



TRILEPIDEA

Newsletter of the New Zealand Plant Conservation Network

No. 211

September 2021

Deadline for next issue:
Friday 22 October 2021

SUBMIT AN ARTICLE TO THE NEWSLETTER

Contributions are welcome to the newsletter at any time. The closing date for articles for each issue is approximately the 15th of each month.

Articles may be edited and used in the newsletter and/or on the website news page.

The Network will publish almost any article about plants and plant conservation with a particular focus on the plant life of New Zealand and Oceania.

Please send news items or event information to info@nzpcn.org.nz

Postal address:

PO Box 147
Mangonui 0442
NEW ZEALAND

PLANT OF THE MONTH, p. 2



Clematis marmoraria. Photo: Simon Walls.

NZPCN 2022 conference: Restoration Ecology in New Zealand

Alex Fergus, Jesse Bythell, and Jo Smith (2022 Conference Organising Committee)

Tēnā koutou katoa. We've been working like mad dogs a good few hours each week to chase up details, dates, and the relevant intricacies of force majeure Covid-19 postponements! We think we know enough (or at least know what we don't know) to be able to release the following details—caveat, small details may change. We are very excited about having an in-person catch up with you all in Queenstown. Hopefully the contents below whet your appetite for our conference - please get in touch with us (details at the bottom of this article) if you have any questions or suggestions.

Session themes

- Challenges to scaling up restoration projects
- Eco-sourcing
- Engagement and education
- Iwi/hapū led restoration processes and case-studies
- Monitoring restoration projects
- Restoration after conifer removal
- Restoration of threatened native plant populations
- Valuing native regeneration

Programme at a glance

- Sunday 20 March: workshops & registration and welcome event (evening)
- Monday 21 March: talks/presentations & botanical bowls (evening)
- Tuesday 22 March: talks/presentations
- Wednesday 23 March: field trips

Poster sessions will be run at multiple times during the conference.

Workshops (Sunday 20th March)

Workshop 1: Setting up a community nursery

When: 10:00–12:00

Where: Jean Malpas Community Nursery, Kelvin Heights

Workshop leaders: Ben Teele supported by Arne Cleland and Chris Rance

Numbers: This workshop is limited to 15 people

Cost: \$10

About: Learn about setting up a community nursery from people who have extensive experience in this area. The workshop will have a practical focus and there will be plenty of opportunities to ask question as you explore a fully functioning community native plant nursery.

cont. page 3

PLANT OF THE MONTH – *CLEMATIS MARMORARIA*

Rowan Hindmarsh-Walls (rowan.hindwalls@gmail.com)

The plant of the month for September is *Clematis marmoraria*, one of 9 species of *Clematis* endemic to the New Zealand region. This species is the only true alpine member of the genus *Clematis* in New Zealand, and is found in only a few localities in eastern Kahurangi National Park, at the top of the South Island.



Clematis marmoraria, Arthur Range, 26 February 2016: (left) plant; (right) seeds. Photos: Simon Walls.

The species is an obligate calcicole, meaning that it is only found on calcium rich substrates, in this case marble. The small sprawling plants are found above the bush-line and generally live in cracks in the marble bedrock, with other stunted alpine species. They put down a long slender taproot to secure themselves and individual plants expand outwards through suckering. The finely divided leaves are thickened, bright green, almost hairless, and resemble parsley in form. The large six petalled white or yellow-cream flowers are borne well above the leaves on erect peduncles (flower stems). As the achenes (seeds) develop the female flowers develop into fluffy pom-pom like seed heads with 20–50 seeds in each head.

The plants are superficially similar in appearance to other *Clematis* species with finely divided leaves, but none of the other species live in the alpine zone as *C. marmoraria* does, and the others are all obvious vines rather than a sub-shrub.

The species is endemic to New Zealand and has a current threat ranking of 'Threatened – Nationally Vulnerable', as it is only found in a few locations. The species is quite palatable and as it is small is severely impacted by browse from goats and deer. It is also potentially threatened by illegal collection by alpine plant collectors, as it has a small population size and restricted distribution.

The genus *Clematis* is from the Greek – klema or 'vine', alluding to the vine-like habit of many of the species in the genus. The species epithet 'marmoraria' means 'growing on marble rocks' and is from the Latin word marmor or 'marble'.

You can view the NZPCN website factsheets for *Clematis marmoraria* at: <https://www.nzpcn.org.nz/flora/species/clematis-marmoraria/>

Workshop 2: Introduction to propagation of native plants

When: 13:00–15:00

Where: Jean Malpas Community Nursery, Kelvin Heights

Workshop leaders: Arne Cleland, supported by Ben Teele and Chris Rance

Numbers: This workshop is limited to 15 people

Cost: \$10

About: Learn about the propagation of native plants – the importance of eco-sourcing, tips for seed collection, propagation techniques and more. This workshop will have a hands on practical focus where participants can roll up their sleeves and have a go and asking lots of questions is encouraged.

Workshop 3: Plant ID course – New Zealand grasses (Poaceae)

When: 09:00–12:00

Where: Coronet Peak

Workshop leaders: Kerry Ford

Numbers: limited to 10 people

Cost: \$25

About: An introduction to the main grass genera you are likely to run into in the mountains and how to tell them apart. Time will be spent outside collecting grasses before we move inside to focus on basic grass morphology and get you using the NZ Grass Key (Lucid multi-access key).

Workshop 4: Plant ID course – New Zealand sedges (Cyperaceae)

When: 13:00–16:00

Where: Coronet Peak

Workshop leaders: Kerry Ford

Numbers: This workshop is limited to 10 people

Cost: \$25

About: Introduction to the NZ Carex Key (Lucid multi-access key). Time will be spent outside collecting sedges before we move inside to focus on basic sedge morphology and how to recognise genera.

Workshop 5: Botanical illustration

When: 09:00–16:00

Where: Sherwood

Workshop leaders: Jo Ogier

Numbers: This workshop is limited to 12 people

Cost: \$100

About: In this workshop you will delve into the intricacies of botanical illustration. Through a series of drawing explorations you will gain a greater understanding of what you see and how to portray it accurately. These explorations will include: plant structure; the use of line, tone and colour to create form; creating perspective and elements of composition. This workshop is suitable for both beginners with a passion for plants and for those with some botanical experience. Lunch is included in the price of this workshop.

Workshop 6: Botanising with iNaturalist**When:** 10:00–12:00**Where:** Kiwi Birdlife Park**Workshop leaders:** Colin Meurk with support from Jon Sullivan**Numbers:** No limits**Cost:** \$10

About: This consists of two contiguous 1-hour workshops back-to-back in one session (1000-1200). The first will be a beginners or refresher course—remembering to record flower/fruit state. Then you will take your iNaturalist experience to the next level learning how to do things like tagging and editing observations; curating the iNaturalist species tree and nomenclature; streaming iNat observations to external websites; and connecting R to iNaturalist for data analysis.

Workshop 7: Lichens workshop**When:** 13:00–16:00**Where:** Kiwi Birdlife Park**Workshop leaders:** Melissa Hutchison, Marley Ford, and Allison Knight**Numbers:** This workshop is limited to 15 people**Cost:** \$10

About: Come and learn about the fascinating world of lichens—their habitats, ecological roles, and how to identify them. The workshop will involve a brief local field excursion (to get a feel for the substrates and habitats occupied by different lichen species), as well as an indoor session on lichen identification using keys and lab techniques.

Workshop 8: Using direct seeding for large-scale native afforestation**When:** 13:00–16:00**Where:** Crown Range**Workshop leaders:** Pieter Brits and Tim Whittaker**Numbers:** This workshop is limited to 20 people**Cost:** \$10

About: This workshop is being coordinated externally by Seed NZ Natives and will focus on a demonstration of the technology they've been developing for direct seeding native plants for restoration. Contact Pieter Brits for details (seednznatives@gmail.com).

Field trips (Wednesday 23rd March)

All field trips are un-catered except field trip 1.

Field trip 1: Islands**When:** 08:30–17:30**Where:** Walter Peak and Wāwāhi Waka/Pigeon Island**Intensity:** medium**Field trip leaders:** Rowan Hindmarsh-Walls with support from Neill Simpson and Tony McCulkin**Numbers:** Limited to 25 people (minimum of 15 people to run)**Cost:** \$65

About: Water taxi to Wāwāhi Waka /Pigeon Island. Wāwāhi Waka is predator free with wonderful bird song. The mature red beech forest contains the only pōkākā, tūrepo and kahikatea in the district with matai and tōtara. Extensive restoration after 2 fires has also occurred. A water taxi will then take us to Walter Peak station, where hectares of Douglas fir have been removed and there is now an extensive native restoration project. Walk along the lake edge to the DOC camping site and inspect

the amazing growth after 6 years. Return to Queenstown on the TSS Earnslaw. Note that all boat trips and lunch are included in the price.

Field trip 2: Mountains

When: 09:00–17:00

Where: Lake Alta and the Remarkables ski area

Intensity: medium-high

Field trip leaders: Arne Cleland and Jo Smith, supported by Melissa Jagger and Ross Lawrence

Numbers: Limited to 25 people (although we might increase this if it proves popular)

Cost: \$30

About: Lake Alta—located within the stunning Remarkables Conservation Area at an elevation of 1800 m, is the easiest high alpine environment you will access on foot! This walk boasts amazing alpine scenery, including wetlands, cushion fields and tussock grassland. This diversity of habitats begets a diversity of alpine species including *Myosotis bryonoma* (first described in 2018) as well as *Hectorella caespitosa*, *Leucogenes grandiceps*, and *Ranunculus buchananii*. We will also look at the restoration and transplanting of alpine communities including tussock grasslands undertaken by NZ Ski.

Field trip 3: Drylands

When: 08:30–17:00

Where: Crown Range, Hikuwai Conservation Area - Albert Town, Butterfield Wildlife Management Reserve, Mahaka Katia (Pisa Flats) Scientific Reserve, Cromwell Chafer Beetle Scientific Reserve, Roaring Meg

Intensity: medium

Field trip leaders: Brian Rance and Jesse Bythell supported by Geoff Rogers.

Numbers: 40

Cost: \$35

About: A whistle-stop tour of several significant dryland sites to learn about their specialised flora, unique management challenges and restoration efforts. Our first stop is Butterfield Wildlife Management Reserve where we will hear about restoration planting efforts including rare shrub species. Lunchtime will see us settled in at Mahaka Katia/Pisa Flats Scientific Reserve where we will hear from Ellery Mayence (DOC rare ecosystem science lead) about monitoring work at this highly significant site. Be prepared to get down on your hands and knees and marvel at tiny, threatened dryland plants like *Lepidium solandri* and *Raoulia monroi*. Then we'll swing by the Cromwell Chafer Beetle Scientific Reserve and head back to Queenstown via the Kawarau Gorge with a short stop at Roaring Meg to see an example of broadscale conifer removal.

Field trip 4: Restoration sites

When: 08:30–17:00

Where: Lake Hayes, Whitechapel, Feely Hill, Slope Hill, Treespace/Coronet Forest, Morning Star Reserve, Tucker Beach

Intensity: low

Field trip leaders: Ben Teele and John Barkla

Numbers: 40

Cost: \$25

About: A terrific tiki tour of native community restoration sites across the Wakatipu Basin, including grey shrubland, riparian, and forest sites encompassing a range of habitats and threatened species.

Social events

We ask you to register for social events when registering for the conference so we can cater them appropriately.

Registration, welcome event, botanical art exhibition and charity auction

When: Sunday 20th March 16:30-19:00

Cost: free

Numbers: no limit

About: After a fantastic day expanding your minds in workshops come and join us for a couple of social hours, we'll provide the snacks, bring your wallet for the bar. Register your conference attendance and watch out for a line-up of events including our charity auction (all proceeds to our David Given Threatened Plant Scholarship fund) and botanical art exhibition.

Bowling and botanical mingle

When: Monday 21st March 17:00-19:00

Cost: \$20

Numbers: limited to 110 people

About: Shake off your 'I've been sitting in a chair all day' conference funk and join us for a late afternoon game of lawn bowls at the Queenstown Bowling Club situated amidst picturesque Queenstown gardens. No need to wear white but please leave your heels at home. Grab a drink from the bar, pick up a bite, and continue that heated discussion you were having about the reclassification of *Weinmannia* (*Pterophylla* is a katydid!).

Registration

Opens on October 1st via the NZPCN website. Registration encompasses all conference events, including registering for workshops, field trips, and submission of presentation abstracts.

Price structure

All costs are expressed in \$NZ and include GST of 15%.

Early bird (1 October – 31 December). Late bird (1 January – 28 February).

Registration	Early Bird	Late Bird
Member full registration	\$290	\$350
Member student/unwaged/retired full registration	\$220	\$265
Member day registration	\$170	\$205
Non-member full registration	\$330	\$390
Non-member student/unwaged/retired full registration	\$255	\$305
Non-member day registration	\$195	\$235

Student scholarships

The NZPCN will refund the registration costs of the first four students who register and submit a relevant poster or spoken presentation abstract.

Abstract and presentations

Abstracts for poster or spoken presentations can be submitted at registration via our website. We recommend only one spoken presentation per primary author (a primary author is the lead author

and speaker). A primary author can submit both a poster and a spoken presentation abstract, there is no limit on the number of poster presentation abstracts that a primary author submits. Spoken presentations will be 12 minutes with 3 minutes for questions.

Covid protocol

In the event of a Covid 19 outbreak, we **do not** intend to convert the conference to an online conference, rather we will postpone until all New Zealand is at Covid Alert Level 1 (based on our understanding of Alert Level 1 on 23 Sept 2021). All venues will have QR codes, and Covid-19 registration forms (for those without smart phones and the New Zealand Covid tracer app) which all conference participants will be required to complete or scan into at all venues. Your registration details will be used for contact tracing in the event of a Covid 19 outbreak being identified at the conference. A complete Covid 19 protocol for the conference is being developed, we welcome your questions and suggestions.

Restoration Pathways workshop for Queenstown Lakes District

The NZPCN are excited about the opportunity for the conference to generate an additional output beyond the general engagement and knowledge sharing resulting from a conference format. We are inviting all conference participants to contribute their restoration experiences to producing a synthesis document which focuses on restoration pathways in the Queenstown Lakes District area. In December 2021 the conference organisers will distribute a draft document which identifies the following with respect to the Queenstown Lakes District:

- Start points for restoration projects
- End points/goals for restoration projects
- Restoration methods – techniques including species used and social integration
- Modifiers to outcomes – climate, pests, terrain, weeds

Conference participants will then be asked to contribute restoration stories if they want wish. We are seeking examples of what people have tried, what's worked and what's failed. We also welcome any additional contributions to the bullet points above if we have overlooked examples. Conference participant restoration stories will then be worked into state-and-transition like examples identifying which restoration pathways have been successful and which have not. In February 2022 a draft synthesis document will be circulated to all conference participants. In a workshop-style format within one of the conference spoken presentation slots we will work through the synthesis as a group, identifying areas of oversimplification or adding examples that have been missed. All conference participants will be welcomed as authors on the final synthesis document which will be published within *Trilepidea* and as a standalone document that will be available to download for free from the NZPCN website.

Please contact Alex if you want to discuss any aspects of the workshop in the interim (contact details at the bottom of this article).

Accommodation discounts

Queenstown Lakeview Holiday Park

<https://holidaypark.net.nz/>

The following discount is available to conference participants:

Tourist Flat for up to 4 pax \$185.00 (additional guests incur extra charge)

Open Plan Studio for 2 pax \$125.00 (additional guests incur extra charge)

To secure this discounted rate, email them directly, info@holidaypark.net.nz, and quote 'NZPCN Conference'.

QT Queenstown and Rydges Lakeland Resort Queenstown (conference venue)

<https://www.qthotels.com/queenstown/>

<https://www.rydges.com/accommodation/new-zealand/queenstown-resort/>

A 10% discount code is available to all guests attending the conference for a stay at both hotel properties, QT Queenstown and Rydges.

Please follow the instructions below:

To access your Rydges special rates please visit: www.rydges.com

Select your hotel, enter your dates and number of people

Click on “BOOK NOW”

Click on “I HAVE A CODE” and in the “CORPORATE ID” field enter your corporate ID: WAKARTWEB

Click “UPDATE BOOKING”

Your special rates will appear on the rates screen

Available for stays between 18/3/22 and 24/3/22 (inclusive)

To access your QT Queenstown special rates please visit: www.qthotelsandresorts.com

Select your hotel, enter your dates and number of people

Click on “BOOK NOW”

Under “MORE BOOKING OPTIONS” in the “CORPORATE ID” field enter your corporate ID: WAKARTWEB

Click “UPDATE BOOKING”

Your special rates will appear on the rates screen

Available for stays between 18/3/22 and 24/2/22 (inclusive)

Sherwood

<https://sherwoodqueenstown.nz>

10% discount for all conference attendees. Discount code ‘WRT’ is applicable to all room types based on their ‘flexible’ rate.

Sponsorship

We continue to seek prospective sponsors for the conference to support specific elements of the programme. This could be plenary sessions, workshops, or field trips. Our goal in seeking sponsorship is to bring down the cost for our members and for the public, so we can engage with as many people as possible and share our collective skill bases widely.

For businesses or organisations unfamiliar with the NZPCN conference format, we are committed to engaging with our conference participants through a motivating and informative programme of speakers, workshops and field trips, each facilitating networking and business opportunities for sponsors. Participants will include staff from central and local government, crown research institutes, non-Governmental Organisations, consultancies, businesses, universities, nurseries, botanic gardens, museums, students and private individuals. Sponsors will receive acknowledgement prior to, during and after the conference through conference materials, the NZPCN website and social media, and will have the opportunity to engage with conference participants at social events.

We ask anyone who might be keen to sponsor part of the conference to get in touch with Alex or Jo if they would like to know more and we can supply you with a conference sponsorship pack.

Alex Fergus, NZPCN committee member, NZPCN Conference Organising Committee

Email: fergusa@landcareresearch.co.nz, 027 261 6906

Jo Smith, Wakatipu Reforestation Trust, NZPCN Conference Organising Committee

Email: educate@wrtqt.org.nz, 021 039 2785

Poor Knights Spleenwort (*Asplenium pauperequitum*) (Aspleniaceae) on the Chatham Islands

Peter J. de Lange (pdelange@unitec.ac.nz), School of Environmental & Animal Sciences, Unitec Institute of Technology, Auckland

Introduction

Asplenium is a diverse, almost cosmopolitan genus of ferns with c.700 species (PPG 1 2016). Within New Zealand there are at least 21 species, of which 10 are endemic (Brownsey & Perrie (2018). One of the more unusual of our *Asplenium* species is the Poor Knights spleenwort, *A. pauperequitum* (Fig. 1). That species was formally described when specimens were collected by a former Lands & Survey field ranger, Peter Jackson, during a 1982 weed survey of the Poor Knights Islands, an important nature and marine reserve located off the eastern coastline of Northland, near Tutukaka (Brownsey & Jackson 1984). Prior to Jackson's discovery the same fern had been collected twice, once in the late 1880s by lighthouse keeper Andreas F.S. Sandager from an unspecified location on the Mokohinau Islands, at the head of the Hauraki Gulf (Cameron 1993) and again in 1970 from the Poor Knights Islands by pteridologist Dr Barbara Parris (Parris 1990).

At the time of its formal description, as the Sandager Mokohinau Islands specimen had not then been recognised for what it was, the new species was believed endemic to the Poor Knights. As such it was given the species epithet "*pauperequitum*", Latin for "Poor Knights" in the belief that the fern was endemic there. As the fern has yet to be rediscovered on the Mokohinau Islands (de Lange et al, 1995), the species was now to all intents and purposes endemic to the Poor Knights anyway. At least we thought so, until a specimen came to light in a collection of plants made by Mark Bellingham on 27 January 2005 from Motcha har / Motuhara / Forty Fours, the eastern most island within the Chatham Islands group (Cameron et al. 2006).

That discovery was documented by Cameron et al. (2006) who also noted additional Rekohu / Wharekauri / Chatham Island occurrences along the Waitangi West coastline, near Te Koparuparu Bay (Fig. 2), Point Somes (Fig. 3), and on rock outcrops at the northern entrance of Ocean Bay (Fig. 4). These discoveries were made during field work on Rekohu in January 2006 by the author.

Currently, *Asplenium pauperequitum* has yet to be found in locations other than the Poor Knights, Mokohinau and Chatham Islands. As Cameron et al. (2006) noted there is a c.1246 km disjunction between the Poor Knight / Mokohinau occurrences and those on the Chatham islands. Whether this disjunction is real still remains to be seen, *Asplenium pauperequitum* is a distinctive fern but because the fronds are small and it grows in shaded ledges it is very easily overlooked. Therefore, it is possible that there are additional New Zealand occurrences, though people have been looking, so far without success. The disjunction between island groups is intriguing, begging the question as to whether the fern dispersed from the Chatham islands to northern New Zealand offshore islands, or perhaps that this happened the other way around? Maybe the fern was present elsewhere between these stations and it has since died out, or has yet to be found? At this stage we don't know. People need to keep looking.



Fig. 1. Poor Knights spleenwort (*Asplenium pauperequitum*) growing in crevice on rhyolitic rock, Tatua Peak, Aorangi Island, Poor Knights Island group (September 1996). Photo: P.J. de Lange.



Fig. 2 (left). Poor Knights spleenwort (*Asplenium pauperequitum*) habitat at Te Koparuparu Bay, Waitangi West Farm (January 2006).

Fig. 3 (right). Poor Knights spleenwort (*Asplenium pauperequitum*) habitat at Point Somes, Waitangi West Farm (January 2006). Photos: P.J. de Lange.



Fig. 4. Poor Knights spleenwort (*Asplenium pauperequitum*) habitat at northern entrance to Ocean Bay, Waitangi West Farm (January 2006). Photo: P.J. de Lange.

***Asplenium pauperequitum* habitats on the Poor Knights Islands**

Even with a good knowledge of where to look, this fern on the Poor Knights is hard to find (de Lange 1994, 2021; de Lange & Cameron 1999). On those islands the preferred habitat is deep clefts and fractures (Fig. 1), on mostly shaded rhyolitic rock faces in dense pohutukawa (*Metrosideros excelsa*) dominated forest; though on occasion plants have been found growing amongst the exposed, shaded roots of pohutukawa (de Lange & Cameron 1999; de Lange et al. 2010). Plants typically grow with their root stock set well back within a crevice, with the roots tightly appressed to the rock wall or saprolite. Usually the rock walls are finely covered in blue-green algae, and in places liberally coated with partially liquefied guano derived from myriad nesting sea birds (de Lange 2021). From the rootstock emerge the fronds which are borne on brittle, wiry stipes, with the pinnules usually developed in the upper half to one third. In thriving populations, the fronds may protrude from the rock crevices but more usually they are hidden within. This penchant for growing in typically heavily shaded, vertical rock faces probably accounts for why this fern was only discovered in 1970 on the islands and remained unknown to botanists until rediscovered in 1982. The fern is also easily overlooked because it is often with *Asplenium haurakiense* whose larger fronds and more robust growth habit can obscure the fronds of the much smaller *A. pauperequitum*.

The Poor Knights habitats of *Asplenium pauperequitum* all suggest that the fern requires a shaded rock face (or rarely nooks within exposed roots) to thrive. Flourishing best where the rootstock is kept moist and cool, and probably well fertilised from guano and possibly nitrogen derived from blue-green algae growing amongst its roots. The requirement for shade was supported when there was major die back of populations on Tatura Peak, Aorangi Island (the second largest island of the Poor Knights group) following the passage of a cyclone which dislodged and toppled pohutukawa trees that had shaded the fern habitat on the rock faces (de Lange 1994). Further, on those islands it has been observed that *Asplenium pauperequitum* plants present in exposed situations rarely persist, and that those occurrences were all the result of the recent loss of covering vegetation (de Lange 1994).

***Asplenium pauperequitum* habitats on the Chatham Islands**

The Chatham Islands occurrences are a marked departure to the heavily shaded, forested habitats occupied on the Poor Knights Islands (Fig. 5, 6). While there is no detailed information about the habitat of the fern on Motuhara / Motuhara / Forty Fours (Cameron et al. 2006) that island group is only sparingly vegetated by low shrubs of *Leptinella featherstonii* and *Senecio radiolatus*, so it is assumed that the fern grows there in exposed conditions. The populations on Rekohu / Wharekauri / Chatham Island are better known.



Fig. 5 (left). Poor Knights spleenwort (*Asplenium pauperequitum*) growing at the back of schist crevices, Point Somes, Waitangi West Farm, (December 2020).

Fig. 6 (right). Poor Knights spleenwort (*Asplenium pauperequitum*), Ocean Bay, Waitangi West Farm, (February 2021). Photos: P.J. de Lange).

There, *Asplenium pauperequitum* has thus far only been found in the north western portion of the island on coastal exposures of Chatham schist, specifically those where the bedding planes are more or less horizontal rather than tilted. Presumably those tilted schist exposures compromise the fern in some way, possibly through competition with other species such as *Asplenium chathamense*, *A. obtusatum* and *Austroblechnum durum*, which are common within the cracks and crevices of tilted schist outcrops, but less frequent in those with horizontal bedding. Chatham Schist with horizontal bedding is best exposed on the coastline from Ocean Bay across to Waitangi West Beach, and there we know of four *Asplenium pauperequitum* populations (Cameron et al. 2006). In those sites the fern grows as single plants or ‘colonies’ at the base of very deep, sometimes 1–2 m deep ledges, often at the threshold of light, though on occasion specimens may be found on smaller ledges – as is the case at Point Somes. Comparable to the situation described for the Poor Knights, the fern root stock is usually firmly attached to the rock wall or associated saprolite surface, and, in most sites, there is at least some evidence of year round moisture, and similar blue-algal co-associates. What is notably different from the Poor Knights is that the fern is found in some sites subjected to salt spray, strong wind and at times potential inundation during storm events. Furthermore, associated plants are more diverse, typically including *Asplenium chathamense*, *A. obtusatum*, *Chenopodium trigonon* subsp. *trigonon*, *Crassula moschata*, *Disphyma papillatum*, *Lobelia anceps*, *L. arenaria* and *Tetragonia trigyna*. It is likely though that some of the Chatham occurrences are remnants that have persisted in the shaded crevices of the Chatham schist outcrops following forest clearance. However, thus far *Asplenium pauperequitum* has not been found on schist outcrops within forest remnants, in those places its habitat is occupied by *Asplenium lyallii*.

The chemistry of the substrates colonised on the islands is also different. On the Poor Knights, the rhyolitic rock being silica rich is naturally nutrient poor, whereas Chatham schist, part of the Otago Chlorite Schist facies (H. Campbell *pers. comm.*, June 2021) is rich in base elements and as such supports a flora of ‘basicolous’ species (*sensu* Molloy 1994). The Chatham Island occurrences, fixed as they seem to be to Chatham schist outcrops, do appear singular when compared to Poor Knights populations. However, the nutrient poor rhyolitic rock of the Poor Knights Islands is misleading because surfaces of that rock in *Asplenium* habitats are usually enriched by the guano left by numerous ground nesting or burrowing sea birds. This means that the habitats occupied by *Asplenium pauperequitum* on the Poor Knights can be considered base-rich as well. So, the differences between the substrates colonised on either island group may not be that important after all. When considering rock substrates, it is peculiar that so far on the Chatham Islands *Asplenium pauperequitum* has not been found on limestone and basalt outcrops, yet these substrates are also base-rich, and inhabited there by a basicolous flora (*sensu* Molloy 1994). Therefore, the apparent restriction of the *Asplenium* to the north-western portion of Rekohu / Wharekauri / Chatham Island may be due to some other factor or factors—determining this would make for an interesting research investigation.

***Asplenium pauperequitum* a threatened species**

Even when *Asplenium pauperequitum* was assumed to be endemic to the Poor Knights it was considered a threatened species, at risk from botanists who accidentally destroyed populations through overcollection (mostly through the accidental dislodging of smaller plants when collecting larger specimens); by the depredations of introduced scale insects, and changes in micro-climate as surrounding forest cover thinned (Wright 1992; de Lange 1994; Cameron et al. 1995). In fact the decline of the species on the Poor Knights Islands was so bad that de Lange & Cameron (1999) pessimistically stated that the future of the fern ‘...looks bleak and it [*Asplenium pauperequitum*] must now rank as one of New Zealand’s most threatened endemic plants’. Therefore the 2005 and 2006 discoveries of the species on the Chatham Islands (Motcha har / Motuhara / Forty Fours and Rekohu / Wharekauri / Chatham Island) were a welcome boon to the species conservation status, resulting in a downgrading of threat from ‘Threatened / Nationally Critical’ to ‘Threatened / Nationally Endangered’ (de Lange et al. 2004; de Lange et al. 2010; de Lange et al. 2018).

Following those Chatham discoveries, aside from incidental checks during other surveys, an assessment of the security of *Asplenium pauperequitum* populations on Rekohu / Wharekauri / Chatham Island was not done until May 2019, December 2020 and February 2021 when I was able to visit the populations discovered in 2006 at Ocean Bay and Point Somes. The population at Point Somes appeared no different to what was observed there in January and February 2006. Plants remained secure in the deep schist crevices, with an apparently healthy population of mature plants and numerous sporelings. Unfortunately, I was unable to visit the Te Koparuparu Bay population, and that population still needs to be checked.

At Ocean Bay however, the situation was not so good. When last surveyed (February 2006) only a few small plants were found. Survey at the time was hampered by the inclement weather. During February 2021 the weather was excellent and so more time could be spent searching the schist outcrops at the northern entrance to the bay. Four subpopulations were found, an increase of three on what was seen in 2006. Concerning though was that three of the subpopulations found were severely afflicted by scale insects. In those populations the pinnae and sometimes the entire frond was encrusted in white ellipsoid scale insects (Fig. 7), which I initially assumed to be a species of *Leucaspis*. However, on posting an observation on iNaturalist (<https://inaturalist.nz/observations/69909496>) the scale was identified as fern scale (*Fusilaspis phymatodidis*) by Stephen Thorpe. *Fusilaspis* is endemic to New Zealand, where it has been recorded from 48 species of fern (45 indigenous, 3 exotic – see <https://plant-synz.landcareresearch.co.nz/ReportForm.aspx?RecordId=384&Type=H&SortBy=Alpha&Biostatus=a,c,e,n>). Of those ferns, four are species of *Asplenium* (*A. bulbiferum*, *A. flaccidum*, *A. oblongifolium* and *A. polyodon*), species present on the Chatham Islands (de Lange et al. 2011). However, *Asplenium pauperequitum* is a new host for *Fusilaspis*, while the scale it seems had hitherto not been recorded from the Chatham Islands. While the find and new host are interesting, the impact of the scale on the *Asplenium* at Ocean Bay is concerning. Afflicted plants were visibly stressed and, in some cases, dying. Management of the scale, assuming that a sensible, environmentally safe treatment is available, would in such a remote area on private land not be easy either.



Fig. 7. Fern scale (*Fusilaspis phymatodidis*) on the fronds of Poor Knights spleenwort (*Asplenium pauperequitum*), Ocean Bay, Waitangi West Farm, (February 2021). Photos: P.J. de Lange.

On the Chatham Islands then, where *Asplenium pauperequitum* has its world stronghold, the species is now in decline. Considering the ferns precarious status on the Poor Knights, this brings us back to the conservation view we started with, namely that the future of *A. pauperequitum* ‘...looks bleak and it must now rank as one of New Zealand’s most threatened endemic plants’ (de Lange & Cameron 1999). We can only hope that the scale infestation at Ocean Bay can be contained, and further populations found on sections of that coastline that have yet to be surveyed for it. It also remains a mystery why *Asplenium pauperequitum* has not been found elsewhere on the Chatham Islands, or indeed elsewhere in New Zealand. It must be there, surely? People need to look.

Acknowledgements

I would like to thank Gary Roper, current farm manager of Waitangi West, Rekohu / Wharekauri / Chatham Island for access to the land he manages. I thank Stephen Thorpe for identifying the fern scale (*Fusilaspis phymatodidis*) from my images posted on iNaturalist NZ (<https://inaturalist.nz/>) and Hamish Campbell for his comments on the Chatham schist.

References

- Brownsey PJ, Jackson PJ 1984. *Asplenium pauperequitum* – a new fern species from the Poor Knights Islands, New Zealand. *New Zealand Journal of Botany* 22: 315–321.
- Brownsey, P.J. & Perrie, L.R. 2018: Aspleniaceae. In: Breitwieser, I.; Wilton, A.D. Flora of New Zealand - Ferns and Lycophytes. Fascicle 18. Manaaki Whenua Press, Lincoln. <http://dx.doi.org/10.7931/B1562D>
- Cameron EK 1993. *Asplenium pauperequitum* – a new locality. *New Zealand Botanical Society Newsletter* 34: 7–8.
- Cameron, E.K.; de Lange, P.J.; Given, D.R.; Johnson, P.N.; Ogle, C.C. 1995: New Zealand Botanical Society threatened and local plant lists (1995 revision). *New Zealand Botanical Society Newsletter* 39: 15–28.
- Cameron, E.K.; de Lange, P.J.; Perrie, L.R.; Brownsey, P.J.; Campbell, H.J.; Taylor, G.A.; Given, D.R.; Bellingham, R.M. 2006: A new location for the Poor Knights spleenwort (*Asplenium pauperequitum*, Aspleniaceae) on The Forty Fours, Chatham Islands, New Zealand. *New Zealand Journal of Botany* 44: 199–209.
- de Lange, P.J. 1994: *Asplenium pauperequitum* - Poor Knights fern in poor condition. *Conservation Science Newsletter* 7: 7–8.
- de Lange, P.J. 2021: *Asplenium pauperequitum* Fact Sheet (content continuously updated). New Zealand Plant Conservation Network. <https://www.nzpcn.org.nz/flora/species/asplenium-pauperequitum/> (accessed: 8 September 2021)
- de Lange, P.J., Cameron, E.K. 1999: The vascular flora of Aorangi Island, Poor Knights Islands, northern New Zealand. *New Zealand Journal of Botany* 37: 433–468.
- de Lange, P.J.; Heenan, P.B.; Rolfe, J.R. 2011: Checklist of vascular plants recorded from the Chatham Island Islands. Department of Conservation, Wellington. 57pp.
- de Lange, P.J.; McFadden, I., Cameron, E.K. 1995: Preliminary report of the flora and fauna of Fanal Island, Mokohinau Islands Nature Reserve. *Science & Research Series* 94. Wellington: Department of Conservation. 20pp.
- de Lange, P.J.; Norton, D.A.; Heenan, P.B.; Courtney, S.P.; Molloy, B.P.J.; Ogle, C.C.; Rance, B.D.; Johnson, P.N.; Hitchmough, R. 2004: Threatened and uncommon plants of New Zealand. *New Zealand Journal of Botany* 42: 45–76.
- de Lange, P.J.; Heenan, P.B.; Norton, D.A.; Rolfe, J.R.; Sawyer, J.W.D. 2010: Threatened Plants of New Zealand. Christchurch, Canterbury University Press. 471pp.
- de Lange, P.J.; Rolfe, J.R.; Barkla, J.W.; Courtney, S.P.; Champion, P.D.; Perrie, L.R.; Beadel, S.M.; Ford, K.A.; Breitwieser, I.; Schönberger, I.; Hindmarsh-Walls, R.; Heenan, P.B.; Ladley, K. 2018. Conservation status of New Zealand indigenous vascular plants, 2017. *New Zealand Threat Classification Series* 22: 82pp.
- Molloy, B.P.J. 1994: Observations on the ecology and conservation of *Australopyrum calcis* (Triticeae: Gramineae) in New Zealand. *New Zealand Journal of Botany* 32: 37–51.
- Parris, B.S. 1990: Book review: New Zealand ferns and allied plants. *New Zealand Journal of Botany* 28: 195–196.
- PPG 1. 2016: A community-derived classification for extant lycophytes. *Journal of Systematics and Evolution* 54: 563–603.
- Wright, A.E. 1992: Survival battle for tiny fern. *New Zealand Botanical Society Newsletter* 30: 12.

Announcing the recipient of the David Given Threatened Plant Scholarship 2021

Alex Fergus (fergusa@landcareresearch.co.nz)

The late David Given was a New Zealand plant systematist and a pioneering plant conservationist, as well as a great friend and mentor to many in the Aotearoa plant world. David was also heavily involved with the NZPCN, as well as many other organisations. To honour his legacy the David Given Threatened Plant Scholarship (DGTPS) was established in 2009 to fund research that assists the protection and recovery of New Zealand's threatened plant species and their communities.

The calibre of the 2021 applications was high and the projects spanned a variety of research methods and species. The panel assessing the applications thanks and commends all applicants for their efforts.

We are very pleased to announce that Debra Wotton is the successful recipient of the 2021 scholarship with her project focused on genetic diversity of *Veronica armstrongii* (see details below). Debra, of Moa's Ark Research, will be working closely with Ben Gibbons, Dave Kelly and Pieter Pelsner – all of the University of Canterbury. The DGTPS committee considered the project to be a very tidy example of how to approach a common conservation challenge for which we have little data. We also appreciated both the collaborative approach and that the project is building on previous work. As well as the summary of the planned research below, the results of Debra and her team's work will appear in a future issue of *Trilepidea*.

My thanks also to other members of the DGTPS 2021 panel—John Barkla, Rowan Hindmarsh-Walls and Shannel Courtney—for volunteering their time and being so passionate about threatened plant research in New Zealand.

Seeking alleles from lost populations of the rare Canterbury endemic, Armstrong's whipcord hebe

Debra Wotton (Moa's Ark Research), Ben Gibbons, Pieter Pelsler & Dave Kelly (School of Biological Sciences, University of Canterbury)

Armstrong's whipcord hebe (*Veronica armstrongii*), like many threatened native plant species, may face long-term challenges due to loss of genetic diversity and inbreeding depression. Funding from the NZPCN David Given Scholarship will enable us to investigate the genetic diversity of this nationally endangered shrub.

Armstrong's whipcord hebe is the plant equivalent of the takahe—it was presumed to be extinct in the wild for at least 50 years, before being rediscovered in 1974. The species was first collected from the upper Rangitata in Canterbury, but these populations were extinct by the 1920s. Then, in 1974, a very small population was discovered near Castle Hill in Canterbury, followed in 1984 by a larger one 40 km away. The latter population (Mounds of Misery, Canterbury) has several hundred adults and seedlings. The one at Castle Hill, legally protected in 1985 as Enys Scientific Reserve, went through a severe bottleneck (a period of very low population size which can cause a loss of genetic diversity) about the time that it was discovered. Only six plants survived at the time. The number of plants in Enys reserve had increased to 85 adults by 2018, but it is presently unknown how much genetic diversity remains in these two populations and what their genetic connectivity is.

Armstrong's whipcord hebe was taken into cultivation before the Enys Reserve and Mounds of Misery populations were discovered, so it seems likely that some plants in gardens and nurseries were sourced from the Rangitata populations. If so, cultivated plants could represent a genetic time capsule for alleles from the lost Rangitata populations, harbouring genetic diversity that is no longer present in the wild.

We will investigate the remaining genetic diversity in the wild populations of *V. armstrongii* and in plants grown in cultivation. This will enable us to assess how genetically distinct the two extant populations are, the genetic diversity and degree of inbreeding in the Enys Reserve population, and whether cultivated plants possess genetic diversity that is no longer present in the wild. Our research findings will inform future management of the two remaining populations, and establishment of additional populations to reduce the risk of extinction.



Fig. 1. The nationally endangered Armstrong's whipcord hebe (*Veronica armstrongii*) went through a severe genetic bottleneck at Enys Scientific Reserve, Canterbury. Photo: Debra Wotton.

Gavenwood Farm – The farmers’ story

Jesse Bythell (jesse.bythell@gmail.com)

Kim Spencer-McDonald and Peter McDonald have a variety of vegetation communities on their farm including matai-kowhai-broadleaf-ribbonwood forest, as well as areas of shrubland, tussockland, secondary broadleaf forest, pockets of kahikatea forest and small wetland areas interspersed throughout. Their farm supports a healthy and actively recruiting population of *Olearia fragrantissima* (At Risk – Declining) and small populations of *Olearia hectorii* (Threatened – Nationally Endangered), *Olearia lineata* (At Risk – Declining) and *Melicytus flexuosus* (Threatened – Nationally Vulnerable). *Tupeia antarctica* (At Risk – Declining) and *Pseudopanax ferox* (At Risk – Naturally Uncommon) are also found on this farm, along with about a dozen *Carex strictissima* (Threatened – Nationally Endangered) – the largest known population in the region.

Jesse Bythell (Southland QEII representative and NZPCN committee member) caught up with Kim and Peter recently to ask them some questions about their farm and the biodiversity it supports.

1. Tell me about your farm?

We operate a 650-hectare farm in Dipton on the northern end of the Hokonui Hills. We have very little flat land; the majority of our farm is rolling to steep hill country. We have 30 hectares of bush on our farm in QEII trust. We are predominately sheep farmers which includes a small stud of Ryeland sheep. We have a couple of cows and for the past few seasons have undertaken some easy-care cattle grazing. Peter has lived on the farm all his life. We are second generation on this farm although the McDonalds have farmed in Dipton since the 1890's. We took over the farm when Peter's parents retired in 1997.

2. What do you love most about your farm?

Peter loves the freedom that sheep farming as a business provides. The freedom to do as he pleases, relative to the seasons and weather.

Kim loves the people that she gets to meet and connect with and for its uniqueness and biodiversity. There are few businesses in the world where you welcome people into your home; provide them with kai and get to learn more about them and their whanau. Farming allows these relationships to develop over many, many years. Be it the stock agent, the vet, the seed specialists, the insurance company, fertiliser reps, the accountant, the bank manager, QEII representatives, regional council staff. All people passionate about what they are doing. When the time comes for us to retire this is honestly what I will miss the most.

3. What are your challenges?

When you eat, sleep and breathe your work 24/7, there is no reprieve during the difficult times. Mentally this is incredibly tough. We are at the beck and call of the market being a commodity-based producer and the environment – droughts, floods and a poorly timed storm can literally ruin our entire season. All these things can have a major effect on our stock which we truly care about and it can be tough at times to cope with everything. An example of this is the clover weevil infestation in the early 2000's. We had no idea initially why our lambs weren't gaining weight and thriving. The clover weevil was literally decimating our pastures.

We think one of the biggest challenges farming has faced in the last few years is that regulatory compliance



Fig. 1. Philip Smith (O2 Landscapes) getting an eyeful of *Carex strictissima* in October 2020—one for the bucket list! Photo: Jesse Bythell.

has increased in all aspects of our business and sometimes this can be difficult to learn and accept. Having someone else externally tell you how you have to run your business can be hard. We believe that many of these regulations are necessary to protect the whenua/land for future generations. We farm with our grandchildren in mind and how they would perceive our actions.



Fig. 2. View of one of the areas of forest on the farm protected with a QEII covenant. (Photo: Jesse Bythell)

4. *Can you tell me about the biodiversity on your farm? How does it make you feel to know this precious stuff is on your farm?*

We love the biodiversity on our farm. It makes the actions we take around our farming practices even more important. It's wonderful having flora and fauna experts and fans come onto our property and be excited about what they see. The opportunity to learn from these people has been wonderful in truly appreciating what we have.

5. *What would you like to tell other people about managing biodiversity on farms?*

Protect it. Share it. Learn from it. Ask yourself what will be important to future generations—we hope that our mokopuna/grandchildren will be proud of the choices we have made and that we had the foresight to know that what we have is special and unique.

NZPCN 2021 favourite native plant vote

Alex Fergus (fergusa@landcarereserach.co.nz)

“One of the most beautiful plants known”! Joseph Hooker, waxing lyrical on kōwhai ngutu kākā - *Clianthus puniceus* (Hooker 1867).

As this issue of *Trilepidea* goes to press (thanks as always to the stellar efforts of our *Trilepidea* assembly team—Bill Campbell and Jeremy Rolfe) the 2021 NZPCN favourite native plant vote is about to explode.

Yes, the whole thing is a bit naff (tacky). But if you can't throw off the shackles of proper internet behaviour to spend a few moments gushing adorably in the direction of the plants you either believe remarkable or care deeply for then why bother going online?

As previously mentioned in *Trilepidea*, October 1–31 is the new permanent calendar position for our NZPCN favourite native plant vote. The purpose of the vote is to find out why New Zealanders love their native plants and help raise a greater awareness and appreciation of native plants. In the build up to this year's vote NZPCN committee members have been taking turns championing candidates. These profiles of floristic luminaries are thematic, targeting issues like conservation concern, ecological function and down-right loveliness.

This month, our treasurer Bill Campbell has put forward the copper beard orchid—*Calochilus herbaceus*, a nationally critical orchid now only found at a few scattered sites in the north of te Ika-a-Māui. Our secretary, Matt Ward, has stuck to the orchid family but put forward an enigma, *Corybas* aff. *sulcatus*. *Corybas sulcatus* is one of the two endemic orchids on Macquarie Island. However it, or something very much like it, has been turning up at sites around our southern islands and on the mainland. Finally, our webmaster and southern-most committee member Jesse Bythell has proposed haumakāroa—*Raukaua simplex*. Haumakāroa is a beautiful small tree found across much of Aotearoa, but as Jesse notes it is an excellent bio-indicator of mammalian browse pressure, being conspicuously absent from forests where goats, deer and possums abound.

Many thanks to Bill, Matt and Jesse for these profiles. Voting begins October 1st!

Contributor: Bill Campbell, NZPCN treasurer and regular trudger of the far north's wetlands and gumland scrub.

Favourite plant candidate: *Calochilus herbaceus*

Why I have selected this species: This plant is critically threatened and its distribution and habitat make it inaccessible to most kiwis. I have been fortunate enough to locate several new colonies in recent years, including one in the suburban street where I live. There's no telling where threatened plants will turn up sometimes.

The local population may now be extinct, as the area has been developed into 90 residential lots and specimens haven't been observed here for several years. Fortunately, it appears to be holding its own at other sites, although, like many other native orchids, it has good years and bad years in terms of numbers present at any particular site.



Calochilus herbaceus, Spirits Bay Road: (left) flower Te Paki 19 October 2013; (right) plant, 31 October 2020. Photos: Bill Campbell.

Current population

The species is assessed as having a total New Zealand population of less than 250 mature plants. This population ranges from scattered individual plants through to sites where 25-30 flowering plants may be observed in a good year for the species. The New Zealand Threat Classification System records its conservation status as Nationally Critical, with the qualifiers 'EF' [Extreme Fluctuations], SO [Secure Overseas] and 'Sp' [Sparse] in the 2017 report by de Lange et al.

Distribution

In New Zealand *Calochilus herbaceus* can be found at several sites in the North Island between Albany and Te Paki on the east coast and at one site on the west coast near Dargaville. It is always associated with wetlands or gumland scrub on poor clay soils. It is present in Australia also, where it is not threatened.

Threats

The biggest threat to this species is the ongoing loss of its preferred habitat, mainly due to land clearance for agricultural and horticultural activities. Another significant and increasing threat is the ballooning numbers of wild pigs at a couple of the known sites for *Calochilus herbaceus*. Pigs eat and trample the plants, as well as uprooting the tubers. Fire is another threat, although new colonies have been located following major wetland fires in the far north. Unscrupulous orchid collectors also pose a threat, although by all accounts this species doesn't survive if removed from the wild.

Prospects

Calochilus herbaceus is hanging on by a thread but will probably continue to do so, as the majority of the sites where it can be found have some form of reserve status. Protecting existing sites is going to be the most likely way of ensuring its long term survival.

What do we need to do right now?

Encourage New Zealanders, particularly trappers and hunters, to keep a watch out for this species when they are out and about during the months of September to November, when it is most likely to be observed. It usually flowers during late October-early November and the flowers are what give the plant away. It can be quite cryptic and blends in very well with its surroundings, so is easily overlooked. Observation details can be forwarded to the NZPCN at info@nzpcn.org.nz or recorded on the iNaturalist NZ site <https://www.inaturalist.org/observations>.

With such a friendly face *Calochilus herbaceus* deserve your vote. Just look at its shining eyes, whisky nose and colourful beard. What a handsome specimen it is.

References and further reading

de Lange, P.J.; Rolfe, J.R.; Barkla, J.W.; Courtney, S.P.; Champion, P.D.; Perrie, L.R.; Beadel, S.M.; Ford, K.A.; Breitwieser, I.; Schonberger, I.; Hindmarsh-Walls, R.; Heenan, P.B.; Ladley, K. 2018: Conservation status of New Zealand indigenous vascular plants, 2017. New Zealand Threat Classification Series 22. Department of Conservation, Wellington. 82 p.

New Zealand Plant Conservation Network 2021: *Calochilus herbaceus* fact sheet (content continuously updated) <https://www.nzpcn.org.nz/flora/species/calochilus-herbaceus/> Date accessed: 23 September 2021.



Calochilus herbaceus, Cable Bay, 21 October 2009. Photo: Bill Campbell.

Contributor: Matt Ward, NZPCN secretary, orchid botherer...

Favourite plant candidate: *Corybas* aff. *sulcatus*

Why I have selected this species:

It's a bit controversial as to whether this entity is actually related to *Corybas sulcatus* or not. There have been suggestions of its presence on mainland New Zealand for some time, with little confirmation as to its status. When I stumbled upon the entity seen in the photos below, I was unsure at the time as to what it may be, making it quite a special find and therefore my favourite plant for the 2021 vote. Anyone who has spent any time looking for or stumbling upon our orchid flora will know just how small and easy to miss they can be. It is therefore rewarding when you do manage to find a bloom. This entity was represented as a single colony in an extremely remote location, which may not have been trodden previously by anything other than pestilent non-human mammals.



Corybas aff. *sulcatus*, Mount Dumblane: (left) whole plant, (centre) close up of flower; (right) habitat. Photos: Matt Ward.

Current population

Data Deficient. Not accurately known as the entity has not been formally recognised. The population I found on Mt Dumblane had approximately 100 plants with three in flower. It has been suggested that other entities posted on iNaturalist NZ are the same if not similar to that which I recorded, which would take the colonies known to four.

Distribution

South Island. Sites at this stage are Arthurs Pass (2), Hanmer, and Mt Dumblane. There are also potential relatives offshore on the Chatham Islands (figure 4), and the Auckland Islands.

Threats

Lack of knowledge about the New Zealand mainland populations (whether *C. sulcatus* or not), as they say you don't know what you don't know. If it is proven to exist on the mainland from DNA samples, it would be a welcome addition, but it could be an entirely new species also. At present iNaturalistNZ has this potential species in only one NZ mainland location and on one offshore island, but this may be more about personal concerns about making an incorrect identification. Hopefully, a few others will be confirmed in time.

Prospects

At this stage no research is being done regarding what this entity may be, as there are other more pressing species needing consideration. All that is known at this stage is that the populations which have been sampled unintentionally can be suggested as relatives to *C. confusus*. This is a candidate well worthy of further DNA investigation, due to its remarkable dis-similarities to other species known to the NZ orchid flora.

What do we do now?

As with most of the orchid species in New Zealand, record them on iNaturalist NZ so that their distribution and population can be better recorded and potentially monitored with revisits to a known area of residence. Adding a few fields, phenology, population size, and associated species can be very useful for further understanding as to what the actual Threat Classification may be. Many orchids are transient, so more records help to paint a picture of potential migrations and habitat necessities.

Finally, don't forget to vote for your favourite plant of 2021, as we have so many extraordinary flora species which need more recognition and acknowledgement to ensure their future survival.



Corybas aff. *sulcatus*: close up of flower, Chatham Islands. Photo: Peter Heenan 2007

References and further reading

- Clements, M., & Jones, D. 2007. A new species of *Nematoceras* and characterisation of *N. dienemum* (Orchidaceae), both from subantarctic Macquarie Island. *Telopea*, 11, 405-411.
- de Lange, P.J. 2020. *Corybas sulcatus* Fact Sheet (content continuously updated). New Zealand Plant Conservation Network. <https://www.nzpcn.org.nz/flora/species/corybas-sulcatus/> (22nd September 2021)
- Government of Tasmania. *Corybas sulcatus* – Threatened Species Section – Department of Primary Industries, Parks, Water and Environment. 8 pages.
- Lehnebach, C. 2021. Personal Communication. Discussion about *Corybas* aff. *sulcatus* and other orchid entities presently being researched, and DNA mapped.
- NZNOG Website 2020. *Corybas sulcatus* – Species Description http://www.nativeorchids.co.nz/Spider_Orchids3_LR.htm (22nd September 2021)
- Ward, M. 2021. A record of *Corybas* aff. *sulcatus*. *The New Zealand Native Orchid Journal*. Feb. 2021 No 160. Pages 14–15.

Contributor: Jesse Bythell, NZPCN committee member and QEII National Trust Regional Rep for Southland, lover of language and general plant geek of southern flora.

2021 Favourite Plant candidate: *Raukaua simplex* haumakāroa (and also haumakōroa, haumangōroa or houmangōroa in the South, also kaiwhiriria and kaiwiria, or kōarearea for the juvenile form).

Why I have selected this species: This plant is not rare or confined to special habitats, nor is it particularly pretty or unusual in appearance. One does not even need a hand lens or consultation of a key to identify it. However, it is one of the key species I look for when working in lowland and montane forests. Along with a range of other widespread and highly palatable forest plants, haumakāroa can tell me pretty quickly what sorts of introduced mammalian browse pressure is occurring. As a gardener and a human who loves to eat a lot of salads, I imagine this plant would be a very welcome snack to any herbivore, though perhaps less tasty than raukawa (*R. edgerleyi*) which has more aromatic leaves.



Juvenile leaves of haumakāroa in montane beech forest, Kepler Mountains. Photo: Jesse Bythell.

A small-tree (up to 8 m tall), haumakāroa has handsome glossy leaves, pale tan bark and inconspicuous green flowers and white fruit. It has distinctive forms as a young juvenile with palmately compound leaves which are deeply lobed, older juveniles are also compound and the leaflet margins are toothed. Adult leaves may be compound or simple and are slightly thicker. The genus *Raukaua* is a Latinised version of the Te Reo Māori name raukawa (*R. edgerleyi*) a name which was reinstated in 1997 (Mitchell et al., 1997). Haumakāroa belongs to the Araliaceae (Ivy) family, which also contains the

following genera in Aotearoa/New Zealand: *Meryta* (1 species of small tree), *Pseudopanax* (13 species of tree and shrub), *Hydrocotyle* (12 taxa of small herb) and *Schefflera* (1 species of small tree).

For Murihiku people, haumakāroa is one of the five important trees in which the fire deity Mahuika hid fire (Riley, 1994), and there are some records of the bark being prepared by tohuka as a medicine to treat lung complaints (Beattie, 1954).

Distribution: This plant occurs from Te Tai Tokerau/Northland to Rakiura/Stewart Island. It may be an understorey and subcanopy component of mature forest or an element of mixed broadleaf secondary forest. In my observations it seems to prefer relatively wet and fertile sites. Hybridisation is known to occur with raukawa (*R. edgerleyi*) when distribution overlaps with haumakāroa.

Current population: Widespread but becoming scarcer as an understorey seedling or sapling in areas where feral deer and goats are present or where domestic livestock have access to native forest or where possum numbers are high.

Threats: The conservation status for this plant is ‘Not Threatened’ (de Lange et al., 2017) however I worry this may change in the future if haumakāroa continues to retreat from our forests due to the onslaught of goats, deer and possums. I have seen repeatedly hinds target this plant to feed on the nutritious bark, easily killing mature trees by ringbarking. In most areas of my region Murihiku/Southland haumakāroa recruitment is prevented by feral deer which are widespread and becoming increasingly abundant, and new plants are only present on inaccessible bluffs or growing as epiphytes. Goats can get into places deer can’t and plants on bluffs or growing as epiphytes are not inaccessible to possums. With chronic pressure from introduced mammals I feel that yet one more taonga is at risk of disappearing from our landscapes. Haumakāroa, along with many others we take for granted as being common and widespread, help form the rich tapestry of our forests and provide resources for our treasured native animals. If we seek to achieve Predator Free 2050 it is crucial we also look after the habitats which support our wildlife.



Raukaua simplex, Southland Plains: (left) epicormic shoot trying to develop after mature trunk has been severely debarked by deer, Southland Plains; (centre) screen grab from trail camera video footage of a red deer hind feeding on the bark of a mature haumakāroa—the understorey has already been severely depleted by feral deer and supports only mātātā *Histioglyphis incisa*; (right) unhealthy crown of mature haumakāroa, severe leaf drop occurring as the tree dies due to ringbarking by feral deer. Photos Jesse Bythell.

References and further reading

- Dawson, J. and R. Lucas, 2011. New Zealand’s Native Trees. Pottton & Burton: Nelson.
- de Lange P.J., Rolfe J.R., Barkla J.W., Courtney S.P., Champion P.D., Perrie L.R., Beadel S.M., Ford K.A., Breitwieser I., Schonberger I., Hindmarsh-Walls R., Heenan P.B. and Ladley K. 2018: Conservation status of New Zealand indigenous vascular plants, 2017. New Zealand Threat Classification Series 22. Department of Conservation, Wellington. 82 p.
- Beattie, H. 1954. Our southernmost Māoris. J. H. Beattie: Waimate.
- Mitchell, A.D, Frodin, D.G, Heads, M.J. 1997. Reinstatement of Raukaua, a genus of the Araliaceae centred on New Zealand. NZ J. Botany 305: 309-315;
- Manaaki Whenua, 2021. Ngā Tipu Whakaoranga - Māori Plant Use Database. <https://maoriplantuse.landcareresearch.co.nz/> Accessed 13 September 2021.
- Riley, M. 1994. Māori Healing and Herbal. Viking Sevenses, New Zealand Ltd: Paraparaumu.

Botanical news from the Wairarapa

Trevor Thompson, QEII National Trust Regional Representative, Wellington-Wairarapa (tthompson@qei.org.nz)

A dry summer was another challenge to our flora, both at home here at Mt Bruce and across the region as a whole. My 15 year old silver beech succumbed along with their *Peraxilla colensoi* mistletoes.

The wild mistletoe populations in the Tararua range, and in particular the blue range population which I found back in 1998, the most numerous in the Tararuas, suffer from possum bands that have tightened and burst as the trees have grown, resulting in possum browse that has stopped any chance of flowering and seed production in a number of cases. When I first found this population it was unpredated by possums and I had to cover the fruit with netting to be able to harvest it so birds wouldn't take it all. 1080 has been used periodically since to control possums but they quickly move back, although the birds don't. Nets on the trees still banded are not required, as the fruit sits untouched.

The last couple of summers have been tough on a number of mistletoe species. The relict population of *Alepis flavida* in eastern Wairarapa basically struggles to hold its own with little progress. One large plant was lost due to a fencer cutting the parasitised branch because it hung low from its mistletoe loading. The most viable population is now on my property where I can manage and intensively monitor the six plants, harvest fruit and plant it on black beech planted specifically for helping this species. There are a total of three new populations now in place.

One of my students from my annual mistletoe propagation workshop was given one seed and has a lone *Alepis flavida* successfully established. I have allocated more fruit this season to this individual.

Other mistletoes

Tupeia antarctica

I was tasked with enhancing *Tupeia antarctica* numbers at a privately owned bush area, sponsored by an oil company. I had worked at this location a number of years ago and had found the biggest wild population in the Wairarapa, 18 plants all on black maire. When I started the project I quickly found a number of the aged black maire had died and possums had dealt to many of the others preventing flowering and fruiting. Fortunately, I found two host trees with fruit and was able to add a further 13 plants to the total. This was nothing like I had hoped for but it likely secured a future short term, as these new plants were in a much easier position to be managed and monitored.

I have approximately 60 *Tupeia antarctica* on my property, all planted and thriving. I have learnt that while setting up or strengthening wild populations is a worthy concept, the reality is that remote populations that take hours to get to are difficult to help and keep safe. All efforts to use black maire as a host have failed, however, *Pittosporum eugenoides* readily takes *Tupeia*, which fruits around four years later.

Peraxilla tetrapetala

Two new plants recently came to my attention on private land soon to be QE2 covenanted. I climbed the host trees and saw the juvenile fruit, following which I coached the land owners on setting up catch nets to get the fruit. I have only four *P. tetrapetala* established on my place, as this mistletoe is by far the most difficult to get established.

I ran a mistletoe propagation workshop for members of Kohinui marae who are keen to return mistletoe to their district of Pirinoa, another Maori name for mistletoe.

Ileostylus micranthus

This is in various locations and is locally numerous if conditions suit. This species is the one that my mistletoe propagation students succeed at establishing new populations of most often.

The population in Upper Hutt growing beside the Hutt motorway on tree lucerne provided seed,

which was successfully established on *Coprosma propinqua* out on the Wellington coast in a QE2 covenant and another QE2 covenant near Makara, both planted by me approximately six years ago. The Hutt population was subsequently wiped out when the tree lucerne was sprayed.

My personal thoughts on the Loranthaceae mistletoes of Wairarapa are that they are facing climate changes that do not suit them. Severe winds, rain and droughts are becoming more and more common. These things make life tough for mistletoe, together with inadequate possum control and disease issues that may be exotic.

Other species

Olearia gardneri

Numbers are now up to around 650 to 700 in the Wairarapa, from the initial 140 nationwide when I started working with this rare plant. Four new populations have been set up with the generous support of Otari in Wellington, who grew many plants for me from seed I gathered from a new population I found. They even came out to plant one of the new population sites. Thank you Otari.

I am close to being happy with this fifth rarest NZ tree in the Wairarapa, both numbers wise and with separate populations now being in place with good numbers of plants. The populations I look after in the Wairarapa are in significant numbers and all are in QE2 covenants.

Other species worked with are the regionally rare *Coprosma obconica* and *Coprosma wallii*, both with a number of new populations established.

In a QE2 covenant in the eastern hill country I found a population of *Corokia cotoneaster*, the only naturally occurring one I know of in the Wairarapa. It is often planted locally but not ecosourced from the Wairarapa. Our local native plant nursery, Norfolk Road Nursery, have seed and cutting material for me to set up another population in another nearby QE2 covenant. .

Brachyglottis pentacopa

This small tree is found only on one steep coastal hill on the Wairarapa coast and nowhere else. I have been monitoring this population for 14 plus years but recently goats have become numerous enough to have a very detrimental effect. Other browsers generally leave this species alone.

Just before lockdown in August, with the help of four Masterton Intermediate School rugby players, we built a 50 metre deer fencing enclosure fence on a flat terrace well up the hill. This was done with the intention of planting the fenced off area with *B. pentacopa* as a significant seed source safe from goats. Seed and cutting material are at Norfolk Nursery to grow plants for this project. As time allows, more goat fencing will be erected to protect individual trees. Planning is being undertaken to find a suitable site for an insurance population.



A fence erected by Masterton Intermediate School students to exclude goats from browsing *Brachyglottis pentacopa*.

Well done to these boys who carried waratahs and stock mesh up a steep coastal hill to the site. My fear is that, in a drying climate, a major fire could potentially wipe out the plants at this one site.

Dysoxylum spectabile

While out at a QE2 covenant about 1 km inland from the Wairarapa south coast I found two sites with a total of four mature trees. While kohekohe has been talked about as being present in this general area no one could actually say where it might be. This is not part of any of those ad hoc possible observations and the locations of all trees have been recorded by GPS. Protective banding will be put in place shortly to allow the trees to seed hopefully. We can then propagate from that seed and return them to suitable areas under legal protection.

Riparian planting

Riparian fencing and planting has been gaining momentum. Local nurseries with local plants are suddenly being asked to supply thousands of plants on top of normal sales. Major nurseries outside of our region are able to supply plants much cheaper, although the quality is often poor.

Many farmers are ignorant of the eco sourcing need and buy from out of the region to save money. The upshot is non-local genetics introduced in big numbers, often swamping our local plants which have lived in the difficult climate that the Wairarapa can have. Drought, floods, high winds, very low and very high temperatures, etc. It is no wonder many that plantings sourced from up north have a poor survival rate.

University of Canterbury Summer Course - Practical Field Botany

Venue: **Mountain Biological Field Station at Cass, Canterbury**

Dates: **18–26 January 2022**

Practical Field Botany (BIOL305) is an intensive, short summer course designed to meet the need for training in the collection, preparation, and identification of botanical specimens. It is a flipped-classroom course in which traditional lectures are replaced by field-based projects and associated workshops and discussions.

This course will be valuable for students who intend to seek employment in areas such as field ecology, conservation, biodiversity, and taxonomy or biosystematics. It will also be of interest to members of the workforce who need to acquire or upgrade taxonomic skills, e.g., from Crown Research Institutes, Department of Conservation, Local and Regional Councils, Botanic Gardens, horticulture, and teaching.

The course is targeted at participants with various entry levels: from students with a limited plant knowledge to experienced career professionals.

Goals of the course

To enable participants to

- become familiar with the plants of the central Canterbury mountains,
- identify and name plants correctly and accurately using online and hard-copy identification keys,
- take and edit scientific-quality plant photos,
- maximise usefulness and minimise environmental impact when collecting specimens,
- prepare high quality voucher specimens of plants,
- use scientific names to access detailed information about New Zealand plants,
- understand the patterns of variation within populations,
- appreciate unique and unusual aspects of the New Zealand flora.

Please follow this link to the Course Outline for more detailed information. <https://apps.canterbury.ac.nz/1/biology/outlines/biol305.pdf>

Enrolment starts 1 October 2021

You can enrol online at [What is myUC](#) or by contacting the Contact Centre at 0800 VARSITY (827 748) or enrol@canterbury.ac.nz

For further enquiries and help with enrolling, please contact us:

Pieter Pelsler (pieter.pelsler@canterbury.ac.nz 03-369-5228)

Matt Walters (matt.walters@canterbury.ac.nz 03-369-5211)

School of Biological Sciences, University of Canterbury, New Zealand

UPCOMING EVENTS

If you have events or news that you would like publicised via this newsletter please email the Network (info@nzpcn.org.nz).

Please note that some of the advertised events may not proceed due to Covid-19 movement restrictions in force. Please check with the appropriate Botanical Society beforehand.

Auckland Botanical Society

All meetings/field trips postponed or cancelled until Covid-19 restrictions allow for their resumption.

Rotorua Botanical Society

Field Trip: Sunday 3 October to Matawai Conservation Area, Matawai.
Meet: Opotiki i-site/DOC office at 8.00am. **Grade:** Moderate.

Leader: Mike Butcher, email mikebutchernz@xtra.co.nz,
ph. 07 315 7160 or 027 455 5610.

Work Day: Okareka Mistletoe Restoration Project Weed Control/Plant Releasing. **Meet:** Corner of Summit and Loop Roads, Okareka (lake end) at 8.45am. **Grade:** Medium/Hard.

Leader: Paul Cashmore, email pcashmore@doc.govt.nz,
ph. 07 349 7432 (wk) or 027 650 7264.

Wellington Botanical Society

Field Trip: Saturday/Sunday 3–4 October. Day one—Duntulm Farm, Mangatarere Valley, Wairarapa. **Meet:** 820 Mangatarere Valley Road at 9.30am.

Leaders: Owen Spearpoint, email owen.spearpoint@gw.govt.nz,
027 285 8083 and Sunita Singh, email sunita@actrix.co.nz, 027 405 2987.

Day two—Timbrel Station. Meet: Martinborough Square outside toilets at 8.50am.

Leader: Frances Forsyth,
021 072 5210.

Meeting: Monday 18 October at 7.30pm. **Topic:** Student presentations – 1. Colin Balkwill on ‘How can we ensure NZ’s plant species are robust in a warming world?’ and 2. Joe Dillon on ‘A hungry botanist’s journey: from bugs to birds to plants.’

Venue: Victoria University, Wellington, Lecture Theatre M101, ground floor Murphy Building, west side of Kelburn Parade.

Nelson Botanical Society

Field Trip: Sunday 17 October. Weedbusting, Wairoa River Forest. Please refer to the website, <https://www.nelsonbotanicalsociety.org/trips-meetings>, for more details.

Leader: Shannel Courtney, email scourtney@doc.govt.nz.

Canterbury Botanical Society

Meeting: Monday 4 October at 7.30pm. Speaker Paul Maurice. **Topic:** In the steps of the great plant hunters of China.

Venue: Upper Riccarton Library community meeting room, 71 Main South Road.

Field Trip: Saturday 9 October to Airport drylands/School Road *Melicytus*.

Field Trip: Saturday 16 October to Boundary Reserve, Motunau, North Canterbury.

Meeting: Monday 1 November at 7.30pm. Speaker Paula Godfrey. **Topic:** Auckland botany.

Venue: Upper Riccarton Library community meeting room, 71 Main South Road.

Botanical Society of Otago

Field Trip: Saturday 16 October to Herbert Forest. **Meet:** Botany Department carpark (464 Great King Street North) at 9.00am.

Contact: John Barkla, email mjbarkla@xtra.co.nz, 027 326 7917.
