BOTANICAL SOCIETY
OF OTAGO

Newsletter Number 105

July 2025

BSO MEETINGS AND FIELD TRIPS JULY — NOVEMBER 2025

Location: *Talks are held in the Benham Seminar Room 215 in the Zoology Benham Building, 346 Great King Street.*

9th July, 5:20pm: Cyanobacteria. Speaker: Nicole Heaton. Cyanobacterial blooms pose a significant threat to freshwater ecosystems globally, fuelled by eutrophication and warming temperatures. More recent studies have shown that the associated heterotrophic bacteria community may have an influential role in cyanobacterial bloom dynamics. Are these interactions affecting blooms in the Ōtākou region?

12th July: Smails beach. Details T.B.A. Contact Lydia Metcalfe

13th August, 5:20pm: Flowers of Annapurna. Speaker: Mike Small. The Annapurna Circuit is one of the great hikes of the world. More than 150 kms of trails pass from an altitude of 80m with subtropical rainforest to as high as 5500m high-alpine/ subarctic areas near the world's highest mountain pass at Thorung La. Culturally diverse, it is also a biodiversity hotspot as a result of the intersection of several floristic regions and extremes of precipitation and altitude. Floral diversity also results from numerous geological uplifts that formed the Himalaya and the monsoon after India collided with Asia 50 million years ago. This talk follows the trail and the flowers during the monsoon flowering season of 2024.

23rd August, 9:00am: Chrystalls Beach. Join us for a mid-winter stroll along a golden sand beach. Though marram is a common feature of the fore dune, the interdune contains an interesting mix of native shrubs and trees along with a small patch of native cushion plants. There will also be a chance to check out the plants on Cooks Head (a 25m high basalt rock). Threatened plants and sea lions are likely to be spotted. This will be a relaxed botanical paced trip. Bring a wind proof coat, warm hat, lunch, and a hot drink. Meet at 9am in the Botany Dept, return time 3pm. Contact Gretchen 021 065 8497

10th September, 6:00pm: Geoff Baylis lecture: Why we're obsessed with *Craspedia*. Speakers: Ilse Breitwieser and Rob Smissen. Location: Archway lecture theatre, University of Otago.

Call them billy-buttons, drumstick flower, billy balls, sun balls in Australia or woollyheads and puatea in New Zealand or with their scientific name *Craspedia* (Gnaphalieae, Compositae / Asteraceae), these everlasting daisies are conspicuous members of many plant communities in New Zealand and Australia but remain an outstanding taxonomic challenge. In 1961, based on a small number of available herbarium specimens, HH Allan's Flora of New Zealand volume 1 recorded just 6 species in New Zealand. However, the 1992 and 1993 checklists of Tony Druce, who made extensive field observations and collected numerous herbarium specimens, distinguished more than 45 undescribed entities that might or might not warrant taxonomic recognition. Morphological variation in New Zealand *Craspedia* is complex, making the definition and circumscription of species problematic. At least in part, this difficulty is the legacy of an extremely rapid and recent diversification of the genus in New Zealand – a scenario that produces challenges for genetic as well as morphological approaches to delimiting species. In this presentation we will review some of our research results about the taxonomy and evolution of *Craspedia* in New Zealand. Much work remains, but we anticipate our extensive morphological study of plants in the field, in cultivation and in the herbarium as well as our new genetic markers will help us provide an improved classification of *Craspedia* in New Zealand and give us better insight into how their diversity has evolved.

13th September: Field trip to the Dunedin Botanic Gardens. Details T.B.A. Contact Lydia Metcalfe.

4th October, 8:00am: Field trip to Mahaka Katia Scientific Reserve (Pisa Flats). Mahaka Katia Scientific Reserve (Pisa Flats) is situated on an elevated terrace above Lake Dunstan just north of Cromwell. It is a unique example of Central Otago dryland habitat that has mostly been lost to

agricultural development and residential subdivision. Pisa Flats is one of the few remaining places where populations of a number of rare, native, dryland endemic species can still be found. These include *Raoulia monroi, Lepidium solandri, Convolvulus verecundus, Myosotis uniflora* and *Craspedia argentea*. *Myosotis uniflora* is classified as At Risk – Naturally Uncommon and the yellow-flowered form is more or less confined to the Pisa Flats. We are timing our visit to hopefully coincide with its spring flowering. *Craspedia argentea* is known only from this location and is considered Threatened – Nationally Critical. If we have time, we will possibly visit the saline sites at Springvale Scientific Reserve or the Chapman Road Reserve both near Alexandra to look at Central Otago spring annuals, a suite of dryland species that includes *Myosotis brevis*, and the tiny buttercup relatives, *Ceratocephala pungens* and *Myosurus minimus*.

We will meet at the Botany Department carpark at 8.00 am and travel to Cromwell and then on to the Reserve. Bring lunch, warm clothing, rain gear and suitable footwear. Travel time from Dunedin to Cromwell is approximately 3 hrs. Contact David Lyttle | djl1yttle@gmail.com | 027 654 5470

8th October, 5.20 pm: Endemic plants and animals of Otago – what have we got and how do we know?' Scott Jarvie, Senior Scientist Terrestrial Ecology, Otago Regional Council. Otago has a high diversity of plants and animals, reflecting the region's contemporary landscapes, geological past and climatic history. Over 450 species have so far been identified as only naturally occurring in Otago, meaning they occur naturally and breed exclusively in the region. In this talk, I will provide an overview of our regionally endemic species in Otago and how this was determined, with a focus on our plants. Other projects that have contributed to our understanding of our regionally endemic species will also be touched upon, including a project assessing the extinction risk to species regionally and a project compiling type localities for species.

12th November, 5:20pm: Rewilding in Action: the hands-on mahi, the podcast, and the thinking behind it. Speaker: Maureen Howard, BSc Hons, PhD (Psychology). Join Maureen on her rewilding journey as she explores what rewilding looks like in our small part of Aotearoa through her podcast Rewilding in Action; as well as her thinking about what this term means – so far! Maureen will share some useful things she has learned along the way, from hands-on experience in assisted native regeneration, to the technical ins and outs of creating a podcast.

15th November, 9:00am: Field trip to Heyward Point Scenic Reserve. This reserve near Aramoana, is a rare example of coastal podocarp/broadleaved forest with many special features including fragrant tree daisy (*Olearia fragrantissima*) and climbing daisy (*Brachyglottis sciadophila*). With luck, lunch will be in the sun admiring the interesting shrub and herb communities on the dramatic coastal cliffs and headland. We'll do a return trip from the end of Heyward Point Road. Meet at the Botany Department carpark at 9 a.m. Leader John Barkla 027 326 7917.

Note: Please review the trip guidelines for participants, drivers and leaders on our website. bso.org.nz/trip-guidelines

Meeting details: Talks are usually on Wednesday evening starting at 5.30 pm unless otherwise advertised. Venue is the **Zoology Benham Building**, 346 Great King Street, behind the Zoology car park by the old Captain Cook Hotel. Please use the main entrance of the Benham Building to enter and go to the **Benham Seminar Room, Room 215**, located on the second floor.

Items of botanical interest for our buy, sell and share table are always appreciated. The talks usually finish around 6.30 pm. Keen discussion might continue till 7 pm.

Field trip details: Field trips leave from Botany car park 464 Great King Street unless otherwise advertised. Meet there to car pool. Please contact the trip leader before Friday for trips with special transport and by Wednesday for full weekend trips. A hand lens and field guides always add to the interest. It is the responsibility of each person to stay in contact with the group and to bring sufficient food, drink and outdoor gear to cope with changeable weather conditions. Bring appropriate personal medication, including anti-histamine for allergies. Note trip guidelines on the BSO web site: www.bso.org.nz

CONTENTS

BSO Meeting and Field Trip Schedule 2

Committee Notes 5

Chair 5
Secretary 5
Editor 5
Treasurer 6

News and Correspondence 7

Registration Grants for the John Child Bryophyte & Lichen Workshop 7

Articles 7

Gardening spiders 9
Slime Moulds: A Love Letter 11

Trip and Talk Reports 14

The Hikaroroa Mt Watkin Conservation Group, a talk by Jamie Hickling, February 14
Field trip to Maukaatua Track, February 16
Re-evaluating some common and rare species of *Cortinarius*, a talk by Andy Nilsen, March 18
Field trip to Truby King Recreational Reserve, Seacliff, March 19
A Samoan Sojourn, a talk by John Barkla, April 21
Fungal Foray to Piano Flat, Waikaia Forest, May 22
AGM and photo competition, May 25

Committee and BSO Contacts 26

BSO Membership Form 27

Artist: Kelly Phillips

PSEUDOWINTERA COLORATA

HOROPITO

Cover photograph by Jo Sinclair: "*Hymenophyllum* species supporting life". Winner of the *Life Under the Lens* category of the 2025 photograph competition, and joint People's Choice winner.

FROM THE COMMITTEE

Chair's notes

Gretchen Brownstein

Trips/Talks – We ran a record 11 trips last year. Our local trips were again some of the more popular and well attended. Always interesting to see new (and revisit old) places in our own backyards. We also went further afield on botanical adventures to Central Otago, the Catlins, and Slope Point. Thank you to our trip leaders for their energy and expertise in leading excellent adventures. We held eight talks which ranged from fungi taxonomy to tropical island plants, to evolution, and even a members night mystery. A big thank you to our speakers for giving such informative and entertaining talks. I hope that everyone has enjoyed the trip and talk programme this last year. If you would like to give a talk or are interested in leading a trip, please get in touch.

Newsletter – Our newsletter continues to be popular thanks to our editor, Lydia Turley. She continues to produce a high quality and informative newsletter. And many thanks to all the contributors for the trip reports, articles, artwork, and photos.

Photo competition / Calendar – 2025 is the 19th annual photo competition. Peter Johnson and Kelvin Lloyd have been judging from the very start, which is amazing, and we are very grateful for their expertise! I think they would agree that the quality and creativity of the entries has increased year on year. Thank you very much to Jo Sinclair for organising this year's competition; the "life under the lens" category was a fantastic idea. The 2025 calendar was produced by the fine team of John Barkla and Jo. The calendar was a popular item and it sold out early again this year.

Committee – Running the society takes effort and having such a lovely committee means that we all just put in a few hours a month to keep it ticking along. So many thanks to the whole committee: Angela Brandt, John Barkla, John Knight, Alex Wearing, David Lyttle, David Orlovich, Lydia Turley, Lydia Metcalfe, Matt Larcombe, Esté Smal, Jo Sinclair, and Allison Knight. This year we are saying goodbye and a big thank you to John Knight (our treasurer) and Esté Smal (web editor). Their efforts are greatly appreciated! And we look forward to welcoming some new members!

Membership – I can again report that our membership is continuing to grow – we currently have 82 subscribed members (up 3 from last year)! I'll close by reiterating a statement from my first chair's report: it's through members' participation on trips and in talks we all have a chance to share and learn botanical knowledge and by engaging with the community through our society we can promote botanical science and raise environmental issues. So as always, keep doing the do: submitting photos, writing articles, coming to talks and trips, and growing our botanical community.

Secretary's notes

Angela Brandt

Thanks to all the BSO members who attended the AGM to vote on our amended Constitution and elect committee members for another year. It's a privilege to be serving once again with such a dedicated group of people. Thanks very much to John Knight for keeping our finances in order and to Matt Larcombe for his support in liaising with the University for space to hold our monthly talks - we have certainly appreciated you both giving your time to the BSO committee!

Welcome to our new members, Phoebe Hunt, Caitlin Valins, Kate Bonné, Steph Marvel, Otto Hyink, Lily Donahue, and Craig Wilson! And welcome back to Aidan Braid and Bill Lee!

Please note that the BSO email address has changed. We can now be contacted at BotSocOtago@gmail.com.

Editor's notes

Lydia Turley

It is time for me to step down and pass the newsletter baton on. Many thanks to Alex Wearing, who has agreed to take over the role. Alex is one of my favourite contributors—always on time, lovely to interact with, and he writes thoroughly researched reports —and I'm sure he'll do an excellent job.

I have loved doing the newsletter. It's really cool seeing what people are up to, and compiling the newsletter is a great excuse to read everything thoroughly. I love the range of topics that people write articles about. I love when someone sends an unsolicited article; it's a welcome sign that this newsletter is appreciated and treated as worth contributing to. I want to say a huge thank you to everyone who has contributed to the newsletter or helped in other ways through the years—there would be no newsletter without your articles, reports, pictures, etc. and there would be many more errors without the wonderful proof-readers!

Editors guidelines: Suggestions and material for the newsletter are always welcome. We welcome stories, drawings, reviews, opinions, articles, photos, letters – or anything else you think might be of botanical interest. Remember to include photo captions and credits. Please keep formatting to a minimum. Send your feedback, comments or contributions to scamblernz1@gmail.com. Copy for the next newsletter is due on *8 October 2025.* Earlier submissions are most welcome.

Disclaimer: The views published in this newsletter reflect the views of the individual authors and are not necessarily the views of the Botanical Society of Otago.

Treasurers notes

John Knight

Statement of Financial Position

Botanical Society of Otago, c/o University of Otago, Botany Dept, P O Box 56, Dunedin North 9059
CC24010

For the year ended 31 March		2025		2024
FINANCIAL INFORMATION				
Statement of receipts and payments				
Operating receipts (deposited into accounts)				
Donations, fundraising and grants	$	80	$	-
Fees and other receipts from members	$	2,255	$	2,311
Receipts from selling goods or providing services	$	1,825	$	1,904
Bank account interest and other investment income	$	796	$	918
Other receipts	$	-	$	-
Total receipts	$	4,956	$	5,133
Less operating payments (withdrawn from accounts)				
Fundraising costs	$	-	$	-
Payments to employees and volunteers	$	-	$	-
Payments related to providing goods or services	$	4,003	$	3,855
Grants and donations paid	$	1,080	$	1,156
Other payments	$	-	$	-
Total payments	$	5,083	$	5,011
Operating surplus/(deficit) for the year		-$127	$	122
Plus opening total of all bank accounts and cash on hand	$	27,574	$	27,452
Closing total of all bank account balances and cash on hand	$	27,447	$	27,574
Subtotal for Audrey Eagle Publishing Fund	$	15,105	$	14,293
KEY ACTIVITIES				
Meetings and public talks		9		9
Field trips		10		9
Newsletters published		3		3
MEMBERSHIP				
Total Paying Members		82		79
Life Members		1		2
Complimentary Newsletters		28		27

NEWS AND CORRESPONDENCE

BSO Registration Grants for the 2025 John Child Bryophyte & Lichen Workshop

The Botanical Society of Otago is offering four grants of up to $400 each to cover registration costs for the 2025 John Child Bryophyte and Lichen Workshop. The workshop will be held at Camp Iona in Herbert (coastal North Otago) from 30 October to 4 November. For more information on the workshop, contact Allison Knight at allison.knight.nz@gmail.com.

To apply for a grant, email BotSocOtago@gmail.com with "Registration Grant" in the subject heading.

In your application:

1. State the ways you (and the BSO) will benefit from this grant.

2. Agree to build on your experience at the conference or workshop to:

> Write an article for the BSO Newsletter
> or Give a Monthly Talk to the BSO
> or Organise a BSO Field Trip.

3. Confirm that you are a current member of the Society. Information on how to join is here: https://bso.org.nz/about-joining-the-bso

Applications close on 31 August 2025.

ARTICLES

Gardening spiders (Not to be confused with garden spiders)

James Crofts-Bennett, Feat. John Steel.

New Zealand is renowned for a wide diversity of spiders (approximately 2,000 species, of which roughly 1,300 have been described), which is likely a much lower number than you are used to seeing while out in the field. Some of this could be attributed to increasing urbanization, surely much of the spider diversity is hidden away in Fiordland, Abel Tasman park and other obscure hidden places such as the entirety of the North Island (I've never seen it). You might argue further that some are probably quite small, and you would be right. Families such as the Theridiidae, Linyphiidae, Anapidae, Huttoniidae, Malkaridae, Mysmenidae, Oonopidae, Orsolobida, Salticidae, Physoglenidae (The NZ fauna was formerly attributed to the Synotaxidae), Theridiosomatidae and Mimetidae (and Cyatholipidae (and most of Cycloctenidae and Desidae)) are present in Otago and largely miniscule, hard to see and tricky to diagnose. We could probably leave it there, but rather than acknowledging that most spiders are obscure because they're tiny, it'd be much funnier to point out that there are four species of tarantula living in Coastal Otago that are largely unknown because they engage in meticulous landscaping and gardening. Now, in fairness, there's actually sixteen species of mygalomorph that fit that description, but finding all sixteen is way too much work and four belong to a genus with very specific habitat requirements that made finding them much easier.

This all started in 2024 (I don't remember when ECOL111 was out at Portobello, my doc prescribed me Duromine and I was high as all hell) where a small, strange looking spider turned up in a pitfall trap. It was barely 5mm in total length, bright orange and very clearly a tarantula (paraxial fangs and closely grouped eye arrangement with large, leg like spinnerets). It was pretty clear, even at the time we were looking at *Migas distinctus*, a small, but sexually mature male. Naturally, I was very excited (to my annoyance, the students were not) but it was not until the start of 2025 that I realised the significance of this find. Portobello labs was, in fact, the type locality of this species and while reviewing the known mygalomorph diversity of Otago I realised that (outside of *Porrhothele antipodiana*) there was very little in the way of records for most Otago mygalomorphs. Many species are known from a single record (typically that of the holotype) and even with

amazing resources like iNaturalist, there was virtually nothing for the trapdoor spiders (represented in Otago by two genera, *Migas* and *Cantuaria*). There is a further complication to this puzzle; most New Zealand mygalomorphs are sympatric and cannot be distinguished from related taxa outside of dissection. This was clear as there are some photos on iNat for *Cantuaria* around Dunedin, some very good photos by talented nature photographers, that simply cannot be described past genus due to the lack of diagnostic features that require harming or otherwise stressing the animal to record.

Now there's only one real solution to this, you have to trick some idiot into agreeing to do a PhD and then hope that he's stupid enough to decide to record every single species of spider in Otago and scour the literature for every known record of aforementioned, alleged species (if he's really dumb, he'll also do a full review of the taxonomic literature associated with each species, could you imagine?). I was that idiot. I did that. Don't follow my example. After I had finished the Mygalomorphae, I realised that A) we had a disproportionate number of coastal *Migas* species in Otago (4) and B) one was exclusively known from a single site in Taieri Mouth. Not the settlement of Taieri Mouth, the actual mouth of the Taieri river (you will quickly learn that spiders like to make things difficult).

Migas taierii

The appropriately named *Migas taierii* was our first target for rediscovery. It was extensively reviewed by Todd (1945, this was also the formal description of this species) and later by Wilton (1968). Now, refreshingly, this species has been checked in on from time to time (last in 2020), as the entire species is restricted to a small rock face coated in thick clay on the Southern bank of the Taieri river. This rock face is roughly 50m long, about 3m tall and knowing the entire species was located on it fills me with an unending anxiety (which I hope to give to you too <3). I conferred with national experts on the ethics of collecting a sample of a notably endangered species (NZTCS considers *M. taierii* nationally endangered) and it was agreed that a sample could confirm the status of the species in 2025 (and could later be used to gather important molecular data for future reference). I asked John Steel if he wanted to see one of the rarest spiders in New Zealand (and really, the world, the population, at the time was estimated to be about 300 mature individuals) and he said something that sounded remarkably like yes (or get bent, once again, Duromine) and before I knew it we were off on a road trip. After engaging in the national pastime of worrying tourists, we made our way down from Knarston Park to the sandy bank of the Taieri. I was unable to find anything but *Steatoda capensis* under some rocks. I slowly moved up the river, looking for a clay bank as described consistently in the literature. I was getting depressed at this point, anything resembling a clay bank had been covered in rocks and netting (presumably due to erosion concerns) when John Steel noted a complex of honeycomb like apertures in clay caked on a sheer rock face that nearly dipped into the water. A quick review found the openings that led to papery tunnels lined with yellowed silk. By this point, John Steel would establish himself as some sort of spidering good luck charm, and a wounded spider was observed on the clay. She was big, but very obviously of *Migas* stock (spiny forelegs, dorky eyes, probably got bullied at school) and straw coloured (virtually yellow in some spots) and I knew we had found *Migas taierii*. John Steel would also note the presence of a smaller trapdoor spider that had a tunnel coated in bryophytes (John later confirmed these were liverworts). Using classical botanical knowledge, this tells me that either A) eating this spider would be good for my liver or B) this spider has an issue with alcohol (possibly cirrhosis).

Figure 1: Tunnel and trapdoor found on site at Taieri Mouth. This is from the sheer rock face that contains the entirety of the species Migas taierii*, but is likely the tunnel of* Migas distinctus *(Photo: James Crofts-Bennett)*

Despite my best efforts, there is actually important information to be gleaned here. *M. distinctus* is a smaller spider of much darker colouration (as ob-

served in the tunnel John had discovered). *M. distinctus* also does not dig tunnels, rather it creates a somewhat flattened tube of silk on the upper surface of a medium, which it disguises with bryophytes (no, really, it's never been observed to use other plant taxa, perhaps due to how easily bryophytes are ripped up?). In contrast, *M. taierii* digs a well-lined tunnel and is the only species of Coastal Otago *Migas* that makes use of the papery silk observed in the derelict tunnels. While it is known that *M. distinctus* is sympatric with all the other coastal *Migas* species, I was not aware it was actually present on the actual rock face with *M. taierii*. As we do not want to be particularly invasive with this species, it does leave some concerns on how to evaluate the population numbers of *M. taierii* without mistakenly counting *M. distinctus*. The best method would be spot lighting at night, but this method is the most likely to accidentally confuse the two species. Initially I believed that the population was still stable but now find that it very possible that the population was potentially exaggerated and may be smaller than initially expected. Not to be discouraged, I put an entry up on iNat (I was unable to locate the spermatheca during dissection, but the pectination of the claws, the overall body size (17mm length) and colouration make it almost certainly *Migas taierii*).

Migas marplesi

Contrary to popular belief, I rarely have a plan when I do something; rather, most things I do happen purely by accident. While out collecting spiders at OPERA on the peninsula, I reached up to grab at what I thought was clay caked on a rocky cliff (Pipikaretu Beach) only for it to crumble into dust. To my horror, I was coated by ancient, dry guano mixed with sand. As I was recovering, I noticed two 3-inch-long cigar shaped objects on the ground where the substrate had landed. Immediately I knew what I was looking at, *Migas* tunnels. I was more than a little excited, as this form of burrow (as noted above) could not be *M. distinctus*. My mind raced, it could either be *Migas marplesi* or an undescribed species. I carefully tugged at the side of one tunnel, revealing a very large, almost jet-black spider with a truncate (and frankly, adorable) form. Far too big to be *M. distinctus*, far too dark to be *M. taierii*, I probably should have been a little more professional with my client as I eagerly suggest it might be a new species. I was quick to point out it could also be *Migas marplesi* (nice save). Once back in the lab, the spiders were placed in the freezer to gently guide them into the great weave in the sky and the soulless shells were dissected. It was immediately obvious we had *M. marplesi* (spermatheca tri-lobed, also I screwed the dissection up partially and twisted one of the spermatheca, which (hilariously) Wilton clearly did as well in 1968). *Migas marplesi* does not appear to have been observed since being collected by Marples and later described by Wilton in 1968 and this is the southernmost record for the species (previously only known from Shag point and a single record from Karitane). While John Steel was not present for this collection, he has similarly been at OPERA surveying the vegetation and I'm willing to

Figure 2: Migas marplesi*, collected from Pipikaretu Beach. These spiders are exceptionally passive and will maintain this defensive position when exposed. Note the pale patches near the anterior margin of abdomen, these are considered diagnostic for this species. This gravid female was 15mm in total body length. (Photo: James Crofts-Bennett)*

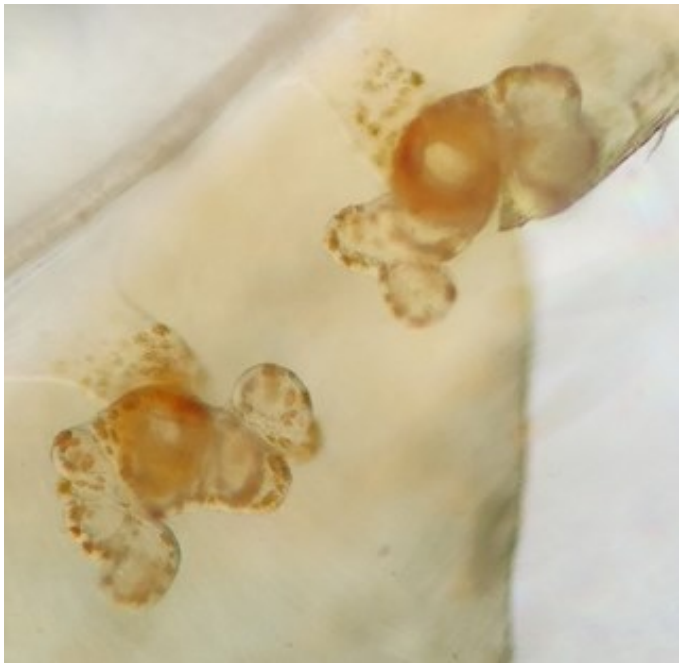

Figure 3: Spermatheca of Migas marplesi*. Sort of like little flowers. (Photo: James Crofts-Bennett)*

chalk this exceptional find up to his strange gift.

(I'm legally obligated (probably) to tell you that OPERA paid me for the invertebrate survey, including the accidental finding of *Migas marplesi* and subsequent identification).

Migas toddae

Perhaps the most obscure of the coastal Otago Migas species, *M. toddae* is only known from one collection event from Trotters Gorge. The cryptic locality notes state it was found in "nests on cliffs" in 1965. Now, I don't know how you would define a cliff, but I immediately think of a sheer rock face that is, at the very least, taller than me (and usually a great deal taller than me). Excited to make more spider history, John Steel kindly agreed to drive me out to Trotters Gorge (my fourth time visiting this locality) and I immediately thought of the track that followed the stream and a sheer (and at some points, concave) cliff face. After picking around the river for *Haplinis* (don't get me started on that story) we made our way around the rocky cliff with very little luck searching for any spiders, let alone cryptic trapdoor spiders with virtually no notes to work on (there was an absolutely tiny little cyatholipid, barely 700µm long). After being thoroughly defeated and starting to believe I had been cocky and foolish to think a spider only ever recorded once would be easily located, we made our way down to the stream (found some more *Haplinis*). I started up the track, figuring I would check near the caves. Not even 20 meters down the track I stopped to look at a small clay embankment, barely reaching my hip in height, and immediately found ten specimens of *M. toddae*. I think we need to have a frank discussion about field notes at some point. We had barely entered the gorge proper; after all that fussing on that cliff track it turns out we really only had to stop at the first exposed clay bank on the easiest part of the track (scored a second cyatholipid too, essentially wandering a trapdoor minefield). I was starting to believe, at this point, that John Steel was the real deal when it came to finding obscure spider species. I'm happy to report that *M. toddae* appears to be doing well, population density appears to be high, and appropriate habitat is plentiful on site (and is likely maintained by DOC, if inadvertently… not sure I want to tell them that). *M. toddae*, as described by Wilton, is virtually indistinguishable from *M. distinctus* outside of the structure of the internal genitalia of the female (the male is not known). While *M. distinctus* has relatively simple spermatheca with two small, pointed lobes, *M. toddae* has much more complex structure with an extended lobe that curls over the top of the primary sperm chamber. Also, I'm not sure we can consider *M. toddae* truly coastal, I know you can see the ocean from Trotters Gorge, but the truly coastal *Migas* are generally right up at the sand line, practically littoral.

Figure 4: Migas toddae*, collected from Trotters Gorge. This appears to be the first photograph of this species ever taken (or at least, published publicly). This gravid female was barely 10mm in body length. (Photo: James Crofts-Bennett)*

Strangely, *M. toddae* was noted to create both

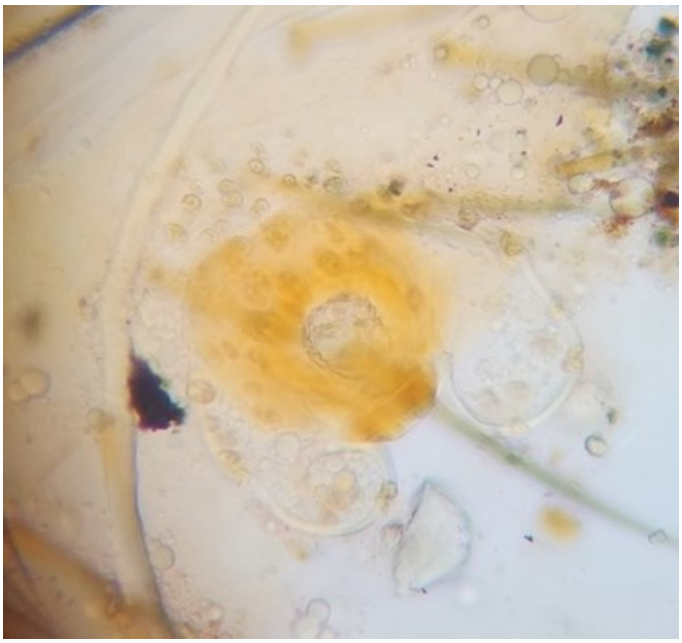

Figure 5: One of the spermatheca of Migas toddae*, notably complex compared to other local taxa in this genus. Note the spots (papillae) over the orange structure (primary sperm chamber), this is one of the spermathecal lobes, curled over the top of the primary chamber. (Photo: James Crofts-Bennett)*

Figure 6: Adult female Migas toddae*, she small! (Photo: James Crofts-Bennett)*

forms of nest on site. Some individuals were collected in flattened tubes such as those known from *M. distinctus*, while others had proper burrows like those of *M. marplesi* and *M. taierii* (sans the yellow papery silk walls). In both situations, exposed silk was covered in bryophytes, just the doors for proper burrows and total cover for exposed tubes. The idea that I've walked past this very spot four times and never once known one of the most obscure spiders in New Zealand was just sitting there will likely drive me insane for years to come. Pretty sure we also found evidence of some form of parasitoid activity, with a silken tube WITHIN a silken tube that had clearly been cut open by sharp mandibles near the tip. The silken spindle was exceptionally strong and required a scalpel to open (only to be completely empty). There were mummified spider remains attached to the tube (to my annoyance, the widely distributed eye arrangement suggested this was the remains of the still unknown male).

The only remaining species of *Migas* left to confirm in Otago would be *M. lomasi* and *M. linburnensis*, known from Makarora and Middlemarch respectively. Unfortunately these species are not coastal and wouldn't really fit in with the theme of this side project (definitely not avoiding looking for them due to having much wider localities to search and being much further away (then again, if I get John to take me to the sites, we'll probably find the spiders in the car park (again))).

Figure 7: Juvenile Migas toddae*, the only scientific evidence so far that* M. toddae *reproduces (otherwise previously assumed, which is clearly bad science). Cute! (Photo: James Crofts-Bennett)*

Slime Moulds: A Love Letter

Caitlin Valins

I've gotten used to the blank expression I receive when I tell people I want to be a Myxomycologist. "You want to be what? Oh, slime moulds? What on earth is a slime mould?" I am so glad you asked! Trainers of algorithms, mappers of the cosmos, pioneers of cancer research. My obsession. In truth, slime moulds (otherwise known as myxomycetes) are many things, including hard to describe. This is because they are undeniably unique.

My interest in myxomycetes began on a spring afternoon with a cluster of strange pink capsules huddled beneath a rotted log. Only a few mm tall and perched on thin stalks, they looked almost fungal. Curious, I took them back to the lab. A microscope soon revealed that the interior was not a solid mass like you might expect, but a twisted afro of pink threads in which tiny spores were cradled. The threads were intricately decorated with beautiful rings and cogs. Their delicate pattern mesmerised me. I quickly learnt that this was a slime mould, a protist belonging to the clade Amoebozoa, far outside the fungal kingdom. Indeed, this particular slime mould belonged to the genus *Arcyria*, however, it would take a long time to be fluent enough to identify the species.

Arcyria denunata. *(Photo: Peta McDonald)*

Once I'd met my first myxomycete, I was hooked. It turned out, a whole other world lived on decaying

wood and leaf litter without my notice, hunting bacteria, as microscopic single-celled flagellates or multinucleate plasmodium, until, upon the worsening of conditions, transforming into spore dispersing works of art, unique to their species. Fruiting bodies (sporocarps) could vary massively in colour, size, and shape. One day I might find a massive *Fuligo septica* that looked like solidified boiling broths of bright yellow, the next, wee *Cribaria cancellata* that were held together by a delicate peridial nets and opened up into exploding star clusters under the microscope. It was all a matter of looking closely enough.

Fuligo septica. (Photo: Jaco Grundling)

However, while my interest began with sporocarps (fruiting bodies), myxomycetes are most famous for their vegetative plasmodial stage. Straight out of science fiction, slime mould plasmodia are massive multinucleate slimy cells that creep along the forest floor, feeding on unsuspecting bacteria, mycelium, and stray spores. They possess an uncanny ability to move using the most efficient pathways. Put a myxomycete in a maze, and it will find the quickest way out. In 2010, scientists studying *Physarum polycephalum* decided to grow some on a map of Tokyo. They had marked the surrounding cities out with the popular slime mould cuisine, oat flakes, and watched the slime moulds find the most efficient routes between flakes. The result was an almost perfect recreation of the real-life metropolitan Tokyo railway system (Tero et al. 2010).

Slime mould plasmodium (Photo: Theo Summer)

Cribraria cancellata (Photo: Peta McDonald)

Since then, myxomycetes have shown they can remember their environments and use these memories to help them quicken the pace of their problem solving. This knowledge can even be transferred to other plasmodia upon fusing (Vogel and Dussutour, 2016). This brainless cognition has thrown back into question how we understand basic intelligence (Smith-Ferguson and Beekman, 2019). Is intelligence simply the ability to solve problems, or is it something deeper? There is certainly an argument for slime mould intelligence as the behaviour of *Physarum polycephalum* has trained numerous algorithms that are now used to help solve complex optimisation problems. It has even helped map dark matter and the cosmic web (Burchett et al. 2020).

Myxomycetes do not only have beauty and brains, many have also demonstrated potentially useful an-

timicrobial, antibiotic, and anticancer properties (Keller and Everhart, 2010). The prestigious *P. polycephalum* has led this once again with its contributions to Polycefin's development, a drug carrier used in the treatment of brain and breast cancer (Ljubimova et al. 2008). What's more, myxomycetes are important ecological regulators. Being a substantial proportion of the bacterivore population in most soils, myxomycetes maintain harmony between micro-organisms, helping insure a careful balance is preserved (Akgül et al. 2021).

Given how peculiar slime moulds are, I was sure people in New Zealand must be studying them. However, they have fallen victim to the disinterest often afforded small or obscure organisms. In New Zealand, myxomycetes have been painfully understudied. Most of our information regarding slime mould diversity has come from the work of Steven Stephenson, a highly respected American professor who named specimens based on similar-looking species found elsewhere in the world. This is common practice in myxomycology but has left New Zealand with only one endemic slime mould, and slime moulds with massive distributions. While sequencing would help discern whether our species are actually unique, sequencing data for myxomycetes remains sparse (Cox, 2024). Personally, I think it is absurd to believe that 70 million years of isolation would have failed to produce multiple novel species. Which is why I think people in New Zealand need to start looking closer at slime moulds and why I want to study them. As any avid slime mould enthusiast will tell you, stumbling upon across new species in myxomycology is not the hard part.

Physarum album (Photo: Tyler McBeth)

There are so many reasons to care and study about slime moulds - their beauty, their intelligence, their usefulness - however, how can we truly explore these without knowing what we have? I love slime moulds in the purest form. I love the peace of walking through damp forest in search for new specimens. I love the thrill of finding a species I've never found before. They are the reason I am excited to be a scientist. I hope you can be excited too.

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REPORTS

The Hikaroroa Mt Watkin Conservation Group, a talk by Jamie Hickling, 12th February

Alex Wearing

Jamie Hickling talked about the past and current activities - and the future - of the Hikaroroa Mt Watkin Conservation Group (HMWCG) which was established in 2023.

The Mt Watkin/ Hikaroroa Scenic Reserve (MWHSR) is in a tributary of the north branch of the Waikouaiti River, coastal east Otago. Mt Watkin/ Hikaroroa (616 m asl) is a volcanic cone emerging through schist rocks. It is distinguished by boulderfields formed by weathered basalt rocks rolling down slopes. These boulderfields are of national significance. The reserve has ecologically significant remnants of lowland podocarp and kōwhai (*Sophora microphylla*)- narrow-leaved lacebark (*Hoheria angustifolia*)- ribbonwood (*Plagianthus regius*) forests.

Hikaroroa is culturally significant as the mauka tipuna for the local hapu Kāti Huirapa Rūnaka ki Puketeraki. It is a traditional and contemporary food and seed gathering site.

The MWHR has an interesting history. It was gazetted in 1895 as 810 ha of endowment land for recreation and then vested in the local authority. Public access was not promoted or protected[1]. From 1970, part of the reserve was leased for grazing on a 21-year lease with perpetual right of renewal. Support for a reserve to protect conservation values increased in the 1980s. A report by Allen (1986) described and emphasized the botanical and ecological significance of the forests in the north branch of the Waikouaiti River. This stream catchment draining the western slopes of Mt Watkin has a small stand - one of two in the area[2] - of unlogged podocarps. This area represents a sample of east Otago coastal forests before the arrival of people.

The Dunedin City Council (DCC) took over ownership in 1989. Mt Watkin/Hikaroroa was gazetted as a 650.8 ha scenic reserve under the control of the DCC in 2005. Part of the original reserve was sold off. Some of the sold-off land contained significant areas of regenerating native vegetation as well as farmland. The potential to establish more extensive buffer zones, and to restore and increase the area under native forest was lost. The current primary management objective is to protect the ecological values of the MWHSR (DCC, 2011).

The MWHSR has 28 vegetation types, 180 indigenous plant species, of which nine are nationally threatened or uncommon, and 25 plant species that are locally important (DCC, 2011).

The main vegetation types are podocarp- broadleaved forest dominated by tōtara (*Podocarpus totara*) and kahikatea (*Dacrycarpus dacrydioides*), with some mataī (*Prumnopitys taxifolia*); broadleaf forest (mainly kōwhai, narrow-leaved lacebark, and ribbonwood); kānuka (*Kunzea* sp.)- broadleaved forest; kānuka scrub and low forest;, rock outcrop scrub; boulderfield scrub; tussock grassland; and exotic scrub (Allen, 1986; DCC, 2011).

The present vegetation pattern of MWHSR is the result of human activity. The small unlogged stand of podocarps is the only remnant of pre-human vegetation. Kanuka stands established before the presence of the arrival of browsing herbivores are more diverse and have different successional sequences to kanuka stands established since the arrival of browsers (Allen, 1986). The latter contains a smaller - more browsing resistant - pool of species.

Pest animals in the MWHSR include goats, pigs, possums, deer, mustelids, rats, and feral cats. Jamie Hickling outlined the current predator control programmes and biodiversity monitoring being undertaken at the MWHSR. Holistic conservation and adaptive management practices are applied at the landscape scale. Decision-making uses data pertaining to the distribution, abundance, densities, dynamics and reinvasion pressures of the pest species.

Pest animal control is problematic. There is a large area of suitable habitat. There are several mobile pest species which need to be controlled simultaneously. Decisions must be made between the suppression and eradication of pest species. Realistically, it will not be possible to eradicate all the problem animals in MWHSR[3]. Blocks of land are target-

ed for control. Control operations in the MWHSR occur in tandem with operations on surrounding private land. Project Halo has expanded its pest control area to include Mt Watkin/Hikaroroa.

Jamie Hickling outlined control operations for possums and mustelids. Significant numbers of animals have been killed. The next target species are goats, pigs, cats, and rodents. There are differences of opinion with respect to pigs. Some members of the community consider pigs to be a significant food resource.

It seems likely that if for whatever reason pest control ceased - or was reduced – pest numbers could rebound quickly. This would have deleterious effects on the ecological values of MWHSR and upset the owners of the surrounding farms (who do not want the reserve to be a source of reinvasion onto their lands).

Pest plants are also present. These include gorse (*Ulex europaeus*), Scotch broom (*Cytisus scoparius*), wilding pines, Himalayan honeysuckle (*Leycesteria formosa*), elderberry (*Sambucus nigra*) and Chilean flame creeper (*Tropaeolum speciosum*).

There are ten transects used for vegetation monitoring, and there are also some historical vegetation plots in the reserve. Increased vegetation monitoring and a network of vegetation photo points would be appropriate. Jamie Hickling said that there was good regeneration at some sites, particularly where there was topographic protection or buffering. It would be worthwhile investigating the regeneration of the canopy-forming species.

Currently, public access to the MWHSR is restricted. There is a requirement to make a booking with the DCC and to pick up a key to unlock the gate to the easiest point of access. This seems regrettable given that the reserve was originally created for the purpose of enabling public access. The lack of public access has been raised frequently since the 1980s until the present day (e.g., Schofield, 2009).

The MWHSR extends to within 1 km of the Bucklands Crossing Reserve (BCR). There is potential to construct a track (or tracks) that goes through the MWHSR and extends to the BCR. This part of east Otago could do with more opportunities for walking and tramping to explore and appreciate its landscapes and native vegetation.

Recently, the HMWCG has been awarded $412,820 by the Department of Conservation Community Fund to continue pest control, expand feral cat control, expand biodiversity monitoring, fund some project coordination, and expand community education and engagement[4].

Jamie Hickling's talk was an excellent introduction to Mt Watkin/Hikaroroa, and to the ongoing efforts to protect and enhance its indigenous conservation values. The planning behind pest control, the efforts involved in carrying out control operations, and the results achieved to date, are impressive and praiseworthy.

Notes

1. There seem to be parallels to the Waihemo Recreation Reserve, near Palmerston, which was endowed for public use in 1862 but has had no public access since the 1920s when it was leased for grazing. A recent decision (in 2025) by the Waitaki District Council will result in the fencing off part of the reserve and its management for conservation and biodiversity but has allowed continued grazing on about two-thirds of the reserve. There is still no commitment to establishing secure public access to the proposed protected part of the reserve.

2. Unfortunately, the second unlogged podocarp stand located in the Garden Bush Creek (GBC) catchment, a few hundred metres south of the eventual MWHR boundary was not included in the reserve. In the GBC stand "totara and kahikatea are the most common podocarps, up to 1.5 m and 1 m respectively in diameter, and 20 m tall. Mataī occurs at a lower density, rimu (*Dacrydium cupressinum*). and miro (*Pectinopitys ferruginea*) are sparse, and thin-barked [Hall's] tōtara (*Podocarpus laetus*) was recorded as a single tree." (Allen, 1986, no page number). In the MWHSR stand, Allen noted that totara predominated with fewer matai and kahikatea, and did not record Hall's totara, miro, and rimu.

3. Eradication is being attempted at Hinewai Reserve, Banks Peninsula. This requires tremendous ongoing commitment. Consult back issues of Pipipi (the Hinewai Reserve newsletter).

4. POWA Community News. June 2025.

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Fieldtrip to Maukaatua Track (from Woodside Glen to the northern flanks of Maungatua), 22nd February

Alex Wearing

The fieldtrip started at the Woodside Glen[1] picnic area. A well-formed track follows the true left of Lee Creek to where the creek is crossed. Lee Creek is deeply incised, and its catchment has predominantly steep slopes with many deep gullies. Crossing Lee Creek involves deciding between slippery boulders or the distinct possibility of wet feet. The track up to the treeline is less well-formed but is well marked. It continues through montane scrubland to low-alpine snow tussock grasslands on the northern flanks of Maungatua[2]. Maungatua at 895 m is the highest hill visible from Dunedin and is the easternmost of the Central Otago schist block ranges.

The forests in this area are mixed podocarp-broadleaf, and silver beech (*Lophozonia menziesii*). In most areas podocarps occur at low density. The forests the track passes through, especially the more accessible areas, have been impacted by logging, fire, and grazing. The forests continue to be modified by deer, pigs, goats, and possums. Many introduced plant species are present, especially in more disturbed and/or open areas.

Plants seen alongside the first section of the track included kānuka (*Kunzea robusta*), silver beech, Hall's tōtara (*Podocarpus laetus*), broadleaf (*Griselinia littoralis*), tree fuchsia (*Fuchsia excorticata*), wineberry/makomako (*Aristotelia serrata*), mahoe (*Melicytus ramiflorus*), weeping māpou (*Myrsine divaricata*), lemonwood/tarata (*Pittosporum eugenioides*), kōhūhū (*P. tenuifolium*), red matipo (*Myrsine australis*), three-finger (*Pseudopanax colensoi*), lancewood (*P. crassifolius*), marbleleaf (*Carpodetus serratus*), milk tree (*Streblus heterophyllus*), kowhai (*Sophora microphylla*), pepperwood (*Pseudowintera colorata*), koromiko (*Veronica salicifolia*), *Coprosma areolata, C. colensoi, C. rhamnoides, C. rotundifolia, Clematis paniculata*, bush flax (*Astelia fragrans*), rata vine (*Metrosideros diffusa*), and *Nertera ciliata*.

Tree ferns seen were *Cyathea smithii* and *Dicksonia fibrosa*. Other ferns noted were hound's tongue fern (*Zealandia pustulata*), crown fern (*Lomaria discolor*), *Asplenium flaccidum, A. gracillimum*, and *Polystichum vestitum*.

Larger/older trees were found on the crest and upper slopes of a small spur crossed by the track (including some impressive large lancewoods). Also present at this site were many Hall's tōtara seedlings and one miro (*Pectinopitys ferruginea*) seedling. Hall's tōtara regeneration was quite widespread in the forest before the Lee Creek crossing.

Many of the tree fuchsias had impressive and arresting growth forms. A single pōkākā (*Elaeocarpus hookerianus*) was seen by the track.

Introduced woody plants seen before the crossing of Lee Creek included holly (*Ilex* sp.), sycamore (*Acer pseudoplatanus*), a large hawthorn (*Crataegus monogyna*) and blackberry (*Rubus* sp.).

Close to the creek, large tutu (*Coriaria arborea*) were common. *Austroblechnum penna-marina* and *Pyrrosia elaegnifolia* grew on banksides. The tenacity of kanuka and marbleleaf was shown by seedlings that had established in the soil and moss accumulated in the crevices and depressions of large boulders in the Lee Creek riverbed. Less welcome presences in the riverbed at the crossing site were bittersweet (*Solanum dulcamara*) and gorse (*Ulex europaeus*).

The track on the true right bank initially climbs up through secondary podocarp-broadleaf forest. Some moist gullies are crossed. Further up the track numerous rocks occur on the surface and there is evidence of slope movement.

The track passes through a small grove of adult Hall's tōtara trees. Also present at this site were very large specimens of broadleaf. Hall's tōtara seedlings and saplings were often seen alongside or close to the track where there is more light, more

open ground, and long lateral branches provide good seed defecation sites for perching birds. Some kowhai seedlings were also seen by the track. Adult mataī (*Prumnopitys taxifolia*) was seen by the track, but it seems to be uncommon in the area the track passes through. Away from the track a large pōkākā (1.2 m diameter at breast height) was found. Near to the pōkākā was a large Hall's tōtara with a distinct flag-form branching pattern, suggesting that at some time in the past this tree was exposed and/or on a forest edge (whereas it is now some distance from the treeline). Based on current regeneration it seems likely that the future forest canopy of this slope will have a greater proportion of Hall's tōtara compared to the forest before European settlement.

Other species present were New Zealand climbing bindweed (*Calystegia tuguriorum*), supplejack (*Ripogonum scandens*), the native hook grass (*Carex uncinata*), and fireweed (*Senecio quadridentatus*). On open sections of the track several introduced plants were seen, including St John's wort (*Hypericum perforatum*), ragwort (*Jacobaea vulgaris*), Scotch thistle (*Onopordum acanthium*) and Yorkshire fog (*Holcus lanatus*), as well as the native poroporo (*Solanum laciniatum*).

Approaching the treeline, some sections of the track were more open and/or disturbed and more introduced plants were seen, such as heal-all (*Prunella vulgaris*), foxglove (*Digitalis* sp.), and several introduced grass and herbaceous species.

The forest at the treeline was dominated by silver beech. Also present were kōhūhū, lemonwood/ tarata, koromiko, red matipo, *Coprosma linariifolia, C. propinqua*, broadleaf, *Olearia arborescens*, marbleleaf, bracken fern, old man's beard lichen (*Usnea* sp.), and some introduced Scotch broom (*Cytisus scoparius*).

The widespread presence of bracken above the treeline suggests that past fires depressed the treeline at this site. Currently, the treeline is moving upslope.

In the montane shrubland mānuka (*Leptospermum scoparium*) was widespread. There were some large *C. propinqua*, and a dismaying amount of Scotch broom.

The forest vegetation is patchy and variable. Over the length of the track below the treeline individual plant species can be present, reasonably abundant, very abundant, less abundant, absent, present, reasonably abundant, and so on. There is also considerable spatial variation in the regeneration of indigenous understorey, sub-canopy and canopy-forming species. Some species (e.g. pōkākā) seem to be very uncommon (based on a 'track-view' of the forest). Topography, aspect, soil conditions, surface conditions (e.g., drainage, woody debris and leaf litter, presence and cover of plants that could inhibit regeneration), site disturbance history (types, frequency, and intensities of disturbance events), and chance all must be considered[3]. There is also the likelihood that the track itself only shows a subset of all the combinations of site and site history influences that are present in the Lee catchment. It is tempting to describe and explain patterns observed in the field, but these patterns may be more apparent than real. Explanation can veer into ecological storytelling. But change is occurring, and different successional sequences are occurring in different areas along the track. The track itself is an agent of change.

The track in the snow tussock grasslands has more disturbed and bare micro-surfaces than the tussock grasslands it passes through, and it is an invasion pathway to higher altitudes for species like dandelion (*Taraxacum officinale*) and Scotch broom.

Species noted in the tussock grasslands included narrow-leaved snow tussock (*Chionochloa rigida*) *Veronica propinqua, Celmisia gracilenta*, tauhinu (*Ozothamnus leptophyllus*), and mountain clubmoss (*Austrolycopodium fastigiatum*).

The views from the highpoint, a rock outcrop at 580 m asl, made the ascent worthwhile, and enabled a landscape-scale appreciation of the topography and vegetation of the Lee catchment and the northern flanks of Maungatua,

A big thank you to Jo Sinclair for organizing and leading a very convivial trip. Interesting plants and vegetation on the way up capped by spectacular views from the highpoint. All in all, a great day out.

Acknowledgements

John Steel's [Species] Checklist -Woodside Glen was invaluable. Marcia Dale provided identifications for *Calystegia tuguriorum, Centaurium erythraea*, and *Senecio quadridentatus*.

Notes

1. Woodside Glen is west of Outram and is about 30 minutes' drive from Dunedin. Woodside was a sizeable settlement in the late 19th century.

2. From Maunga-Atua meaning' hill of the gods'; the track and scenic reserve on the tops use the Kai Tahu dialect version of the name, Mauka-Atua.

3. A walk on the Maukaatua Track encourages thinking about ecological matters with respect to patterns and processes and acts as a spur to revisit books such as Discordant Harmonies by Daniel B. Botkin (1991), Chance and Change by William Holland Drury Jr. (1998), and Land Mosaics by Richard T. T. Forman (1995).

Re-evaluating some common and rare species of *Cortinarius*, a talk by Andy Nilsen, 12th March

Gretchen Brownstein

In March, Andy Nilsen presented two talks on the molecular detective work being done to untangle the complex taxonomy of New Zealand's *Cortinarius* species. *Cortinarius* is the most common mushroom genus in New Zealand and the species within it are often hard to distinguish. Both talks highlighted how new and old DNA sequencing techniques are helping us to understand the taxonomy of these common but easily confused fungi.

DNA from old type specimens

Andy began by explaining the importance of type collections - the physical representative specimens that define a species. These are the samples researchers refer to check characters (e.g. spore shapes or DNA) when there are questions about a species' identity. These samples are often old, fragile, and very tiny so carrying out any work on them, especially the destructive sampling required for DNA work, needs careful thought. Extracting usable DNA is a real trick as many of the type specimens are over 50 years old and DNA degrades over time, becoming increasingly fragmented. Researchers often get only one shot at sequencing from these precious tiny samples. So working out good methods is key.

Andy's work focuses on sequencing both sequestrate and agaric types of *Cortinarius*. He tried both traditional and modern methods on samples with a range of ages (newly collected to over 100 years old). The traditional sequencing methods work well on specimens up to about 50 years old, but for older material, Andy found modern genome skimming techniques that sequence everything in the DNA "soup" were required. This soup reveals not just the target fungus, but also bacteria, viruses, and about 20% mitochondrial DNA. Interestingly, some specimens showed heavy contamination from moulds related to drying and storage conditions, while others contained surprisingly high amounts of viruses.

Andy has successfully sequenced 14 type collections, revealing some intriguing results. *C. nivalis* from Nelson Lakes, Murchison and Wellington appears to have no closely related relatives. *C. luteobrunneus* from Cave Stream, Craigieburn, appears distinct but is known from only its single original collection (it would be good to collect more of this species). *C. cartilaginous* and *C. flavidulu* were thought to be synonyms, but have proven to be distinct.

However, some results raised questions. The sequencing of *Nivatogastrium lignicola* and *N. sulcatum* produced unexpected results that don't align with morphological expectations, highlighting the need for careful interpretation of molecular data from degraded specimens.

The elegant blue webcap mystery

The second talk (authored by David O and Teresa Lebel) delved into a 25-year project attempting to resolve the identity of the elegant blue webcap, *C. rotundisporus*. This taxonomic puzzle perfectly illustrates how morphologically similar fungi can confound even experienced mycologists.

The saga began in 1918 when two species were described: *austroevernius* and *rotundisporus*. Then in 1948, a third similar species, *C. oleaginous*, entered the picture. The plot thickened in 1990 when Horak considered all three synonymous, suggesting they all occurred in both New Zealand and Australia. However, in 1997, Grgurinovic split them back into three species, though she couldn't locate the original type specimens and had to designate new neotypes.

DNA fingerprinting in 1999 supported three distinct groups, seemingly confirming three species. Further

complications arose in 2008-2010 when Soop described additional species (*C. calaisopus* and *C. tessiae*) that appeared to match some of the earlier DNA fingerprints.

The current molecular investigation aimed to answer the fundamental question: which is the real *C. rotundisporus*? Using both traditional and modern sequencing methods on type specimens and other material from New Zealand and Australia, the team obtained DNA barcodes for *C. austroevernius* and *C. oleaginous*, but initially failed to sequence the *C. rotundisporus* type. But by carefully mapping of raw sequence reads, they eventually determined that the *C. rotundisporus* type matched *C. oleaginous*.

Which led to the conclusion that none of the collections previously identified as *C. rotundisporus* actually represent the true type species. Instead, *C. calaisopus* proved to be the real *rotundisporus*. The taxonomic implications are significant: *C. rotundisporus* should be transferred to *C. calaisopus*, while both *C. calaisopus* and *C. oleaginous* become synonyms of *C. rotundisporus*. The species currently known as *C. rotundisporus* needs an entirely new name, and *C. austroevernius* stands as a distinct species unrelated to the others.

This work demonstrates both the power and the challenges of molecular taxonomy. While DNA provides the ultimate "ground truth" for species identification, the elegant blue webcap saga shows that even with molecular tools, untangling decades of taxonomic confusion requires painstaking detective work and careful interpretation of both morphological and genetic evidence.

Fieldtrip to Truby King Recreational Reserve, Seacliff, 15th March

Alex Wearing

The Truby King Recreational Reserve (TKR) is 16.4 ha in area. It once formed part of the grounds of the Seacliff Asylum/Hospital. When the main building was completed in 1884, it was the largest building in New Zealand. The gardens at Seacliff Hospital were seen as providing therapeutic space for patients to work in and enjoy. The Seacliff Hospital closed in 1973. Within the TKR there are few physical remains of Seacliff Hospital. The TKR is a Category 1 Historic Place of historical, architectural, aesthetic and cultural significance. It has been administered by the Dunedin City Council (DCC) since 1991.

Entering TKR the visitor passes large lawns, a sports field, specimen trees, and some foundations of the original hospital buildings. Sloping seawards there are several entry points to the area of planted woodland and natural regrowth, which akin to an informal arboretum[1]. The area is sometimes referred to as ‘The Enchanted Forest’. There are plenty of opportunities for botanical wandering on meandering paths and trails.

The fieldtrip started with Maia Mistral-Armour explaining - with the aid of a blown-up aerial image - the tree-mapping that she is undertaking with Belinda Smith-Lyttle. They aim to identify and map the surviving trees that date back to the original and subsequent planting plans for the Seacliff Hospital grounds. Information is also recorded on the health and dimensions (height and diameter at breast height) of the mapped trees. It should also be possible to identify ‘missing’ trees, which may warrant replacement.

There are numerous survivals of the original - mostly introduced - tree plantings. In addition, there are also many more trees that have spread from the original plantings. There is also a community orchard of old fruit trees at the southern end of TKR. Near the main entrance is a walnut (*Juglans regia*) grove. Also, near the main entrance there is a magnificent pair of witch elm (*Ulmus glabra*). These trees have wide umbrella crowns touching the ground, and there is enough interior space to stage a play or concert for a small audience.

There are also informal plantings of mostly native species by person or persons unknown (or forgotten). Planted species include silver beech (*Lophozonia menziesii*), rimu (*Dacrydium cupressinum*), Hall’s tōtara (*Podocarpus laetus*), mataī (*Prumnopitys taxifolia*), kahikatea (*Dacrycarpus dacrydioides*), and kauri (*Agathis australis*). An area of wet ground has been enriched by the planting of cabbage trees (*Cordyline australis*).

Throughout the woody areas of TKR both native and introduced species have established spontaneously. Some species, notably sycamore (*Acer pseudoplatanus*) are seriously/dismayingly invasive, dis-

persing throughout the wooded areas of THR. Intermittent efforts to control sycamore are largely ineffective. The pulled-up seedlings are soon replaced by new seedlings. Saplings and trees cut down and poisoned often resprout. Some sycamores that were poisoned are now standing dead trees (and detract from the aesthetics of TKR). Currently, the invasive potential of wind-dispersed sycamore is well-illustrated in open areas of the 'Forest Glade' where there is literally a carpet of different aged seedlings and saplings. Native seedlings and saplings are also present at 'Forest Glade' but are bird-dispersed growing under the spreading canopy of introduced trees.

Other introduced woody invasive species are holly (*Ilex* sp.), hawthorn (*Crataegus monogyna*) and in some areas, Darwin's barberry (*Berberis darwinii*). There are also numerous woody, grassy and herbaceous pastoral and garden escapes, some with weedy propensities.

A considerable number of indigenous plants are present. There are some very tall kōwhai (*Sophora microphylla*) and cabbage trees (*Cordyline australis*). Currently, it is not possible to determine if they are planted, or were present when the gardens were planted. There is an impressive planted southern rātā (*Metrosideros umbellata*), which is currently hemmed in by other trees and requiring some sympathetic management, so natives were part of the tree-planting plans.

Some native species are effective in dispersing around the TKR, notably kōhūhū (*Pittosporum tenuifolium*), māhoe (*Melicytus ramiflorus*), red matipo (*Myrsine australis*), and lemonwood / tarata (*Pittosporum eugenioides*). Other native species seen whilst wandering include patē (*Schefflera digitata*), *Olearia paniculata*, wineberry / makomako (*Aristotelis serrata*), Hall's tōtara (*Podocarpus laetus*), miro (*Pectinopitys ferrugineus*), broadleaf (*Griselinia littoralis*), *Pseudopanax crassifolium*, pepperwood (*Pseudowintera colorata*), and several species of *Coprosma* (including *Copsoma propinqua* x *C. robusta*). There were some impressive tree fuchsias (*Fuchsia excorticata*), including one tree which was growing next to toilet bowl. A non-local native seen was rangiora, *Brachyglottis repanda*.

Ferns noted were *Asplenium gracillimum, Austroblechnum penna-marina, Parablechnum procerum, Polystichum vestitum,* bracken *(Pteridium esculentum), Pyrrosia eleagnifolia*, and hound's tongue fern, *Zealandia pustulata*.

In the woodland area there are the remains of a circular rose garden (with one rose plant).

There is considerable diversity in the character of different wooded areas, with respect to penetrability (ease of passage), surface light levels, ground surface cover (e.g., presence/abundance of grasses and herbs, ferns, woody debris), and surface drainage.

Mowing the grass is a major cost for management of the TKR. Grazing is not an option. Whilst it is desirable to have some open grass areas for public recreation and to keep the many wide grass covered tracks easily accessible, it seems appropriate where possible to plant up other areas, especially the north boundary grass area, with more trees (and to reduce dependence on fossil fuels to manage the reserve). On the 9th of August 2025, on Nagasaki Day, two ginkgos (*Gingko biloba*) will be planted in this area. This could be the start of an ornamental parkland of specimen trees.

Another possibility is the establishment of an area of trees that can be sustainably harvested. Sustainable ways of managing wood-producing trees include coppicing, suckers, stubs, pollarding, and shredding[2]. Such a stand would serve an educational purpose and provide raw materials for a variety of purposes for the local community.

One of the attractions of the TKR is the presence of many very big/tall trees. These are nearly all exotic species, but that does not detract from the enjoyment of being amongst them. It is interesting to reflect that the treescapes of 2025 are very different in appearance and dimensions from what the patients and staff experienced in the years that the Seacliff Hospital was open. A small group of *Eucalyptus delegatensis* is of very impressive height. It is likely that if these trees were natives, they would be a tourist attraction. Some of the tall trees in the TKR may be approaching the end of their lifespan when grown in New Zealand conditions, and thought must be given to replacement trees.

There is a Truby King Reserve Management Committee[3] that is supposed to facilitate the management of the TKR. The grounds are very well main-

tained, but to date proposals to improve signage, parking, to relocate the public toilet, and control invasive plants have not produced results. A TKR management implementation plan is in the offing. This may - or may not - lead to change. But the lack of action to date has been frustrating for everyone committed to the well-being of the TKR. With respect to the plants and vegetation, there is the possibility of an informal group of interested people working to promote and carry out new plantings (e.g., specimen trees, replacement of 'missing' trees, replanting bulbs under some stands, restoring the circular garden, planting trees for educational purposes), establishing a significant trees walk, and to organize a programme of working bees to undertake the control of problem plants (especially sycamore).

The TKR is a great destination to see lots of different native and introduced plant species, and to enjoy aesthetic attractions of a hybrid botanical landscape.

Acknowledgement

I would like to acknowledge the botanical expertise of John Steel in the field and his [Species] Checklist- Truby King Reserve.

Notes

1- In the TKR are cypresses, cedars, larches, pines, spruces, firs, redwoods, yews, maples, eucalypts, beeches, ashes, holly trees, walnuts, laurels, poplars, *Prunus* sp., oaks, lindens, and elms.

2- See Rackham, O. 1986. The History of the Countryside. Dent, London.

3- The author is the Botanical Society of Otago representative on the Committee.

A Samoan Sojourn, a talk by John Barkla, 9th April

Alex Wearing

Samoan Sojourn was a gloriously photographed and interesting account of John and Marilyn Barkla's September 2024 cycle-tour of Savai'i, the largest island of Samoa. Samoa has a population of about 217,000[1]. Most Samoans live on Upolu, the second largest island. Saavai'i has a population of about 42,000 and is less developed than Upolu[2].

Samoa has an equatorial climate. The main rainy season is between November and April. Samoa is part of the Samoan tropical moist forest ecoregion. Most lowland forests have gone, but in recent years there has been reafforestation, both natural and planted. The flora is 28% endemic.

Samoa was settled by Polynesians between 2900 and 3500 years ago. Contact with Europeans started in the late 18th century. New Zealand involvement in Samoa dates from 1914 when New Zealand troops seized control of the German colony of German Samoa. New Zealand rule lasted until 1961 when Samoa became independent.

Savai'i has an area of 1,694 km and is the sixth largest Polynesian island. Savai'i has volcanic origins. The most recent eruptions occurred in 1725, 1902, and 1905-11. The Saleaula lava field on the central north-coast was created between 1905 and 1911 and left 50 km^2 of solidified lava. The highest point on Savai'i is Mt Silslii (1858 m).

The population of Savai'i is nearly all found on the coastal fringe. The round-the-island road is about 200 km long. The format of the Barkla cycle tour was to cycle in the mornings when it was cooler, and then to spend the hot afternoons botanizing, or at the beach and in the sea.

The talk was distinguished by lots of excellent photographs of colourful plants, both indigenous and introduced (visual appeal is not discriminating with respect to a plant's origins).

Plant species illustrated in the talk included; *Morinda citrifolia* (nonu/Indian mulberry), which was spread across the Pacific Ocean by Polynesia settlers and has reputation as a famine only fruit; *Artocarpus altilis* (breadfruit); *Barringtonia asiatica* (fish-poison tree), fruits of which have washed up on the North Island, New Zealand; *Pandanus tectorius* (fala/screwpine), *Ficus* sp. (there are several species of fig trees in Samoa, both native and introduced), *Chrysothermis pulchella* (sunset bells, seen at the Afu Au Falls); *Scaevola taccada* (naupaka), a shrub or small tree found on beaches; *Ipomoea pes-caprae* (beach morning glory, a creeping vine also found in northern New Zealand); *Rhizophora samoensis* (mangrove); and an attractive orchid (*Dendrobium* sp.).

John Barkla said that he saw only one specimen of mistletoe, *Decaisnina forsteriana*, which ranges from New Guinea to the South Pacific.

Ferns noted included *Microsorum scolopendia* (monarch fern, which looks like the New Zealand's hound's tongue fern, *Zealandia pustulata*); *Pyrrosia lanceolata* (lanceleaf tongue fern); and *Asplenium nidus* (Bird's nest fern).

Introduced plants shown included *Ceiba pentandra* (kapok tree); *Tradescantia pallida* (purple heart); *Catharanthus roseus* (Madagascar periwinkle); and *Psilotum nudum*[2] (whisk fern, which has a widespread native range, including New Zealand). Whisk fern grows both epiphytically and in rock crevices. The common water hyacinth (*Pontederia crassipes*), which is native to South America, is a serious problem on water bodies.

Of interest were photographs of cocoa (*Theobroma cacao*) processing at Viamoana, Auala.

John Barkla said the frequent tropical cyclones had large and easily discernable impacts on the vegetation and ecology of Savai'i. Lava flows have also shaped the vegetation of Savai'i. But the strongest influence in recent years has been human activities. A plethora of introduced plant species have increased the Samoan flora. Samoa's plants, both native and introduced, constitute a treasure trove for botanists, especially those who - like John Barkla - are adept with the camera.

Notes

1. Information on population, geology, geography, ecology and history is sourced from en.wikipedia.org/wiki/Samoa [Accessed 05/06/2025].

2. Source: en.wikipedia.org/wiki/Psilotum nudum [Accessed 05/06/2025].

Fungal Foray to Piano Flat, Waikaia Forest, 3rd-4th May

David Lyttle

The 2025 BSO Fungal Foray to Piano Flat, Waikaia Forest took place on the weekend of the 3rd -4th May alongside a field trip led by Dr David Orlovich, Department of Botany, University of Otago held as part of his ongoing research.

Waikaia Forest is one of the largest remnants of the mixed beech forests comprising red beech (*Nothofagus fusca*), mountain beech (*Nothofagus cliffortioides*) and silver beech (*Nothofagus menziesii*) that once covered much of the area prior to the arrival of humans. Other isolated pockets of beech forest survive in the region but they are scattered and difficult to access. Beech trees are dependent on various mycorrhizal fungi for their survival and growth and support a diverse collection of species. Waikaia Forest has proved to be a regional hotspot for fungal diversity and many novel, interesting species of fungi have been collected there on previous field trips.

We left Dunedin on Friday afternoon and travelled to Gore where we based ourselves at the Oakleigh Motel for the duration of the trip. Collecting fungi requires a systematic approach which has been refined over the years. First, specimens that are collected in the field are photographed in situ with an OTA accession label using a cell phone. The photo is subsequently uploaded to the iNaturalist website which captures the location data from the phone's GPS (and possibly gets identified by one of the expert fungal taxonomists in the process). The specimens with their label are wrapped in grease-proof paper packets for transportation and taken back to the field base where they are photographed again to show the details of the specimen (dead rat photo).

The labels are completed with provisional identification, location and other details included and all the data is then entered in a spreadsheet. The specimens are then dried usually overnight in a domestic fruit dehydrator (which often leaves motel bathrooms smelling a bit mushroomy).

Lactarius *specimen photographed for Fungarium record. ("dead rat photo")*

On the way down we stopped at Whiskey Gully near Tapanui. The forest there is silver beech and we did not need to go very far to begin collecting. Collections made included *Cortinarius tessiae, Cortinarius phaeomyxa, Lactarius* sp and *Russula* sp. Total collections 18.

Russula *sp. Very easy to identify the genus but not the species*

On Saturday morning we drove to Piano Flat and crossed the swing bridge giving access to the Waikaia River Track on the bank opposite the DOC campground. There was an abundance of fungi in the beech forest and we started making collections almost immediately. In the afternoon we moved back across the river to the Piano Flat Loop Track and made additional collections. This track is situated on an elevated terrace where the forest is drier than the riverside track. A diverse array of fungi was collected from both sites. Many were strikingly coloured and quite beautiful particularly *Cortinarius canarius* (yellow), *Cortinarius purpureocapitatus* (purple) and *Aureonarius ruficollybianus* (brick red). Other *Cortinarius* species collected included *C. castoreus, C. majestaticus, C. tessiae, C. alboroseus, C. taylorianus,* and *C austrocyanites*.

Cortinarius canarius *a striking yellow species*

Non-cortinoroid fungi collected included *Pholiota subflammans, Psathyloma catervatim, Amanita taiepa,* and *Hypholoma australianum*. The *Lactarius* species found the previous day at Whiskey Gully turned up again at Piano Flat as did *Cortinarius tessiae*. A number of other fungi species were observed but not collected, including *Tylopilus formosa, Stereum ostrea* and a coral fungus (*Artomyces* sp.).

Cortinarius purpureocapitatus, *one of the several purple secotioid fungi found in New Zealand Nothofagus forests.*

A total of 46 collections were made

and deposited in the University of Otago Herbarium (OTA). Photographs of the specimens collected can be viewed on the iNaturalist website by following the links below;

See https://inaturalist.nz/calendar/davidorlovich/2025/5/2 and https://inaturalist.nz/calendar/arnilsen/2025/5/2

https://inaturalist.nz/calendar/davidorlovich/2025/5/3 and https://inaturalist.nz/calendar/arnilsen/2025/5/3

Gabriel's Gully

A further collecting trip was made to Gabriel's Gully on May 25th to collect mycorrhizal fungi. Gabriels Gully was the site of Otago's first gold rush in 1861. After the alluvial gold had been worked out, the hillsides of the Blue Spur were sluiced away and the tailings were deposited in the bottom of the gully. The tailings have subsequently been colonised by a mixture of manuka (*Leptospermum scoparium*) and kanuka (*Kunzea robusta*). As well as this shrubland there is a small pocket of silver beech forest in an adjacent gully that has managed to survive in spite of the major environmental disturbance wrought by the gold mining.

Two notable finds associated with silver beech (*Nothofagus menziesii*) were the spectacular icicle fungus *Hercium novae-zealandiae* and the pagoda fungus *Podoserpula pusio*.

See https://inaturalist.nz/calendar/davidorlovich/2025/5/25 and https://inaturalist.nz/calendar/arnilsen/2025/5/25

These two field trips show there is rich diversity in the mycological flora found in local Nothofagus beech forests and Leptospermum/Kunzea shrublands. This diversity is illustrated in the following photos.

Lactarius *sp. Note milky exudate on cap of overturned specimen*

Hercium novae-zealandiae *known as the "icicle fungus" A saprophytic fungus growing on a dead standing beech trunk. This fungus is edible and is reputed to have medicinal properties.*

Forest remnant in Gabriel's Gully. A pond formed by damming the creek is surrounded in the foreground by native wetland vegetation and on the far side exotic European larch. The beech forest is more or less confined to the gully with the higher parts of the catchment planted with exotic production forest.

Left: Podoserpula pusio *"Pagoda Fungus" A fungus with a very distinct morphology unlikely to be confused with anything else.*
Right: Aureonarius ruficollybianus *a provisional identification.*

AGM and photo competition, 14th May

Lydia Turley

The AGM was short and sweet. We voted in favor of a new constitution. This won't change much, but has been updated to reflect the way we actually operate, add some sensible limits on the powers of committee members, and to fill some gaps which were missing from the previous constitution. Many thanks to Gretchen Brownstein, Angela Brant, and John Barkla, who put a lot of work into writing this new constitution. Special thanks also to Alyth Grant, who proved that she did read the document by spotting a typo. We elected ten people to the committee but no chair. We would love to hear from anyone interested in taking on the chair's role. Please consider volunteering for the committee next year (or at any point in the future) - fresh perspectives are very valuable!

With that done, I know that everyone really came for the photo competition. Many thanks to our judges Peter Johnson, Rod Morris and Kelvin Lloyd. They must have had a tough job. We received 48 photos from 11 photographers across the three categories. All photos are still able to be viewed on our website. The people's choice award was shared by two category winners and are marked by *.

Winners:

Plant portrait: Dune gentian, Rakiura by John Barkla (pg. 26) *

Plants in the landscape: *Celmisia* in St. Marys by Rachael Baxter

Life under the lens: *Hymenophyllum* species supporting life by Jo Sinclair (Cover) *

I was particularly impressed by the entries for *Life under the lens*, due to the creativity and skill. There were several microscope pictures, one which appeared to look through a hand lens and several others where the only hint as to the magnification was a giant moss. I want to give special mention to Jo's *Lenses are made of water*, which captures reflections on water droplets.

Lenses are made of water (Photo: Jo Sinclair)

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Please submit copy for next newsletter to Alex Wearing by 8th October 2025

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Dune gentian (Photo: John Barkla)

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Right: Fuchsia excorticata *(Artist: Kelly Phillips)*

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