TRILEPIDEA

Newsletter of the New Zealand Plant Conservation Network

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Deadline for next issue:
Monday 14 October 2013

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**

Postal address:
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Wellington 6242,
NEW ZEALAND

PLANT OF THE MONTH, p. 2

Hebe benthamii

President's message

Several important announcements and articles are presented in this newsletter. First, the AGM on 6 November; we look forward to seeing you there; and secondly, we repeat the call for nominations for our awards, which will be presented at the AGM. Please forward these to Melissa Hutchison, our awards convener. Congratulations to John Braggins for the 2013 Alan Mere Award, and to Nicholas Head for winning the Loder Cup; two very worthy recipients who have contributed enormously to plant conservation in New Zealand.

Ostriches browsing on shrubs beside the Atlantic Ocean, near the Cape of Good Hope.

I was recently lucky enough to travel to South Africa—a visit planned quickly to support our son who was selected to compete at the World Mountain Bike Championships. We visited several areas, including Table Mountain and Cape of Good Hope, and were completely blown away by the enormous diversity and colours of the South African flora (and fauna). There are *c.*33,000 vascular plant species in South Africa and almost 9,000 species in the Cape Floristic Region, two-thirds of which are found nowhere else in the world; this compares with *c.*2,580 for New Zealand, which is also considered to be a biodiversity hotspot. We saw too much to describe here, but, watching ostriches browse low-growing shrubs beside the Atlantic Ocean reminded me vividly of those reconstructions of moa browse, seeing natural areas reminiscent of exotic coastal gardens in New Zealand, with species such as pigsear (*Cotyledon orbiculata*), gazania, dimorphotheca, geranium (*Pelargonium* spp.), protea, *Leucadendron*; exploring the extensive Fynbos[1] vegetation associations, and observing many of our weeds in their natural environments, including climbing asparagus

Dimorphotheca at Postberg Nature Reserve, north of Cape Town.

1 Fynbos is an evergreen hard-leafed shrubland occurring on nutrient-poor soils.

PLANT OF THE MONTH – *HEBE BENTHAMII*

Hebe benthamii. Photos: (left) John Barkla, (right) Barry Hartley.

Plant of the month for September is *Hebe benthamii*, a Hebe named in honour of George Bentham (1800–1884). Bentham is considered one of the great botanists of the nineteenth century, known famously, among other endeavours, for the early taxonomic system known as the Bentham and Hooker system.

Hebe benthamii is naturally uncommon, being restricted in its natural range to the Auckland and Campbell Islands. It is usually found growing in peat amongst grasses, tussocks and shield fern and sometimes grows around boulder and rocky outcrops. It forms a bushy spreading shrub up to 1 x 1 m, with striking violet-blue flowers appearing terminally in spring and summer. It is easily distinguished from other *Hebe* by the often toothed leaves, densely fringed by white hairs, terminal inflorescence leaf-like bracts and its impressive blue flowers.

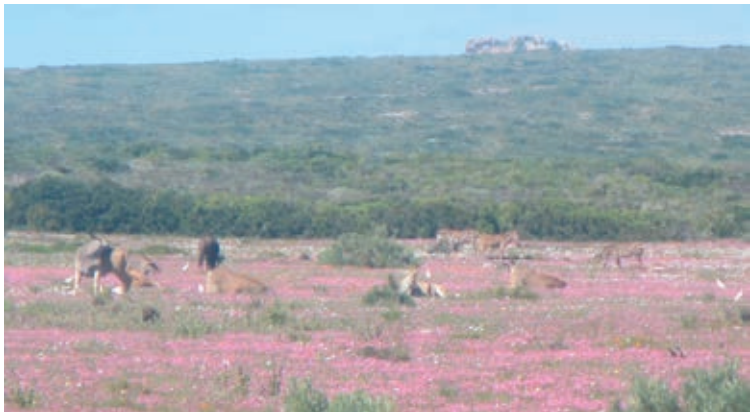
You can see the Network fact sheet for *Hebe benthamii* at:
http://www.nzpcn.org.nz/flora_details.aspx?ID=519

(*Asparagus asparagoides*), boneseed (*Chrysanthemoides monilifera*), and arum lily (*Zantedeschia aethiopica*) are just some initial impressions.

I look forward to seeing many of our Wellington members at the AGM on 6 November (see information below). More information on the AGM will follow later in October.

Happy botanising out there.

Sarah Beadel
Wildland



Mountain zebra, cattle egrets, and eland amongst the flowers, Postberg Nature Reserve.

New Zealand Plant Conservation Network Annual General Meeting

The Annual General Meeting will be held on Wednesday 6 November at 5.30 p.m. at Wellington City Council, Committee Room 1, Ground Floor, 101 Wakefield St, Wellington. All members are welcome but we especially ask Wellington area members to make a determined effort to attend. Details of the full programme will be circulated later.

Department of Conservation botanist, Nick Head awarded the Loder Cup

Conservation Minister, Dr Nick Smith, last week presented the country's most prestigious conservation award, the Loder Cup, to Christchurch botanist Nicholas Head. "Nick Head is a very deserving winner of the country's oldest conservation award. He has been a tireless advocate for Canterbury's unique plant life, both through his professional work with the Department of Conservation and as a volunteer and advocate for numerous trusts and organisations," Dr Smith says.

Christchurch botanist Nicholas Head and Conservation Minister Dr Nick Smith.

Nick Head—hard at work.
Photo: Helen Kettles.

"His contribution has included extensive work in plant identification, guided field trips, public talks and advocacy for conservation before councils and the Environment Court. A particular benefactor of his work has been the unique plant life of the limestone areas of South Canterbury and the spectacular Mackenzie Basin."

Mr Head was nominated by the Canterbury Aoraki Conservation Board, with supporting letters from Forest and Bird, Environment Canterbury, DOC, Landcare Research, and the QEII National Trust.

The Loder Cup was donated by Gerald Loder in 1926 to encourage and honour New Zealanders who work to investigate, promote, retain, and cherish New Zealand's indigenous flora.

John Braggins—noted New Zealand hepaticologist awarded 2013 Allan Mere

Dr John Braggins, hepaticologist, Auckland, has been awarded the 2013 New Zealand Botanical Society Allan Mere. The Allan Mere is New Zealand's premier botanical award given only to those botanists who have made outstanding and dedicated long-term contributions to the field of botany in this country. The award, a pounamu (nephrite) mere, was initiated by the late Dr Lucy Moore as an internal award for staff of the former DSIR Botany Division (now part of Landcare Research). With the demise of Botany Division, the award was taken over in 1999 by the New Zealand Botanical Society at the instigation of the late Dr Peter Wardle.

The nomination of Dr John Braggins by Prof. Peter de Lange (Department of Conservation) and Assoc. Prof. Brian Murray (retired, formerly University of Auckland) was supported by three botanical societies, a host of John's former students, colleagues and research associates and significantly the New Zealand Plant Conservation Network whose website is augmented by numerous high quality images of vascular plants and liverworts supplied by John.

Amongst John's many notable achievements has been his M.Sc. research on the New Zealand fern genus *Botrychium*, PhD on New Zealand species of *Pteris*, and 30 years as a senior lecturer at the University of Auckland. During the early stages of his career, he developed a fondness for bryophytes, in particular hornworts and liverworts, which at that time were scarcely known to New Zealand people. John fostered a working relationship with the late Dr Ruddy Schuster (USA) and, later, one of Ruddy's students Dr John Engel (USA, Field Museum), assisting them with their field work here and providing considerable help with specimens, images and other support when both were engaged in preparing a New Zealand Liverwort Flora. That project, now steered by Dr Engel and assisted by New Zealand hepaticologist Dr David Glenny, is still assisted by John Braggins who

has provided many images for the flora, which is due to come out as three volumes (volume one is already published).

John has also played a key role in the conservation of New Zealand bryophytes initiating as early as 1991 a listing of hornworts and liverworts requiring conservation management attention. In New Zealand botany, John has helped describe nine liverworts (*Anastrophyllum papillosum* J.J. Engel et Braggins, *Chiloscyphus mediinfrons* J.J. Engel & Braggins, *Frullania colliculosa* von Konrat, Braggins, Hentschel et Heinrichs, *Frullania hodgsoniae* von Konrat, Braggins, Hentschel et Heinrichs, *Frullania truncatistyla* von Konrat, Hentschel, Heinrichs et Braggins, *Frullania wairua* von Konrat et Braggins, *Radula cordiloba* subsp. *erigens* M.A.M. Renner et Braggins, *Riccardia furtiva* E.A. Brown et Braggins, *Zoopsis nitida* Glenny, Braggins et R.M. Schust.) and had the singular, endemic liverwort genus and species *Bragginsella anomala*—'the anomalous little Braggins' named after him.

It's good to see formal recognition of John's long-time research and advocating for what are is easily one of New Zealand's more neglected plant groups honoured in this way.

Major updates to Network website

In the last month, there have been some significant new developments on the Network's flora website (see www.nzpcn.org.nz). They include:

Conservation status – the new threat status of all indigenous vascular plants have now been added from the Department of Conservation's new list published in September 2013 (see story p. 9). The past status is still shown on the species page so you can see how the status has changed over time.

Plant distribution data – thanks to collaboration with Landcare Research, the Network has loaded all the National Vegetation Survey data (1.2 million records) onto the website. The Network website now has 2.5 million plant observations (searchable by species or site). For more information about the NVS database go to: https://nvs.landcareresearch.co.nz/

Search filters (see image) – a series of new search filters has been built on the website such as searching by "district" (e.g., Auckland), "structural class" (e.g., fern), "status" (e.g., Nationally Endangered), "flower colour" (e.g., red). These filters narrow down the results and can help with plant identification or with creating summary statistics about your local flora. Please let us know if you see errors in plant distribution.

And, coming soon:

Native tree and shrub smart phone app – Need a reason to buy a smart phone? Currently being built and planned for launch in the near future is the Plant Conservation Network's Native Tree and Shrub app for smart phones. This project is being done in partnership with the Department of Conservation and the Nelson Marlborough Institute of Technology (NMIT). The app will include photos and information and an identification key for all 630 species of native tree and shrub. Download it to your phone and you will have the entire native tree and shrub flora in your pocket. If you have a smart phone and you are keen to test the app before it is launched please contact us at: info@nzpcn.org.nz

New *Lepidium* from New Zealand

P.J. de Lange, P.B. Heenan, G.J. Houliston, J.R. Rolfe, A.D. Mitchell

Lepidium oleraceum s.s. Photo: Cynthia Roberts.

A revision of the Cook's scurvy grass (*Lepidium oleraceum*) complex has now been published as a special issue of the open access journal *Phytokeys* (de Lange et al., 2013a—follow link below and you can download all 147 pages free!). The paper completes a revision that started 17 years ago following the chance rediscovery of 'Cook's scurvy grass' at Kaiangaroa Point, Rekohu (Chatham Island). In *Threatened Plants of New Zealand* (de Lange et al., 2010) and again in *Trilepidea* (de Lange, 2010) some of the new species now recognised were illustrated and briefly described under *L. oleraceum*. The *Phytokeys* paper describes 11 new species, 10 segregated from *L. oleraceum* and one from *L. obtusatum*, and offers new descriptions for *L. banksii*, *L. flexicaule*, *L. obtusatum*, *L. oleraceum* and *L. naufragorum*.

The basis for the revision was twofold: i) to provide a reliable classification that reflected natural patterns of genetic and morphological variation; ii) to provide taxonomic and other biological information that was crucial for conservation management. It had long been recognised that the circumscription of *L. oleraceum* offered by past authors, e.g., Kirk (1899), Cheeseman (1906, 1925) and Allan (1961) encompassed a remarkable range of morphological diversity. However, some authors, such as Given (1981), felt that a modern revision of this variation was probably impossible as there had been so much regional extinction of the variation within the species.

The New Zealand Department of Conservation when faced with the task of managing *Lepidium oleraceum* realized that further research was needed, because, as then recognised, the species ranged from the Kermadec Islands to the Auckland Islands (Norton & de Lange 1999). Faced with such a wide geographic range and taxonomic uncertainty, what were they to do? One management option being touted was that *L. oleraceum* had the best chance for conservation success if the populations on the Otago Peninsula were exclusively managed. These had been identified as the most accessible, were of good size and health, and past management effort there had been successful.

However, the recovery team had concerns. The members felt that such an action may result in the loss of critical morphological and genetic variation throughout the species' range. Further, they believed that there was sufficient evidence already to suggest that *L. oleraceum* was not the one 'variable' species but rather a species complex in dire need of revision. If this issue were not explored further, then we may very well have signed the death sentence for a range of variation that probably merited formal taxonomic recognition.

Accordingly, the late Phil Knightbridge pushed for funding to support a modern taxonomic revision. The *Phytokeys* paper fulfills his wishes. His efforts resulted in a successful bid to the Department of Conservation's Conservation Management Units fund. The work was then further expanded via collaboration with the Landcare Research Conservation Genetics and Systematic groups. The revision stemming from the combination of these funding sources was completed in 2012 after a thorough study examining all of the type specimens of each species along with the variation within *L. oleraceum* spanning the entire known range of the species. To do this, where possible, plants from throughout the range of *Lepidium oleraceum* were cultivated for many years and a range of DNA

markers used on multiple specimens to investigate the phylogeny of the complex. By that time, it was already known that there were potentially distinct races present on the Chatham, Antipodes, Snares and Auckland islands (see de Lange, 2010). Though DNA sequence data confirmed these, the wider sampling also recognised that plants long attributed to *Lepidium oleraceum* from the southern Kermadec Islands, Banks Peninsula, Otago coast, and Stewart and Bounty islands were also distinct.

Had the Department of Conservation managed *L. oleraceum* without considering the morphological and genetic data, then in the Otago area they would have been managing two new species (*L. crassum* and *L. juvencum*) rather than 'securing' *L. oleraceum* from extinction. There was also a real risk that genuine *L. oleraceum* would not have been managed at all! The new revision thankfully averted this and, with the recognition of 11 new species, offers more confidence for the Department to make more informed management decisions than would otherwise have been the case. The work also highlights the obvious but often overlooked importance of properly addressing taxonomic issues before making conservation management assumptions.

In addition to naming 11 new species of coastal cress, the *Phytokeys* paper reaffirmed *Lepidium banksii*, and offers new descriptions for *L. flexicaule*, *L. obtusatum* and *L. oleraceum*—the latter necessarily so because 10 species have been split from it. It also resolves the ambiguity behind the names *L. oleraceum* var. *acutidentatum*, var. *frondosum* and var. *serrulatum*. The most recent conservation status (see de Lange et al., 2013b) for each species is also given

New Species

Lepidium aegrum.
Photo: Gary Houliston.

Lepidium aegrum

This species, a new addition to the endemic vascular flora of Banks Peninsula, is known from only one wild population on a small rock stack. Unfortunately, the sole known population is infected by turnip mosaic virus (Fletcher et al., 2009). The species has been translocated to two other sites on Banks Peninsula and also to Motunau Island.

Conservation Status: 'Threatened/Nationally Critical CD, DP, OL'

Lepidium amissum

This species is extinct. The last known collection was made in 1917. With its formal recognition, the peculiar disjunct distribution of *Lepidium obtusatum* (also extinct) is now resolved. *Lepidium obtusatum* is now redefined as a Wellington endemic. *Lepidium amissum* is endemic to the Waitakere coastline. Its recognition adds a second species to the list of endemic vascular plants for the Waitakere Ranges (the other is *Hebe bishopiana*).

Conservation Status: 'Extinct'

Lepidium castellanum.
Photo: John Barkla.

Lepidium castellanum

A new endemic for the Kermadec Islands, which now has 22 endemic vascular plants. Previously, this species had been confused with *Lepidium oleraceum* var. *frondosum*, a variety now treated as part of the natural variation within *L. oleraceum*. *Lepidium castellanum* is known only from the Southern Kermadec Islands Group where it has been recorded from Haszard Islet and Macauley, Curtis and Cheeseman islands. On some of these islands, it is sympatric with *L. oleraceum*.

Conservation Status: 'Threatened/Nationally Critical CD, DP, IE, RR'

Lepidium crassum.
Photo: Peter Heenan.

Lepidium crassum

A south-eastern South Island endemic. This new species once ranged from the upper Waitaki Valley and Oamaru south to the Catlins Coast. It is now mostly found on the Otago Peninsula. This is the species found on the Aramoana Mole, an artificial structure which is the species type locality. As the species epithet implies it has very thick, fleshy leaves.

Conservation Status: 'Threatened/Nationally Endangered CD, DP, EF, RR'

Lepidium juvencum.
Photo: Peter Heenan.

Lepidium juvencum

Historical collections suggest that this new species was once more wide ranging. However, today it is known with certainty from only one wild site just north of Dunedin and from a few locations on the north-eastern Titi Islands off Stewart Island. This species may also occur on the south-western Titi Islands. Uncertainty about the identity of these plants stems from the poor condition of the herbarium material (mostly collected in the 1960s), but they are probably this species. On those islands it has been collected growing sympatrically with *L. limenophylax*.

Conservation Status: 'Threatened/Nationally Critical CD, DP, RR'

Lepidium limenophylax.
Photo: Sue Lake.

Lepidium limenophylax

This very distinctive species is mostly known from the Snares. However, it has been collected once from the Auckland Islands (where it probably still exists), and from the south-western Titi Islands. DNA sequence data revealed that this is the most distinctive species of the *L. oleraceum* complex. The ecology and conservation of the species was described in some detail by Lake (2011).

Conservation Status: 'Threatened/Nationally Critical CD, DP, RR'

Lepidium oblitum.
Photo: Graeme Taylor.

Lepidium oblitum

One of three new species endemic to the Chatham Islands, *L. oblitum* was discovered by cultivating plants *Lepidium* plants from Mangere Island that were originally thought to be *L. panniforme*, but were later considered to be either hybrids between *L. panniforme* and *L. oleraceum* or a new species. DNA sequence and fingerprint data confirmed that these plants were not hybrids and, on further investigation of live plants and herbarium material, its distinctiveness was confirmed. Although the more common of the three species recorded from Mangere Island, this species is threatened there by the reforestation of that island and possibly through introgression with *L. panniforme*. It is also known from nearby Rabbit Island.

Conservation Status: 'Threatened/Nationally Critical CD, DP, IE, RR'

Lepidium oligodontum.
Photo: Peter de Lange.

Lepidium oligodontum

This species is endemic to the Chatham and Antipodes Islands. It is a prostrate species with variable leaf dentition and stamen number. On the Chatham Islands, it is virtually confined to the outer islands, islets and rock stacks where intact, functional examples of the ornithocoprophilous ecosystem survive. It appears to have a much localised distribution on the Antipodes Islands. This species is vulnerable to white rust (*Albugo candida*) infections, which, in cultivation, will kill plants.

Conservation Status: 'Threatened/Nationally Vulnerable DP, EF, RR'

Lepidium panniforme.
Photo: Peter de Lange.

Lepidium panniforme

This species is known only from Mangere and Little Mangere Islands. It has a shrubby growth habit, with deeply divided, lacerate leaves. DNA sequence data suggest that this species and *L. oblitum* (see above) are sister to the extinct *L. obtusatum*. *Lepidium panniforme* is known only from a few mostly track side populations on Mangere Island, where it is vulnerable to track maintenance. It may also be threatened by loss of the open habitat it needs since that island is being reforested. Introgression between it and *L. oblitum* is possibly occurring.

Conservation Status: 'Threatened/Nationally Critical CD, DP, IE, OL'

Lepidium rekohuense.
Photo: Peter de Lange.

Lepidium rekohuense

This, another prostrate species, is New Zealand's largest and probably longest-lived species. Healthy specimens may reach 2 m diameter and one plant is known to be at least 17 years old. It is endemic to the Chatham Islands where it has been found at two sites on Rekohu, on the Forty Fours (Motuhara) and Rabbit Island. The species is being effectively managed at Kaiangaroa Point, Rekohu.

Conservation Status: 'Threatened/Nationally Critical CD, IE, RR'

Lepidium seditiosum.
Photo: Jacinda Amey.

Lepidium seditiosum

Known only from the type collection. This is not only the first vascular plant to be reported from the Bounty Islands (Amey et al., 2007) but also the first endemic terrestrial plant to be described for that island group. Although the type material lacks mature fruits, the deeply divided leaves and circumferentially hairy inflorescences are unique. Morphologically, it seems closest to *L. panniforme* but DNA sequence data place it within a polytomy including the South Island endemics *L. aegrum*, *L. crassum* and *L. juvencum*. These are species that it scarcely resembles morphologically.

Conservation Status: 'Threatened/Nationally Critical CD, DP, IE, OL'

Lepidium oleraceum.
Photo: Cynthia Roberts.

Lepidium oleraceum

With formal recognition of these new species *Lepidium oleraceum* now has a much narrower range. As recircumscribed, *L. oleraceum* is now known only from the Kermadec, Three Kings, North and northern South Islands, and from Mangere Island in the Chatham Islands group. In the South Island, it is virtually restricted to the Marlborough Sounds though a few populations also occur near Whararíki Beach, Puponga, North-West Nelson.

Conservation Status: 'Threatened/Nationally Critical CD, DP, EF, RR, Sp'

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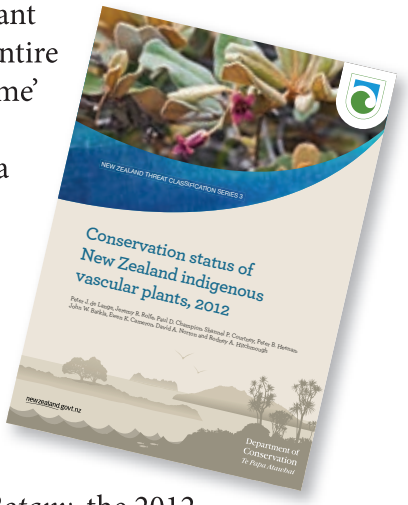
Tenth indigenous New Zealand vascular plant threat listing assessment published

Peter J. de Lange, New Zealand Indigenous Vascular Plant Threat Listing Panel Chair, Science and Capability Group, Department of Conservation, Private Bag 68908, Newton, Auckland 1145, New Zealand

The May 2012 threat assessment of the New Zealand Indigenous Vascular Plant flora is now published (see de Lange et al., 2013). The list, which covers the entire indigenous vascular plant flora, including 166 informally recognised, 'tag name' entities, is now available at www.doc.govt.nz/publications/conservation/nz-threat-classification-system/nz-threat-classfication-system-lists-2012-14/ as a free downloadable PDF.



The listing was undertaken by a panel of experts appointed by the New Zealand Department of Conservation and the *New Zealand Botanical Society*. The panel had a wide representation of experts from Crown Research Institutes (NIWA, Landcare Research), museums, universities and the Department of Conservation.

In a departure from previous threat assessments, which have been published through the peer-reviewed scientific periodical the *New Zealand Journal of Botany*, the 2012 listing has been published in a new series set up by the Department of Conservation, the '*New Zealand Threat Classification Series*'. These publications are also peer-reviewed. The series was set up

as a deliberate measure to ensure that any person, anywhere in New Zealand or the world was able to obtain free of charge the threat listings for all of New Zealand's biota.

The current plant listing, which is the tenth to be published for the New Zealand flora continues a process pioneered by the late David Given in 1976. Given was arguably the first New Zealander to draw to world attention the plight of our native flora. Since Given's first listing, eight native plants have now been listed as extinct, a figure that includes plants like *Logania depressa* that was seemingly simultaneously discovered, and wiped out, by missionary botanist William Colenso in the early 1840s. The most recent addition to that list is the newly described scurvy grass (*Lepidium amissum*), which actually went extinct in 1917 but was only recognised as a distinct species in 2013.

Though the current list of extinct flowering plants involves taxa whose loss happened before, or around, 1954, it's clear that we are potentially facing a new wave of plant extinctions. These will be extinctions that can no longer be swept away using the excuse of historical ignorance as our justification. Indeed it may surprise New Zealanders to learn that even such iconic taonga as the red-flowered kakabeak are still facing imminent extinction. Of the two species, one, the eastern North Island *C. maximus*, now exists with a national population of c. 120 individuals; the other, the Northland endemic *C. puniceus*, is still known from only one wild plant.

Indeed, since the last listing was prepared in 2008, there has been an increase of 46 plants in the category 'Threatened', bringing the total number of plants facing a high risk of extinction to 289 (12% of our known flora). This is an alarming trend, which reflects a wide range of threats to our native plants that include not only the familiar 'loss of habitat', 'predation from introduced animals', 'competition from weeds', and 'changing land use practices', but also the spread of plant diseases, including exotic viruses, which are increasingly being found in our indigenous flora. In the case of viruses it's not yet clear whether this is a new trend or simply that we are seeing part of a process that has been going on for a long time, but which we are only now just beginning to research and so detect.

However, a big factor in the increase of threatened plants has also been, ironically, better science. It is estimated that 20% of our vascular flora still requires formal description. As those scientists concerned with the naming of our native plants and animals review our biota, many new species are being discovered, or often as not 'rediscovered' and, not surprisingly, many of these are threatened or, if not, are extremely uncommon. For plants, a prime example is the June 2013 publication in the international journal *PhytoKeys* of a revision of Cook's scurvy grass (*Lepidium oleraceum*), where 10 new species were segregated from Cook's scurvy grass. All of these species are seriously threatened. For New Zealand, this situation is not that unusual and, indeed, more threat listings (and possibly a few extinctions) are anticipated when on-going revisions on *Craspedia*, *Cardamine* and *Euphrasia*, two of which are due for completion in 2014, are published. Nevertheless, though it increases the proportion of threatened plants in our flora, the process is encouraging in that it shows that the full extent of our indigenous biodiversity is finally beginning to be recognised. This is critical if we, as a nation are to make sensible decisions about managing our flora and fauna.

Threat listing is a critical pathway toward ensuring we have a better understanding of our country's conservation issues. The routine listings are used by many different walks of life, such as researchers, students and organisations to help determine conservation priorities and to establish more effective networks toward preventing further erosion of New Zealand's biodiversity. It is salutary lesson that with the publication of each plant threat listing there has been corresponding increases in the number of people empowered by that process who want to help, and who go out there and look. This is to be applauded, particularly as threat listing is only as good as the data that flow in to support it.

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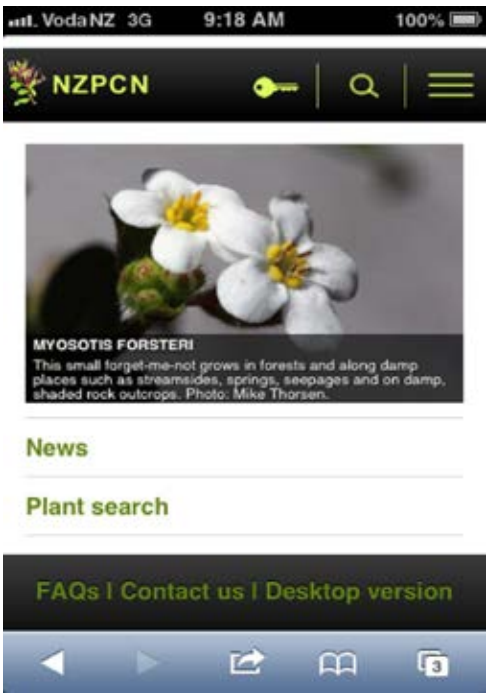
New Zealand's plant life goes mobile



You can now have the whole flora literally in your hands as the Plant Conservation Network's website has been redesigned and optimised for smart phones of all types.

Anyone accessing the Network's website from a smart phone will be automatically redirected to this new version of the site. This will enable users to access plant information on the go, in the field (provided you have internet or phone coverage), to ask questions to the Forum, to record plant observations or to view the image library and details for more than 7500 plant species.

Sponsorship for this work came from Auckland Council's Environmental Initiatives Fund for which the Network is most grateful.

The new version of the website can be viewed here: http://m.nzpcn.org.nz

Kauri faces uncertain future with no word from Government on future funding

That the future of wild New Zealand kauri is uncertain is the only conclusion one can reach from an evening conversation about the species at Auckland Museum. Five excellent speakers (Councillor Sandra Coney, Professor Giles Hardy, Te Warena Taua, Dr Bruce Burns and Dr Nick Waipara) led a packed auditorium through the many issues facing kauri with a particular emphasis on kauri dieback. Though New Zealand is doing a reasonably good job, there is still much to do but with government funding about to finish in 2014 the future could be quite bleak for one of New Zealand's iconic plants.

Auckland Councillor Sandra Coney and Te Warena Taua

Sandra spoke about how colonisation led to demand for kauri and that it was kauri timber that built Auckland. "Kauri suburbs sucked ecosystems dry of the species" she said. Timber, shingles and prefabricated houses used kauri and the kauri industry was a major export earner. The advent of powered machinery increased the rate of deforestation and the industry was wasteful with whole crown sections left behind as well as offcuts. Sawdust led to forest fires and, by 1900, only 3000 ha of kauri remained. Sandra said that by the 1950s a campaign to protect the remaining remnants of kauri proved successful. Today, recovery, at places such as Piha, is now on the ridges and skylines. However, in 2006, the first sick trees were discovered as kauri dieback arrived on the scene. No tree appeared to be immune. Of greatest concern is that government funding finishes in 2014 and Sandra indicated that the Minister, Nathan Guy, has said "Nothing can be done to stop kauri dieback". Te Warena Taua added that "We need to save our kauri, if we don't then the rest will follow".

Dr Bruce Burns (Auckland University)

Bruce spoke about what makes kauri special – it is an extreme species and extremely important. Bruce said that kauri is from an ancient lineage, is biologically extreme and a foundation species creating highly diverse forests The ancestors of kauri were contemporaries of the dinosaurs and were once global but now are found only in the Southern Hemisphere. The plant family containing kauri includes monkey puzzle, Wollemi pine and Queensland kauri. New Zealand kauri is extremely big with specimens such as Tane Mahuta reaching 4.4 m diameter and 51 m tall (although much larger trees were once known, up to 6.4 m diameter). Kauri is the third largest conifer in the world.

Kauri is also extremely old with an average life expectancy of about 600 years (the oldest measured reached 1679 years). The ability of kauri to live for a long time helps understanding of climate and it

is important as a palaeo-historical archive. There is now a kauri chronology going back 3631 years and the species ring width patterns are particularly sensitive to El Nino events. Information on the past from kauri was recently used to revise the date of the Taupo eruption (at AD 232+/-5).

Kauri also has an extremely high biomass and productivity; it stores huge amounts of carbon. The basal area of kauri (i.e., the sum of tree cross sectional areas over 1 hectare) is generally twice as much as other forest tree species worldwide.

Kauri has extremely strange effects on soil. There is a huge accumulation of litter around trees and a slow decomposition rate. This creates deep organic soil that is acidic, with low available N, and very drought prone. Because of this unusual environment it creates around itself, kauri also supports a diverse array of species that occur only under kauri such as *Schizaea dichotoma*. There is also an extreme diversity of vascular plants in kauri forests compared with other New Zealand forests.

The tree is a forester's dream with a high volume of wood per tree, no tapering, self-shedding branches and excellent wood strength. Kauri was New Zealand's principal timber until the 1920s but could be the timber tree of the future because of its high silvicultural potential and fast growth rates on good sites.

Finally, Bruce pointed out that kauri is "a flagship species, awe inspiring and a major attraction. It creates sense of place and is a flagship for forest conservation".

Dr Nick Waipara (Auckland Council)

Nick spoke about the management of kauri dieback. He said kauri dieback is a causal disease agent of kauri and is a virulent primary kauri pathogen or "plant destroyer". The disease damages roots and destroys the symbiont that aids growth. It causes lesions at the base of the trunk and results in defoliation, yellowing, thinning, dead branches and stag heads. The disease spreads quite rapidly causing sudden tree collapse. Drought exacerbates this effect and kauri dieback infects all stages and ages of growth and spores can survive for 4 years.

Regional surveys have been undertaken since 2010. Currently, kauri dieback is not known from the Hunua Ranges. It is spread by moving soil (this could be done by humans, animals, deer, livestock and streams). The management priority is to contain, reduce and stop soil borne spread. Protecting healthy populations is the highest priority. Controlling and treating kauri dieback where it occurs is also needed. Finally, raising awareness is important because 68% of dying trees are within 50 m of a track or road.

Phytosanitary stations have been installed and it is imperative they are used; cleaning footwear is important. Prevention is better than cure so restricting access to areas of high health is needed although this does not necessarily stop vectors such as feral pigs (so pig control is needed).

Work is needed on planting and propagation of kauri without movement of plants inter-regionally. A system is needed to report sick or dead plants. Nursery hygiene is vital otherwise the disease could be spread by restoration groups. Finally, treatment trials are underway in Auckland.

Oly Hopwood uses a cleaning station to prevent the spread of kauri dieback.

Professor Giles Hardy (Murdoch University, Western Australia)

Giles spoke about dealing with *Phytophthora* from a Western Australian (WA) perspective. He said that New Zealand still has areas that can be protected and they should be the priority and managed to ensure kauri growing in areas free of *Phytophthora* species do not become diseased due to human activities. This

includes any activities that move infested soil such as bush walking, four-wheel driving, movement of infested nursery stock or machinery with *Phytophthora*-infested soil adhering to it. He also said that they now know how to clear areas of the pathogen to make them disease-free. If trees are going to die anyway, then why not try saving them with new techniques.

He said we should not underestimate the role of *Phytophthora* species in kauri and asked whether these species act synergistically. More worryingly, he asked whether kauri dieback is the only cause of decline. There are 123 species of *Phytophthora* worldwide, and an estimated 100-300 more are still to be discovered. *Phytophthora* species like to have sex, which can result in new diseases; therefore good hygiene is critical to ensure different *Phytophthora* species to not come in contact with each other! *Phytophthora multivora*, a newly described species with a wide host range, is also in New Zealand, especially in urban areas, and has been associated with declining kauri and he advised we should not underestimate it. Many species of *Phytophthora* are coming from nurseries but we do not yet know if they pose a threat. They could also predispose trees to other plant pathogens. Sourcing disease-free stock from nurseries is critical to ensure *Phytophthora* species are not spread into the environment.

Mapping is important to identify areas for protection; remote sensing tools such as digital multispectral imagery can be used to help detect disease. Dying plants known to be susceptible can be used as indicators to also help the mapping process and he recommended blazing trees to delineate disease fronts for forest users. A standardised signage system for indicating the presence of the pathogen should also be used.

In WA, dieback groups help to control the disease by injecting or spraying trees with phosphite. He said not to be hesitant about using phosphite because it protects susceptible plants against most *Phytophthora* species. So old iconic and young kauri trees can be kept alive by the application of phosphite; we are very lucky to have such an effective tool available to us. Gardeners, urban landscape managers and foresters can use phosphite as foliar applications or by injecting trees to stop shrubs and trees being killed by *Phytophthora*.

He concluded saying that there are many different ways that *Phytophthora* can survive – "It is a very plastic genus". Phosphite as a spray or injection has potential in the fight against *Phytophthora* in kauri and other plant species in New Zealand. Managing and informing people is key issue and teaching the unconverted is important to ensure the pathogen is not spread to areas of kauri forest that are currently free of the pathogen. The nursery industry, bushwalkers, and 4WD owners need *Phytophthora* information kits to help inform them how not to spread *Phytophthora* during their activities.

View the presentations

The presentations may be viewed at this link: http://aucklandconversations.e-cast.co.nz/auckland-conversations/details/58

In conclusion

It was proposed that a Kauri Dieback Symposium be held each year. Since this event, the date for the first symposium has now been set for Saturday 30 November. Details of the programme will be circulated at: www.kauridieback.co.nz. This is set to coincide with the Australasian Plant Pathology Society conference and EcoTas 13 (the joint conference of the New Zealand and Australian Ecological Societies) that are being hosted concurrently in Auckland 25-29 November.

NZ Plant Conservation Network awards: 2013

The prestigious New Zealand Plant Conservation Network Awards are now in their eighth year. We are now calling for nominations for the 2013 awards (see the nomination form attached at the back of the newsletter). The purpose of these awards is to acknowledge outstanding contributions to native plant conservation. The award categories are:

- **Individual** involved in plant conservation
- **Plant nursery** involved in plant conservation
- **School** plant conservation project
- **Community** plant conservation project
- **Local authority** protecting native plant life
- **Young Plant Conservationist of the Year** (under 18 years at 30 June 2013)

Information about the awards and nomination forms is available on the Network website: www.nzpcn.org.nz

We look forward to your nominations; you may make multiple nominations under different categories. Anyone is eligible to make nominations, not just Network members. The awards will be presented at the **Network Annual General Meeting** to be held in Wellington on **Wednesday 6 November 2013**. Nominations close on **Friday 4 October 2013.**

Another image milestone achieved on Network website

Melicytus lanceolatus at Belmont Regional Park. Photo: Jeremy Rolfe.

The NZPCN now has one of the largest online collections of plant images for any national flora in the world. The number of images on the site has reached 26,000 with images loaded recently from Bill Clarkson, Julia Brooke-White, Alice Shanks, Amy Whitehead, Colin Ogle, Sir Alan Mark, Anna Burrows, Nick Goldwater, John Barkla, Jane Gosden, Pat Enright, Jacinda Amey, Gary Houliston, Karen Baird, Nick Singers, Rebecca Stanley, Jon Terry, Simon Walls, Peter de Lange, Lisa Forester, Thomas Emmitt, Sue Lake, Jesse Bythell, Jane Gosden, Rowan Hindmarsh-Walls, Jeremy Rolfe, Peter Heenan, Mike Thorsen, Bridget Gibb, Marcia Dale and John Sawyer.

If you have images you would like us to add to the online collection, please email them to the Network (info@nzpcn.org.nz) or contact us to arrange to send a CD. Images that are accurately identified with a date and location are preferred.

Phyllocladus toatoa at Awakino Scenic Reserve. Photo: Bill Clarkson.

Land Management Officer (biosecurity focus)

Bay of Plenty Regional Council is looking for a Land Management Officer to work on biosecurity (pest plant) projects. Applications close 3.00 p.m. on Monday, 7 October 2013 and will be accepted online at www.boprc.govt.nz/jobs. Copies of the position description are available from our website www.boprc.govt.nz.

UPCOMING EVENTS

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

Conservation Incorporated – What's ahead for community-based conservation in New Zealand?

Yellow-eyed Penguin Trust: 25th anniversary national conference for citizen-based conservation organisations. Dunedin on 17–18 October 2013. The conference is entitled *Conservation Incorporated*. Its aim is to strengthen and diversify the community base for biodiversity conservation in New Zealand. The conference will be preceded on 16 October by applied workshops on fundraising, leadership and predator management. *Conservation Incorporated* will be a strongly applied conference, from which participants will leave better prepared for the future and more aware of their place in the broader conservation landscape. **Venue:** the newly refurbished Dunedin Centre, which is conveniently located in the Octagon in the central CBD.	**Website:** conference@yeptrust.org.nz for details about conference themes, workshops, events. Earlybird registrations opened on 1 June.

5th Global Botanic Gardens Congress

Dunedin: Sunday 20 – Friday 25 October, 2013.	**Information and to register:** www.5GBGC.com.

Auckland Botanical Society

Meeting: Wednesday 2 October at 7.30 p.m. for a talk by Teresa Lebel titled 'Intriguing interactions: Fungi-plants-insects and other mycophagists'. **Venue:** Unitec School of Health Sciences, Gate 4, Building 115, Room 2005.	**Contact:** Maureen Young (youngmaureen@xtra.co.nz).
Field trip: 11 to 15 October for the spring camp at Ahipara.	**Contact:** Mike Wilcox (mike.wilcox@xtra.co.nz).
Field trip: Saturday 12 October to Matheson's Bush, Mangawhai.	**Leader/contact:** Maureen Young (youngmaureen@xtra.co.nz).

Waikato Botanical Society

Field trip: 19 and 20 October to the Pikiariki Ecological Area for a weed control weekend. t of the Department of Conservation ecosystem prioritisation project. **Accommodation:** in the Firestation large dorm room with bunks and a large kitchen/living room. **Meet:** 9.00 a.m. at the Department of Conservation, Pureora. **Grade:** medium; bring protective clothing; DOC will supply the tools.	**Leader:** Thomas Emmitt, email: temmitt@doc.govt.nz, ph: 07 878 1055 (work) or 021 152 3030.

Rotorua Botanical Society

Field trip: 4–6 October for East Cape revisited #7. **Meet: t**he car park Rotorua at 7.30 a.m. or the ex Opotiki DOC office (cnr Elliot and St John Street) at 9.15 a.m. **Grade:** medium. **Cost:** $20 donation for accommodation for those staying Sat night.	**Leader:** Tim Senior, ph: 0800 368-288 extn 6010 or 07 315-7371, email: tim.senior@envbop.govt.nz
Field trip: Saturday 12 October to the Okareka mistletoe restoration project for a weed control/plant releasing work day. **Meet: c**nr Summit and Loop Roads, Okareka (lake end) at 8.45 a.m. **Grade:** medium-hard (activities suitable for all ages and abilities will be provided).	**Leader:** Paul Cashmore, ph: 07 348-4421 (hm), 07 349-7432 (wk), email: pcashmore@doc.govt.nz

Wanganui Museum

Meeting: Tuesday 1 October for a talk by Clive and Nicki Higgie on their Europe experiences. **Venue:** Museum's Davis lecture theatre.	**Contact:** Colin Ogle robcol.ogle@xtra.co.nz
Field trip: Sunday 2 November to Bushy Park for weeding. **Meet:** at the Police Station at 9.30 a.m.	**Leader:** Esther Williams. **Contact:** Colin Ogle robcol.ogle@xtra.co.nz

Wellington Botanical Society

Field trip: Saturday 5 October to the Ngauranga-Horokiwi coastal escarpment. **Meet:** at 9.00 a.m. at the bottom of Malvern Rd next to coffee caravan.	**Co-Leaders:** Frances Forsyth, ph: 04 384 8891 or 021 072 5210; and Gavin Dench, ph: 04 3879955 or 027 405 2987.
Meeting: Monday 21 October at 7.30 p.m. for a talk by Kerry Ford, botanist, Allan Herbarium, Landcare Research, titled 'Grasses in New Zealand'.	**Venue:** Lecture Theatre M101, Murphy Building ground floor, west side of Kelburn Parade.

Nelson Botanical Society

Field trip: Sunday 20 October to Inches' covenant, Wairoa River to weed around threatened species.	**Leader:** Shannel Courtney ph: 03 546 9922.
Field trip: 25-28 October for Labour Weekend camp to Shuckards' Taipare Bay.	**Leader:** Shannel Courtney, ph: 03 546 9922.

Canterbury Botanical Society

Meeting: Friday 4 October at 7.30 p.m. for a talk by Lynley Hayes on Bio control. To be confirmed**.**	**Contact:** Gillian Giller, ph: 03 313 5315, e-mail: ggillerma1@actrix.gen.nz.
Field trip: Saturday 12 October to Laidmore, Waipara. Meet: in the Belfast tavern car park at 8.00 a.m. to carpool (shared fuel costs) or outside the Amberley toilets at 8.45 a.m. **Leaders:** Miles Giller and Jean Tompkins (ECAN Biodiversity Officer).	**Contact:** Miles if you are coming, email: broadleaf@actrix.gen.nz, ph: 03 313 5315 so that you can be contacted if the trip is cancelled.
Field trip: 14-17 November for the annual Show Weekend Camp to 'Island Hills' station, inland from Culverden**. Cost:** $30/person/night.	**Bookings:** Gillian Giller, ph: 03 313 5315, email: ggillerma1@actrix.gen.nz.

University of Canterbury summer course: Practical Field Botany

Summer course: Practical Field Botany (BIOL305) is an intensive, short course designed to meet the need for training in the collection, preparation and identification of botanical specimens. **Venue:** Mountain Biological Field Station at Cass, Canterbury. **Dates:** 7–15 January 2014.	**Information:** Dr Pieter Pelser, email: pieter.pelser@canterbury.ac.nz, ph: 03 364 2987 ext 45605.

Otago Botanical Society

Field trip: Saturday 5 October to the Johnson's Garden and Styles Creek Bush, Broad Bay. **Meet:** at 9.30 a.m. at the Botany Department car park or 10.00 a.m. at 5 Matariki Street, Broad Bay.	**Contact:** Robyn Bridges, ph: 03 472 7330, email: robyn.bridges@otago.ac.nz
Meeting: Wednesday 16 October at 5.20 p.m. for talks by Botany Department Colloquium winners. **Venue:** Zoology Benham Building, 346 Great King Street, behind the Zoology car park by the Captain Cook Hotel. Use the main entrance of the Benham Building to get in and go to the Benham Seminar Room, Rm. 215, 2nd floor.	Please be prompt as we have to hold the door open.
Field trip: 2-3 November weekend trip to Long Point. For more information visit the website: http://yellow-eyedpenguin.org.nz/our-work/habitats/long-point/. **Meet:** Botany car park 9.00 a.m.	**Contact:** Robyn Bridges, ph: 03 472 7330, email: robyn.bridges@otago.ac.nz if you would like to come.

NEW ZEALAND PLANT CONSERVATION NETWORK

PLANT CONSERVATION AWARDS: 2013

The New Zealand Plant Conservation Network is now accepting nominations for the 2013 awards. The purpose of these awards is to acknowledge outstanding contributions to native plant conservation.

The award categories are:

- ☐ Individual involved in plant conservation
- ☐ Plant nursery involved in plant conservation
- ☐ School plant conservation project
- ☐ Community plant conservation project
- ☐ Local authority protecting native plant life
- ☐ Young Plant Conservationist of the Year (under 18 years at 30 June 2013)

More information about the awards scheme and additional nomination forms are available on the Network website - www.nzpcn.org.nz. You can make multiple nominations under different categories. Anyone is eligible to make nominations, not just Network members. The awards will be presented at the Network Annual General Meeting to be held in Wellington on **Wednesday 6 November 2013**.

NOMINATION FORM

Category (please circle):

Individual *Plant* *Nursery* *School*

Community *Local Authority* *Young Plant Conservationist*

NAME OF NOMINEE: _____

Contact details for person, school, nursery, community group or local authority:

Address: _____

_____

Phone: _____ Email: _____

REASONS FOR NOMINATION:
(*Please add more details on separate pages if required*.)

Your Name: _____

Relationship to Nominee: _____

Your contact details:

Address _____

_____

Phone _____ Email: _____

Please send your nomination form by Friday 4 October 2013 to:

New Zealand Plant Conservation Network
P.O. Box 16-102
Wellington, New Zealand
Email: melissa.hutchison@wildlands.co.nz
www.nzpcn.org.nz