



TRILEPIDEA

Newsletter of the New Zealand Plant Conservation Network

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Deadline for next issue:
Friday 22 March 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



Euphrasea cockayneana.
Photo: Rowan Hindmarsh-Walls.

The living dead: Why is *Hebe armstrongii* failing to recruit?

Debra Wotton, Moa's Ark Research and University of Canterbury

Hebe armstrongii (also known as *Veronica armstrongii*) is a nationally endangered shrub confined to just two sites in Canterbury. The only protected population, at Enys Scientific Reserve, was on the brink of extinction when it was discovered in 1974 (Molloy 1990). Despite 40 years of management, including fencing and restoration plantings of *H. armstrongii*, the Enys Reserve population has failed to recruit. Although a dozen naturally occurring seedlings were discovered for the first time in 2013 (Wotton 2016), none of these have survived. Only one self-established seedling, discovered later, still persists. The adult plants are effectively 'living dead' (Janzen 1986)—without recruitment (or ongoing management inter-vention), the population will go extinct.



The Nationally Endangered *Hebe armstrongii* is failing to recruit at Enys Scientific Reserve (Canterbury), which is the only protected population.

In 1974, the bog pine (*Halocarpus bidwillii*) shrubland of the future Enys Reserve was severely browsed and trampled by stock and only six *H. armstrongii* plants and small remnants of bog pine remained (Molloy 1990). The loss of the native bog pine shrubland habitat in which *H. armstrongii* grows may be limiting its recruitment in this dryland ecosystem. Shrubs provide shade and shelter, which can increase seedling recruitment especially in dry environments. Non-native grasses (predominantly browntop, *Agrostis capillaris*) and hawkweeds (*Pilosella* spp.) are widespread in Enys Reserve and may also be limiting *H. armstrongii* recruitment. Additionally, the small population size may be constraining recruitment via reduced seed production.

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PLANT OF THE MONTH – *EUPHRASIA COCKAYNEANA*

The plant of the month for February is *Euphrasia cockayneana*, one of sixteen *Euphrasia* (eyebright) species native to New Zealand. The species is found in the South Island, from North-West Nelson to south of Arthurs Pass along and to the west of the main divide, in the higher rainfall areas. It can be found in sub-alpine to low alpine in tussock and open shrubland, often in open bare areas within these vegetation types. It is a small erect annual herb with semi-fleshy, hairy leaves that are tipped by finger like teeth. The flowers are bright yellow and are borne at the tips of the leafy branches. The immature fruit are green and flattened along one plane with rounded tips. Other *Euphrasia* species are semi-parasitic on grasses and other woody plants, but I couldn't find any information on this species, and whether it is parasitic.



Euphrasia cockayneana: (left) Flowering plant; (right) Close up of flowers. Photos: Rowan Hindmarsh-Walls, February 2019, Mt Turiwhate, Westland.

When in flower the species is easily distinguished from other native *Euphrasia* by its bright yellow flowers, as although some other species have yellow parts to the flowers, no other species has full yellow flowers. Without flowers the species is hard to separate from the other annual *Euphrasias*.

The species is endemic to New Zealand, and has a threat status of Not Threatened, as it has a limited distribution, but is quite common within its range. It doesn't appear to have many threats as most of its habitat has remained intact. Exotic weeds such as *Pilosella* could become threats in the future if they spread into the wetter mountainous regions, as they occupy the open areas needed for the species to germinate in each spring.

The genus *Euphrasia* is very large, with over 450 species scattered across the globe. So far only one exotic species, *Euphrasia nemorosa* has become well established in New Zealand.

The genus name *Euphrasia* is a greek word that translates to 'cheerful', or 'good cheer'. The species is named after Leonard Cockayne, one of New Zealand's great early botanists. The common name 'Eyebright' is a reference to some species in the genus being used in early medicine to cure eye infections.

You can view the NZPCN website factsheet for *Euphrasia cockayneana* at: http://www.nzpcn.org.nz/flora_details.aspx?ID=1875

In 2016, I began research to learn whether *H. armstrongii* recruitment failure is due to loss of native shrubland, competition with weeds or a lack of seeds. I measured the effect of shade cloth shelters (a proxy for native shrub cover), a one-off herbicide application or sowing seeds on *H. armstrongii* seedling establishment compared to untreated plots. The experiment was set up at Enys Scientific Reserve, Canterbury, in May 2016 in grassland areas dominated by hawkweeds and browntop. I counted the number of *H. armstrongii* seedlings and measured soil moisture in all plots every spring and autumn, with the most recent check in November 2018. I also germinated seeds at Otari Wilton's Bush, Wellington from the same batch as used in the field experiment.



Hebe armstrongii seedling establishment experiment at Enys Scientific Reserve, Canterbury.

Twenty-five percent of seeds sown in the nursery germinated, so seed viability does not appear to be an issue. Interestingly, I discovered that *H. armstrongii* can form a persistent seed bank—seeds sown in the field in May 2016 germinated in spring in both 2016 and 2017. *Hebe armstrongii* recruitment at Enys Reserve was limited by seed supply—I found seedlings only in plots with seeds added. This may be due to poor seed dispersal and/or low seed production. *Hebe* seeds have no specific structures that promote their dispersal by vectors such as wind, water or animals, although the seeds are light so more easily transported by wind. In addition, there are only 85 patchily distributed adult *H. armstrongii* plants producing seed (Nelson et al. 2018) in a c. 4 ha reserve. Consequently, seeds may fail to reach suitable recruitment sites.

Hebe armstrongii seedling recruitment was most successful where shade and shelter were provided. Seed germination and seedling establishment were significantly greater beneath shade cloth shelters than in untreated plots in the open. Killing weeds with herbicide had no effect on the number of *H. armstrongii* seedlings that established compared to untreated plots. Soil moisture was significantly higher under shade cloth shelters, and lower in plots sprayed with herbicide, than in untreated plots in the open. I will continue monitoring the experiment until autumn 2020 to measure survival and growth of seedlings that remain alive.

The historic destruction of native bog pine shrubland at Enys Scientific Reserve appears to be limiting present-day *H. armstrongii* seedling establishment, possibly due to reduced soil moisture in the open in this dryland ecosystem. Seed availability is also constraining *H. armstrongii* recruitment, due to poor seed dispersal and/or a scarcity of seeds. Hawkweeds and browntop do not appear to be limiting *H. armstrongii* recruitment.

Sowing *H. armstrongii* seeds in the shelter of remnant bog pine shrubland at Enys Scientific Reserve may promote seedling establishment, although available habitat is scarce. Restoration plantings to increase the extent of bog pine shrubland at Enys Scientific Reserve is likely to be the most effective measure to ensure the persistence of this population, by increasing the availability of suitable sites for

H. armstrongii seedlings to establish in. Additional considerations for the long-term persistence of *H. armstrongii*, both at Enys Reserve and as a species, are the potential consequences of the genetic bottleneck at Enys Reserve (when the population was reduced to only six plants), the vulnerability of this small reserve to random catastrophic events (such as fire) and the protection of the only other remaining population (Nelson et al. 2018).



Left: Early establishment of *Hebe armstrongii* seedlings in an experimental plot at Enys Scientific Reserve, Canterbury, November 2016. Centre, right: *Hebe armstrongii* seedlings in experimental plots at Enys Scientific Reserve, Canterbury, April 2018.

Acknowledgements

This research was conducted in collaboration with Danny Kimber, Department of Conservation. Thanks to Renny Bishop (Biological Sciences, University of Canterbury) for helping to construct the shade cloth shelters, Brian Molloy and Nick Head for advice, Rewi Elliot and Finn Michalak (Otari Wilton's Bush) for providing nursery facilities, and Ronny Groenteman for helping with fieldwork. This research was funded by the New Zealand Plant Conservation Network (David Given Scholarship), Brian Mason Trust, Wellington Botanical Society and JS Watson Trust.

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Moving House – A New Age for Plant Translocation and Restoration

a report from the ANPC conference 2018

Bec Stanley & Emma Bodley

We attended the 12th Australian Network for Plant Conservation Conference (ANPCC12) in Canberra in November 2018. The theme was ex-situ conservation, specifically translocations of plants. At the heart of this was a project sponsored by ANPC to review all known plant translocations over the past 30 years in Australia. This review was conducted by Laura Simonds and Jen Silcock and forms the basis of the Australian Plant Translocation Database. The database contains records of 1000 translocations of plants. It is an amazing effort to collate this data as most of these projects are poorly documented.

The conservation legislation in Australia permits offsetting the removal of wild populations of plants for developments. The result is a large-scale conservation experiment in plant translocation. Plenary speaker Dr Jennifer Silcock outlined that in 62 per cent of these translocations none or fewer plants survived than were needed to form a self-sustaining population. In the ones tentatively deemed successful, with more than 50 per cent of plants translocated surviving, only 13 per cent show signs of

recruitment. The researchers conclude that you cannot guarantee you can create a new population of plants through translocation and the approach remains largely experimental. They urge caution when specifying this as mitigation. In New Zealand we think we should pay attention to this work so we can learn and build on it. Dr Silcock's plenary talk can be read here http://anpc.asn.au/sites/default/files/Jen_Silcock_APCC12_presentation.pdf

We enjoyed hearing about several *Pomaderris* species projects (run out of the Wollongong Botanic Gardens and the Australian National Botanic Garden) because we work on this genus too. David Taylor (ANBG) outlined the importance of documentation and records in any ex-situ project based on his *Pomaderris* work. Their genetic work to support this is enviable because it is so informative. For example, they found some populations were entirely triploid (and so how does a sterile population reproduce?) http://anpc.asn.au/sites/default/files/David_Taylor_APCC12_presentation.pdf

Dr Margaret Byrne discussed eco-sourcing and thinking about how to capture adaptive variation and capacity for plasticity in traits in advance of climate change. You cannot escape talking about climate change on a trip to Australia's Botanic Gardens or any conservation project – it is foremost in their minds and a priority for planning at present. Conservation genetics as it relates to threatened plants and revegetation projects is also an active research area.

The conference was a fantastic opportunity to connect practitioners in Botanic Gardens, conservation agencies and communities. Bec gave a talk on the strengths of botanic gardens in conservation (namely high numbers of visitors to engage with the issue and our horticultural expertise in growing plants and keeping records). Emma presented our work at Auckland Botanic Gardens on myrtle rust (it was great to catch up with Bob Makinson who's written the myrtle rust strategy in Australia).

We went on a conference field trip to the Australian National Botanic Gardens for a garden tour and behind the scenes of their seed bank. It was great to see the inner workings of the seed bank and what a small seed bank can achieve in a shipping container!

The ANPC committee are keen to talk to the NZPCN about a joint conference at some time which we think would be a great idea. Bec was funded by the Botanic Gardens Australia New Zealand (BGANZ) and Emma by the Friends of Auckland Botanic Gardens.

Many of the talks are online: <http://anpc.asn.au/APCC12/presentations>

The latest revision (2018, 3rd edition) of the translocation guidelines can be purchased here: <http://www.anpc.asn.au/translocation>

Kauri Dieback disease consultation

Round three of consultation on the future protection of kauri is now open. This is a valuable opportunity to have a say in shaping that plan.

This round presents a final refreshed national strategy, a proposed National Pest Management Plan for Kauri Dieback Disease and two options for the national agency required to implement the plan and deliver on the strategy.

The pest management plan includes a set of proposed rules that could affect the way you access kauri forests, or require you to carry out actions to protect kauri if you have kauri forest on your land.

Biosecurity New Zealand (MPI) provides overall coordination of the Kauri Dieback Programme on behalf of the partners and wants your views on how workable you think the proposals are, and the impacts they might have on you and your community, iwi, business or group. They want to know if there are any major issues you believe they have missed, that could significantly affect the proposals.

Consultation runs from 18 February to 18 March 2019.

Find out more at: <https://www.kauridieback.co.nz/consultation/>

Seed Science Forum 2020 – Seeking the views of the seed science community

The Australian Seed Bank Partnership is pleased to announce that we will hold a Seed Science Forum in April 2020, hosted by the Australian National Botanic Gardens, Canberra, with partner organisations, the Australian Grains Genebank and the Australian Network for Plant Conservation (with more to be announced). The forum will be open to national and international seed scientists and seed practitioners from conservation, restoration, forestry, agricultural and research sectors.

The Australian Seed Bank Partnership's National Seed Science Forum was last held in 2016 at the Australian PlantBank, Australian Botanic Garden, Mt Annan. Following the 2016 forum we received overwhelming feedback that the seed science community would like to see the forum become a regular event. We are thrilled to be able to once again convene a forum with a strong focus on seed science and its applications.

We are seeking your input to assist us in developing a forum program that will be of greatest value to the diverse seed science community. Please feel free to forward this to your networks. The survey of seven questions will be open until 3 March 2019, and should take no more than five minutes to complete.

[Take the Survey here!](#)

If the above link doesn't work, copy the following address into your browser: <https://www.surveymonkey.com/r/LDSJDXC>

Taxonomy for Plant Conservation – Ruia mai i Rangiatea

24–28 November 2019, Wellington, New Zealand

The Australasian Systematic Botany Society and the New Zealand Plant Conservation Network are proud to announce our joint conference *Taxonomy for Plant Conservation – Ruia mai i Rangiatea* in November 2019. Attending this conference is a must do for anyone who is passionate about science and conservation of native plants in New Zealand and Australia.

This conference will be held at Wellington's premier venue, the Museum of New Zealand Te Papa Tongarewa.

- Get up to date with our stimulating and comprehensive range of speaker presentations
- Explore Wellington's forests and rugged coastlines on our field trips
- Network with people involved in a wide variety of plant conservation work
- Discuss and learn about a range of issues at our workshops
- There will be opportunities to tour the Te Papa herbarium and Otari Native Botanic Gardens

Our programme in brief

Sunday 24 November

- Workshops at various locations; welcome reception at Te Papa; after-hours access to new Taiao-Nature exhibition

Monday 25 November

- First day of presentations; public lecture in the evening

Tuesday 26 November

- Second day of talks; conference dinner in the evening on Te Marae at Te Papa

Wednesday 27 November

- Field trips at various locations

Thursday 28 November

- Final day of talks; conference closes; public lecture in the evening

A more detailed programme, calls for abstracts and registration fees will be available in early 2019.

About the Australasian Systematic Botany Society

Our 2019 conference will be in partnership with the Australasian Systematic Botany Society (ASBS). With over 300 members, the ASBS is an incorporated association of people with professional and amateur interests in Australasian systematic botany. The aim of the Society is to promote the study of plant systematics in Australasia.

Plant systematics includes taxonomy and nomenclature, and is the science that unravels the relationships and evolutionary history of the flora. It provides the framework for all comparative biology and is essential for the identification and conservation of threatened species, the management of native vegetation, and the detection of naturalised species.

Conference Sponsorship

Participating as a sponsor at the conference will lead you to a range of people involved in plant conservation, taxonomy and related fields and demonstrate your level of support and commitment to native plant conservation. Our 2019 ASBS-NZPCN joint conference has several sponsorship packages available, providing sponsors with a choice of exposure related to financial commitment.

The 2019 ASBS-NZPCN joint conference can provide your organisation with:

- Exposure at a premier conference devoted to leaders in plant conservation work and scientific research.
- Time to network with industry colleagues and key decision makers.
- A cost effective way to reinforce your organisation's brand to a relevant audience.
- Access to a broad network of potential partners from the public and private sectors.
- Marketing opportunities including online visibility and associated conference material.

We therefore invite you to discuss with us options available to tailor-make a sponsorship package that best suits your organisation.

Conference contacts and information

- Key conference organisers: Rewi Elliot (NZPCN) and Heidi Meudt (ASBS).
- To contact the conference organisers, email: plants2019nz@gmail.com
- Updates: follow us on our Facebook page: [ASBS NZPCN Wellington 2019](#)
- Conference website: https://systematics.ourplants.org/asbs_2019/

UPCOMING EVENTS

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

Auckland Botanical Society

AGM and Meeting: Wednesday 6 March – Speaker Rachel Nepia.

Topic: The role and impact of honey bees in NZ indigenous sub montane forest.

Field Trip: Sunday (not Saturday) 17 March to Dunn's Bush, Puhoi. **Leader:** Janeen Collings;

Meet: At the stockyard carpark entrance to Dunn's Bush. **Bring:** Very clean boots. ph. 022 410 5471.

Lucy Cranwell Lecture: Wednesday 3 April at 7.00pm in the Auckland Museum Auditorium – Speaker David J. Mabberley on 'Sir Joseph Banks and his *Florilegium*'.

Rotorua Botanical Society

Field Trip: Saturday 2 March to Mamaku Wetlands. Explore some of the *Machaerina*, manuka, *Gleichenia* wetlands on the Mamaku Plateau and look for orchids in flower. **Meet:** 9.00am at the Convention Centre carpark, Fenton Street, Rotorua. **Grade:** Easy.

Leader: Sarah Beadel, email: sarah.beadel@wildlands.co.nz; ph: 07 345 5912 or 021 924 476 (mob).

Whanganui Museum Botanical Group

Meeting: Tuesday 19 March at 7.30pm in the Whanganui Museum Davis Lecture Theatre – Speaker Dr Alistair Robertson. **Topic:** NZ animal/plant interdependencies.

Field Trip: Sunday 10 March to Koitiata (Turakina Beach). **Meet:** 8.30am outside the Police Station in Bell Street for car pooling or at the Koitiata Domain at 9.00am. **Bring:** Closed footwear, sun protection, drink, lunch, hand lens and binoculars.

Leader: Laurel Stowell.
Transport co-ordinator: Colin Ogle, email: robcol.ogle@xtra.co.nz; ph: 06 347 8547.

Wellington Botanical Society

Field Trip: Saturday 2 March to Steenkamp property, Long Gully. **Meet:** 9.00am at Brooklyn Turbine carpark.

Leaders: Chris Horne, ph: 04 475 7025 or 027 474 9300; Jon Terry; ph: 04 971 1631 or 021 168 1176.

Meeting: Monday 18 March at 7.30pm for two presentations – 1. Greater Wellington Regional Council's key native ecosystems, wetlands and riparian programmes by Richard Romjin and 2. Wellington Regional Indigenous Biodiversity Strategy Process by Joshua McLennan-Deans.

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

Field Trip: Saturday 6 April for Wellington Botanic Gardens Bioblitz. **Meet:** 9.00am at the Treehouse main entrance or the Cable Car Kelburn terminus.

Leader: Eleanor Burton, email: esmeraldadoris93@gmail.com or ph: 04 479 0497.

Nelson Botanical Society

Field Trip: Sunday 17 March for Lake Rotorua waterfall walk in Nelson Lakes National Park. **Meet:** 8.00am at Cathedral steps. Please contact Penny by Friday 15 March if intending to participate.

Leader: Penny Palmer, email: stevepenny@xtra.co.nz or ph: 03 539 1329 or 027 535 6441.

Canterbury Botanical Society

Meeting: Monday 4 March at 7.30pm for a presentation by Dr Pieter Pelsler from the University of Canterbury. **Topic:** New research on herbaceous *Brachyglottis* leads to one species.

Venue: Upper Riccarton Library, 71 Main South Road.

Botanical Society of Otago

Meeting: Wednesday 13 March at 5.20pm for a presentation by Rod Morris and trustees of the Otago Peninsula Biodiversity Group. **Topic:** The vision of a pest-free peninsula.

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

Field Trip: Saturday 16 March to the Otago Peninsula. **Meet:** 9.00am at the Botany Department carpark. **Barbecue:** at 189 Centre Road for all participants following the field trip. Alternative date Sunday 17 March if postponed due to weather conditions.

Contact: David Lyttle, email: djl1yttle@gmail.com; ph: 03 454 5470.
