



TRILEPIDEA

NEWSLETTER OF THE NEW ZEALAND PLANT CONSERVATION NETWORK

Please send news items or events to events@nzpcn.org.nz

Postal address: P.O. Box 16-102, Wellington, New Zealand

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Deadline for next issue: Monday 16 March 2009

Message from the President

Recently, I received a worried telephone call from a friend who has taken it upon herself to restore native plants, largely at her own cost, to a very large area on her rural property. She was deeply concerned about not having enough help with the planting and, in particular, the care needed following planting. Watering, weeding and protection from rabbits were the main tasks. Some plants died in the recent drought. She was very upset and most concerned that her efforts would all be in vain. I suppose this is not an unusual plight and indeed I know of many similar projects throughout New Zealand where much help is needed. Some of you will know that some help is available for these native plant projects by way of grants from the Department of Conservation, regional government and some NGOs. But there may be another source and that could come from students. I am thinking particularly of tertiary students, many of who are currently registering for the new academic year. I know from experience that there are many students who would willingly give up their weekend (well some weekends) to help with native plant projects. There are student clubs and societies that organise local events around such conservation and environmental projects. So, I reassured my friend that, in a few weeks after the semester has commenced, I would try to make the connection between her needs and the potential interest of students. Looking at the last pages of the Newsletter, I am also reminded of the possibilities and indeed benefits of botanical societies in making links and liaising with students and student groups. Is this a topic (that is sources of help for native plant projects) that could be improved on the Network website? Is there enough information available on the website or could we improve that particular part? Please let me know.

This month's newsletter has a distinctly international flavour. There is a reminder about the U.N. designating 2010 as the International Year of Biological Diversity. I think that it is not too early to start planning events that could benefit from being linked to this international designation. Let's try to be strategic in our thinking and use the opportunities to promote the fundamental importance of 'diversity' in biological systems for sustainability. It will also be an opportunity to highlight the fundamental importance of 'diversity' (at various biological levels of organisation) in plant systematics, taxonomy and ecology. The international flavour is greatly enhanced by a most welcome article from Sri Lanka (Rare Plant Resource Centre—plant conservation in Sri Lanka). I would like to see more such contributions from overseas. Closer to home, there is a very useful contribution from Heidi Meudt on snow hebe. This is a very interesting account and one that is sure to prompt discussion. The article by Ross Cullen on 'weeds' is also sure to prompt healthy discussion. I wonder if there is anyone out there who might like to write a response (even a brief response) to Ross Cullen's article—noting in particular his last paragraph. He invites comments so please—someone—keep the discussion going! Perhaps we need a 'letters to the editor' section in the newsletter with a prize draw.

*Ian Spellerberg
Lincoln University*

PLANT OF THE MONTH – *Leptinella calcarea*



Leptinella calcarea. Photo: Simon Walls.

Plant of the month for February is *Leptinella calcarea*. This is a creeping member of the daisy family, endemic to the South Island, in north-west Nelson from Cape Farewell south to Kahurangi Point. It is often found growing near the coast where there is minimal vegetation cover and, as its specific name suggests, on calcareous mudstones, limestone and conglomerate rock. It can form a dense carpet and becomes smothered with little round yellow flowers. The flowers are composed of 25–120 tightly packed florets and are sometimes called bachelors buttons. Leaves are a muted yellow-green or grey-green colour and hairy.

This is a great plant for home gardens because its tight habit means weeds find it hard to compete. It grows very easily from division and it best in full sun. In the wild, *L. calcarea* is a naturally uncommon, range restricted species. Most populations are rather small and it could be at risk if current land use management practices in the area it occupies change. The NZPCN fact sheet for *L. calcarea* can be seen at www.nzpcn.org.nz/vascular_plants/detail.asp?PlantID=574

The snow hebes

Heidi Meudt, Research Scientist (Botany), Museum of New Zealand Te Papa Tongarewa, (heidim@tepapa.govt.nz)

The Southern Hemisphere hebes will hardly require an introduction to members of the NZPCN. They are the largest and arguably the most fascinating flowering plant radiation in New Zealand, comprising ca. 120 closely related species ranging from tiny herbs to small trees that are found in a variety of habitats and elevations (Bayly and Kellow, 2006). Although the centre of diversity for this monophyletic group is New Zealand, some species are restricted to Australia or New Guinea, while others extend into other areas of the Southern Hemisphere.

The taxonomy of the Southern Hemisphere hebes has recently become a hot topic among scientific and botanical society circles, with arguments for and against recognition of seven allied genera (*Chionohebe*, *Derwentia*, *Detzneria*, *Hebe*, *Heliohebe*, *Leonohebe* and *Parahebe*) versus placement of all species in *Veronica* subg. *Pseudoveronica* (Garnock-Jones et al. 2007). I have opted for the latter in my most recent work; those who wish to read the arguments about these two competing classifications are referred to Brummitt (2006), Garnock-Jones et al. (2007), Thorsen (2007), Gardner (2007), Garnock-Jones & Albach (2008). But it is important to remember that whatever hebe taxonomy you may prefer (or even if you are still straddling the nomenclatural fence), the plants themselves of course are still the same. As a plant systematist, I believe it is extremely important that we have a useful taxonomy that reflects current scientific knowledge. Nevertheless I hope we don't get too bogged down in it, so losing sight of the bigger picture, which is this: whatever we choose to call them, the Southern Hemisphere hebes are indeed an exceptional group of plants that provide us with a unique opportunity to study the evolution of plant diversity.

An excellent example of this is a small, poorly known species group within *Veronica* subgenus *Pseudoveronica* called the snow hebes (formerly *Chionohebe*) that is found in high-elevation

habitats of New Zealand and Australia. The reduced habit (they are often cushions) and putative dimorphic breeding system of the snow hebes have likely evolved as adaptations to their extreme alpine habitats, and yet their taxonomy, species limits, and evolutionary relationships have remained unclear. The two main challenges in snow hebe systematics are: (1) understanding the boundaries and closest relatives of the group as a whole; and (2) delimiting species and subspecies within the group. This second issue is the main focus of my recent work (Meudt & Bayly 2008; Meudt 2008) that is summarized here. Up to seven species of snow hebes have been recognized previously (Ashwin 1961; Briggs and Ehrendorfer 1976; Heads 1987), including up to five cushion species and two prostrate subshrubs. Species delimitation among the cushion species is especially difficult owing to the reduced pulvinate habit, solitary flowers and an apparent lack of many gross morphological characters. Ashwin (1961) considered that leaf trichome (hair) characters were the most useful for distinguishing the species. Because snow hebe leaves and their corresponding hairs are very small (<7 mm and <1 mm long, respectively), a hand lens (and preferably, a dissecting microscope) is essential to tell them apart.

To test species' boundaries and revise the taxonomy of the snow hebes, an integrated approach was used, combining AFLP DNA fingerprinting and chloroplast DNA sequences from one study (Meudt & Bayly 2008), and morphological, geographical and ecological data from another (Meudt 2008). In the first study, which was done in collaboration with Mike Bayly (University of Melbourne), AFLP was used to reconstruct a phylogeny of over 150 individuals representing six snow hebe species and a few out groups (Meudt & Bayly 2008). In general, AFLP delimited snow hebe lineages that corresponded in large part to most species as defined by Ashwin (1961) (under the earlier generic name *Pygmea*) and others, but AFLP was not that useful for depicting relationships among those lineages. To complement the molecular studies, numerous morphological characters were measured and observed from >700 herbarium specimens, and phenetic and ordination analyses were performed on 60 characters from 115 of these specimens (Meudt 2008). Based on the results from these two studies, a taxonomic treatment including a key, descriptions, specimens examined, distribution maps, photos, and illustrations was produced (Meudt 2008). The following five species of snow hebe are now recognized:

Veronica densifolia is a sub-shrub that is highly supported as distinct (relative to the cushion snow hebes) by AFLP, and phenetic and ordination analyses of morphological data. Common throughout the ranges of central and eastern Otago (and also present on Mt Kosciuszko, Australia), *Veronica densifolia* is distinguished by its habit, its decussate, imbricate leaves that are widest below the middle, keeled and glabrous except for the short hairs on the lower margins, and its funnel-form corollas with long (>1 mm) filaments, among other characters. The AFLP data suggest this species may not be the closest relative to the cushion species and instead may be sister to *V. trifida* (formerly *Parahebe*), with which it can be easily confused in the field.

Veronica ciliolata can be distinguished from the other cushion species by its ciliate but otherwise largely glabrous leaves. *Veronica ciliolata* is found on the western slopes of the Southern Alps from northern Westland to Fiordland; it is also known from one site in Tasmania. AFLP and morphological analyses do not exactly support the three geographical varieties as described by Ashwin (1961). Instead the AFLP data showed that there were two groups of *V. ciliolata* corresponding to a central South Island lineage and a southern South Island lineage. (Individuals from northwest Nelson, which have historically



Veronica ciliolata subsp. *fiordensis*, Tasmania.
Photo: Mike Bayly.

caused confusion whether they were *V. ciliolata* or *V. pulvinaris*, were placed solidly within *V. pulvinaris* by AFLP.) The morphological analyses largely confirmed these same two groups within *V. ciliolata*, which are now recognized at the subspecies rank due to their geographical separation and few minor morphological differences. Thus, *V. ciliolata* subsp. *ciliolata* (northern Westland to southern and western Fiordland) and *V. ciliolata* subsp. *fiordensis* (eastern Fiordland and Tasmania) are distinguished based on differences in hairs on the ovary, bracts, calyx, and leaves, as well as the leaf length:width ratio.

Veronica pulvinaris is also highly supported by AFLP analyses and was morphologically distinct in ordination analyses. Distinguishing features include leaf surfaces and margins with hairs that are evenly and sparsely distributed, and hairy ovaries and capsules. The range of *V. pulvinaris* is largely in the eastern slopes of the southern alps of Marlborough and Canterbury, but it is also present in northwest Nelson and possibly Otago. The northwest Nelson individuals are morphologically similar to *V. ciliolata* (see above) but can still be distinguished by their isolated to sparsely hairy leaves on the margins and inner surface, generally higher length:width leaf ratio, and densely hairy ovary.

Veronica thomsonii is largely confined to the ranges of central and eastern Otago, with a few populations in southern Canterbury. This species is distinguished from the other cushion species by its characteristic tight band of densely distributed trichomes on the inner leaf surface, irregularly sparsely to densely ciliate margins, and glabrous or nearly glabrous outer leaf surfaces. Phenetic



Veronica thomsonii. Photo: Mike Bayly.

analyses of these and other morphological characters clearly separate *V. thomsonii* from most of the other individuals of cushion species. Nevertheless, the AFLP data only weakly support a *V. thomsonii* lineage, and then only when individuals of *V. myosotoides* and *V. chionohebe* are also included in it. In fact there is no morphological, ecological or genetic evidence that *V. myosotoides*, which was originally described by Ashwin (1961), is distinct from *V. thomsonii*. Therefore, I do not recognize *V. myosotoides* and instead consider it to be a synonym of *V. thomsonii*.

Veronica chionohebe is morphologically the most distinct cushion snow hebe species with its (almost) entirely glabrous habit, branches, leaves, bracts, calyx, ovary and capsule. *V. chionohebe* was originally described as *V. thomsonii* var. *glabra*, and as noted above, AFLP analyses cannot distinguish *V. chionohebe* from *V. thomsonii*. *Veronica chionohebe* is known from only four localities in Otago; all overlap with the range of *V. thomsonii* at its south eastern extreme. Importantly, although the two species are known to occur in close proximity in at least two localities, they are found in completely different habitats. *Veronica chionohebe* is restricted to damp, sheltered hollows where late snow banks would persist, whereas *V. thomsonii* is found in much drier, exposed sites. Because of its morphological and ecological distinctiveness, I recognize *V. chionohebe* at the species level, with the caveat that further studies on its population genetics, pollination biology, and evolutionary relationship with *V. thomsonii* should be performed (hopefully by an enthusiastic graduate student!). *Veronica chionohebe* (formerly *Chionohebe glabra*) is the only snow hebe species that required a new species epithet in *Veronica*.



Veronica chionohebe. Photo: Mike Bayly.

Veronica ×*uniflora* has proven to be an enigmatic, doubtful sub-shrub species that has been seldom collected since its description in 1882. Observations and measurements on a handful of specimens from its six known localities in Otago confirmed that these individuals are morphologically very similar to *V. densifolia* but also have several characters that are intermediate between *V. densifolia* and the cushion species. I consider this entity to be a hybrid between the sub-shrub *V. densifolia* and *V. thomsonii*. The name *Veronica* ×*uniflora* can be used to refer to this putative hybrid.

In conclusion, the two studies summarised here represent the latest instalments of biosystematic research on the Southern Hemisphere hebes. There are now recent taxonomic revisions that address species limits and provide descriptions, maps, keys and illustrations for nearly all species in the group (i.e. *Chionohebe* Meudt and Bayly 2008, Meudt 2008; *Hebe* and *Leonohebe*: Bayly and Kellow 2006; *Heliohebe*: Garnock-Jones 1993; *Parahebe* and *Derwentia*: Briggs and Ehrendorfer 1992, Garnock-Jones and Lloyd 2004, van Royen & Ehrendorfer 1972). The next challenge will be getting to the bottom of the boundaries and relationships of all the species groups within the Southern Hemisphere hebes (including the snow hebes). A DNA sequencing study currently in progress (D. Albach & H. Meudt, in prep.) will build upon previous such studies to hopefully provide the best phylogeny to date of this fascinating group of plants.

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Kiwiherb sponsorship

The sales of Kiwiherb products for the quarter 1 October to 31 December have resulted in \$224.60 being received by the Network.

Website news

The website is being transferred to a new server by our hosting company. We apologise for the loss of access to the site in the interim.

Rare Plant Resource Centre – Plant Conservation in Sri Lanka

Sri Lanka is a country with rich plant diversity, 4000 plant species of which 800 are endemic and a long cultural heritage of more than 2500 years combined with ancient agriculture. In the past most of these plants were well utilised in building up healthy rural communities under the precise



Children should be part and parcel at ground level.

guidance of traditional local healers, older community members and Buddhist monasteries. These indigenous plant species have unique medicinal and nutritional properties that may be useful in solving acute global health problems.

Because of agricultural development, the importance of gathering these plants and dietary diversity is decreasing. The number of wild foods and natural home remedies has dropped dramatically with people's transition from hunter gatherers to farmers as is common to much of the developing world.

The present generation, accustomed to modern technology, is not prepared carry the indigenous varieties/knowledge over to the next generation and cannot even identify the basic native plants and their properties around them and destroy them as weeds. We have identified that there is an enormous wealth of important ethno-botanical values and indigenous ecological knowledge associated with native plants and a dramatic loss of this wisdom that could well be used for the benefit of mankind through future scientific research but no proper plans were being implemented to preserve or use this valuable knowledge in our country.

We are a group of people, who have been involved for the last couple of years in exploring indigenous knowledge associated with native plants and their usage by meeting a number of local healers and elderly community members in remote areas and by collecting rare plant species for conservation and documentation. In this exercise, we are establishing an ethno-garden focusing on native wild fruits and rare medicinal plants as an arboretum with over 250 native plant species. We are also documenting a wealth of ethno-botanical data as the Rare Plant Resource Centre (RPRC) in fulfilling key academic and educational functions by providing a facility where people can learn, exchange information and research with hands on experience from local traditional knowledge bearers. The knowledge is spread to the next generation by distributing these plants amongst Sunday schools in rural church parishes and Buddhist monasteries with religious and spiritual endorsement in plant conservation.

The project is 50% complete; we have acquired land and we are conserving over 100 varieties of rare plant species and collecting and documenting some of the ethno-botanical data and conducting number of hands-on sessions in plant conservation through our established religious conservation network in the district.

Some key stages in our development are:

- Incorporated in 2003 as a major native plant conservation project under the technical guidance of Dr Channa Bambaradeniya of the World Conservation Union (IUCN) as an environmental initiative for children for the first time in Sri Lanka.
- Establishment in 2005 of a native plant arboretum with over 160 plant species and the documentation of fast disappearing indigenous knowledge associated with native plants to propagate the message amongst children.

- Incorporated in 2005 with the John Ray Project Initiative (University of Gloucestershire, UK) in plant conservation.
- In 2006–07, granted 3131 pounds sterling by the John Ray Initiative (UK) for the water supply and basic infrastructure development of the arboretum.
- In 2006, granted 1700 pounds sterling by Conservation International (UK) for the development of the arboretum.
- In 2007 the Native Forest Foundation was formed to have total focus on inculcating future generations on plant conservation.

We trust that you would agree with us on the importance of initiating a project of this nature, especially in collecting disappearing native food plants and the documentation of traditional ecological knowledge by getting the younger generation involved through religious and spiritual values in sustainable future utilization of natural resources.

For more information, please contact

Damitha, Native Forest Foundation, Sri Lanka (damilda@sltnet.lk)

Plant images required for the Threatened Plant Book

John Sawyer (jsawyer@doc.govt.nz)

In 2009, Canterbury University Press will publish the Network's new book describing all New Zealand's threatened vascular plants (based on the soon to be published threatened plant list for 2009). To complete the book, we still seek images of the following species. If you have images of any of these plants, please contact me and/or e-mail high resolution versions to me at the above e-mail address or post slides or prints to John Sawyer, c/o Department of Conservation, PO Box 5086, Wellington.

Species for which we have only one image

Carex unciifolia
Carmichaelia carmichaeliae
Crassula manaia
Davallia tasmanii subsp. *cristata*
Eplobium pictum
Gentianella calcis subsp. *calcis*
Gentianella calcis subsp. *manahune*
Gentianella calcis subsp. *taiko*
Gentianella calcis subsp. *waipara*
Hebe armstrongii
Hebe sociatatis
Juncus holoschoenus var. *holoschoenus*
Olearia polita
Simplicia buchananii
Leucogenes tarahaoa
Senecio lautus var. *esperensis*
Trithuria conspicua

Species for which we have images only of herbarium specimens

Gnaphalium luteoalbum var. *compactum*
Poa aucklandica subsp. *rakiura*
Ranunculus viridis

Species for which we would benefit from having images of flowers

Gunnera densiflora
Oreomyrrhis basicola
Ourisia modesta
Pittosporum turneri

Species for which we need extra shots

Australopyrum calcis subsp. *calcis*
Australopyrum calcis subsp. *optatum*
Carmichaelia crassicaulis subsp. *racemosum*
Geranium retrorsum
Pittosporum obcordatum

Are we failing on weeds?

Professor Ross Cullen, Lincoln University (Ross.Cullen@lincoln.ac.nz)

Humans have lived in New Zealand since only about 1280. Our impact on the land, species, and ecosystems during the intervening 730 years has been dramatic resulting in the loss of at least 34 species including several species of moa, the Haast eagle, huia, and the South Island kokako. Plenty more bird, reptile and invertebrate species are threatened by loss of habitat and by vertebrate pests including cats, rats, mustelids and possums. Vertebrate pests are high profile villains in New Zealand and attract large amounts of expenditure aimed at reducing their impacts on agriculture and threatened species.

Invasive plant species are not exactly forgotten but do not attract such attention, or opprobrium, except amongst a minority, some of whom can become near fanatical about weeds. I may well be one of those people. I certainly note the spread of woody weeds such as gorse, broom, briar, and wilding pines across grassy slopes and the ability of shade tolerant tree species to survive under the canopy of native forests. Observation out the car window, extrapolation of current trends in weed numbers and areas leads me to the pessimistic conclusion that we are indeed slowly wrecking the place.

Introduction of plant species has been going on for quite a while in New Zealand. Maori introduced six crop species (kumara, taro, hue gourd, aute, yam and ti pore), early explorers planted potatoes and vegetable gardens (Rahman and Popay, 2001). The expansion of agriculture following European colonisation in the nineteenth century brought plenty more new crops and seeds, including our first weeds. Weeds were introduced both as contaminants and as deliberately introduced species. Gorse and dock were amongst the first of those deliberately introduced species and have been succeeded by 25,000 more species of which about 2500 are now growing wild.

New Zealand has several systems in place to prevent entry, eradicate, contain and provide surveillance of weeds. The success of those efforts is far less than some of us hope for and the numbers of naturalised weedy plants, and the areas they occupy, are in almost all cases still increasing.

Should we care? On agricultural land, weeds impose costs for most landowners either through reduced yields of crop, pasture or logs or through increased weed control costs (Bourdôt et al., 2007). Both effects reduce profitability and provide an incentive to landowners to prevent weeds becoming established and to remove them if they are established. Those incentives are clearly not strong enough to result in successful weed prevention, removal or control in many areas of privately owned land. In many cases, no weed control effort is applied and weeds prosper untouched by herbicide or machinery. A similar situation seems to occur on much government (local and national) owned land.

There are reasons why financial incentives to control weeds do not call forth effective, or even any, weed prevention, removal or control. Weed control action is most likely to occur where the problem is clearly visible, control is readily achievable, control costs are low, and profit loss due to weediness large. If those circumstances do not occur, landowners and managers may conclude weed control is not justifiable at present and weeds will bloom—often colourfully.

Decisions about weed control can have long term consequences and discount rates implicitly or explicitly enter calculations of whether it's worthwhile preventing, removing, or controlling weeds. Some basic calculations indicate that even for low productivity land, low cost annual weed removal that prevents weeds taking over land will generate a higher net present value (NPV) than a 'let weeds go' stance, or a 'remove weeds in 25 years time' approach. Decisions by individual landowners can also affect neighbouring properties. My conclusion following the NPV calculations would be reinforced if I had included an external cost for my model property of spreading seeds to neighbouring properties. Department of Conservation staff members comment that for wilding conifers the problem escalates every 6 years if uncontrolled (and until some land limit is reached).

Myopia due to high discount rates, lack of knowledge of the ecology of weeds, overconfidence in the likelihood of new controls being developed, and overlooking of external effects can all lead to faulty decision making about the merit of weed prevention, removal or control today.

Are the current approaches to weeds by regional councils correctly targeted at those underlying issues? Are more prescriptive policies justified to prevent the spread of weeds? Should we reintroduce subsidies for weed control? Or will only a fusillade of silver bullets – effective biological controls—deal to the problem? Comments welcomed.

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International Year of Biodiversity

In case you had not already heard, the United Nations has declared 2010 as the International Year of Biological Diversity. It may be useful for all to keep this in mind while making plans ahead. For further information see: www.un.org/events/RP46.pdf

There are two relevant imminent events in the South Island. First, on Friday 27 March, there is a Biodiversity Bonanza!! in Kaikoura. This is aimed at raising awareness of the biodiversity in the Kaikoura area and will provide a 'one-stop shop' for those interested in learning more about Kaikoura's biodiversity and the services and opportunities available to protect, enhance and restore it. The second event is a BioBlitz in Lincoln from Friday 3 April to Saturday 4 April. The target area is the Liffey Domain. BioBlitz is a celebration of the diversity of life. It helps people understand and appreciate local biodiversity, and measure the health of their local environment. Part contest, part festival, part educational event and part scientific survey—BioBlitz is a scientific race against time. Our goal is to find as many species as we can in 24 hours in the Liffey Domain. For more information on both of these see the Events Section.

Council meeting

The Network Council will meeting in Wellington on Thursday 12 March. If any member has an item that they would like to have discussed please contact the President (Jan.Spellerberg@lincoln.ac.nz) or Secretary (jsawyer@doc.govt.nz).

Subscriptions

Subscriptions for the 2008–09 year are due. All corporate and NGO members whose subscriptions are due have been sent invoices. Individual members, including those in the categories of student or unwaged, have received a reminder. Many have paid very promptly and we thank you for that; we ask that the rest will treat their subscription payment as a matter of urgency. The Network can maintain and expand its services only as fast as finances permit.

UPCOMING EVENTS

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

Auckland Botanical Society

Dinner: Saturday 21 February to Goldies Bush, Waitakere Ranges.

Contact: Maureen Young (e-mail: youngmaureen@xtra.co.nz).

Meeting: Wednesday 4 March, AGM and a student talk by Micke Kapa on the ecology of *Eleocharis sphacelata*. **Venue:** Unitec School of Natural Sciences Gate 3, Building 023, Room 1018.

Contact: Maureen Young (e-mail: youngmaureen@xtra.co.nz).

Meeting: Saturday 21 March to Alice Eaves Bush and Wenderholm Regional Park.

Contact: Maureen Young (e-mail: youngmaureen@xtra.co.nz).

Waikato Botanical Society

Field trip: Saturday 21 February, a Threatened Plant Collection Working Bee. Please bring gloves, old clothes and boots for weeding, planting and propagating activities. **Meet:** 9.45 a.m. at Waikato University Gate 9, Hillcrest Rd.

Contact: Liz Overdyck
ph: 07 846 0965,
e-mail: eg3@waikato.ac.nz

Field trip: Saturday 7 March to Port Waikato Coastal Remnants. Cook's scurvy grass and *Hebe speciosa* should be able to be viewed from the Ward property with binoculars. **Meet:** 8.30 a.m. at the BP petrol station at the south end of Ngaruawahia township SH1.

Contact: Gerry Kessels or Britta Deichmann, ph: 07 825 9025,
e-mail: britta@kessels-ecology.co.nz or gerry@kessels-ecology.co.nz

Meeting: Tuesday 24 March at 6.30 p.m. the AGM followed at 7.00 p.m. by a talk titled "Pollen can tell a story—A vegetation history and environment change from Whangapoua estuary, Great Barrier Island" by Yanbin Deng. **Venue:** University of Waikato, Room S 1.01, S Block, Gate 8 Hillcrest Rd.

Contact: Liz Overdyck
ph: 07 846 0965
e-mail: eg3@waikato.ac.nz

Rotorua Botanical Society

Field trip: Saturday 28 February – Sunday 1 March to Ngatamahinerua Plateau, Kaimai Mamaku Forest Park. **Meet:** The car park 7.45 a.m. or Thompsons Track start (corner of Thompsons and Wairakau Road) at 9.00 am. Bring 4-wheel drive if you have one to access near to the summit of Thompsons Track. **Grade:** Hard! Track recently cleared to hut. Some steep sections and lots of Gahnia on the slips. **Bring:** Full gear and food for an overnight tramp to Kauritatahi Hut T14 E2762613 N6389033 (3 bunks—cost free). Bring a tent as hut maybe full.

Leaders: Paul Cashmore
ph: 07 348 4421 (hm),
07 349 7432 (wk)
e-mail: pcashmore@doc.govt.nz
and
Matt Renner
ph: 07 348 3606 (hm),
07 343 9017 (wk).

Field trip: Saturday 7 March an Okareka Mistletoe Restoration Project Weed Control /Releasing Work Day. **Meet:** Ex-Okareka store 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)
e-mail: pcashmore@doc.govt.nz

Wellington Botanical Society

Field trip: Friday 7 March – Sunday 8 March to Turakirae Head Scientific Reserve, Barney's Whare, Palliser Bay coast.
Accommodation: Barney's Whare (sleeps 6–8 people) and camping; costs as yet unknown but to be shared. Car pooling for drive to Orongorongo Station essential to minimise storage of vehicles on Station. Two packs per person needed: your daypack and an overnight pack to be delivered by vehicle to Barney's Whare. **Meet:** 9.00 a.m., Orongorongo Station, end of Wainuiomata Coast Rd.

Leaders: Chris Hopkins, ph: 04 564 3980; and Mick Parsons, ph: 04 972 1148.

Meeting: Monday 16 March a talk by Dr Carol West titled "Changes on Raoul Island: rats, eruptions and cyclones".

Venue: Victoria University, Wellington, Lecture Theatre 101, Murphy Building, Kelburn Parade.

Nelson Botanical Society

Field Trip: Sunday 15 March, proposed field trip to Mt Starveall now altered to Adele Island because of the condition of the forest and also fire hazard.

Contact: Lawrie Metcalf, ph: 03 5402295, e-mail: landlmetcalf@xnet.co.nz

Anniversary Dinner: The Society's 20th Anniversary will be celebrated at Fairfield House on Monday 6 April at 6.00 p.m. with a potluck dinner, followed by a talk by our guest speaker Graeme Jane (the Society's founding President). Past members and friends most welcome.

RSVP: by 31 March to Jocelyn Lewis, ph: 03 547 2812.

Field trip: The Easter camp will be at Mangarakau; details to follow next month.

Kaikoura District Council (in association with Environment Canterbury and the Canterbury Biodiversity Strategy)

Biodiversity Bonanza!!: Friday 27 March, 9.00 a.m. – 4.00 p.m. at the Kaikoura Memorial Hall and surrounds.

Contact: Jodie Denton, ph: 03 319 5026 ext 234, e-mail: jodie.denton@kaikoura.govt.nz.

Canterbury Botanical Society

Meeting: Friday 6 March a talk by Gerry McSweeney on a topic subject to be finalised organized.

Venue: Room A5 University of Canterbury.

Field Trip: Saturday 7 March to High Peak, Upper Selwyn.

Contact: Jodi Rees: mallotus@yahoo.com.au.

Botanical Society of Otago

Barbecue: Friday 6 March at 12 noon, a BBQ to welcome new botany/ecology students and new BSO members on the front lawn, Botany House Annex, Great King Street (across the road from the main Botany building). Sausage sandwiches and drinks provided free by the Botanical Society of Otago. All current and prospective BSO members welcome!

Contact: [David Orlovich](mailto:David.Orlovich@otago.ac.nz), phone: 03 479 9060.
