subscription (\$35 if paid by the early payment date)
- \$15 per student (\$10 if paid by the early payment date).

Invoices in 2022 will be issued to reflect these increases.

As President I move, and Ewen Cameron, Secretary/Treasurer, seconds a resolution "That the 2021 Annual Financial Statement published in Newsletter 147 (March 2022), be adopted".

Voting in the Annual General Meeting is by means of Ballot by either email or post. There is a Ballot Paper included with this issue of the Newsletter. The ballot will close at 5 pm on Friday 22 April 2022. Scanned ballot papers can be emailed to hbenson@canterburymuseum.com prior to this time.

Voting papers being posted should reach the Secretary/Treasurer, New Zealand Botanical Society, C/- Canterbury Museum, 11 Rolleston Avenue, Christchurch, 8013 no later than this closing time. An addressed envelope has been included to assist you.

The results of the AGM ballot voting will be notified in Newsletter 148, June 2022. Thank you for your continued support for the New Zealand Botanical Society.

Anthony Wright, President, New Zealand Botanical Society

■ From the Treasurer: Subscriptions 2022

Enclosed is your subscription invoice for 2022. Please pay via direct credit following the instructions on the invoice, or alternatively post your remittance back to us using the self-addressed envelope enclosed, along with your Ballot Paper.

■ Call for Nominations for Allan Mere Award 2022

Nominations meeting the following conditions are invited for the award of the Allan Mere for the year 2022.

Conditions of the Allan Mere Award

1. The Award shall be made annually to a person or persons who have made outstanding contributions to botany in New Zealand, either in a professional or amateur capacity.
2. The Award shall be administered by the New Zealand Botanical Society.
3. Nominations for the Award may be made by regional Botanical Societies, or by individuals, to the Secretary of the New Zealand Botanical Society. Nominations shall close on 30th June each year. Nominations shall be signed by nominator and seconder, and accompanied by supporting information.

4. Selection of the successful nominee/nominees shall be made by the Committee of the New Zealand Botanical Society, normally within three months of the closing date for nominations.
5. If, in the opinion of the Committee, no suitable nomination is received in any particular year, the Committee may refrain from making an award.
6. The Mere shall be formally presented to the recipient on an appropriate occasion by the President of the New Zealand Botanical Society or his/her nominee, but otherwise shall remain in the custody of, and be displayed by, the Herbarium Keeper of the Allan Herbarium (CHR) at Landcare Research, Lincoln, together with the book recording awards.
7. The recipient shall receive an appropriately inscribed certificate.

Nominations should be forwarded by 30 June 2022 to:

Ewen Cameron, Secretary, New Zealand Botanical Society, c/- Canterbury Museum, Rolleston Avenue, Christchurch 8013.

Regional Botanical Society News

■ Auckland Botanical Society

December picnic and field trip

Newly released from lockdown, it was a pleasure to meet up with our botanical friends and celebrate at our annual Christmas function, this time at Point Wells, on the Whangateau Harbour. The local hall was well set up for our pot-luck luncheon, and the harbour side walk displayed a profusion of saltmarsh plants, many of them in flower. After cleaning up the hall, some enthusiasts drove the short distance to the Omaha Causeway, to view the *Ophioglossum petiolatum*, which, after the warm, wet winter, was present in large numbers.

February field trip

Unfortunately, the trip to Kariotahi, west of Waiuku, was cancelled, due to the prevalence of Omicron in Auckland.

Auckland Botanical Society PO Box 26391, Epsom, Auckland 1344

President: Ewen Cameron

Secretary: Kirsty Myron (acting)

aucklandbotanicalsociety@gmail.com

■ Rotorua Botanical Society

October Trip - Matawai CA

There are few places to access the Matawai CA by track and recent rain meant we chose the track to the Search and Rescue lodge. This is a 4WD track that meanders across a flat terrace, then finally following a small creek it to the end of the terrace at a gully in the slope and a hut.

The fringes of the forest near the road are quite rich with plants such as wineberry, *Coprosma robusta*, *C. autumnalis*, *Alseuosmia pusila*, mingimingi, tree ferns, especially *Dicksonia fibrosa*, and hen and chicken fern. But further in where logging for podocarps had occurred, it was open red and silver beech with a dense cover of crown fern in the frequent, large openings. Here the subcanopy was sparse kamahi, kaikamako, broadleaf, pepperwood and an odd quintinia. The target of the trip was to relocate mistletoe recorded over a decade ago. Progress was slow as the canopy was scanned but we were soon rewarded by a large *Peraxilla colensoi*, then a *P. tetrapetala* not much further along, but that was all. Along the creek, tawari became more common and more open areas were covered with waterfern. At the hut the vegetation began to change again with divaricating shrubs such as *Raukua anomalous* (and hybrids with *R. simplex*) and *Neomyrtus pedunculata* becoming more common. On the return there was some debate about whether hard beech was present (we decided it wasn't) and a successful search for *Microsorium novaezealandiae* with its fat scaly rhizome, amongst the similar and more abundant patches of *M. pustulatum*.

November Trip - Coromandel weekend

Saturday: Preeces Point QEII (Golden Ridge)

The hills were clouded in and it looked like rain so we headed to Preeces Point. At first we took the left track, which was a long loop out to the eastern boundary through mostly tall kanuka or mahoe forest with scattered emergent rewarewa and ricker kauri. Scattered patches were dominated by adults as well as regeneration of *Coprosma arborea*, kohekohe, pigeonwood and lancewood. Initially many herbaceous weeds were present along the path. Near the reserve boundary we encountered a large elaeagnus patch with many seedlings nearby. Later many more seedlings were seen along the shore track. Many rimu, miro and totara along the track edge were evidently recently planted. Along the shoreline track we made several forays out to the shore including one long grassy one along a stream meander that led to a long shell bank (one of several we could see) and to mangrove swamp. Here a good representation of wetland plants included *Bolboschoenus medianus* and salt marsh plants such as *Cotula coronopifolia*, *Samolus repens*, *Juncus kraussii* and *Plagianthus divaricatus*. After lunch under a large pukatea were rewarded with a grand swamp maire amongst kiekie and *Carex geminata*. Near where the coast track turned to lawn we saw three *Pommaderis* species, *P. kumarahoe*, *P. amoena* and the local endemic *P. rugosa*. *Sophora chathamica* and, of course, pohutukawa were also common with *Olearia furfuracea* and manuka forming a low shrubland on the slope above. On the return to the vehicles we passed through a small but magnificent piece of coastal forest of puriri and taraire forest containing tawa, kohekohe and pukatea. The area as a whole is a truly interesting example of a transition from shelly shore through mangroves, rushes or sedge wetland to coastal forest and regenerating kauri on the ridge above.

From there we headed to the magnificent Waiau kauri, stopping briefly at the short Falls Walk by mistake, 1 km short of our intended destination. The waterfall track was swamped by *Sellaginella kraussii* and the forest was dominated by tree ferns and mahoe, the waterfall clothed in *Tradescantia*. The kauri walk was a marked contrast. Although *Sellaginella kraussii* was common at the start of the track, by time we reached the lookout the forest, although modified, was pretty weed free. The lookout is an overview of spectacular piece of unlogged mature forest, rescued from the loggers in the 1940's. The large mature kauri stand out from the surrounding forest with a few pale green round-crowned *Nestegis montana* also standing out with them in the subcanopy. Beneath the kauri plants, of particular interest were *Mida salicifolia*, *Quintinia serrata*, *Brachyglottis kirkii* and terrestrial *Pittosporum cornifolium*. A few significant additions to a previous list included the orchids - *Acianthus sinclairii* and *Corybas acuminatus* in fruit and *Pterostylis agathicola* still in flower. Near the creek a good list of ferns of ferns was noted including kidney fern and the bronze *Hymenophyllum frankliniae*.

Sunday: Kaipawa Trig

Enroute to the Whangapoua saddle much of road was in fog, but at the summit the sky soon cleared and the day turned calm, clear and sunny. For about two thirds of the way the route follows a recently cleared, old mining road through low secondary forest dominated by tawa, mahoe, pigeonwood, towai, red matipo, with occasionally kanuka or black matipo. Scattered patches of more mature forest occurred with emergent northern rata or pukatea standing out above kohekohe and tawa with nikau. At the first track junction, the track followed an old miner's track across the slope through mature forest with abundant quintinia in full flower, past several mine entrances to open out to grassland and very low scrub at the second intersection. By that time the party was reduced to two! From there the track ascended steeply to the Kaipawa summit through patches of gorse, grass and a low scrub of *Coprosma autumnalis*, pepperwood, *Metrosideros perforata*, pigeonwood and tree ferns. Since one member of the party already arrived and was waiting at the bottom of the Success Track we made a rapid descent to the old hospital. The early part of yet another old mining track and road was through secondary forest of mahoe, hinau, and pigeonwood and later through very old pine plantation containing a sub canopy of native species such as kohekohe, taraire and puriri at about 6 m tall. Finally we emerged briefly through *Ligustrum lucidum* forest at the road end one hour later than our driver.

FUTURE EVENTS

March 12 Mt Tarawera (Combined with Forest and Bird and Waikato Botanical Society)

President: Sarah Beadel 021 924476; Sarah.Beadel@wildlands.co.nz

Secretary: Elizabeth Miller (07) 343 5613 rotorua-botanical-society@gmail.com

■ Waikato Botanical Society

April 3	Pukerimu Ecological Area, Mamaku Plateau (with Rotorua Botanical Society), Leader: Paul Cashmore 07 349 7432 (wk) or 027 650 726 / pcashmore@doc.govt.nz
May 14	Hamilton Gully Crawl, Leader: Kerry Jones 027 747 0733 / km8j1s@gmail.com
May 28	Waikato Ecological Restoration Nursery, Leaders: Linda Watson watsonlinda092@gmail.com , Catherine Smith, Annette Arnold
June 12	Waharoa QEII Covenant, Leader: Dell Hood 027 521 9260 / dhood@xtra.co.nz
July 23	Pakoka Scenic Reserve, Leader: Kerry Jones. 027 747 0733 / km8j1s@gmail.com
August 21	Robbie Bennetts QEII Covenant, Leader: Catherine Beard. 027 536 6928 / cbeard@doc.govt.nz
September 4	Homunga Bay, Waihi (with Rotorua Botanical Society), Leaders: Graeme Jane & Gael Donaghy 07 5703123 / gtjane@kinect.co.nz
September 24	Handcock Rd, Te Kopia Forest, Paeroa Range (with Rotorua Botanical Society), Leader: Jacqui Bond 021 1259 273 / supajac@yahoo.com
October 24	Taupiri Scientific Reserve (with Auckland Botanical Society), Leader: Kerry Jones. 027 747 0733 / km8j1s@gmail.com
November 5	Taupo Reserves and some geothermal sites (with Rotorua Botanical Society), Leader: Chris Bycroft 027 498 5513 / chris.bycroft@wildlands.co.nz (email preferred)

Waikato Botanical Society

President: Kerry Jones

Secretary: Wyne Johns

General contact: secretary@waikatobotsoc.org.nz

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

■ Wellington Botanical Society

October Fieldtrip: South Wairarapa

Day 1: Duntulm Farm, Mangatarere Valley, Wairarapa

Duntulm Farm is a privately-owned mixed beech-podocarp bush remnant, adjoining Tararua Forest Park, a 30-minute drive north from Carterton. It is the property of Alistair Nicholson and Celia Wade-Brown. BotSocers and friends botanised the lower valley and northern slope, up to the ridge top. We walked up the valley as one group and climbed the Fish's Trail to the bush paddock. The bush was mixed black beech (tawhai rauriki / *Fuscospora solandri* var. *solandri*) and broadleaved forest (tawa / *Beilschmiedia tawa*, hīnau / *Eleocarpus dentatus* and rewarewa / *Knightia excelsa*) and podocarps (rimu / *Dacrydium cupressinum*, miro / *Prumnopitys ferruginea* and tōtara / *Podocarpus totara*) with dense epiphytic communities kahakaha / *Astelia microsporum*, peka-a-waka / *Earina mucronata* and kāpuka / *Griselinia littoralis*). Of notable interest was the abundant regeneration of both black and white maire (*Nestegis cunninghamii* and *N. lanceolata*) with the occasional narrow-leaved maire (*N. montana*). The group admired a tall mature white maire (ca. 20m) that dominated the canopy alongside black beech half-way from the valley floor to the ridge top.

The fern species were diverse with thirty-eight species recorded during our visit. The abundance of understorey species, in particular hangehange (*Geniostoma ligustrifolium* var. *ligustrifolium*), and the vibrant bird life reflected low deer numbers and successful pest-control. At mid-day, we were joined by Celia Wade-Brown who guided us to visit the red-mistletoe (*Peraxilla tetrapetala*). Being outside the flowering season, the shape of the plant was hardly distinguishable against its host's canopy.

After lunch in a forest clearing on a flat section of the mid-ridge, several of us headed for the top ridge. A similar plant community to the dominant bush paddock covered the summit but was highly stunted and we also saw a couple of *Gaultheria rupestris*.

Exhausted by the scramble up the ridge, the group slowly potted down a 4WD track, back to the woodshed where we caught up with Leon Perrie, Lara Shepherd and Shaun Thompson who ended up on a separate foray. Leon and Lara had a successful day collecting liverwort species. One of their

interesting finds was the uncommon species of liverwort *Frullania nicholsonii*, which on this day was collected for the first time from the Tararua Range. Although tiny, it is distinct from other *Frullania* species by its perianths which resemble little pine cones.

Day 2: Corner Creek, Ocean Beach, Palliser Bay.

Our first stop on arrival at Ocean Beach was a gully that opened onto the beach with a small unnamed stream below the Wharekauhau plateau. The gully featured damp banks and drier spots. Exposed in the drier spots were *Chenopodium triandrum* / pigweed, *Disphyma australe* / horokaka / native ice plant), *Raoulia hookeri* var. *hookeri*, / scabweed, mat daisy and *Tetragonia* sp. (native spinach). Tucked away on damp banks further up the stream were the ferns *Asplenium appendiculatum*, *A. lyallii* and *Blechnum blechnoides*, and the herbs *Plantago raoulii* and *Craspedia uniflora* var. *grandis*. It was interesting to see *A. lyallii* so close to the beach, and also because it is not common so close to Wellington. Also interesting to see were the *Craspedia*, for its size, and *Blechnum blechnoides*, an uncommon find.

Along the opening of the gully onto the beach, we saw occasional tauhinu / *Ozothamnus leptophyllus* and thick-leaved mahoe / *Meliccytus crassifolius* in full flower, as well a large *Pinus radiata* seedling which Gavin removed. A key feature here was the medium sized tutu / *Coriaria sarmentosa*, although there is some question about the presence of hybrids between *C. arborea* and *C. sarmentosa*.

Our next stop was at Sunita and Gavin's bach, which is tucked in to the edge of the bush, with an almost closed canopy of kānuka, interspersed with *Coriaria arborea* / tree tutu, and *Sophora molloyi* / Cook Strait kōwhai in stunning full flower. Around us we saw dozens of these trees in full flower in the canopy covering the surrounding hills. Abundant *Clematis forsteri* was in many places breaking the canopy, while the ground featured patches of *Acianthus* and *Corybas* orchids. We saw a patch of flowering *Corybas trilobus* agg. / spider orchids, a minute plant with an inconspicuous black flower, emerging from under its single leaf.

After lunch, we visited the wetland area on DOC land bordering the seaward edge of Remutaka Forest Park, close to Corner Creek. The swamp was created when the beach was uplifted during the 1855 earthquake, after which wave action impounded it behind a raised bank of gravel. A stream flowing into the new landscape from a spring source on the hillside above has since kept it well watered. Over the last many years, increasing wave action has carried seawater into the freshwater wetland, and increasingly, gravel and sea detritus are being washed into the edges of the swamp.

On our way there, under the shade of a large ngaio / *Myoporum laetum*, we saw a ground cover of *Azorella hookeri*, before breaking through onto the beach through a sturdy stand of toetoe / *Austroderia toetoe*. The two ends of the approximately 750 m × 100 m wetland have slowly become dryer over the past 40+ years, with its edges transitioning gradually to a dryland coastal plant community dominated by ngaio and tauhinu. But the bulk of it remains wet, though the raupō / *Typha orientalis* and other freshwater-loving species are retreating from the seaward edge as the saline influence increases. The wetland is also a home to one of our native eels / tuna.

A large area of the wetland is populated by *Isolepis prolifera* which clearly tolerates the saline edges of the wetland. Further along the seaward edges, we saw *Ranunculus macropus* / swamp buttercup and *Machaerina juncea* / swamp twig rush. Alongside are a profusion of oioi / *Apodasmia similis* and sea rush / *Juncus kraussii* with many raupō growing further inland in deeper waters. The exotic *Iris pseudacorus* / yellow flag iris is present, numbering in the hundreds and *Hypericum calycinum* / rose of Sharon is very common too.

In a dryer part of the swamp, surprisingly we saw a silver beech / *Lophozonia menziesii*, several *Dracophyllum filifolium*, *Machaerina juncea*, *Carex subdola* and kāmahi / *Weinmannia racemosa*. Some weedy *Pinus radiata* and *Banksia integrifolia* will be removed soon.

The return walk on the track on the inland side of the wetland offered some delights as well. The flowering native clematis / *Clematis forsteri*, had a lovely fragrance, as did its leaves when crushed, much like the akiraho / *Olearia paniculata*.

The final treat of our field trip was the remnant population of *Brachyglottis greyi*, located high up on the cliff face of a narrow steep-sided gully, well out of reach of the numerous goats that are a constant threat to it and have eliminated it from elsewhere.

November Fieldtrip: Ōtaki Gorge terrace wetland

Despite the overcast and drizzly morning that greeted us, thirteen keen members travelled up the Kāpiti Coast and into Ōtaki Gorge. We met at the road end and after a short safety briefing, a round of introductions and instructions to refrain from botanising until we arrived at the wetland, we walked up the private road. We were mostly successful on the latter instruction, until we hit a clay bank covered in *Gunnera monoica* in flower!

The private properties near the wetland, and through which we were generously granted access, were cleared some time ago. Forest communities, native scrub and colonising ferns are now regenerating well. The wetland is largely within the boundary of Tararua Forest Park. It is a fen-type wetland, situated at the toe of the foothills of the Tararua Range, the peaks above reaching up to 655 m.

While at first, the dense vegetation made it appear that the surface water was not deep, some of us discovered the water and soft sediments was in places, at least one metre deep! We edged around the north side of the wetland, where several kahikatea stood out over the sparse canopy. Within minutes we had stumbled across our first of several healthy-looking swamp maire. The open areas included some of the more common wetland sedge communities, including *Isolepis prolifera*, *Eleocharis acuta* and in under the forest canopy, mounds of *Sphagnum* mosses with *Nertera depressa*, *Drosera binata* and many *Pterostylis* and *Corybas* orchids. More than once, I found myself so focused on the smaller things on the forest floor, only to see the pneumatophores of the swamp maire to remind me to look up! Other highlights included a large northern rātā (~80 cm dbh) along the eastern edge. We reached as far south as a rāupo swamp.

FUTURE EVENTS

21 March	Talk – Lara Shepherd: New research into NZ flaxes (harakeke and wharariki)
2-3 April	Trip to Ocean Beach and Te Rata Rd Covenant, South Wairarapa
19 April	Talk – Sarah Herbert: Is habitat enhancement a viable strategy for lizard conservation in NZ? Results of a case study on Wellington's coastal lizard communities
7 May	Forest Loop Walk, Whareroa Farm Park
16 May	Members' evening

President: Jon Terry

Secretary: Kate Jordan wellingtonbotsocsecretary@gmail.com <http://wellingtonbotsoc.org.nz/>

■ **Canterbury Botanical Society**

Despite the varying Covid alert levels the Canterbury Botanical Society managed to fit in a full programme of events over the past months. The committee were kept busy with submissions on Selwyn and Waimakariri plan changes and zoom committee meetings. Talks had to be changed to Knox Church hall, a larger venue to enable social distancing, when the library room became unavailable.

August Talk: Rob Allen: To plant or not to plant in forest restoration

Rob Allen is a retired forest scientist. Rob retired from a life-time researching forests for the former NZ Forest Service and later Landcare Research, and then found himself involved in governance of a project to regenerate indigenous forest over 600 ha for Ngāti Whare, adjacent to Whirinaki Forest in the inland Bay of Plenty. Rob investigated the history of planting indigenous trees in NZ. Trials on establishing indigenous trees began in the 1870's, at the time of the Vogel government nurseries were set up to raise tree seedlings. The results were discouraging for indigenous seedling plantings, and the government soon moved its focus towards exotic plantings. Rob suggested that since the 1880's there is now \$25,000/ha and a potential total cost of over \$15 million. That started the Trust investigating other options such as commercial harvest followed by utilising natural regeneration with

weed control, and horses being fenced out. The Trust mapped the naturally occurring seedlings in the blackberry and other weeds in cutover areas, and discovered that there was often >2500 seedlings/ha, including more than 130 podocarp seedlings/ha. Sufficient for forest establishment without the need to mound, spray, and plant. Seedling density varied, and for some species was highest in sites closest to seed sources. However, the areas with high weed cover would still need weed releasing at a cost of \$4,000/ha. The Trust is now looking at other options. Conversion could use selective manipulation of plantation trees to manage weed growth and encourage natural regeneration. The Trust could buy the existing cutting rights (at around \$9,000/ha) for approximately 50 hectares of low-value *Cupressus lusitanica*.

This cypress plantation has some natural regeneration underneath, including rimu. Cypress trees could be manipulated to create light-wells, with just enough light to grow the shade-tolerant indigenous tree seedlings without triggering rampant blackberry growth. There would need to be some weed control but not to the extent of the direct conversion method. Rob went through criteria around weighing up when to plant and when to use natural succession. He noted that short-term gratification and relatively abundant per unit area resources are drivers of many current small-scale plantings. To be successful, new indigenous forests must be embedded a multi-generational long-term goal built upon the aspiration for diverse benefits. These must be embraced by landowners rather than through regulations which are known to change. For a much greater new forest cover in a century's time, sites need a level of natural resilience. The experience of the 600-hectare Ngāti Whare project has convinced Rob that natural and managed regeneration and succession should be a key part of establishing new indigenous forest.

August Field trip to Charteris Bay

Tom Ferguson invited the Botanical Society to botanise his parent's 40 hectare hill block in Charteris bay. Eighteen members started up the hill in chilly weather then the sun came out and it was positively not August weather. Purchased four years ago the land has not been grazed since. Planted radiata pine and macrocarpa blocks may have been planted for logging, instead they are shelter for thick-leaved mikimiki (*Coprosma crassifolia*), poroporo, mahoe seedlings, poehuehue (*Muehlenbeckia complexa*), *Asplenium* ferns (*A. flabellifolium*, *A. appendiculatum*), *Polystichum neozelandicum* subsp. *zerophyllum*, and dichondra (*Dichondra repens*), the first signs of a slow return of native forest. On the south-west slope there is 12 hectares of glorious 2-metre high scrub – largely *Coprosma crassifolia*, with a sprinkling of kowhai, mānatu, matagouri, ti kouka, all draped with pohuehue, *Clematis foetida*, *Calystegia tuguriorum*, pirita green mistletoe (*Ileostylus micranthus*), in a matrix of gorse, broom, bracken, pig fern (*Hypolepis ambigua*). Brian Patrick found evidence of the rare mistletoe leaf miner moth (*Zelleria sphriota* - At Risk-Declining). In true Botanical Society tradition, the group fractured into those who wanted the view from the hut on top of the hill, those who stopped to look at lichens and blackberry, and the moth specialist. Finally, the group coalesced and ambled down the hill for lunch on the lawn looking over a sunny harbour.

After lunch one group went on a bryophyte hunt in the most unlikely place, out on the saline mudflats. The other half visited the Orton Bradley farm park gardens. Fortuitously manager Ian Luxford was stopped as he drove past so he could tell us about the long history. The big trees, such as the coastal redwoods, sycamores and a phoenix palm, were planted by Orton Bradley or his family a century ago. Ash trees and Ponderosa pines were added later by the Arboretum Association. In 1985, the Rhododendron Society started planting a hectare of magnificent rhododendrons, still managed by the Rhododendron Society members. The Camellia Society added their favourite plants, and the Diamond Harbour Garden Society come in every week to maintain the cottage garden around the historic cottage and farm buildings. Now there is a lovely mix of flowering shrubs, set off by old, gnarled mahoe trees, kawakawa seedlings and native ferns.

Around the old gardens we noted the common weeds of homesteads everywhere in NZ – sycamore, ivy, stinking iris (*Iris foetidissima*), arum lily (*Zantedeschia aethiopica*), and the insidious garden spreaders lesser celandine (*Ficaria verna*), bears breeches (*Acanthus mollis*), and the impossible-to-exterminate Italian arum (*Arum italicum*). Several weedy species are corralled in the succulent collection - *Sedum* spp., *Aeonium* spp. German ivy (*Delairea odorata*) is being controlled on the hillside and toad ivy (*Cymbalaria muralis*) is flowering on the rock walls. We were slowed down figuring out the identification of more recent garden plants. Ian Fryer was a great help here. The

shrubs that hold berries over winter have a high chance of being spread by birds (especially blackbirds) into the areas on native bush further up the valley – Japanese aralia (*Fatsia japonica*), sweet box (*Sarcococca ruscifolia* in the family Buxaceae), red cestrum (*Cestrum elegans*), and a ground cover that we could only identify as a member of the *Tradescantia* family (Commelinaceae), and scrambling lily (*Geitonoplesium cymosum*). Red cestrum is banned from sale and propagation under the National Plant Protection Accord due to its ability to invade native bush. It is also extremely toxic to stock. Popular ground cover *Geitonoplesium cymosum* was listed as a weed in October 2000 by the Auckland Regional Council when it started to pop up in native bush. Giant Himalayan lily (*Cardiocrinum giganteum*) is much loved but has been reported beyond its garden boundaries. The suspicious ground cover was identified as Tahitian bridalveil (*Gibasis geniculata*) by Allan Herbarium; in fashion as a highly desirable indoor plant. One tree that took several keen people on iNaturalist to identify is a single specimen of Picón *Oreopanax capitatus*, a frost-tender tree from Central America which is promoted for winter nectar for monarch butterflies. It is in the ivy family so it has berries for birds as well. No matter how ‘beautiful, hardy and easy-care’, we just met the next generation of weeds we will be killing. It was a great day out.

September field trip Hidden Valley conservation area

Just in time to catch the kowhai in flower, 20 Botanical Society members enjoyed a sunny day out in Purau. The steep, craggy dry upper slopes east of Purau have long been recognised as significant for biodiversity. First, Hugh Wilson proposed 300 hectares were worthy of protection based on his botanical surveys of Banks Peninsula in the 1980's. Next, a doomed proposal for a sub-division between the steep hills and the sea offered a QEII covenant as mitigation. Then in 2014, the Christchurch City Council mapped 102.8 hectares as a Site of Ecological Significance (based on Hugh's survey). After six years of waiting, 72 hectares became available to purchase early this year. By April twenty-three people had formed the Hidden Valley Conservation Trust and the land will finally be managed for natural revegetation, carbon sequestration, quiet recreation, amongst the archaeological traces and stories of the long Māori and short early Settler residency in the area. On the steep walk up the hill through old rough pasture William Reinders found an inconspicuous Australian exotic daisy *Solenogyne dominii*, only recorded from the Port Hills and Wellington. *Romulea minutiflora* has a recent South African origin with a largely Christchurch distribution. Everyone got a chance to meet the exotic cudweed *Stuartina muelleri* looking its best. Soon it will dry out and become an anonymous hard to identify scrap.

Further up the hill we had a primer on identifying small-leaved scrub made up of 14 coprosma species, rōhutu (*Lophomyrtus obcordata*), poataniwha (*Melicope simplex*), weeping mapou (*Myrsine divaricata*) and porcupine shrub/*Melicytus* aff. *alpinus* BP form. A few specimens of *Coprosma virescens* and *C. wallii* topped 5 metres so technically qualify as trees. Scattered kōwhai, mānau, kaikōmako, houhi were draped in a confusing mix of climbers, including flowering scrambling aniseed *Scandia geniculata*. A sole remaining female matai is the hope for a future podocarp forest. On the west-facing dry, rocky slopes we encountered prostrate kowhai and Banks Peninsula mat daisy (*Leptinella minor*) in flower. There was a competition for new vascular additions to the species list. Jane Gosden won with a suite of small herbs: *Dichondra brevifolia*, *Epilobium brunnescens*, *E. rotundifolium*, *Montia fontana* subsp. *chondrifolium*, and *Clematis forsteri*. Sarah Richardson pointed out *E. cinereum*. These have been added to the illustrated species list on iNaturalist.

October Meeting: Piecing together the past to reset the future: a McLeans grassland case study
Nicholas Head, Christchurch City Council botanist Nick started by declaring that drylands are dry. The lack of rain and high seasonal evapotranspiration results in seasonal, cryptic flora in non-forest vegetation or an open, light forest. Drylands are in a parlous state, a most threatened and least protected ecosystem. The facts are they made up 19% of NZ's land area and only 3% of drylands are protected. 70% have been so modified or poorly buffered from adjacent irrigation that they are no longer a functioning dryland ecosystem. The consequences are to be seen in the lists of threatened flora and fauna. Why is there not urgent action to protect what remains? Nick reckons it is to with being plain unimpressive coupled with no resilience to destruction. Landowners and land managers don't see the need for ecological advice, ambiguous Council planning rules try for “balance”, flawed significance assessments by developers are skewed to development, and the modified state of drylands leads to an argument that they are not worthy of protection. On the western edge of Christchurch City, the Council and ECAN hold 175 hectares of recent, harsh, dry, Waimakariri flood

plain. It is the largest remaining area of undeveloped soils left on the Canterbury Plains, with a high level or fine scale habitat variation that drives ecological complexity. What appears to be flat land is embossed with dunes, channels, terraces, and slight aspect differences that change the composition of the plant communities.

Seven rare plant species hang on in small numbers. This is a moribund ecology, cut off from natural renewal of floods from the Waimakariri by three stop banks. In the 1940 aerial photos the vegetation is woodier with more biomass: bracken, matagouri, tussocks, shrubs, and kowhai. Up to now management has favoured heavy grazing to remove competition grasses and reduce fire-risk. Nick has recognised that this is producing a regression to an induced mossfield. Overgrazing removes completing exotic sward grasses but also results in browsed shrubs. Undergrazing results in low-growing native plants shaded out by dense exotic grass. Past experimental plots show that moss cover and patōtara increase with the removal of grazing and so does Australian dry-adapted grasses. Nick's conundrum is how to maintain a riverbed ecosystem when there is no longer a river. Any ecological restoration must be ecologically authentic with the right species, right composition, and active ecological processes. The challenge is to do as little as possible to lead to ecological processes that rebuild the natural succession. In fact, there is evidence from Tekapo Scientific Reserve that more environmental stress favours the recovery of dryland species.

Nicholas is working towards: 1. Reserve status for the land (done). 2. Building up and supplementing existing shrubs. 3. Reintroduce woody mosaics: tahiniu (*Ozothamnus leptophyllus*), matagouri, mikimiki (*Coprosma propinqua*, *C. crassifolius*), porcupine shrub (*Melicytus* aff. *alpinus*), native broom (*Carmichaelia australis*), shrub daisy (*Olearia adenocarpa*). 4. Plant a copse of kānuka to build a source of seed for natural recruitment. 5. Investigate decommissioned quarry sites to re-establish early session native plants such as the mat daisies. 6. Trialling different grazing regimes and gradient management. He is starting with a species inventory, vegetation monitoring, pest control and fauna restoration (lizards, moths, butterflies). Success will be natural recruitment of dryland plants and a greater public appreciation of Canterbury's natural lowland flora and fauna.

October Field trip: McLeans Grasslands reserves

Under a threatening sky with light rain falling 22 participants headed off to the drylands behind the Airport. First stop was School Road site. Part of a swathe of old flood plain between Yaldhurst Road and the McLean's Island stopbanks that ECan and CCC own. The flood channels were still obvious and an irrigation ditch runs through the property. Much of the land is grazed heavily by stock belonging to long term leaseholders.

It didn't take long for Melissa to spot the leaf like thallus of liverwort *Riccia cartilaginosa* while many of us observed the unusual fruiting body of the introduced spoon leaved cudweed *Stuartina muelleri*. Jason's beady eyes spotted a Mayten tree next to the irrigation race, its suckers fortunately, controlled by grazing. The next stop was further north off Guys Road. Part of the 360 walkway runs through this area which is also used as a research area. There are several plots fenced off, demonstrating grazing impacts on ecology. Colin Meurk joined us here. He gave us a short talk on the area. Before the stock bank was built the Waimakariri would flood the plain about every 10 years. He explained that the vegetation patterns were determined by a combination of grazing, dryness and competition by exotic grasses, most plants being small with a low profile. Coping with these stresses were large clusters of *Carmichaelia corrugata*, masses of the exotic onion-grass *Romulea minutiflora*, the occasional patch of *Raoulia monroi* and a very small *Leptinella serrulata*. Most were still flowering. The three native geraniums, *Geranium retrorsum*, *G. solanderi* and *G. brevicaule* were common in the introduced grasses. Common too was the cushion plant *Scleranthus uniflorus*. Several plots have been fenced off for about ten years demonstrating how removal of stock and hare grazing enables survival of shrubs while rampant long grass shades out low growing herbs. A dilemma of grassland management.

While most of us were on our hands and knees looking for tiny plants Brian Patrick was spotting indigenous Lepidoptera. Here's an annotated list of indigenous Lepidoptera he spotted; diurnal grass moth *Orocrambus corruptus* was numerous flying low over tightly grazed sward; sod webworm moth *Eudonia leptalea* was common too; diurnal geometrid *Arctesthes catapyrrha* with orange underwings was abundant over low herbfield as was an undescribed boulder copper butterfly (*Lycaena* sp.) over hostplant mat pohuehue with Canterbury Plains endemic *Eurythecta robusta* with its flightless females

that runs and jumps rather than flies! Another leaf roller *Capua semifera* was common too. He commented "this suite of indigenous moths and butterflies specialised to open cushion field and short turf highlights the grazing issue; given their habitat now contains such a high percentage of exotic grasses, a grazing regime is required to maintain a low open habitat and I think sheep are the best tool we have; determining the ideal sheep numbers and timing of that grazing will require experimentation; I'd like to see that initiated soon".

November Meeting: Microbes and Climate Change talk by Paul Broady

Paul Broady, University of Canterbury adjunct senior fellow, researched the ecology and taxonomy of freshwater and terrestrial algae. In support of the UN Climate Change Conference (COP26) that opened in Glasgow today (NZ time) Paul explained the role of plants and algae in the carbon cycle and why COP26 is a critical meeting. Climate change discussions are normally centred on gases emitted from anthropogenic sources but there has been very little importance placed on the roles of microbes in climate change.

Of the estimated 500 billions of tonnes of carbon tied up in the world's biomass, 450 billion is contributed by plants and 50 billion tonnes by microorganisms. These microorganisms include bacteria, fungi, protists, archaea and viruses, a hugely diverse and relatively unstudied group. It is estimated over 8 million of the over 10 million microorganisms are yet to be described.

Greenhouse gases are only 0.04% of the atmosphere. The main greenhouse gases are CO₂, CH₄ and NO₂. NO₂ having 280 x the warming effect of a molecule of CO₂. While CH₄ has 34 x that of CO₂. In the past 200 years post the industrial revolution, there has been a significant rise in global temperatures which has become exponential in the past 30 years. The rise in atmospheric CO₂ is thought to be the main contributor to the temperature rise followed CH₄. These rises in global temperatures have seen more droughts, glacial ice melting, rainfall and storms all of which affect the number and the productivity of microbes. Marine phytoplankton fix CO₂. Higher temperatures and more CO₂ may mean more phytoplankton blooms.

With higher temperatures there tends to be more aerobic decomposition in soils rather than anaerobic, partially due to wetland areas drying out. More aerobic decomposition results in more methane being released into the atmosphere and more carbon. One model predicted with an increase of 4°C in soil, 34% more carbon would be released to the atmosphere. New Zealand studies have shown that soils in warmer wetter areas of New Zealand have higher levels of nitrogen and carbon while the drier cooler dry-stock grazing areas have lower nitrogen and carbon. New Zealand native plants are adapted to low nutrient levels, changes in climate that increase nutrient levels will affect the viability of some species.

Another 2016 model predicted 50-200 billion tonnes of carbon could be lost from soils by 2050 with a 1°C temperature change. Currently 9 billion tonnes of carbon are emitted from soils per annum. With higher temperatures tundra and peat bogs tend to dry out and permafrost areas have become unfrozen. Permafrost areas and Tundra contain large amounts of carbon sequestered in decaying vegetation. Permafrost has about 1,300 billion tonnes of carbon locked up. This has been slowly warming up by 2-3°C in the past 40 years. Thawed permafrost releases large amounts of CO₂, CH₄ and NO₂. One estimate is that with warming by just 1°C 3.1 to 41 billion tonnes of carbon will be lost from the former permafrost areas. Unfortunately there is low confidence in the loss figures so it can be hard to convince non science people of the importance of this model.

Draining of peat bogs releases CO₂ when oxidation of sediments occurs. It is estimated that 200 million tonnes have been lost from peat bogs. There have been a number of mitigation measures suggested most of which either cause a lot of climate change gases to be produced in setting up the system or have limited viability over time. One is the production of starch (corn) from soil to prevent the emission of CO₂. While this does utilise carbon, the production of ethanol from the starch requires a lot fuel input into the infrastructure and transport. Regenerative farming increases carbon in soils until a peak is reached at which point the soils emit as much carbon as is absorbed. Injection of carbon into deep shale deposits is another mitigation measure but requires the building of costly infrastructure resulting in carbon outputs.

Show Weekend Spring Camp Kaikoura 11th -14th November 2021

Tom, with his work connections, had the unenviable task of organising the November 2021 spring camp. The camp was based at Raukautara beside the main road and railway line 15 minutes' drive north of Kaikoura. The camp belongs to the Te Wai-ora trust and had recently been partially rebuilt and refurbished with a very new well appointed, kitchen and bathrooms. On the first day we meet our guide Doug Poharama from the local Iwi at the Mangamauna Urupa entrance along with Heath and Mike from Ecan. Doug told us some history of the area then led us through. It is a relatively small reserve on the southern side of the actual cemetery just off the main road. Like many other reserves there was a lot of weeds out competing natives and control measures were not keeping up the rabbit numbers. Despite this, *Pennantia corymbosa*, *Clematis forsteri* and *Rubus schmidelioides* were found in sunny patches. While the fragrant *Parsonsia heterophylla* looked stunning in almost full bloom. *Melicope simplex*, mahoe and black mairie were common on the outer forest fringes. Doug then lead us on a fairly convoluted circuit within the forest to show us the few mature matai still standing. Having taken too long at the first stop we headed off up Blue Duck Valley to a farm. The area in pre-European days supported a large number mature, totara, post settlement these were quickly milled for timber with just the odd tree remaining. After a quick lunch most participants, trekked all the way up to some rocky outcrops on the ridge line, only to find the many wild goats had decimated anything edible on the rocky faces. Despite a recent cull of about 12,000 goats, we saw and heard lots of goats in our three days in the area. Next stop was the DOC conservation reserve at the head of the valley. The first interesting find was Gillian and Miles car on the side of the road (they were doing some QE11 work on a nearby covenant). Just inside the forest from their car were several specimens of the forked fern *Tmesipteris elongata*. A walk up the road a little further yielded views of very tall black beech, totara, rimu and hinu trees. Selena's beady eyes spotted *Pterostylis irsoniana* orchids on the road side. This was a very impressive reserve with a surprising variety of vegetation where we could have spent all day. Well worth a visit if you are in the area.

DAY 2: The weather forecasters promised a mixed bag for this day - and they delivered. Nevertheless, we were able to get about without much inconvenience. After grouping at the Puhi Peaks woolshed, owner Nicky McArthur provided refreshments and a power-point delivery about the remarkable range of biodiversity featuring at Puhi Peaks. These ranged from precious alpine plants to the Hutton's Shearwater colony up in the headwaters of Shearwater Stream. We then headed off to walk around the mid-slopes of the Mount Alexander limestone ridge. The hazard of post-earthquake rockfalls meant that we could not delve into the rougher country, however there was plenty to see close to the fence-line. Gnarly old broadleaf (*Griselinia littoralis*) and hoheria (*Hoheria lyallii*) stood out over a variety of shrubs including mikimiki *Coprosma propinqua* and mountain wineberry *Aristotelia fruticosa*. A few *Olearia odorata* bushes contrasted with their grey-green foliage.

The relatively browse-resistant Halls totara *Podocarpus laetus* appeared to be reestablishing itself through much of the shrubland. The porcupine bushes led to some debate, most appeared to be the entity currently known as *Melicytus* aff. *alpinus* 'Waipapa'. Limestone screes often supported large clumps of prickly Spaniard, which we understood to be *Aciphylla* aff. *ferox* 'Mount Cass'. Following lunch we descended to a farm track, to see perhaps the highlight of the day – a small but healthy population of the deciduous daisy tree *Olearia hectorii* (Nationally Endangered). A pleasant ramble further down the farm track led to Wharekiri Stream, where the pink tree broom *Carmichaelia glabrescens* (not yet in flower) somehow clung onto the steep rock faces. Nibbled seedlings in the riverbed gravels below reminded us of the recruitment challenges that many of these special plants have to face - feral goats and deer are currently present in high numbers all through the wider Seaward Kaikoura mountain landscape. The party split into two for our return to the woolshed, some of us taking the opportunity to overview a small remnant of matai forest on a terrace above Wharekiri Stream. We finished off the day with another cuppa and a discussion about opportunities to protect our native biodiversity in the rural landscape. Our thanks go to Nicky for hosting us, and for all the wonderful conservation work she is doing.

DAY 3: The morning of our last day in Kaikoura was spent cleaning the accommodation at the Wai-Ora farm at Rakautara. We then headed to the Hapuku scarp and wetland. Known as the southernmost locality for tawa (*Beilschmiedia tawa*), the scarp also features black maire (*Nestegis cunninghamii*) and toro (*Myrsine salicina*). Unfortunately, due to cattle in the paddock, we decided not to botanise the scarp, however we botanised the wetland, which was made up of *Phormium tenax*, *Carex secta*, *C. virgata*, *C. maorica*, *C. geminata* and a native *Ranunculus* species.

We then went to a covenanted broadleaf-kowhai woodland off Bay Paddock Road on Kaikoura Flat. A well regenerating woodland, with a ferny understory and mistletoe on many trees, the highlight was *Solanum aviculare* var. *aviculare* in flower, the less common species of poroporo with a Threatened-Nationally Vulnerable threat ranking. Our last visit of the day was to the Mt Fyffe wetland, a Manuka (*Leptospermum scoparium*) dominant wetland, where we saw a healthy population of *Astelia grandis*, the Swamp Astelia, as well as *Machaerina rubiginosa* and *Sphagnum* moss.

November Field Trip: Mt Cloudsley, Castle Hill

On a perfect late spring day eleven members of the Canterbury Botanical Society met to ascend and botanise Mt Cloudsley, in Cragieburn Forest Park. The sun was warm but not too hot, and it was only at the higher altitudes that it began to be cool and breezy. We took the Hogs Back Track from just above Castle Hill Village, which gently ascends through a remnant of southern beech forest, likely *Fuscospora cliffortioides* but in the zone of hybridisation with *F. solandri*. We were delighted to find abundant orchids alongside the track, although only a small number of *Corybas trilobus* agg. were in flower. *Chiloglottis cornuta* and at least one *Thelymitra* sp. were also present. Beyond the forest lies a mixed grassland/shrubland, likely fire-induced and formerly grazed. Above the exotic *Anthoxanthum odoratum* and *Pilosella officinarum* the dominant shrubs were *Discaria toumatou*, *Ozothamnus leptophyllus*, *Dracophyllum longifolium* and *Dracophyllum rosmarinifolium*. Common sub-shrubs included *Gaultheria depressa*, *Leucopogon fraseri*, and *Pimelea oreophila* with white flowers on display. We ascended the aptly named Long Spur, with the most enthusiastic ultimately achieving an altitude of 1800 m, but not quite reaching the summit.

As always, frequent botanising helped to set an easy pace. As we went, the vegetation graded into a more truly alpine character, with a diversity of cushions, rosettes, mats, tussocks and low shrubs, including some that seemed to favour the rock outcrops. There were too many species to name here, including at least four each from the genera *Celmisia* and *Veronica*. *Veronica tetrasticha* perhaps stands out as being mostly restricted to the mid-Canterbury alpine zone. Melissa observed it was a bit early for some alpine species – the snow banks might have only recently melted. Nonetheless it was a great time of year to see *Ranunculus* in flower, with the bright yellow marking the locations of *R. ensyii* and *R. insignis*. The white flowers of *Ourisia caespitosa* were similarly in bloom. Unfortunately, a few individual *Cytisus scoparius* were also flowering. It would be a shame if this weed were to spread through this relatively uninvaded location. *Aciphylla aurea* occasionally punctuated – but thankfully not punctured – this part of the trip.

As we reached the higher altitudes and the substrate changed to extensive bare ground and mostly-stable scree we were granted the chance to observe some of the eastern alpine zone's scree specialists. Ed was fortunate enough to spot a patch of *Notothlaspi rosulatum*, cryptic amongst the grey stones at this time of year, prior to flowering. This is the plant that graces the Canterbury Botanical Society's logo. Juvenile *Stellaria roughii* was beginning to emerge. Most spectacular, though, were another flowering buttercup, the fleshy stems of three *Ranunculus haastii* having found their way through gaps between surprisingly large scree to bring their flowers to the light. Of course, plants are associated with animals, and we noticed three species of butterfly – red admiral, black mountain ringlet, and a copper – and some short-horned grasshoppers. We also saw evidence of exotic mammals – ungulate tracks, possum remains, and a live mustelid. Perhaps the latter is related to the lack of kea seen or heard during the day. Returning down the spur, near the end of the day *Pterostylis tanypoda* was discovered in flower, adding another orchid to the roster. It was great to experience an example of the drier, Eastern alpine zone and in particular scree specialists. This is an excellent botanical walk, as long as one checks the weather forecasts and comes prepared for alpine hazards.

December talk was by Peter Heenan Te reo Māori and botanical nomenclature naming systems as complementary naming systems for New Zealand's Flora on the dual use of Māori and scientific names.

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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.

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BIOGRAPHY / BIBLIOGRAPHY

■ Biographical Sketch – Patrick John Brownsey (1948-)

Val Smith, valdsmit@xtra.co.nz

In September 2021 a new genus, *Brownseya*, was described to accommodate the morphologically aberrant clubmoss *Lycopodiella serpentina*. The name honours Dr Patrick Brownsey, for his floristic and taxonomic study of pteridophytes of New Zealand and neighbouring regions.

Patrick John Brownsey was born on 5 May 1948 in the city of Wells in Somerset, England, the son and only child of Margaret and John Derek Brownsey, a banker in a succession of small rural branches. At Crewkerne Grammar School, Somerset (1959–1966) an exceptional teacher inspired Patrick to pursue a career in biology. His parents were supportive and the family spent many hours in rural Somerset and sometimes on holidays in Wales or Scotland, bird watching or seeking out new wildlife species. Choosing to study botany at university, Patrick was offered a place at the University of Leeds under Professor Irene Manton, an inspirational teacher when, even in 1966, a female professor was a rarity. Leeds botany department was home to a school of biosystematic research focussed on ferns, and two lecturers, John Lovis and Arthur Sledge, had spent time in New Zealand.

Also studying for their PhDs at Leeds, Kiwis Ross and Jessica Beever encouraged Brownsey to consider going there. His European *Asplenium* studies took him to Italy and Crete and he had barely completed his PhD thesis (1973) when he was offered an inaugural post-doctoral fellowship at Victoria University, Wellington.



Brownseya serpentina by Barbara Hammonds

Within a year of arriving in New Zealand with his wife Wendy (they had married in May 1971), Brownsey was invited to accompany John Dawson to New Caledonia where he was studying the Myrtaceae for the *Flore de la Nouvelle Calédonie et Dependances*. Wendy, a fluent speaker and teacher of French, went too. Then, encouraged to travel throughout New Zealand collecting ferns, especially species of *Asplenium*, they visited localities from Te Pahi to Stewart Island/Rakiura, building up a store of knowledge that became the framework of Brownsey's subsequent publications. Their two children Kerry and Darren were born in New Zealand. In 1976 Brownsey spent a year at Auckland University as a stand-in for John Braggins who was on sabbatical leave, and in 1977 he was appointed Curator of Botany at the then National Museum of New Zealand, where he remained until his retirement in 2021. During his 44 years there, his research interests focussed on ferns and the publication of papers on many of the main fern genera, culminating in *New Zealand ferns and allied plants*, with John Smith-Dodsworth in 1989 and a second edition in 2000. He also contributed the section on ferns to Botany Division's *Flora of New Zealand* Vol. IV, family treatments of Dennstaedtiaceae and Aspleniaceae for the *Flora of Australia*, and in 2010 embarked on the electronic *Flora of New Zealand - Ferns and Lycophytes*, which eventually ran to 32 family treatments. Along the way, he got a grant to undertake a revision of *Hebe* and brought Mike Bayly and later Alison Kellow from Australia to do the work.

Soon after his National Museum appointment, Brownsey was asked to curate the then very small collection of stamps in its care. Having been interested in philately from a very young age, he quickly accepted the sinecure. Little did he know that 20 years later Te Papa would be gifted the archives of the old New Zealand Post Office, and it turned into what should have been a fulltime job. But no new appointment was made, and he continued to curate the collection as best he could, under the umbrella of his real job as Curator of Botany. Now retired, he is employed one day a week as Te Papa's first Curator Philatelic.

Brownseya serpentina

Bog clubmoss *Brownseya serpentina*, formerly *Lycopodium serpentinum* ("snake-like"), is uncommon in New Zealand and rare in both Australia and New Caledonia. A coastal or lowland species intolerant of competition from taller plants, it is now known only from Ahipara and Karikari Peninsula in Northland and the Whangamarino wetlands and Kopouatai peat bog in the Waikato, usually among mosses and liverworts in naturally open, nutrient-starved, permanently damp ground or sites recently cleared by fire. It is a yellow-green to green prostrate, shortly creeping clubmoss, with the main stems forking and rooting at intervals. Aerial stems, unbranched, 30-60 mm long, are invariably topped by fertile cones.

REFERENCES

Brownsey, P.J. 2021. pers. comm.

Brownseya serpentina. New Zealand Plant Conservation Network. <https://www.nzpcn.org.nz/> (accessed 3 January 2022).

Chen, D-K.; Zhou, X-M.; Rothfels, C.J.; Shepherd, L.D. et.al (2021) A global phylogeny of the Lycopodiaceae (Lycopodiales; lycophytes) with the description of a new genus, *Brownseya*, from Oceania. *Taxon*. DOI:<https://doi.org/10.1002/tax.12597>; <https://onlinelibrary.wiley.com/doi/full/10.1002/tax.12597> (accessed 8 November 2021).

PUBLICATIONS

■ Publications Received

Wellington Botanical Society Newsletter December 2021 Upcoming trips and talks, submissions made, botanical highlights from Wellington's City Nature Challenge, Ōtari update, distorted growth in rimu, trip reports for South Wairarapa trip (Mangatarere Valley and Corner Creek) and Ōtaki Gorge wetland.

The New Zealand Native Orchid Journal January 2022 No. 164 *Corybas orbiculatus* from Cannicla Bay, Catlins *Corybas*, naming and the importance of communication, editorial.

Auckland Botanical Society Newssheet March 2022 Upcoming meetings and trips, grants awarded, Request for native oyster mushrooms sightings, trip report for Point Wells, Whangateau.

Botanical Society of Otago February 2022 No. 95 Upcoming meetings and trips, Chair's and Secretary's notes, photo competition, recollections about Geoff Baylis, umbrella moss, trip reports for Portobello QEII covenant and Herbert Forest.

Waikato Botanical Society December 2021 No. 49 President's report, talk reports, info on the QEII Trust, trip report for St Joan's Radius Care, Endangered Plant Garden update, Waipapa River Trail and Coromandel, upcoming talks and trips.

- **Book review - The Hidden Beauty of Seeds & Fruits: the botanical photography of Levon Biss. Royal Botanic Garden Edinburgh (text) and Levon Biss (images). 2021. Abrams, New York. ISBN 978-1-4197-5215-5. 305 x 250 mm. US \$40.00.**

Book review by **Rhys Gardner** rhysogardner@hotmail.com

Hidden beauties from the Edinburgh herbarium, presented here in a coffee-table book, form the subject of this versatile photographer's second such venture, after his recent insect-world 'Microsculpture' project (exhibitions, children's book, etc.).

Its 102 full-page plates illustrate the seeds or fruit of 92 flowering-plant genera, chosen for their looks and not for taxonomic or morphological completeness. The images, each made by stitching together thousands of smaller ones, mostly appear at about two to twenty times magnification, but do not seem over-sharpened or 'larger than life'. Their subdued colouring (especially the browns so pleasing to the herbarium taxonomist), and general lack of harsh shadows, further contribute to the feeling that the viewer is seeing these objects with the kind of botanical eyesight he or she has always wanted to have.

The half-dozen lines long captions mostly include common name, history of discovery, uses, and the inevitable conservation status. Many of the genera are unfamiliar ones, like the cover's *Cybistax* (Bignoniaceae, name from the Greek word for an acrobat, green-flowered, dry forests of South America). A few, though, are ubiquitous garden plants (poppy, peony, castor-oil plant).

A little more written information is needed to understand some of the images—to see that the pale face of a *Northia* seed is its hilum, the tangle of *Abrus* pods is not just a single fruit, and in *Adenocarpus* it is the pods' peg-like projections that are the caption's "short, sticky glands".

The plates are ordered according to some system I am unfamiliar with (APG V already?). So, an index would have been useful, but page-numbers are lacking. Perhaps this is a hint to botanists just to relax, look and enjoy—fair enough, except that the mood is broken a little on discovering that the repetition in the genera depicted (eight at least) does not have much extra artistic or botanical effect.

Some of the plates are too dark for my taste, but a larger number—*Dryobalanops*, *Esenbeckia*, *Gymnostoma*, *Sacoglottis*, *Corylus*, etc., are beautiful and striking. *Araujia* has never appeared more alien (and the special appreciation New Zealanders have for it is mentioned). Enjoy all this fine art some afternoon, then, and, if it stimulates a desire for harder-core carpology, try to find a copy of William and Wendy Cooper's "*Fruits of the Australian Rainforest*" (available in several versions, becoming scarce in the world's second-hand bookshops).

