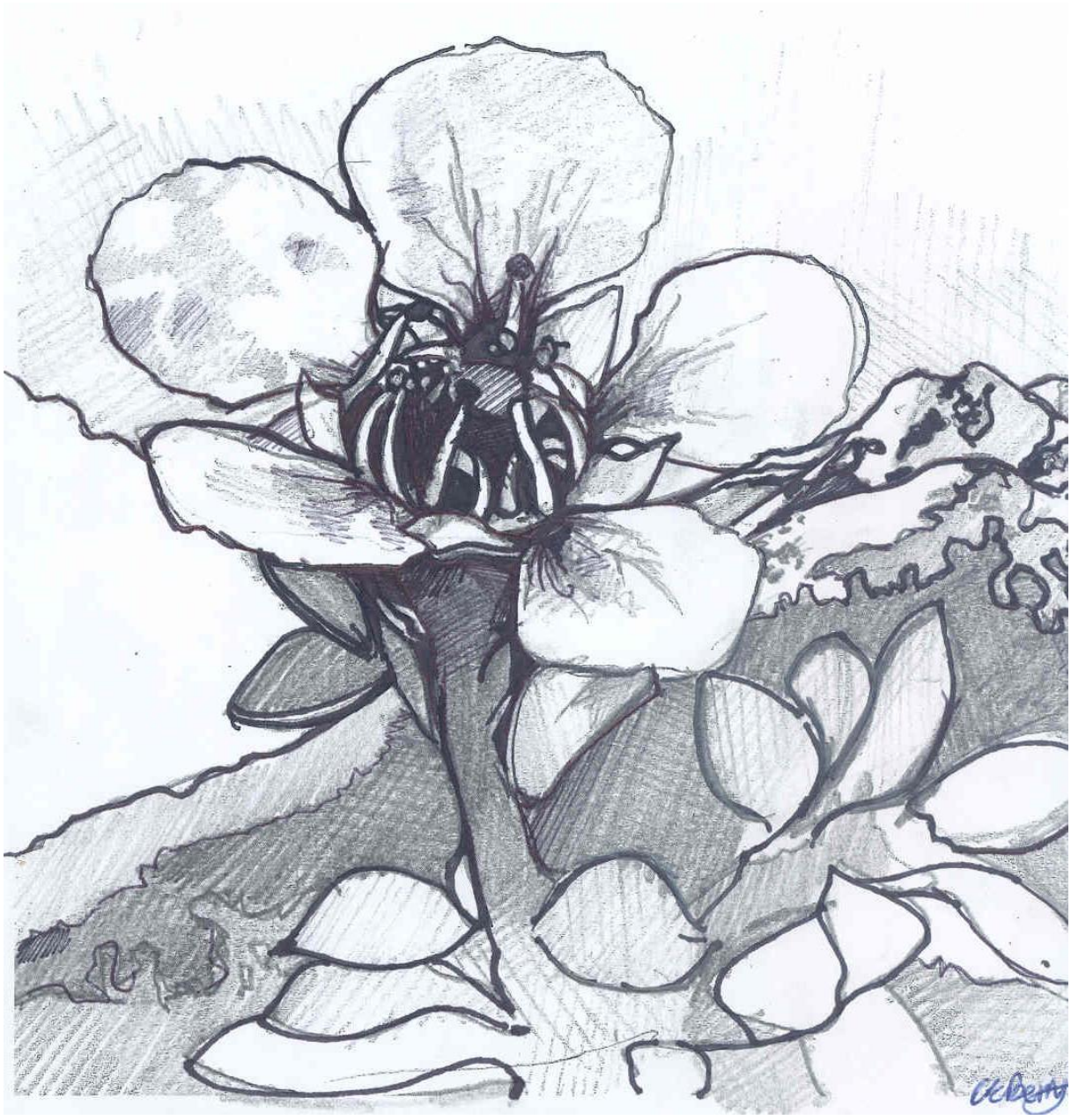
BOTANICAL SOCIETY

OF OTAGO

Newsletter Number 64 September 2011



BSO Meetings and Field Trips

10th September 9.00 am. **Field trip to Mihiwaka** guided by Alf Webb. We will walk through some podocarp forest representative of the Dunedin area, then go on to regenerating shrub-land with a small sphagnum bog. We will see some of the eastern most Libocedrus bidwillii stands, and see wonderful views from the rock out-crops. Depart from the Botany Department car park, corner of Great King Street and Union Street (West). For details, contact David Lyttle, phone: (03) 454 5470.

14th September 5.30 pm. **2011 Baylis Memorial Lecture: Complex relationships with friends and foes: How native plants manage the risks**. Speaker Dr Bill Lee Landcare Research, Dunedin; Joint Graduate School of Biodiversity and Biosecurity, School of Biological Sciences, University of Auckland. Plants share a world with many other organisms that represent both potential enemies and possible allies. For their enemies plants are a food source, but plants have developed numerous defences, including co-opting other animals, to protect vital organs. This involves strategic alliances, armed neutrality and active warfare. Plants also develop interdependencies with other biota for obtaining resources, assisting reproduction and dispersal, and limiting herbivory. The talk will explore what we know about these interactions in New Zealand, and discuss some of the extraordinary relationships amongst and between fungi, arthropods, birds, and plants. Emphasis will be on the strategies and tactics involved from the perspective of the plants, and how much plants are prepared to repel enemies and gain friends in natural ecosystems. At Castle 1 Lecture theatre. Nibbles and drinks from 5:30 in the Castle concourse, talk starts at 6:00 pm and finishes at 7.00 pm.

21st September 12.00 pm. Union St Lecture Theatre. Department of Botany Seminar **Friendly Forest Fungi: mycorrhizae of NZ native forest trees.** A talk by Dr David Orlovich.

6th October 2.00 pm. Orokonui Ecosanctuary. **Garden design and plants to attract native birds.** Philip Dunn, Ribbonwood Nursery. Cost: $5.00 (Donation).

7th October 12.00-1.00 pm. Botanic Garden Centre. Hort Talk: **Green Ways to Eradicate Invasive Weeds.** T.J. Irvin**.**

12th October 5.30 pm. **Three talks by the winners of the Botany Postgraduate Research Colloquium.** Jaz Morris will discuss how greenhouse conditions affect the physiology of giant kelp? Diego Urrutia Guevara presents a talk about the response of alpine plant and soil composition to induced environmental conditions on the Old Man Range, New Zealand. And Tim Crawford explains profiling low-oxygen electron transport in the cyanobacterium *Synechocystis* sp.

PCC 6803. Abstracts relating to each talk can be found in the communications section of this newsletter. Contact Allison Knight, phone: (03) 479 7577.

29th October 10.00am-3.00 pm. Orokonui Ecosanctuary. **Workshop on plant photography with digital SLR cameras.** David Lyttle. Cost: $29.90 (Donation).

30th October 9.00 am **Field trip to Leith Saddle (celebrating year of the Forest).** This trip is open to members of the public and will be led by various members of the Botanical Society. The trip will follow a well formed track from Leith Saddle up through mixed podocarp broadleaf forest that grades into *Libocedrus* forest that in turn gives way to mixed tussock/ shrubland. This is perhaps the best piece of representative forest close to Dunedin. Depart from the Botany Department car park, corner of Great King Street and Union Street (West). For details contact David Lyttle, phone (03) 454 5470.

4th November 12.00-1.00 pm. Botanic Garden Centre. HortTalk: **What's Cookin? – tips for cooking local produce.** Steve Ellwood.

9th November (TBC). Orokonui Ecosanctuary. **Beating the Big Leaf in the Vatthe Conservation Area of Vanuatu.** Sue Maturin. Cost: $5.00 (Donation).

9th November 12.00 pm. Union St Lecture Theatre. Department of Botany Seminar **Ecosystems in waiting or a bright new future? John Ogden.** Mixed plant and animal communities are now widely established in New Zealand. Will the forests of yesteryear eventually re-establish, or should we welcome a new species mixture dictated by a new disturbance regime? Work on the dynamics of the scrub communities on Great Barrier Island will be discussed.

9th November 5.30 pm**. Year of the Forest Public Lecture. Beech forest dynamics. What Milhankovic didn't know and other anecdotes. John Ogden.** The likely behaviour of beech forests through glacial/interglacial cycles will be discussed and some of the current spatial and temporal patterns will be described in relationship to these past events. (with George Perry as co-contributor). Venue to be announced.

19th November 9.00 am. **Field trip to Akatore Creek.** Akatore is a remnant of diverse coastal shrubland at the mouth of Akatore Creek, 45 minutes south of Dunedin. Some special features of this site include the diversity of shrub species and threatened species such as *Coprosma obconica*, *Olearia fragrantissima*, *Melicytus flexuosus* and *Carex littorosa* with the possibility of our discovering other threatened species. We may also visit the adjacent coast where the threatened cress *Lepidium tenuicaule* is present as well as *Myosotis pygmaea*. Depart from the Botany Department car park, corner of Great King Street and Union Street (West). Contact Robyn Bridges, phone: (03) 472 7330.

3rd/4th December 7.00 am. **Weekend field trip to Omarama bog pine and wetland sites**. We will base ourselves at Omarama and spend one day visiting the bog pine dominated rare ecosystem of Ben Dhu Scientific Reserve, followed by a day investigating the Tarnbrae wetlands or the Wairepo kettle hole wetlands. Visits to these post-glaciation derived ecosystems with their distinctive shrubland and turf vegetation are graded "easy". A range of accommodation options are available at the Omarama Holiday Park http://www.omaramatop10.co.nz/. Participants are expected to arrange their preferred accommodation. Leaders are Geoff Rogers and John Barkla. Contact Geoff Rogers Ph. 454 5732 or email bogpine@xtra.co.nz by Wednesday 30 Nov.

7th December End of year dinner at the Asian Restaurant. Always a fun and popular event! This year we return to the fabulous Asian Restaurant, 43 Moray Place, Dunedin. Make sure you let Bill Wilson know if you'd like to come. Contact Bill Wilson, phone: (03) 477 2282.

Meeting details: Talks are usually on Wednesday evening, starting at 5:20 pm with drinks and nibbles (gold coin donation), unless otherwise advertised. Venue is the 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, Room 215, 2nd floor. Please be prompt, as we have to hold the door open. Items of botanical interest for our buy, sell and share table are always appreciated. When enough people are feeling sociable we go out to dinner afterwards – everyone is welcome to join in. Talks usually finish around 6:30 pm, keen discussion might continue till 7 pm.

Field trip details: Field trips leave from the Botany Department car park 464 Great King Street, unless otherwise advertised. Meet there to car pool (10 c/km/passenger, to be paid to the driver, please). 50% student discount now available on all trips! **Please contact the trip leader before Friday for trips with special transport, and by Wednesday for full weekend trips**. A hand lens and field guides always add to the interest. It is the responsibility of each person to stay in contact with the group and to bring sufficient food, drink and outdoor gear to cope with changeable weather conditions. Bring appropriate personal medication, including anti-histamine for allergies. Note trip guidelines on the BSO web site: http://www.botany.otago.ac.nz/bso/.

Contents

Chairman's Notes

David Lyttle

The next major event for the BSO is the 10th Annual Baylis Lecture, which will be held on Wednesday 14th September. The speaker this year is Dr Bill Lee from Landcare Research in Dunedin. In the course of a long and productive research career, Bill has come up with some novel experimental approaches to investigate the ecological interactions that have shaped the New Zealand flora. Bill's originality and insights make this lecture an event not to be missed.

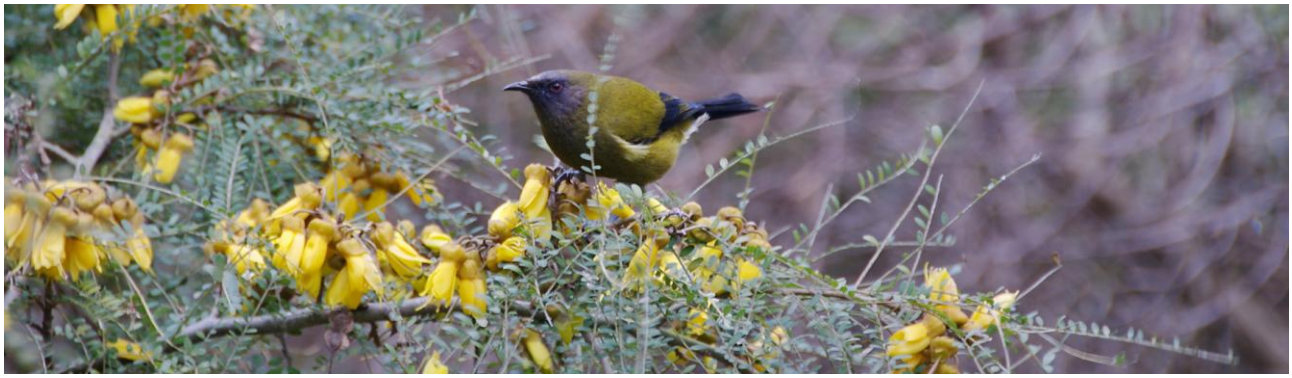
There are four more field trips scheduled for the remainder of the year; a day trip to Mihiwaka, a day trip to the Leith Saddle cloud forest, a day trip to Akatore Creek (in this case it is the third time this trip has been scheduled) and in December, a weekend trip to Omarama in the Mackenzie Basin. These trips cover a very diverse set of plant communities; all well worthwhile visiting.

This spring several tuis have been visiting my garden. The attraction is some kowhais that my grandfather planted over 80 years ago recognizing at the time that New Zealand native plants had intrinsic value in a landscape from which they, and the birds they supported, had been largely extirpated by European pastoralism. By and large tuis tend to shun my cold, windy corner of the Otago Peninsula but I am pleased to see them back and hope they might find conditions more to their liking in the future.

This season's possum trapping campaign has yielded rather modest numbers of the pests. Considering the plague numbers that were present two years ago this another hopeful sign that for local biodiversity may in time recover some of its original variety and

richness. The present initiative by the Otago Peninsula Biodiversity Group to eliminate possums from the Peninsula has made considerable progress in sectors 1, 2 and 3 east of Allans Beach Road but sectors 4 and 5 abutting the harbour suburbs and the city have yet to be dealt with. In the meantime landholders in section 4 such as myself must rely on setting Timms traps to do the business for us but many of my neighbours who are busy farmers do not see environmental protection and pest control as priorities.

The present initiatives on possum control and ecological restoration on the Hereweka/Harbour Cone Block, now owned by the City of Dunedin, are very welcome after decades of inertia and neglect. However if there is any moral to this story, it is that small acts such as planting trees may have effects for generations but controlling pests and weeds is a long and arduous battle and requires sustained community effort and involvement.



Bellbird on Kowhai (*Sophora microphylla*). Photo by David Lyttle.

Editor's Notes

Alex Fergus

Hi folks, these notes are pretty much just a long line of acknowledgments. On behalf of everyone in the Botanical Society of Otago I want to make a big call of thanks to David Orlovich who has just stepped down as our Newsletter editor. David will continue to maintain the BSO website and has been supporting myself and Katherine Lyttle as we take over his role. Our chairman David Lyttle should also be recognised for his on-going efforts in bringing the Newsletter together. From the current issue praise goes to all of our contributors, particularly Cambrian Berry who supplied the manuka (*Leptospermum scoparium)* drawing that adorns our cover page. If anyone has contributions for the next issue, or would like to volunteer to report on an upcoming fieldtrip or seminar, then please get in touch with me. Thanks team, Alex.

Please submit copy for next newsletter by 30 November 2011.

Editor's guidelines: Try to aim for a 0.5–1 page of 14 pt Times for news, trip/meeting reports and book reviews,

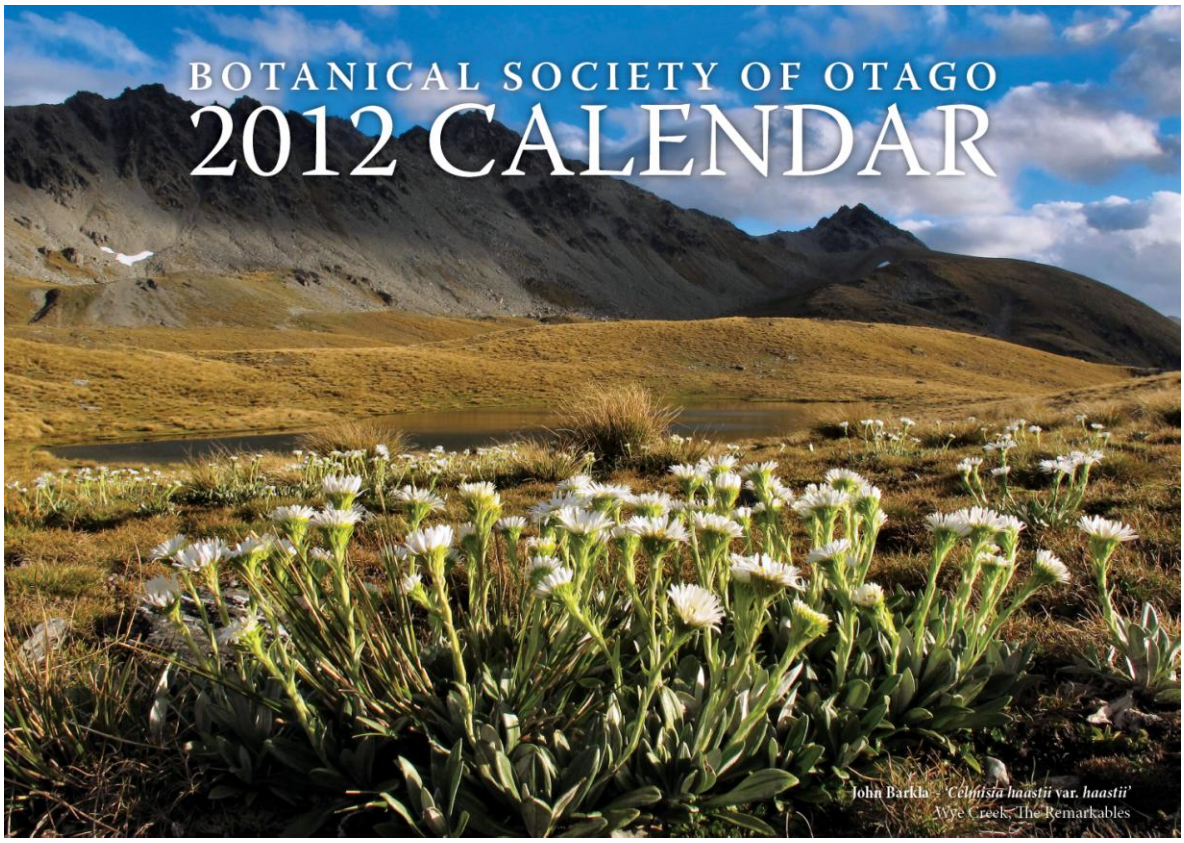
and 1–5 pages, including illustrations, for other articles. Electronic submission (by email to the editor: fergus.alex@googlemail.com) is preferred. Send photos as separate files and remember to include photo captions and credits.

Disclaimer: The views published in this newsletter reflect the views of the individual authors, and are not necessarily the views of the Botanical Society of Otago.

Correspondence and News

Botanical Society of Otago's 2012 calendar

The Botanical Society of Otago's 2012 calendar is on sale now. The Calendars are $20 each (or two for $36) [add $2.50 for mail orders]. For electronic payment email the Botanical Society of Otago (bso@botany.otago.ac.nz) with your name and address and payment details will be sent. The Calendar will also be available from Trish Fleming at the Botany Department office. All proceeds to the Botanical Society of Otago www.botany.otago.ac.nz\bso\



Botanical Society 2012 Calendar, cover image of *Celmisia haastii* var. *haastii*. Photo by John Barkla.

Te Papa MSc Scholarship in Molecular Systematics at Victoria University

The Museum of New Zealand Te Papa Tongarewa and Victoria University of Wellington are offering a Master of Science (MSc) scholarship in the field of molecular systematics at Victoria University of Wellington. The student stipend is $10,000 over two years.

Potential projects for 2012-2013 include: analysing the population genetics of lancewood (*Pseudopanax crassifolius*) to locate its glacial refugia; unravelling a species complex in the New Zealand forget-me-nots (*Myosotis*); or another group to be determined.

Applications close 1st November 2011.

For more details, contact Leon Perrie (leonp@tepapa.govt.nz).

The Arnold and Ruth Dench New Zealand Botanical Award - Applications sought

Alison Dench (daughter of the late passionately active members of the Wellington botanical society - Arnold and Ruth Dench's daughter), has generously made available an annual award of $1,000 in memory of her parents. The Award aims to enhance understanding and awareness of New Zealand's indigenous flora including interactions between indigenous flora and invasive species (flora or fauna). The Award will be administered by the Wellington Botanical Society Inc.

A full description of the award and the application process can be forwarded to anyone interested from the BSO editor.

Wellington Botanical Society Jubilee Award 2011 – applications sought

The Wellington Botanical Society invites applications for an Award of up to $2,600 to encourage and assist applicants to increase knowledge of New Zealand's indigenous flora, and to commemorate the Society's Jubilee in 1989.

Purpose of the award

The Award is open to anyone working in New Zealand. It will be granted for: fieldwork; artistic endeavour; publication; research; propagation or cultivation of NZ native plants for educational purposes and/or other studies which promote the better understanding of NZ's indigenous flora and vegetation. The interpretation of these conditions will be flexible, except that the main criterion will be the furtherance of knowledge or promotion of the intrinsic value of NZ's indigenous flora and vegetation. The Award may be used to defray costs such as travel, accommodation, materials or publication.

Further information can be found at this link:
http://www.wellingtonbotsoc.org.nz/awards/jubilee.html

Abstracts for the Botany Department Student Colloquium winners.

Honours student winning talk: How will greenhouse conditions affect the physiology of giant kelp?

Jaz Morris, Michael Roleda, Catriona L. Hurd

Increasing global temperatures and ocean acidification (OA), the result of anthropogenic CO_2 emissions, are predicted to cause a 'greenhouse effect' worldwide. However, studies have only lately begun to investigate the effects of greenhouse conditions on marine algae, and relatively few have investigated kelp species; the ubiquitous flora of coastal benthic environments. One of the major kelp species, *Macrocystis pyrifera*, has received little attention despite work showing resilience of recruitment of juvenile *Macrocystis* to OA conditions. Here, *Macrocystis* tissue disks were grown in vitro for ten days in ambient and future (2100 AD) CO_2/pH conditions (400/750ppm) as well as present and ambient and 2100 (14ºC and 19ºC) summer temperatures. Results show that OA ameliorates tissue bleaching at high temperatures, and that growth by area increases with CO_2 concentration and temperature when nutrients are not limiting. At days two and five, increased availability of CO_2 in OA conditions resulted in a decrease in carbonic anhydrase levels, suggesting that macroalgal carbon-concentrating mechanisms may be down-regulated due to OA. However, by day 10 this trend was not observed and bleaching had occurred in all replicates suggesting cellular damage due to high light levels *in vitro*. These data represent the first attempt to grow *Macrocystis* in simulated greenhouse conditions, and suggest a separate effect of pH and temperature on kelp physiology.

Master's student winning talk: The response of alpine plant and soil composition to induced environmental conditions in the Old Man Range, New Zealand.

Diego Urrutia Guevara

Alpine Zones are characterized by short, cold, and unpredictable growing seasons. One of the locations where Alpine environments are found is the Old Man Range, in the South Island of New Zealand. The topography of these mountains creates sheltered areas where snow accumulates and exposed areas where the strong winds remove the snow from the exposed slopes and ridges. The presence of the snow determines the length of the growing season, and its insulation effect creates milder and more stable temperatures, higher soil moisture, and offers protection from wind and ice impact. As a result of these conditions, the distribution of soils and vegetation is largely determined and limited by its distribution. One of the world's oldest experimental snow fences was built in 1959 in the windward side of the summit plateau of the Old Man Range. The snow fence, built perpendicular to the prevailing westerly winds, reduces the wind speed, and accumulates larger amounts of snow which lasts longer in

the season on its leeward side. As a consequence, changes in the plant species composition were reported by Smith et al. (1995), from their survey in 1991, and by a second survey done by the Department of Botany in 2003. A third vegetation survey has been done in 2011. All these results will be analyzed together to study the responses of soil and plant composition to these induced environmental conditions over the past 20 years. Additionally, soil samples have been taken from areas with different exposure around the snow fence to study the effects of different snow accumulation in soil composition. Macronutrients, pH, moisture and texture will be analyzed. Two nearby natural snowbanks are the control in this experiment and the same methodology is being used to study the soils and plant composition. These two snowbanks will provide us with the natural plant and soil composition of this area. The main hypothesis of this study is that a similar plant and soil composition to a natural snowbank is being caused behind the snow fence.

PhD student winning talk: Profiling low-oxygen electron transport in the cyanobacterium *Synechocystis* sp. PCC 6803.

Tim Crawford

Cyanobacteria are an ancient, diverse and highly successful group of prokaryotic photoautotrophs, and remain one of the most important primary producers on Earth as well as the historical source of much of the oxygen in the atmosphere today after more than two billion years of oxygenic photosynthesis. Current research focuses on realising the potential of cyanobacteria as sources of renewable energy, such as exploiting the natural biological hydrogen production endowed on these creatures by the presence of a hydrogenase enzyme. Hydrogen is one of the most promising future energy vectors known, however at present it is essentially not renewable. Cyanobacteria could provide a renewable source, but unfortunately the hydrogenase is only functional in transient bursts under low-oxygen conditions, due to the enzymes sensitivity to the oxygen produced by the photosynthetic machinery. In order to increase biological hydrogen production to viable levels, we must first understand how cyanobacteria perform this feat in nature – thus this project aims to create a profile of the changes in gene expression and functioning of the photosynthetic and respiratory electron transport chains that accompany low-oxygen conditions in the model cyanobacterium *Synechocystis* sp. PCC 6803. Results obtained so far from analysing electron transport in a number of genetic knockout mutants suggest that a wide range of systems exist to allow this creature to survive under low-oxygen tension, including regulation of a number of respiratory enzymes and a 'low-oxygen cluster' containing alternative copies of key proteins of Photosystem II and the cytochrome b_6f complex. Research has also suggested that the expression of some of these components may be regulated by antisense or non-coding RNAs.

AUCKLAND BOTANICAL SOCIETY INC.

PO Box 26391, Epsom, Auckland 1344

LUCY CRANWELL
STUDENT GRANT for BOTANICAL RESEARCH

CALL FOR APPLICATIONS FOR 2012

Applications are invited for the Lucy Cranwell Grant of $2,000 from the Auckland Botanical Society to assist a student studying for the degree of PhD, MSc or BSc (Hons.) in any tertiary institution in New Zealand whose thesis project deals with some aspect of New Zealand's flora and vegetation. Priority will be given to projects relevant to the northern half of the North Island.

The research project to be supported will be chosen on the basis of appropriateness to the objects of the Society, namely to encourage the study of botany, and to stimulate public interest in the plant life of New Zealand and its preservation, conservation and cultivation.

The grant will be administered by the student's supervisor as a contribution to expenses associated with the project.

Closing date for applications: **5pm Wednesday 26th October 2011**

A copy of the Application Form and the Rules of the award may be downloaded from the Auckland Botanical Society website:

https://sites.google.com/site/aucklandbotanicalsociety/

Contact for enquiries:

Kristy Hall
Secretary
Auckland Botanical Society
Email: aucklandbotanicalsociety@gmail.com

NEWSLETTER
NZ NATURAL HISTORY AND SCIENCE BOOKSTORE

Manaaki Whenua PRESS

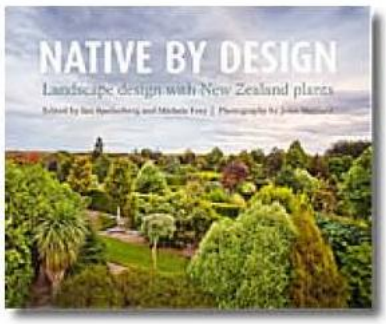
Landscape Design with New Zealand Plants

Launched on 1 September, *Native by Design: Landscape design with New Zealand Plants* is the latest book from the team that produced *Living with Natives: New Zealanders talk about their love of native plants.* This time professional garden design experts share their inspiring stories. It's a beautifully designed publication from Canterbury University Press, and a great price, thanks to generous support from their sponsors.

Bot Soc members receive 10% discount (this also applies to the full price of all books listed on our website). Please advise us of your membership when you order.

To order please visit www.mwpress.co.nz For more information, please email us at mwpress@landcareresearch.co.nz

NATIVE BY DESIGN: LANDSCAPE DESIGN WITH NEW ZEALAND PLANTS



RRP $45.00 **BotSoc Price $40.50**
P&P $7.00 within NZ

In this lavishly illustrated book, 20 of New Zealand's top landscape architects and designers offer their wisdom and advice on the subject of landscaping with native plants. These personal narratives showcase some of our country's most beautiful outdoor environments, from private gardens to public recreation land, urban and industrial spaces, and even farmland.

Stunning colour photographs capture the uniqueness and splendour of each location, from Kaeo in the Far North to Queenstown in the south. Contributors include Dennis Scott, Alan Titchener, Xanthe White and many other landscape architects and garden designers spend their lives transforming featureless blocks of land into welcoming spaces, evoking the special character of New Zealand. In this book they communicate their vision and passion, their experiences – good and bad, and the things they have learned the hard way

Edited by Ian Spellerberg and Michele Frey
Photographs by John Maillard
2011, 292 pp
ISBN 9781877257957
Published by Canterbury University Press

Manaaki Whenua Press, PO Box 40, Lincoln 7640, New Zealand

Articles

Formosa plants

Peter Johnson

At the BSO photo competition in April, one of Mary Anne Miller's plant portrait entries was of *Swainsona formosa*, Sturt's desert pea (above), which is the floral emblem of South Australia. The question arose as to why an Australian plant should have the epithet *formosa*, with our discussion narrowed into the concept of Formosa, the island in the China Sea.

I have stumbled upon the answer, from reading the 2010 Yearbook of The Republic of China (or ROC as they call themselves, being principally Taiwan): "It is said that when a Portuguese ship on its way to Japan sailed by Taiwan in 1542, the sailors were struck by the beauty of its mountains and dubbed it "Ilha Formosa", meaning "beautiful isle". It was under the name Formosa that Taiwan was known to the Western world until after World War II."

So back to the Latin: formosus = beautiful, hence the species name for Sturt's desert pea (one of its former classifications was as *Clianthus formosus*).

Now, on to *Lilium formosanum*, which does indeed originate in Formosa/ Taiwan. A tall lily with narrow white trumpet flowers, this has gone wild on dunes and roadsides in the North Island, and is listed on the NZ National Pest Plant Accord. I have seen it naturalised in the Bay of Islands, Taranaki coast, and common also on both coastal and upland rock faces on Lord Howe Island. We grew it in Dunedin for a while, but it often struggled to open its flowers before late autumn.

Sturt's desert pea, *Swainsona Formosa*, in Alice Springs. Photo by Mary Anne Miller.

We do retain in our garden the dwarf form, *L. formosum var. pricei*, which grows only about 0.4 m tall. Actually, this lily needs more effort to restrain than retain. David Lyttle has told me that he also needs to stop it spreading everywhere. Geoff Baylis would have described such a plant as being "very willing"! We make a point of picking all the flowers, either for a vase or else, when spent, into the compost heap. The occasional overlooked, sneaky plant

provides enough flaky seeds, stacked like book pages in a brown capsule, to keep the population going.

Similar flattened seeds are arrayed in tiers in the capsules of the giant Himalayan lily, *Cardiocrinum giganteum*. I saved some seed recently. Each fat capsule has about 720 seeds (c.120 in each of 6 locules). The inflorescence stalk reaches 3 m tall, and when you dead-head it you get a long fat tubular structure, quite like a didgeridoo (and, as I discovered, with similar acoustic properties!).

Lilium formosanum on slopes of Mt Gower, Lord Howe Island. Photo by Peter Johnson.

New Lichen found on the 2011 Summer Trip to Western Fiordland

Allison Knight

The combined Otago and Wellington Botanical Society summer trip based at Boyd Creek, near Te Anau Downs, was even more successful than I expected. My main aim was to photograph common lichens for an introductory Field guide to Lichens and I spent a lot of time searching for some common species from the genus *Pertusaria*. These are white crust lichens that are common on sea shore rocks and the bark of forest trees. Diligent searching turned up four well-known species along with two that I couldn't key out. At first I thought they might be Australian species, so I consulted Alan Archer in Sydney. He suggested we ask Jack Elix in Canberra to do

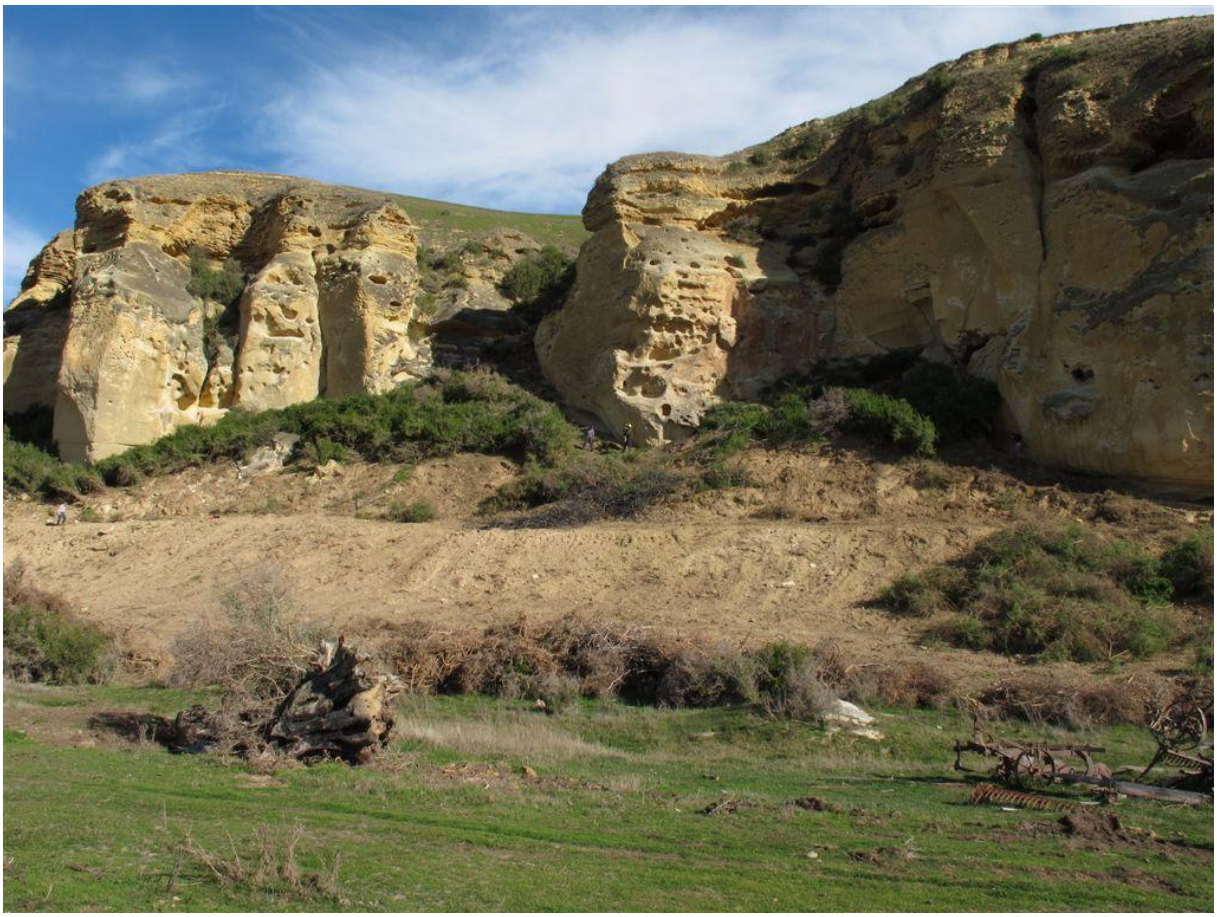
advanced chemistry. After careful visual and chemical comparisons with similar species in the genus both experts agreed that one must be an entirely new species of *Pertusaria*. We named it *Pertusaria southlandica* and pulished it recently. So far it is only known from this one spot, so please do keep a look out for it and take a photo or bring me a specimen if you find anything that looks like this. If you'd like to read more about it the full paper can be found on-line – just Google 'Australasian Lichenology'.

A Knight, JA Elix & AW Archer. A new species of *Pertusaria* (lichenized Ascomycota, Pertusariaceae) from New Zealand. Australian Lichenology 69 (July 2011), 33 – 35.

Pertusaria southlandica growing on a twig of *Nothofagus solandri* among bog pine (*Halocarpus bidwillii*) beside the car park before the ford on the track to Boyd Creek Lodge. Photo by Allison Knight.

Bash Boxthorn for Better Bluff Biota *Graeme Loh and John Barkla*

The recent lecture by Peter Raven "How many species will survive the 21st century" raises the question of what is most at risk of going extinct near us. One plant which had a stronghold in Otago, *Stellaria elatinoides*, is already known to have become extinct. Others, like many native members of the genus *Lepidium*, feature near the top of lists



Gard Road limestone escarpment with boxthorn clearing underway. Photo by John Barkla.

cataloguing our most threatened plants. The entire populations of eleven 'Threatened: Nationally Critical' plants occur only within 120 km of Dunedin. Two skinks and a moth are in the same situation. They are in the heavily settled and developed lowlands, with ten of them found on limestone bluffs in North Otago.

These local species are in most need of our attention if they are not going to go extinct "on our watch":

Cardamine cf. *bilobata*
Carmichaelia hollowayi
Festuca aff. *novae-zelandiae*
Gentianella calcis subsp *calcis*
Gentianella aff. *G. calcis* subsp. *waipara*; (CHR 569771; Earthquakes)
Koeleria aff . *novozelandica*
Lepidium kirkii
Lepidium aff. *oleraceum* (f)
Pachycladon exile
Poa spania
Trisetum aff. *lepidum*

Some of these are so poorly known they haven't been formally described and don't have published names. A recent trip to north Otago even discovered what appears to be a new taxon in the genus *Gingidia* and it seems to be present at just one site.

What can the botanists of Dunedin do?

There is work going on to save some of these species now and your help is sought. An island of limestone that supports Trig Z on Gards Road in the Waitaki Valley is a great place to do this. *Carmichaelia hollowayi*, *Lepidium sisymbrioides*, and a rare gentian are all highly threatened species that hang on to bluffs here. Other 'At Risk' species present include *Raoulia monroi*, *Muehlenbeckia ephedroides* and *Leptinella serrulata*. Dwarf kowhai (*Sophora prostrata*) is present and near its southern distributional limit.
Boxthorn and exotic grasses are the current most important problem plants. Methods to control these weeds and foster threatened plants need to be tested and applied. Translocations to establish new populations of some of the species known only from further up the valley near Awahokomo, are probably appropriate. There are paleobotany opportunities too in buried ash layers and possibly in the inaccessible large ledges. The Department of Conservation recognises the high priority of this site and is conducting work focussed particularly on the welfare of *Carmichaelia hollowayi.* Ranger Graeme Loh would love a hand in all manner of activities. Give him a yell on 4746935 or gloh@doc.govt.nz

Lepidium sisymbrioides at Gard Road. Photo by John Barkla.

Gentianella aff. *G. calcis* subsp. *Waipara*. Photo by Graeme Loh.

Carmichaelia hollowayi. Photo by John Barkla.

Bash Boxthorn Addendum *Alexander Fergus*

On Saturday the 20th of August about a dozen volunteers and a crew from the Department of Conservation arrived at the Trig Z site armed with loppers, saws, rakes and chainsaws. Graeme explained to us what had been done; the plan for the days attack; and then we set to it. With a team this size it was extremely gratifying to watch Boxthorn succumb. After an hour or so we broke for lunch after which Graeme and Ewan Fordyce led the newbies on a botanical and paleontological tour. A second Boxthorn assault was fuelled with our enthusiasm for the Trig Z circuit. This is the third trip Graeme has organised to the site, there will be more, and there are other sites that need input, so do get in touch with him if you are interested in helping out.

The green roof on top of Otago University's William James Psychology building. Photo by Janice Lord.

Up on the roof *Janice Lord*

The "Green roof" on top of Otago University's William James Psychology building has the feel of a riverbed, with a rich red-gold mosaic of tussocks, low shrubs and mat- plants incompletely covering the white

pumice-gravel substrate. Planted in December 2009 by a group from the Botany Department the green roof is a significant feature adding to the building's environmental credentials.
The plants and pumice "soil" contribute to lowering heating and cooling costs and filter rainfall before it is used to flush the 5-storey building's toilets. But from a botanist's point of view a green roof is an opportunity to create an island of vegetation, to construct a plant community.

Unlike other green roofs in New Zealand we aimed for diversity from the outset. Plants were selected that naturally occurred in open, drought-prone habitats and were ideally native to Otago or at least to the South Island. In the end we planted more than 2000 plants of a mix of 20 species (see below) in blocks dominated by either insect-pollinated or wind-pollinated species. The idea behind this block design was not only to provide a mosaic of plant heights and textures but also provide varying types of habitat for insects. Establishment success has been outstanding, far better than for green roofs in Auckland, mostly due to lower evapotranspiration in Dunedin's cool moist climate, and the plants are growing rapidly.

Acaena inermis. Photo by David Lyttle.

We have been monitoring invertebrate diversity and the influx of weeds since planting, with Asteraceae and *Trifolium* species the main invasives. The most dramatic successes have been among the mat plants with *Selliera radicans* and *Disphyma australe* patches now covering much of the previously bare ground. Likewise *Libertia ixioides* and *L. peregrinans* have extended their rhizomes up to 30cm from each initial planting site. *Coprosma acerosa* and *Pratia angulata* are now fruiting and even a seedling *Hebe odora* has been sighted.

The roof will obviously continue to change and develop over time and will require ongoing management (for example the self-sown kanuka seedlings won't be allowed to stay!) but I hope it will provide educational and research benefits for a long time to come.

Mat plants:
Acaena inermis var. *purpurea, Disphyma australe, Leptinella squalida, Muehlenbeckia axillaris, Pratia angulata, Selliera radicans.*

Shrubs and subshrubs:
Coprosma acerosa, Coprosma depressa, Corokia cotoneaster, Hebe toparia, H. odora, Melicytus alpinus, Pimelea prostrata

Graminoids and herbs:
Festuca actae, Isolepis nodosa, Libertia peregrinans, L. ixioides, Microtis unifolia, Poa colensoi, Wahlenbergia albomarginata

Range extension or ephemeral event for *Fumaria capreolata* L. in Otago?

Maia Mistral

Three years ago in early summer I was invited to admire a recently constructed succulent garden on a friend's property in Waikouaiti. My eye was instantly attracted to an unusual weed (much to my host's bemusement) which I assumed was a white sport of one of the common pink flowering fumitories. Not so, *Fumaria capreolata* is a white flowering species introduced and naturalised in other parts of New Zealand but not known in Otago. Webb *et al.* (1988) gives a patchy distribution for the species; in the North Island from Northland and South Auckland, and the Huntsbury area of Canterbury in the South. The species may have been previously overlooked in the Otago region, although it is a robust scrambler with conspicuous dark tipped creamy white flowers around 1cm in length. The Waikouaiti plant may reflect a recent range extension into Otago, or the single specimen may have been just that - a one off event.

The garden the specimen was found in had been partially constructed with soil supplied by a local transport company. This suggested one possible seed source. A quick search of the transport company yards revealed plenty of *F. muralis* but no *F. capreolata*.

When I returned with Florence Sorrel to the garden 6 weeks later to collect seed from the plant (in addition to floral attributes, seed rugosity and the shape of the apical notch are diagnostic for *Fumaria* species), we checked for further individuals within a 500m radius of the garden to no avail. Where had this plant come from?
A second possible seed source (and one that may prove difficult to find evidence for) could have been via one of many trucks that pass the garden daily, transporting feed from Canterbury to a large poultry farm neighbouring the property.

Any further thoughts of the origins of the plant lay idle until last summer when I was in Waitati at the local art gallery, again finding *F. capreolata* in a rough abandoned flower bed in the car parking area. It is possible that both gardens had used the same supplier of top soil in the past to construct the beds (the poultry feed trucks don't travel that far South), or perhaps a more likely explanation for the presence of *F. capreolata* in both gardens is each presented an ideal habitat for the species, irrespective of seed source.

F. capreolata is the only white flowering species of the five introduced fumitories in New Zealand. The white colouring is most pronounced in the early stages of flowering as the corolla flushes pink following pollination The species is native to Northern Africa, Western Asia, both Northern and Southern Europe and naturalized widely, from North America to Japan and Australia in the Pacific, including island groups such as Juan Fernández off the coast of Chile (USFS).
Introduced fumitories generally have the diminished status of garden weeds, although the genus has been used medicinally in the past for the treatment of a range of conditions from dermatitis to liver complaints (Wren 1975, Brown 1995, Grieve 1998). Suau *et al* (2002) have distinguished 3 major chemotaxonomic groups within *Fumaria* based on alkaloid extracts. *Fumaria capreolata* chemistry is most similar to that of *F. bastardii* (present in N.Z.) with protopine alone comprising 66-79% of total plant alkaloid extracts. The European medicinal species *F. officinalis* (also present in N.Z.) is characterized by two major protopine alkaloids- protopine and crytopine which are present in much smaller quantities.

Being both weedy and non-native, *F. capreolata* may have been thought unworthy of collection in the past and consequently Otago has not been included in the distributional range. It may be an occasional in the Waikouaiti/ Blueskin Bay area, or perhaps it is more widespread?

Botanical Society members could help by looking out for this charming (invasive?) exotic on light soils in full sun. It has a preference for roadsides and hedgerows elsewhere in the country. Flowers and fruits can be seen from June to January. Two specimens are lodged in OTA. I would be happy to co-ordinate any new sightings, and can be contacted either at by leaving a message at the Botany Department or by email at maia@ botany.otago.ac.nz.

Fumaria capreolata. Photo by Jeremy Rolfe.

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Meeting and trip reports

Conifer workshop- July 1st

Alexander Fergus

This was a great day out for a small group of conifer-keen gardeners and amateur botanists. We started in the Botanic Garden centre where John Steel gave us an introduction to the variety of native and introduced families in Pinophyta, and went on to include aspects of morphology, physiognomy, reproduction and evolution. Barbara Wheeler took over and illustrated the variety of specimen trees found in and around Dunedin. We had lunch, and then spent the afternoon in the sun employing our morning's tuition exploring the gardens collection. Most significantly, this was

a very successful union of Dunedin's two big botanical bodies, namely the botany department at Otago University and the Dunedin Botanic Gardens. Let's hope for more of the same.

Botany in the bush. Orokonui and beyond- July 6th *Alexander Fergus*

A small enthused group turned up at the eco-sanctuary in early July to hear Peter Johnson discuss, with a variety of botanical props, the botany and ecology of local Dunedin forest types. Peter described the localised presence of *Weinmania racemosa*, *Metrosideros umbellata*, and *Libocedrus bidwillii* with its almost obligate epiphyte the filmy fern *Hymenophyllum malingii*. The poor recovery of *Kunzea ericoides* under its own canopy was touched on, as was the importance of endo- and ecto-mycorrhiza for most of our forest tree species. This fantastically wide-ranging talk included various aspects of physiognomy, life history, and the evolution of our local forest plants. The importance of interactions in forest ecosystems was illustrated with the feeding preferences of Kereru (*Sophora* leaflets), possums (*Pseudopanax colensoi*), and red and yellow admiral butterflies (*Urtica ferox* and *U. incisa* respectively). A myriad of small facts including the multiple summer flowerings of *Melicytus ramiflorus*; the deciduous character of *Olearia fragrantissima*; and the hygroscopic hairs in the capsule of *Earina autumnalis*, left the audience with a unique insight into our local forests. Much appreciated Peter.

New Zealand Fungal Foray 2011- July 13th *Alexander Fergus*

David Orlovich kicked off this fungal picture show like any proud new father would, with a picture of his then 6 week old son Jack. The listeners immediately recognised future mycological celebrity in Jack's countenance and returned a round of applause. The 2011 fungal foray took place in and around Taupo in May this year. David retold a hectic time of exploring, however he begrudged the number of dead rat photos (mycology speak for photos of shabby looking collections) that resulted from the frenetic collecting. Some fungal families featured more than others, either as a result of David's predilections or the availability of material. The domination of *Cortinarius* species in his talk seems to stem from both causes, being the 'awesomeness' and the largest genus of mushrooms in the world. Everyone seemed to agree it is a pretty neat genus with representatives including *C. alienatus*, described as an alien bursting out of an egg; *C. cucumeris*, which smells like cucumbers; and *C. porphyroideus*, a purple spongy mass. Other species, like *C. rotundisporus* are found only in association with *Leptospermum* or *Kunzea*. We learnt that not all *Amanita* species are toxic, just those that belong to a certain section; that birds nest fungi, *Crucibulum leave*, are closely related

to puffballs; and that *Inocybe leptospermi* have star-shaped spores. *Aseroe rubra*, the anemone stinkhorn, and *Calostoma rodwayi*, colloquially 'hot lips', proved to be colourful crowd pleasers. On aside, David is collecting *Aseroe rubra* from across the length of New Zealand, so do get in touch with him if you have the opportunity to collect (david.orlovich@otago.ac.nz , (03) 479 9060). Next year's fungal foray will either be in Gore or at Borland lodge, much more accessible for any BSO members keen to get along.

Birds Nest Fungi, *Crucibulum laeve*, in the Pureroa Forest Park.
Photo by David Orlovich.

Aseroe rubra. Photo by David Orlovich.

Cortinarius cucumeris. Photo by David Orlovich.

Ross Creek–Woodhaugh Garden Track Network - July 17th *Ella Hayman*

On a sunny Dunedin winter day nine eager BotSoc members met at the George Street entrance to Woodhaugh Gardens. Led by John Barkla we wandered along admiring the large *Sophora* and *Hoheria* in the alluvial forest before crossing Malvern Street and following the banks of the Water of Leith. Restorative planting in this area includes *Streblus* with distinctive fiddle shaped juvenile leaves and *Teucridium parvifolium* with square, hairy young stems.

As we climbed Ross Creek Track to the reservoir we came across a carpet of the introduced *Ranunculus ficaria*. Once at the reservoir we relaxed in the sun for a bit before continuing along the Podocarp Track past the big rimu (*Dacrydium cupressinum*). Here we noted many species of *Blechnum* and *Asplenium* as well as a number of small leaved *Coprosma* spp. that kept us guessing. Eventually we came out onto the suburban streets of Balmacewen and admired gardens filled with cultivars of *Lophomyrtus* in many shades of purple. We also took a couple of detours in search of mistletoes. On one large specimen tree at the end of Stonelaw Terrace we

marvelled at an intermingled mass of two native mistletoes; *Tupeia antarctica* and *Ileostylus* sp., one likely hemi-parasitic on the other. We also found the cryptic dwarf mistletoe *Korthalsella* sp. on *Coprosma crassifolia* while making our way down the Bullock Track.

Eventually we made it back to where we started having walked in a large loop. It was nice to get out and explore an area with so many treasures so close to home and great to see so many people using the tracks.

John Barkla studying an intermingled mass of *Tupeia antarctica* and *Ileostylus* sp. Photo by Andrew Tanenzap.

It's time to save the planet- July 21st *Kelsey Picard*

Some say Professor Peter H. Raven is the greatest living botanist, he has been called "the Hero of the Planet" by Time magazine, but he is possibly better known as the author of the BIOL113 text book; The Biology of Plants. We were lucky enough to see Peter give a talk entitled 'How many species will survive the 21st century?' on the 21st of July. The importance of preserving species for future generations was the essence of his lecture. According to Raven, "Living species are indispensable and essential for our lives". There are estimated to be around 12 million species in our world

and just under one sixth of these have been documented and identified. Prof. Raven stated that 1000 species are being lost from our world every year and that this rate is not constant and may reach up to 10,000 species a year if it follows the predicted forecast. A well-focused point in this lecture was the direct affect that the human population has on the environment. The human race is growing at a phenomenal rate and since 1936, when Prof. Raven was born, the population has trebled. More people also require more resources to sustain them but there is a limit to the world's natural resources. "The world provides enough to satisfy every man's need but not every mans greed". Prof. Raven also pointed out the alarming fact that 200,000 people are born every day (40% of these in Africa) but also that 50% of the world's population live on less than $2 a day. He also touched on human impacts on plant diversity; at present 90% of our food comes from 100 species and 60% of this comes from only 3 species, wheat, rice and maize. This huge reliance on these heavily selectively bred plants and the pressure to increase yield and crop land puts huge pressure on species diversity. The possibility of disease in these major crops could cause extinction and mass problems for the world. His visual aids were excellent and strongly portrayed the beauty in the world and therefore emphasised our need to preserve its incredible diversity. Prof. Raven concluded that we need to step up and try to save species or everyone will miss out.

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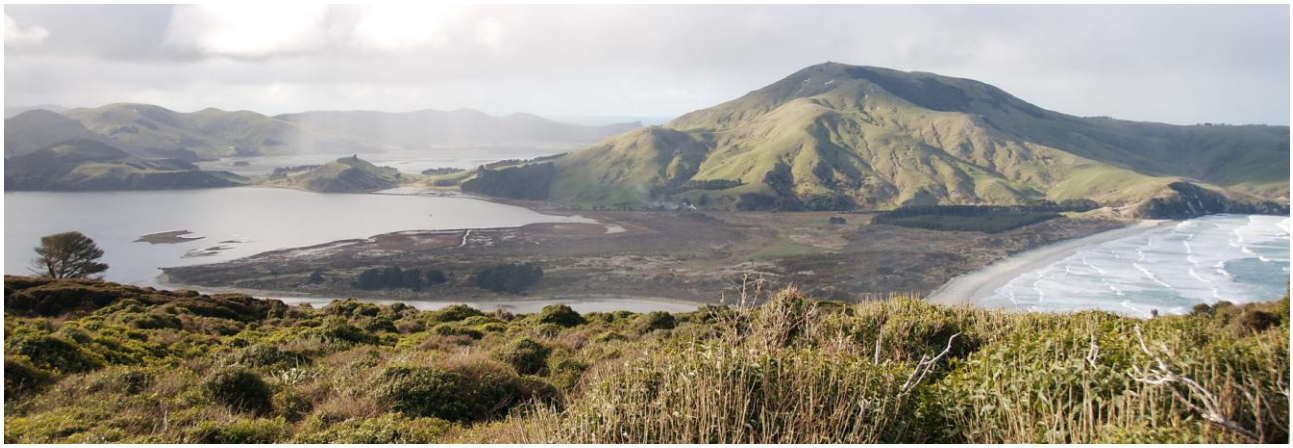

Otago Peninsula Panorama: Mt Charles and Hooper's Inlet from Sandymount. Photo by David Lyttle.

Centella uniflora Okia Flats. Photo by David Lyttle.

Geoglossum sp Waipori. Photo by David Lyttle.

Botanical Society of Otago: PO Box 6214, North Dunedin 9059, NZ

Patron: Audrey Eagle http://www.botany.otago.ac.nz/bso/

Committee 2011–2012

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