



TRILEPIDEA

Newsletter of the New Zealand Plant Conservation Network

No. 187

June 2019

Deadline for next issue:
Friday 19 July 2019

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 events@nzpcn.org.nz

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NEW ZEALAND

PLANT OF THE MONTH, p. 2



Rubus parvus. Photo: Rowan Hindmarsh-Walls.

CONFERENCE REGISTRATION OPEN NOW!

We invite you to register for the 2019 Australasian Systematic Botany Society and New Zealand Plant Conservation Network joint conference to be held at the Museum of New Zealand Te Papa Tongarewa, Wellington, New Zealand in the last week of November.

Start planning now! Spaces in workshops and field trips are limited, so register early to get your top choices.

Check out the recently updated conference website to get all the important details about conference dates, venue, accommodation, programme, keynote speakers, field trips, workshops, silent auction, and more!

The conference theme, 'Taxonomy for Plant Conservation – Ruia mai i Rangiātea' aims to capitalise on the vast expertise of our two societies. There will be multiple upskilling workshops, three days of symposia, and a chance to explore Wellington's forests and rugged coastlines on our five different full-day field trips.

Feel free to contact the organising committee by email if you have any queries: plants2019nz@gmail.com, otherwise go to the conference website (<https://systematics.ourplants.org/>) to keep up to date with developments, or follow us on [Facebook](#) or [Twitter](#) for announcements.

We look forward to seeing you in Wellington in November!

Ngā mihi nui

Nā Rewi, Heidi and the Organising Committee

Thank you to our sponsors!

We would like to thank our sponsors that are showing their commitment to plant conservation networking by supporting our conference.

If you or your organisation is in a position to show your support please contact us for a sponsorship package today at info@nzpcn.org.nz



PLANT OF THE MONTH – *RUBUS PARVUS*

The plant of the month for June is *Rubus parvus*, one of five *Rubus* species endemic to New Zealand. The species is in the South Island only, mostly in the north and west, but extending down to South Westland. It can be found in lowland to montane forest and open areas, often on old slip scars and river flats, or in valley floor forest. The plant is a ground hugging scrambler, and can form relatively dense mats, especially on open rocky ground. The leaves are linear with serrated margins and hooked thorns on the underside and along the stems. The flowers are relatively small and white with five petals, but the fruit are large (the size of a raspberry) and bright red. They are edible, as are the fruit of most *Rubus* species, but are generally watery and fairly tasteless.



Rubus parvus at Ugly River, Kahurangi National Park, 3 May 2019: (left) close-up of fruit and leaves, (right) growth habit. Photos: Rowan Hindmarsh-Walls.

The plants are superficially similar to other *Rubus* species but are easily distinguished from all other native species by the sprawling rather than climbing habit, generally single, rather than compound leaves and small, generally singly borne flowers.

The species is endemic to New Zealand, and has a threat ranking of 'Not Threatened' as, although sparsely distributed, it can be abundant within the right habitat. The species is not generally under threat, but may be threatened in some areas by competition with exotic grass species, especially on river flats, and is sometimes browsed by goats.

The genus name *Rubus* is the latin word for bramble as it is the genus of brambles. The genus contains many famous species such as *Rubus fruticosus*, the blackberry, and the Eurasian Red Raspberry, *Rubus idaeus*. The species epithet 'parvus', meaning small, probably refers to the small stature of the plant.

You can view the NZPCN website factsheets for *Rubus parvus* at: <http://www.nzpcn.org.nz/flora/details.aspx?ID=1264>

Revision of “Above the Treeline: a nature guide to alpine New Zealand”

My co-authored book: “Above the Treeline: A nature guide to alpine New Zealand” is now out of print and the publishers, Potton & Burton, have decided to republish it in a revised and slightly enlarged version, with somewhat more space allocated to the images.

This provides an opportunity to have more of the plants illustrated and also to improve some images where possible. Accordingly, I invite anyone who wishes to contribute images to contact me for further details at: alan.mark@otago.ac.nz.

The New Zealand threat classification system database website

Alex Fergus

I was recently made aware of a website which enables easy access to the New Zealand threat classification system (NZTCS) database (<https://nztcs.org.nz/>). I had failed to note the arrival of said site, and prior to this I simply downloaded relevant publications from the Department of Conservation's publications' webpage when I required a threat listing, or information about why a certain taxon had a certain threat listing. Many of us are aware that the NZTCS assesses the conservation status of New Zealand plants, animals and fungi. Conservation status is assessed for a species using a rules-based approach and is a function of extinction risk based on estimates or known population size and trend projected over three generations or 10 years, whichever is longer. The time span of the assessment for each species can now be displayed alongside the forecast trend in the database, and this information will progressively become available as new assessments are completed. For most groups of species an expert panel meet to undertake this process, usually on a five-yearly rotation.

The NZ Threat Classification System administrator, our very own Jeremy Rolfe, is keen to help people understand the implication of the time span of the assessment. Assessments are conducted approximately every five years but each assessment is for three generations of the species being assessed or 10 years, whichever is longer. This means that the time span for an estimate of change in population size may range from 10 years for an annual plant to a few hundred years for a long-lived tree. This is significant when you think about *annual* rates of decline. Long-lived species can tolerate only very small annual declines before they are in serious trouble, and small annual population changes can be very difficult to detect. Although you might think that you have plenty of time to recover a threatened long-lived species, the reality is that its decline and recovery plays out in very slow motion. Repeating assessments every five years enables adjustments to be made if circumstances change or new information becomes available.

Current summary statistics on the NZCTS website report 13,258 species have had a conservation status assessment. Of these, 79 are extinct, 996 are threatened, and perhaps most worryingly 4,402 are data deficient, slightly more than are considered not threatened (4,136). These numbers highlight the importance of the work the NZTCS panels do, and the importance of this data for prioritising research.

On the website itself different tabs provide access to reports, assessments and exports from the database. The assessments tab allows you to identify data relating to certain taxa and can be filtered by threat classification and environment—freshwater, marine or terrestrial. Here I have added a couple of examples to illustrate the website's functionality. Imagine I wanted a list of all the threatened plants in New Zealand. By specifying the relevant report—Vascular Plants 2017 (de Lange et al. 2018)—and using a drop down to limit the umbrella category to threatened, the resulting search generates the list I am after, which I can then export to work on it further. A more specific example could be a search specifying *Cardamine* species currently assessed as nationally critical. The output of this search reveals 11 taxa (10 species and a tag name), and for each the known or estimated population size, the population trend and the qualifiers for the conservation status.



A screenshot of part of the online database's NZTCS Vascular Plants 2017 assessment Report page.

Qualifiers are additional information which caveat the assessment, for example Range Restricted (RR) or Data Poor (DP). Qualifiers are explained, along with more information on the assessment process, in the New Zealand Threat Classification System Manual (2008) which is linked to the NZTCS website. The exported data also includes simple biostatus information—endemic, indigenous, exotic, and work is proceeding to validate the biostatus records that feed into this data field.

Another new feature of the database is provision for notes about the assessments. In the past, the NZTCS reports simply presented the lists with a summary at the beginning of the report. The expert panels now record notes in the database so that users of the data can better understand how the assessments were made. These notes will increasingly appear in the database as new assessments are completed.

The accessibility of this data and the increasing transparency of the process are both boons to the conservation community, so I encourage you to make use of this excellent resource.

ASBS-NZPCN 2019 Conference in Wellington: Updates

Planning and organising for the 2019 conference are now well underway Registrations are open, as per the front page article. Following up from our presentation at the 2018 ASBS Conference in Brisbane (which was then published as an article in the [Dec 2018 ASBS Newsletter](#)), we've got a few updates to share with you regarding the 2019 conference.

2019 Conference at a glance

- Conference title: “Taxonomy for Plant Conservation – Ruia mai i Rangiatea”
- This is a joint conference of ASBS and the [New Zealand Plant Conservation Network](#)
- Our venue is the [Museum of New Zealand Te Papa Tongarewa](#), Wellington, New Zealand
- Dates: 24–28 November 2019
- Overview: 5 full days including presentations, workshops, field trips, and public events.
- Follow us on [Facebook](#), [Twitter](#) and [Instagram](#)
- Get more details and subscribe to updates on the [conference website](#)
- Please support our [sponsors](#)!

Important dates to diary

- From now: If you are planning to collect plants in New Zealand during your stay, make sure you get your permit applications in soon. See [our website](#) for more details.
- From now: Source some items for our silent auction (see related article in this newsletter).
- Early April 2019: The conference website was fully updated with registration costs, field trip and workshop options, and other important information to help you plan. Get helpful information now on [transport and accommodation options](#) from our website—if you know you are coming, book accommodation now.
- 23 April 2019: Early-bird registration (with reduced registration fees) was officially open!
- 23 August 2019: Abstracts due. Early-bird registration closes. Standard fees will apply from this date.
- 24–28 November: The conference is on!
- Various dates from Oct–Dec 2019: A number of other conferences and events of potential interest to conference attendees are happening in Wellington and elsewhere in New Zealand around the same time as our conference. For those planning to come to the conference, why not stay a bit longer in New Zealand to take advantage of these other opportunities? Check out the latest list on [the conference website](#).

Confirmed workshops

We will be offering seven half-day or full-day pre-conference workshops on Sunday 24 November. Please note: all workshops will need to have a minimum number of participants to go ahead, and spots will be limited, so register early to make sure you don't miss out on your first choice. For more information on these workshops, please check the conference website regularly.

Workshop #1: Wikipedia Edit-a-thon on Australasian endangered plant species

An Edit-a-thon is an all-day attempt to improve Wikipedia's coverage of a particular topic. Led by experienced Wikipedia editors [Mike Dickison](#) and [Siobhan Leachman](#), participants will learn how to edit pages, correct mistakes, add references, and upload photos. Complete beginners are welcome; training and troubleshooting is provided. This edit-a-thon will focus on adding content on **New Zealand and Australian endangered plant species** to Wikipedia. Our goal for this full-day workshop is to collectively improve the representation of Australasian endangered plants in Wikipedia.

Workshops #2 & #3: Botanising with iNaturalist – workshops for beginners and advanced users

[iNaturalist](#) is the world's biggest online community dedicated to recording all species. Being a botanist in the iNaturalist community is both great fun and useful; we connect people to nature and grow both botanical knowledge and future botanists. There will be two half-day iNaturalist workshop options, a morning workshop for beginners, and an afternoon workshop for advanced users. You may sign up for one or both! The morning workshop will give you an introduction, starting from scratch and get you up to speed as both an observer and an identifier on iNat. The afternoon workshop will focus on how to take your iNat use to the next level, including bulk operations, curating the iNaturalist species tree and nomenclature, managing projects, dealing with threatened species, and other advanced functions. Both workshops will be led by [Jon Sullivan](#), who is the site admin of [iNaturalist NZ–Mātaki Taiao](#) and a trustee on the charitable trust that operates iNaturalist NZ. His day job is an ecology lecturer at Lincoln University.

Workshops #4 & #5: Plant identification workshops

[Otari Native Botanic Garden and Wilton's Bush Reserve](#) is the only public botanic garden in New Zealand dedicated solely to native plants. It is also home to the largest forest remnant in Wellington City. Come along and experience this national treasure as we host two half-day workshops running morning and afternoon on the day. These workshops will give participants the opportunity to look closely at New Zealand ferns in the field and under the microscope with the Te Papa Botany team (WELT), and to do some field botanising in the forest with the [Wellington Botanical Society](#). There will be guided walks telling the story of the forest, gardens, and the unique New Zealand flora. Botanists from Landcare Research and the Department of Conservation will also be helping out on the day. It will be a fantastic day for beginners and experts alike!

Workshop #6: Basics of Illustration

Simple drawings are a very effective form of scientific communication: after all, a picture is said to be worth a thousand words! Photographs do not always provide a suitable visual aid. This workshop is meant for those who would like to produce simple illustrations, but think they cannot draw or don't know how to get started. We will work with photographs to create illustration-quality line drawings. You will learn some basic drawing techniques using pens. Composition, scale and preparation for digitisation will be discussed. By the end of the workshop, you should have some line drawings that you can be proud of and would not hesitate to include in your publications, laboratory manuals or teaching resources. The main goal of this workshop is for participants to create simple line drawings as an alternative to photographs so as to improve communication of scientific observations.

Workshop #7: Science Communication Skills

Confirmed field trips

Field trip organisers: Anita Benbrook and Tim Park

We can now confirm we will have a total of five different, full-day field trips on offer for Wednesday 27 November. Please note: all field trips will need to have a minimum number of participants to go ahead, and spots will be limited, so register early to make sure you don't miss out on your first choice. For more information on these and other field trips, please check the conference website regularly from early April.

1. Old-growth forests of Wainuiomata and Remutaka (travel by bus; good fitness required)

2. Coasts, freshwater lake and lowland beech forest across the harbour (travel by bus; good fitness required)
3. Rugged south Wellington coast & ecological restoration (travel via 4WD vehicles on rough terrain)
4. Mātī/Somes Island plants and wildlife (travel via ferry; easy walking)
5. Otari-Wilton's Bush, Te Papa herbarium and Bush City (travel via bus; easy and accessible to all).

Please don't hesitate to get in touch with us (plants2019nz@gmail.com) with any queries or ideas you have. Looking forward to seeing as many of you as possible in November in Wellington!

Heidi Meudt & Rewi Elliot – 2019 ASBS-NZPCN joint conference co-organisers

2019 ASBS-NZPCN Conference Charity Auction: Items required! Can you help?

Matt Ward, NZPCN Secretary – mattwardward@gmail.com

I am happy to announce we will be having a charity auction at the 2019 New Zealand Plant Conservation Network (NZPCN) and Australasian Systematic Botany Society (ASBS) "Taxonomy for Plant Conservation – Ruia mai i Rangiatea" joint conference running this November in Wellington, New Zealand. The charity auction is a fundraiser that the NZPCN has carried out successfully at our conferences since 2013. The funds raised from the auction will be split 50/50 between our two societies and used to bolster the allocated research funds of each society. The NZPCN will split its share of the funds raised between the 'David Given Scholarship' and the 'John Sawyer Plant Conservation Fund' [http://www.nzpcn.org.nz/page.aspx?nzpcn_awards].

The ASBS will use the funds raised to bolster its Scientific Research Awards, which currently include the 'Hansjörg Eichler Scientific Research Fund' and the 'Marlies Eichler Postdoctoral Fellowship' [<http://www.asbs.org.au/asbs/research-funds/index.html>].

The auction will be silent, allowing some level of mystery as to whom you may be bidding against when you wish to win a must-have item. Each conference attendee will be given a number in their conference pack for use when bidding. Bidding will simply involve adding your number and the dollar value you wish to bid on a sheet next to the item, which will be on display at the conference. It's a fun and exciting way to support your societies! Depending on the number of items up for grabs, the conclusion of each auction may occur in a staggered fashion to prevent any conclusion confusion. More running details will be established closer to the date.

To make the auction a success, we rely on worthy donations from individuals, businesses, institutions and agencies. This is where you can help! If you can donate an item, or have a suggestion for a donation, please let me know. Items which garner substantial interest include artwork, experience vouchers, books, outdoor gear, handmade uniqueness, etc. You can see what was on offer at our 2015 conference here: http://www.nzpcn.org.nz/page.aspx?nzpcn_events_conference_2015_auction. Te Papa Press has kicked things off by kindly donating three fantastic NZ-themed hard back books.

There is an excellent chance of the silent auction having extra-interesting items this year with the trans-Tasman tie-in, so let's make the auction a ripper and raise as much as possible for our societies' worthy funds. Please contact me on the above e-mail address with any queries or to make your donation!



News release
FT154
15 June 2019

Rat numbers set to explode in forests this Spring *Native birds to bear the brunt of multi-species mega-mast*

Conservationists in the central North Island warn that native bird populations are due to “take an epic hammering” this Spring when predator populations balloon. Staff of the Forest Lifeforce Restoration Trust have seen a significant increase in rat numbers on their two properties in inland Hawke’s Bay, a precursor to spikes in the number of stoats, ferrets, possums and other pest or predator species.

Rats are being detected at rates of up to 58 percent, about twice as many as would normally be detected in August, when counts are usually conducted. This early monitoring was in response to warning signs at the back end of last year, when heavy fruiting of several plant species signalled the multi-species mast event taking place at the moment.

Peraxilla tetrapetala, or red mistletoe, was one of the species that flowered unusually early last year. It is known in te reo as pikirangi, pিরangi or roeroe. It is a parasitic shrub up to one metre tall with smooth leaves which normally only flowers around Christmas time. Numbers have increased markedly at the Trust’s property in the Maungataniwha Native Forest and by early November the forest floor beneath host trees was already littered with flowers.

Elaeocarpus dentatus, known in te reo as hinau or whīnau, also flowered heavily. It is common at Maungataniwha and has plump berries during the winter which can escalate rat numbers through the colder months into spring. This is the point at which the rats then cause carnage among native birds that are breeding. Red beech was flowering about as heavily as FLRT staff have ever seen.

“The rats will have a massive effect on the populations of smaller birds such as tomtits and robins,” said Trust staffer Barry Crene. “Rat numbers will help drive up stoat numbers and they’re going to nail heaps of kiwi and whio. The whole thing’s going to be as ugly as we’ve seen it in a very long time.”

Mr Crene said there was little that conservationists could do except “take the hit” and make preparations for increased trapping and other predator and pest control work.

Masting is a natural event that happens every three to five years. A tree species will produce more seeds than usual. It’s an effective species survival mechanism because predators will not be able to consume all the seeds. Ironically though, it leads to a boost in predator numbers. This year the Trust has seen several species mast simultaneously.

“I have no doubt that this mega-mast event will have a detrimental impact on the population numbers of pretty much all our native species,” Mr Crene said. “We’ve been tracking really well in recent years but this definitely feels like a ‘three steps forward, one step back’ type of situation.

The Forest Lifeforce Restoration (FLR) Trust is fast carving out a name for itself as one of the most prolific and successful kiwi conservation initiatives in the country. In addition to the Maungataniwha Kiwi Project the Trust runs a series of native flora and fauna regeneration projects. These include a drive to increase the wild-grown population of kākābeak (*Clianthus maximus*), an extremely rare type of shrub, and the re-establishment of native plants and forest on 4,000 hectares currently, or until recently, under pine.

About the Forest Lifeforce Restoration Trust

The Forest Lifeforce Restoration Trust was established in 2006 to provide direction and funding for the restoration of threatened species of fauna and flora, and to restore the *ngahere mauri* (forest lifeforce) in native forests within the Central North Island.

It runs eight main regeneration and restoration projects, involving native New Zealand flora and

fauna, on three properties in the central North Island. It also owns a property in the South Island's Fiordland National Park.



The Restoration Planting Guide Series for Taranaki is now available online at this link www.restoretaranaki.nz/resources/

The Guides correspond with the different Ecological Districts in Taranaki. Hard copies are available upon request from the Wild for Taranaki office.

The Foxton and Manawatu Plains Guides are shared by Taranaki and Manawatu-Whanganui, and stretch as far south as Paekakariki.

Please feel free to share this resource. Thank you.

Contact: Leigh Honnor - Environmental Support Lead, Wild for Taranaki
M 027 469 6939 – www.restoretaranaki.nz

A question of rank for New Zealand *Trithuria* (Hydatellaceae)

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

Trithuria (Hydatellaceae) is an innocuous little genus (and family) of grassy tufted wetland and lacustrine plants with a mainly Australasian distribution (there is one outlier known from the Western Ghats, India). The genus had for many years been thought to be monocotyledonous and had, along with *Hydatella* (now merged into *Trithuria*), been treated as a strange member of the Centrolepidaceae (Moore & Edgar 1970; Ford 2014)—a family of monocotyledonous plants that was then thought to bridge the gap between the rushes (Juncaceae), restiads (Restionaceae) and grasses (Poaceae). The group earlier treated as the family Centrolepidaceae is now more or less generally considered to be part of the expanded Restionaceae, which in that circumscription also includes the formerly recognised family Anarthriaceae (APG IV). However, in 1976 the German botanist Ulrich Hamann suggested that *Hydatella* and *Trithuria* were better placed in their own family, the Hydatellaceae (Hamann 1976), a move that was more or less adopted by world botanists by the mid-1980s; New Zealand, for example, adopted it in 1987 (Connor & Edgar 1987).

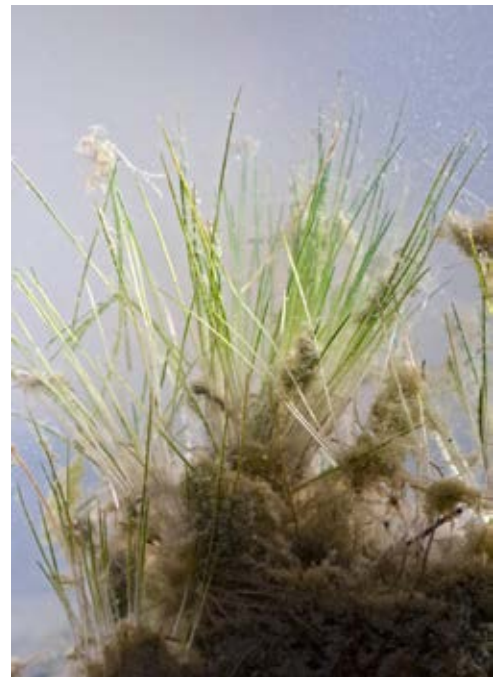


Tufts of *Hydatella inconspicua* in the shallows of a Northland lake.
Photo: Jeremy Rolfe.

While debate continued about the validity of accepting the Hydatellaceae, in the late 1990s and early 2000s researchers suddenly realised that this tiny group of wetland / aquatic plants were not monocotyledonous at all (Saarela et al. 2007); actually they are part of the so called ‘basal’ flowering plant lineages. The Hydatellaceae is most closely related to the plant order Nymphaeales that contains *Nymphaea* (water lilies) and some other genera, usually placed in two families, Nymphaeaceae and Cabombaceae. At about the same time, it was also decided that *Hydatella* should be merged into *Trithuria*. The shock discovery that these little plants were a ‘basal lineage’ prompted a worldwide surge of interest into the phylogenetic relationships, embryology, morphology, and taxonomy of the genus (see Sokoloff et al. 2008, 2011, 2019) culminating in a special session devoted to the family at the July 2011 XVII Botanical Congress, Melbourne, Australia.

Meanwhile back in New Zealand, way back in 1989, I had just graduated with an M.Sc. (Hons.) and started my professional career working for what was then the Ministry of Agriculture and Fisheries Aquatic Plants Division (MAF(Tech) Aquatic Plants Division). That team, headed by Dr John Clayton and based at Ruakura, Hamilton, had initiated a long-term study of Northland’s dune lakes, in part because they were then believed to be the sole habitat for *Trithuria inconspicua* Cheeseman. As that species had been listed as a threatened plant (Given 1981), the team at MAF(Tech) Aquatic Plants Division elected to keep a special eye out for it. When I left the team to work for the Department of Conservation in May 1990, I was privileged to later accompany my old boss Dr John Clayton and friend Paul Champion on an October 1990 survey of the *Trithuria* lakes.

Seeing *Trithuria* in the wild, is, I confess, a bit of non-event. Plants typically grow in water 0.1–3.0 m deep, usually where onshore reeds, such as kutakuta (*Eleocharis sphacelata*) provide some sediment stability but not where their covering is too thick, so as to excessively shade or clog the lake sediment with leaf litter. It is also fair to say that plants can sometimes be found growing directly on the lake shore as part of the marginal turf but this is more the exception than the rule for *T. inconspicua*. In its preferred lake habitat *Trithuria inconspicua* is hard to find because it is usually covered in masses of algal and cyanobacterial floc, such that plants are only noted by the presence of circular blobs of muck through which the fine green hair like leaf tips of *Trithuria* protrude. If you carefully fan water across these blobs the floc is easily dissipated to reveal the whole *Trithuria* plant, which resembles a small grass-like tussock, the filiform leaves of which are only green where they emerge from the surrounding floc. Sometimes associated with these tussocks you may find small knob-like structures – the female reproductive units—and, in *T. inconspicua* you may also see the prominent red anthers which are the male reproductive units, and that is about as exciting as it gets. To view this, you usually need to be snorkelling or using scuba gear. Most people can wander a *Trithuria* dune lake and never know it’s there. Whilst this protects the plant from over-collecting (a serious problem now that the plant is world famous) it doesn’t prevent it from being threatened, as it most certainly is. Nutrient-rich run off from surrounding farms and plantation forestry can cause algal blooms that smother plants, while the oxygen weeds (*Egeria densa* especially) and yellow bladderwort (*Utricularia gibba*) will rapidly destroy the lake habitat the plant needs. These two threats alone have accounted for the loss of *Trithuria inconspicua* from eight of the 12 lakes in which it was once found. Sadly, its key stronghold, the Kaiwi lakes, is still threatened by the indiscriminate use of jet skis and jet boats by holiday goers and their associated boat clubs. At these lakes, at least until recently, it was not uncommon to find masses of *Trithuria* washed up along the lake shore; the little plants dislodged



Trithuria inconspicua emergent from the algal floc on a lakebed. Photo: Jeremy Rolfe.

by these water-sporting frivolities. It is also a miracle none of these lakes have been colonised by oxygen weed because until recently minimal biosecurity was being carried out. However, now that management of the lakes has been returned to Te Roroa, concerted efforts are being made to protect them, and one waahi tapu lake is now fenced off from the public. This is good news as, *Trithuria* aside, those lakes are an international treasure, so it's great to see the iwi taking charge of their care.

While working with John Clayton on *Trithuria* we always wondered why it was confined to western Northland dune lakes. This seemed anomalous considering the presence of similar lakes and associated vegetation south of the Pouto Peninsula (then the plant's southern-most recorded location) all along the North Island west coast to the Horowhenua. The assumption we made at the time was that either this was a real pattern, or, as we felt was more likely, it had gone extinct from these other lakes because they are way more modified than the Northland ones. Another enigma was not answered so easily, why was the genus absent from the South Island? The South Island did, and mostly still does have a plethora of more or less intact lakes similar to the Northland *Trithuria* lakes. We all felt that the species should be there.

So, imagine the joy when John Clayton found *Trithuria* in the Southland / Fiordland Lakes in early 1991. Subsequent surveys by the former MAF(Tech) Aquatic Plants Division—now all part of the National Institute of Atmospheric Research (NIWA) soon established that *Trithuria* plants were present in Fiordland, Westland (Lake Brunner) and even some western Otago lakes. It was also noted that these South Island plants were 'somewhat different' from the North Island *Trithuria inconspicua*.

The find also got some of us thinking. After all, there are other floral links between New Zealand and Tasmania, e.g., the shrub *Sprengelia incarnata*, cushion plant *Donatia novae-zelandiae* and fern *Sticherus urceolatus*. This led Dr Peter Heenan and me to wonder whether the South Island *Trithuria* might not be the same as the Tasmanian *T. filamentosa*. Our interest in this was enhanced when we attended the Melbourne 2011 Botanical Congress where the Hydatellaceae symposium highlighted that of the then known species only two, *Trithuria filamentosa* and *T. inconspicua*, are perennial and both are sister species. Peter and I felt a closer study into their relationships was merited.

That study was undertaken and published by Landcare Research staff who in the process segregated out the South Island *Trithuria* as a new subspecies of *T. inconspicua*, subsp. *brevistyla* K.A.Ford (Smitsen et al. 2019). The taxonomic segregation from *T. inconspicua* is certainly merited; there are genetic differences, as well as morphological and reproductive ones. Notably South Island plants are apomictic, North Island ones sexual (see comments below). However, the authors elected to use subspecies rank on the basis of the closer genetic relationship of North and South Island *Trithuria* to each other than to the Tasmanian *T. filamentosa*, and the fact that the New Zealand plants are allopatric (i.e. South Island apomictic plants don't grow with North Island sexual ones). These are fair considerations, however, how does that decision align with other world assessments of the genus?

Trithuria plants are highly conserved. That is they don't offer much in the way of taxonomic characters. The little plants are vegetatively similar to each other so, aside from the fact most species are annual and two (or perhaps now three) are perennial, the key differences are found in the reproductive structures. Thus, by world standards the apomictic South Island plants are hugely significant with their morphologically distinct female reproductive units covered in shortened stigmatic hairs so forming a knobbly capitate head (consider the basis for the segregation of entities in the *Trithuria australis* group by Sokoloff et al. (2019)). There are also seed differences and more minor but consistent vegetative differences. The question of genetic relationships is another matter; it's good to know that New Zealand *Trithuria* is distinct from Tasmanian – that answered one of Peter Heenan and my original questions nicely. Having resolved that, then surely one would anticipate that North and South Island populations of *Trithuria* would be closer to each other than to *T. filamentosa*? This pattern, with respect to the New Zealand flora, is repeated over and over again – our flora is overall young, full of hybrids and by and large our plants are all very closely related to each other. So, with respect to the

decisions taken for New Zealand *Trithuria*, have we been consistent in the application of rank when deciding this for other New Zealand plants that have a closer genetic similarity to each other than they do to their Australian or South American relatives? No. We have tended to treat them as species rather than subspecies. For many genera morphological differences have been considered more important than genetic ones.

Finally, the problem of deciding rank for allied allopatric taxa raised by Smissen et al. (2019) is a problem that is not easily resolved. There is no consistent approach on this matter globally. However, in New Zealand we have tended to use subspecies for minor but consistent allopatric variation within a species. For example, kawakawa (*Piper excelsum*) is divided into four subspecies, *P. excelsum* subsp. *delangei*, *P. excelsum* subsp. *excelsum*, *P. excelsum* subsp. *peltatum* and *P. excelsum* subsp. *psittacorum* (Gardner 1997; de Lange 2012). Each subspecies is allopatric, and each differs by minor though consistent differences in leaf shape, thickness and pigmentation. The Three Kings endemic *Kunzea triregensis* on the other hand, though allopatric from all the other New Zealand members of the *K. ericoides* complex, was awarded species rank because of the many consistent floral and foliage differences that set it well apart from the other sympatric species found on the New Zealand mainland (de Lange 2014). These decisions and those of other New Zealand biosystematists help provide some guidance. So, while Smissen et al. (2019) in their discussion about deciding an appropriate taxonomic rank for *Trithuria* stated that any such decision is somewhat arbitrary, I don't fully agree. In these situations, I believe one should look abroad to see what others have done. This is what I was advised when naming *Atriplex hollowayi* a species I described (de Lange et al. 2000). At the time I felt it should be a subspecies but world experts on the genus strongly felt otherwise. This was also the same approach taken when I helped to describe the allopatric Chatham Islands endemic *Carex auceps* (described initially as an *Uncinia*) (de Lange et al. 2013).

So, I discussed the matter with my colleague Professor Sergei Mosyakin of the M.G. Kholodny Institute of Botany, National Academy of Sciences of Ukraine, Kyiv (Kiev), and we both felt there was sufficient evidence to elevate *Trithuria inconspicua* subsp. *brevistyla* to species rank, as *T. brevistyla* (K.A.Ford) de Lange et Mosyakin. This we have now done in the *Ukrainian Botanical Journal*. You can access our paper free at <https://doi.org/10.15407/ukrbotj76.02.095>

Following the publication of de Lange & Mosyakin (2019), the Landcare eFlora treatment for the New Zealand Nymphaeales has become available (Ford & Champion 2019). There, not surprisingly, the authors have elected to use the original subspecies rank for *Trithuria brevistyla*. Of our decision to elevate their subspecies to species rank Ford & Champion (2019: 9) state that 'we reject their argument that species rank **should be preferred over infraspecific ranks for threatened plants** [my stress]. They also stress a difference in breeding system between the two subspecies. However, both the subspecies of *T. inconspicua* and *T. filamentosa* exhibit apomixis, and Smissen et al. (2019) hypothesised a gradual transition from habitual self-fertilisation to apomixis. Smissen et al. (2019) also emphasised the subtle morphological differences between the two subspecies of *T. inconspicua* and described how similar *T. inconspicua* is to the Tasmanian *T. filamentosa*'.

These are interesting arguments. It is true that de Lange & Mosyakin (2019) discussed the world wide problem of 'taxonomic inflation' to ensure conservation management but that was not the key reason for our preference for species rank. Our paper clearly states that the change in rank was made '*on the basis of morphological and reproductive distinctions between that species and the closely related North Island, New Zealand endemic T. inconspicua*' though we do discuss taxonomic inflation noting that '*we think it advisable, in cases when species and subspecies ranks are considered as equally (or almost equally) acceptable options and when there are no strictly scientific (taxonomic, evolutionary, genetic, etc.) obstacles against using either of these ranks, to prefer the species status for plant taxa in need of conservation, especially those of the high-risk categories. That is, in our opinion, the case with Trithuria brevistyla, for which Smissen et al. (2019) proposed a conservation status of Nationally Endangered A (3/1), and which merits species-rank recognition for both taxonomic and conservational reasons*'. The

key issue here is this point, which I think worth repeating ‘*when species and subspecies ranks are considered as equally (or almost equally) acceptable options and when there are no strictly scientific (taxonomic, evolutionary, genetic, etc.) obstacles against using either of these ranks, to prefer the species status for plant taxa in need of conservation*’. On the question of rank Smissen et al. (2019: 8) stated “*given these factors, choice of rank is inevitably somewhat arbitrary*”. Which I naturally take to mean their *Trithuria* could be equally described as a species (or, in this case, elevated to species rank through validating a new combination), which is exactly what we have done.

As regard their hypothesis of a transition from habitual self-fertilisation to apomixis and the inference that both *Trithuria inconspicua* and *T. brevistyla* exhibits apomixis, Smissen et al. (2019) don’t actually show this is the case, rather they *infer* it from genetic data. That is reasonable and it merits further study but it is a subtle distinction that I feel needs further evaluation. In this respect, their description of *T. inconspicua* subsp. *inconspicua* notes ‘apomictic or sexual’ which is hard to reconcile with their supporting research remaining unclear as to whether this is truly the case. However, what they are emphatic about is that their *T. inconspicua* subsp. *brevistyla* is apomictic and here they do present reasonable evidence, not least of which only female plants have ever been found. Given that Smissen et al. (2019) seemed to regard their decision as to rank as ‘arbitrary’ (see above) an alternative (or rather alternatively acceptable) rank, at species has now been offered **not** because *T. brevistyla* is threatened but rather because of the morphological and sexual distinctions between it and North Island *T. inconspicua*.

So, in conclusion we now have two formalised ranks for New Zealand *Trithuria*, one species with two subspecies or two species. In these situations, ultimately it is up to the end user to decide which rank makes the most sense to them, species or subspecies. Until further evidence comes to light the choice for now is really up to you.

Acknowledgements

I would like to thank my colleague Sergei Mosyakin for his interest in the matter, and his addition of a very insightful essay about the impact of taxonomic rank with respect to threat listing and conservation management. Thanks also to Peter Heenan for his interest in and encouragement that I look into this matter further. Finally, I would like to acknowledge the amazing work of John Clayton who did so much to put New Zealand “Hydatella” (*Trithuria*) on the map at a time which very few people knew of it, or for that matter cared about it.

References

- Angiosperm Phylogeny Group (APG IV) 2016: An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG IV. *Botanical Journal of the Linnean Society* 161: 105–20. doi:10.1111/boj.12385
- Connor, H.E.; Edgar, E. 1987: Name changes in the indigenous New Zealand flora, 1960–1986 and Nomina Nova IV, 1983–1986. *New Zealand Journal of Botany* 25: 115–170.
- de Lange, P.J. 2012: Taxonomic notes on the New Zealand flora: new names in *Piper* (Piperaceae). *New Zealand Journal of Botany* 50: 485–487.
- de Lange, P.J. 2014: A revision of the New Zealand *Kunzea ericoides* (Myrtaceae) complex. *Phytokeys* 40: 1–185. doi:10.3897/phytokeys.40.7973
- de Lange, P.J.; Norton, D.A.; Crowcroft, G.M. 2000: Taxonomy, ecology, and conservation of *Atriplex billardi* and *A. hollowayi* sp. nov. (Chenopodiaceae) in Australasia. *New Zealand Journal of Botany* 38: 551–567.
- de Lange, P.J.; Heenan, P.B.; Rolfe, J.R. 2013: *Uncinia auceps* (Cyperaceae): a new endemic hooked sedge for the Chatham Islands. *Phytotaxa* 104: 12–20.
- 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.
- Ford, K.A. 2014: Centrolepidaceae. In: Breitwieser, I.; Brownsey, P.J.; Heenan, P.B.; Wilton, A.D. Flora of New Zealand – Seed Plants. Fascicle 2. Manaaki Whenua Press, Lincoln.
- Ford, K.A.; Champion, P.D. 2019: Nymphaeales. In: Breitwieser, I.; Wilton, A.D. Flora of New Zealand – Seed Plants. Fascicle 5. Manaaki Whenua Press, Lincoln. <http://dx.doi.org/10.7931/b1jh-cp50>
- Gardner, R.O. 1997: *Macropiper* (Piperaceae) in the south-west Pacific. *New Zealand Journal of Botany* 35: 293–307.
- Given, D.R. 1981: Rare and endangered plants of New Zealand. Wellington, A.H. Reed & A.W. Reed Ltd.

- Hamann, U. 1976: Hydatellaceae – a new family of Monocotyledoneae. *New Zealand Journal of Botany* 14: 193–196. <https://doi.org/10.1080/0028825X.1976.10428894>
- Moore, L.B.; Edgar, E. 1970: Flora of New Zealand. Vol. II, Wellington. Government Printer.
- Saarela J.M.; Rai H.S.; Doyle J.A.; Endress P.K.; Mathews S.; Marchant A.D.; Briggs B.G.; Graham S.W. 2007: Hydatellaceae identified as a new branch near the base of the angiosperm phylogenetic tree. *Nature* 446: 312–315.
- Smitsen, R.D.; Ford, K.A.; Champion, P.D.; Heenan, P.B. 2019: Genetic variation in *Trithuria inconspicua* and *T. filamentosa* (Hydatellaceae): a new subspecies and a hypothesis of apomixis arising within a predominantly selfing lineage. *Australian Systematic Botany* 32: 1–11.
- Sokoloff D.D.; Macfarlane, T.D.; Rudall P.J. 2008: Classification of the early-divergent angiosperm family Hydatellaceae: one genus instead of two, four new species and sexual dimorphism in dioecious taxa. *Taxon* 57: 179–200. <https://www.jstor.org/stable/25065959>
- Sokoloff D.D.; Remizowa M.V.; Macfarlane T.D.; Yadav S.R.; Rudall P.J. 2011: Hydatellaceae: A historical review of systematics and ecology. *Rheedea* 21: 115–138.
- Sokoloff D.D.; Marques I.; Macfarlane T.D.; Remizowa M.V.; Lam V.K.Y.; Pellicer J.; Hidalgo O.; Rudall P.J.; Graham S.W. 2019: Cryptic species in an ancient flowering-plant lineage (Hydatellaceae, Nymphaeales) revealed by molecular and micromorphological data. *Taxon* 68: 1–19. <https://doi.org/10.1002/tax.12026>

37th annual John Child Bryophyte and Lichen Workshop

Camp Taringatura, Southland

14–19 November 2019

Thank you to those who have already expressed interest in attending the 2019 John Child Bryophyte and Lichen Workshop! In this circular we have provided more details about the workshop and request you confirm your place at the workshop with a deposit to help us cover the expenses we need to pay up front. There are certainly still spaces available and we look forward to seeing more of you there! Please note that if we don't hear from you (even just to say you “may or may not” be coming this year), we won't send you future circulars for this year's event.

When

Evening of Thursday, 14 November, to morning of Tuesday, 19 November

Where

Camp Taringatura, Southland

Accommodation

Accommodation is available on site at Camp Taringatura (\$25/night for a bunk in one of 5 cabins and \$15/night for a campsite)—and in nearby Winton (15 km south of the camp). Winton has a large supermarket and we can recommend motels there (e.g. Paramount Motels).

Getting there

Camp Taringatura is <1 hr drive from the Invercargill airport, a 1.75 hr drive from the Queenstown airport, and a 2.5 hr drive from the Dunedin airport. We can help facilitate carpools from various locations to the camp. Members from the organising committee will also have some space available for carpools from Dunedin and Christchurch.

Meals

Evening meals (Thursday – Monday) will be cooked by caterers at the camp for all who wish to eat with the group. Breakfast and lunch supplies will be provided to all attendees Friday morning through Tuesday morning.

Costs

We anticipate total cost for the workshop to be around \$350, which includes \$20–30 per dinner, \$5–15 per breakfast/lunch, accommodation at the camp, and the booking fee for use of the camp. We request a deposit of \$150 to be paid by 14 October to confirm your place at the workshop; the deposit can be waived for overseas attendees so please get in touch. If you have to cancel your registration for any reason, please do so before 31 October so we can guarantee at least a partial refund of your deposit.

Transport costs

Most of the field trip sites are close to Camp Taringatura—a mileage charge (10c/km) will apply to passengers and drivers will receive a refund for providing transport on field trips during the workshop. Those carpooling to/from the workshop will be responsible for making their own arrangements to reimburse drivers.

How to register: Please e-mail Angela (angela.j.brandt@gmail.com) with the following information:

- If you will attend the full workshop, or which dates you will attend
- If you would like to reserve a bunk or campsite at Camp Taringatura
- If you will join in group meals, and which meals (breakfast/lunch/dinner on which days)
- If you are vegetarian, vegan, gluten free, or dairy free; we will try to accommodate special dietary requirements wherever possible but will need to discuss options well in advance with the caterers

Tom Moss Award

This award is open to any student studying any aspect of Australasian bryophytes and/or lichens. See the Wellington Botanical Society page for details.

Botanical Society of Otago Grants:

This year the Botanical Society of Otago is offering two grants of \$100 each to assist two people who might otherwise not be able to attend the workshop. If you would like to apply for one of these grants, please email bsotago.ac.nz by 1 September with a paragraph summary, including:

1. Your background and why you would benefit from the grant
2. What you can do to benefit the Workshop (e.g., give a talk, help set up a display table)

Thank you and we look forward to seeing you in Southland this November!

Organisers

Angela Brandt, Allison Knight, Maia Mistral, John Steel, David Glenny, Kelly Frogley, and Penelope Gillette.

UPCOMING EVENTS

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

Botanic Gardens Australia New Zealand (BGANZ)

9th Congress: Te Papa (Wellington). 20–23 October 2019

Plants from the past – Plants for the future.

<https://www.confer.nz/bganz2019/>

This conference will explore the role of Botanic Gardens in science communication & story-telling, plant conservation, managing collections and displaying plants. Join us—or submit an abstract to contribute your ideas. Botanic Gardens Australia and New Zealand (BGANZ) is the peak body representing all botanic gardens in Australia and New Zealand. BGANZ promotes the interests and activities of all Australian and New Zealand botanic gardens through its 140 member gardens, enhancing the state of botanic gardens internationally. The 9th BGANZ Congress will be attended by over 20 Directors, General Managers and Presidents of botanic gardens from Australia and New Zealand. More than 50 botanic gardens are expected to attend.

More information: <https://www.confer.nz/bganz2019/>

Auckland Botanical Society

Meeting: Wednesday 3 July at 7.30pm. **Topic:** Orchids.

Speaker: Carlos Lehnebach.

Field Trip: Saturday 20 July to Western Springs.

Leaders: Mike Wilcox and Ben Goodwin.

Waikato Botanical Society

Meeting: Monday 15 July at 6.00pm. **Topic:** Working with DOC on special projects in the South Island in 2018–2019.

Speaker: Kerry Jones.

Rotorua Botanical Society

Field Trip: Sunday 7 July to Maungaongaonga Scenic Reserve, near Waiotapu. **Meet:** 8.30am at the Convention Centre carpark, Fenton Street, Rotorua or 9.00am at Benny Tee Tearooms, Waiotapu. **Grade:** Medium/Hard.

Leader: Martin Pearce,
email: mpearce21@xtra.co.nz,
ph. 07 349 1929.

Wellington Botanical Society

Field Trip: Saturday 6 July to Te Ahumairangi – Tinakori Hill. **Meet:** 10.00am at the end of Puketiro Avenue.

Co-Leaders: Michelle Dickson,
ph. 04 972 2350 or 022 635 0193
and Chris Horne, ph. 04 475 7025
or 027 474 9300.

Meeting: Monday 15 July – Speaker Brian Patrick. **Topic:** Nature's Rainbow – discovering NZ's exciting butterflies.

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

Field Trip: Saturday 3 August to Whitirea Park bush remnant.
Meet: 9.30am at the Onehunga Bay carpark, Whitirea Park.

Leader: Robyn Smith,
email: robsmithii@xtra.co.nz,
ph. 027 437 2497.

Nelson Botanical Society

Field Trip: Sunday 21 July to the 6 mile walkway, Murchison.
Meet: 8.00am at Cathedral steps.

Leader: Uta Purcell,
email: mupurcell@xtra.co.nz,
ph. 03 545 0280.
Please contact Uta in advance if
you intend to participate.

Meeting: Monday 22 July at 7.30pm – Speaker and topic to be advised.

Venue: Jaycees Room, Founders
Park.

Canterbury Botanical Society

Meeting: Monday 1 July at 7.30pm – Speaker Nick Dickinson.
Topic: Plants and soil: ecological restoration underground.

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

Field Trip: Saturday 6 July to Brooklands lagoon. **Meet:** 10.00am at Peg Hotel, 899 Main North Road, Belfast or 10.20am opposite the entrance to Spencer Park. **Bring:** Lunch, drink, warm jacket, woolly hat, hand lens and a copy of the Johnson wetland book. Wear sturdy boots that you can get wet.

Leader: Alice Shanks,
ph. 03 337 1256.

Botanical Society of Otago

Field Trip: Saturday 6 July to Pipeline Track to look at Bryophytes.
Meet: 9.00am at the Botany Department carpark, 464 Great King Street.

Contact: John Steel,
email: john.steel@otago.ac.nz.

Meeting: Wednesday 10 July at 5.20pm – Speaker Dr Toni Atkinson. **Topic:** A search for the co-evolutionary partner(s) of New Zealand's sequestrate fungi.

Venue: Room 215, 2nd Floor,
Zoology Benham Building, 346
Great King Street.
