BOTANICAL SOCIETY
OF OTAGO

Newsletter Number 77 February 2016

BSO Meetings and Field Trips

Friday – Sunday 12th to 14th February 2016 Field trip to Borland – A weekend field trip to Borland in East Fiordland to explore the beech forests, lake margins and alpine areas. The area is rich in botanical and ecological history. A hand lens, camera and sense of adventure are a must! We will be staying at the Borland Lodge. Contact Gretchen Brownstein (brownsteing@landcareresearch.co.nz).

Wednesday 10th February 5.20pm Around the World in 80 Plants. Speaker: Dylan Norfield, Collection Curator Geographic and Arboretum Collection, Dunedin Botanic Garden. Experience a trip around the globe through the eyes of the Geographic Collection at Dunedin Botanic Garden. This collection covers over 2000 species and is a treasure trove of rare and interesting plants. Hear about the rare and unusual in this asset for botanists New Zealand wide.

Wednesday 9th March 5.20pm The Moriori: an example of precontact innovation in plant management. Speaker: Dr. Justin Maxwell, Department of Anthropology and Archaeology, University of Otago. The technical challenges to successful Polynesian colonisation were substantial in the New Zealand archipelago at the cool-temperate margins of south-western Polynesia. This talk is concerned with the last and arguably most difficult place to be permanently settled by Polynesians in the New Zealand region: Rekohu of the offshore Chatham Islands. A combination of archaeology, anthracology, palynology and ethnographic records are used to determine how the Moriori, the first people of Rekohu, modified the environment and adapted ancestral Polynesian ideas and technologies. The results demonstrate the resilience and technical skills of early Polynesian settlers to successfully adjust to a new climate zone. Central to the success of Moriori settlement was the translocation of *Corynocarpus laevigatus* from mainland New Zealand to Rekohu and the management of the coastal broadleaf forests. The management of fruiting *Corynocarpus* trees was a core economic activity with major implications for questions of Moriori socioeconomic development. This research also highlights the historical adaptability of Polynesian societies to overcome major changes in climate.

Saturday 5th March, 8.30am Field Trip: Taieri Mouth Track to John Bull's Gully – This track runs from Taieri Mouth upstream along the true right of the Taieri River towards Henley through native bush in varying degrees of recovery and includes some estuarine salt marsh and a fine example of native carr vegetation. The area has an interesting Maori and European history still evident in some of the landmarks to be found on the way. The track is in good condition and fairly easy. Leave the Department of Botany car park at 8.30 a.m. returning early afternoon. Contact John Steel 021 2133 170, email john.steel@otago.ac.nz

Wednesday 13th April 5.20pm BSO AGM and Photographic Competition – A popular and eagerly anticipated event for anyone interested in botanical photography. Learn what makes a good photograph and how to improve your photographic skills from our panel of expert judges. The best photographs will be chosen for the BSO Calendar so this is your opportunity to have one month of fame. Start organising your entries now and don't wait until the last minute.

Saturday 23rd – Sunday 24th April. Harbour Cone Bioblitz – Using the Pukehiki hall as a base, the BSO will run a Bioblitz as part of the 'Wild Dunedin' event (a three day nature festival with various groups and organisations coming together to host events celebrating Dunedin's natural environment and wildlife). Details will be updated on the Botanical Society's website and Facebook page.

Wednesday 11th May 5.20pm Diversification of New Zealand Lineages. Speaker: Gregory T. Nelson, MSc Student, Botany Department, University of Otago/Landcare Research. New Zealand has many charismatic plant lineages that have diversified profusely. Understanding how this process occurs contributes greatly to our understanding of the evolutionary history of New Zealand and the interplays between ecological and evolutionary dynamics. Using resolved phylogenies of representative New Zealand groups, I explore morphological and environmental differences between closely related species with the hypothesis that New Zealand's diversity of habitats have contributed to its diversity of species.

Saturday 28th May 9.30am Field Trip to Stevensons Bush Scenic Reserve – Probably one of Dunedin's least known and least visited public reserves. This substantial remnant of dry, coastal, native bush with some mature podocarps surrounded by regenerating trees and shrubs forms a large V-shaped gully from McGregors Hill down to St Leonards and is a remnant of the extensive forest that once covered the north-harbour hills. Access to the reserve is by climbing the boundary fence and can be quite steep in places; there aren't any tracks! Leave the Department of Botany car park at 9.30 a.m. returning early afternoon. Contact John Steel 021 2133 170, email john.steel@otago.ac.nz

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 old Captain Cook Hotel. Please use the main entrance of the Benham Building to enter and go to the Benham Seminar Room, Room 215, located on the second 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 to dinner afterwards: everyone is welcome to join in. The talks usually finish around 6.30 pm: keen discussion might continue till 7 pm.

Field trip details: Field trips leave from Botany car park 464 Great King Street unless otherwise advertised. Meet there to car pool (10c/km/passenger to be paid to the driver, please). 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.otago.ac.nz/botany/bso/

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Chairman's Notes

David Lyttle

Now 2016 has arrived we can look forward to another year of Botanical Society activities. December 2015 turned out to be a very busy month with the presentation of the Allan Mere to Sir Alan Mark on the 10th. This was followed by a joint field trip with Forest and Bird to the Old Man Range on December 19th. The trip proved very popular, with over thirty people and eleven vehicles involved. Organising these field trips involves some anxiety in terms of the weather being favourable and the logistics with vehicles. Fortunately, the weather on the day was fine, and there were enough vehicles available to convey the party to the top. We had a very full day with visits to several sites where Sir Alan Mark was able to elaborate and explain decades-long research programmes on the ecology of the Otago subalpine vegetation. For many people on the trip it was their first experience of a Central Otago mountain environment and the unique plants growing there. We were very fortunate to have Alan along with us to share his knowledge.

In contrast with the sometimes sparse attendance for our local field trips, these major field trips attract a large number of people many of whom are from out of town and do not regularly attend our meetings. We do not restrict participation in the BSO's field trips to members but we would hope that people who see value in participating in our activities support the Society by joining up and paying a subscription. As our only regular source of income is membership subscriptions we are completely dependent on a healthy membership to keep the BSO viable.

The first field trip of 2016 will be a weekend trip to Borland in East Fiordland on Friday 12th to Sunday 14th February. The area is full of botanical interest so it should be a great trip.

The BSO Photographic Competition continues to be a popular event giving members a chance to present their favourite botanical images for review by our three experienced judges. In 2015 at total of 43 images by 13 photographers were submitted. Although several of the regular entrants are very competent photographers they do not always win as the photos are evaluated for "technical and artistic merit" by our judges who are always on the lookout for images that show novel and fresh approaches to botanical photography. We have included an additional open category for non-members again this year to encourage people to join the BSO and participate in its activities. The key to success is a creative idea presented in a technically competent manner so it is always helpful for photographers to turn up on the night and listen to the feedback and comments from the judges on their entries.

As the result of possum control work in 2015 by the Otago Peninsula Biodiversity Group there are now 1757 fewer possums in sector 4 (Portobello to Dunedin City) than there were a year ago. It is gratifying there are now roses blooming and plum trees bearing fruit in my garden (- more extensive monitoring will doubtless show that the native trees in the scattered forest remnants on the Peninsula now can flower and set seed). There are tui permanently living in my garden as there is sufficient food available for them all year round. It is gratifying to see that a determined community effort can result in measurable environmental gains. I am hoping the progress will continue and new initiatives can be undertaken such as removing exotic weeds. Among the undesirable plants I have located

that still seem to be relatively restricted in their distribution are boneseed (*Chrysanthemoides monilifera*, Portobello Road), aluminium plant (*Lamium galeobdolon*, Paradise Track), wandering Jew (*Tradescantia fluminensis*, Highcliff Road) and Spanish heath (*Erica lusitanica*, Paradise Track). See Otago Peninsula Biodiversity project on the Nature Watch NZ website:

http://naturewatch.org.nz/projects/otago-peninsula-biodiversity.

A considerable amount of work has been carried out by Moira Parker and others to remove Chilean flame creeper (*Tropaeolum speciosum*) and *Bomarea caldasii* from various sites on the Peninsula. BSO members could play a role in identifying and recording the locations of these pest species in Dunedin City so control measures may be undertaken. I will leave these suggestions open for the present and if anyone has any thoughts on this matter I would welcome further contributions through the BSO Newsletter.

Secretary's Notes

Allison Knight

Continuing the theme of my October note a sixth honour came to BSO members when Queenstown based Neill Simpson QSM was awarded another honour and this time Barbara was rightly included. They were jointly awarded the Loder cup for outstanding services to conservation and it will be presented to them in Wellington in June this year.

In December the BSO meeting programme finished on a high note with the presentation of the Allan Mere to Alan Mark for his outstanding contribution to botany over a lifetime of research, teaching and conservation. Sir Alan has shared his expertise and enthusiasm at many BSO meetings and field trips.

Marcia Dale's stunning oil painting of *Dracophyllum menziesii* was the highlight of the auction at the New Zealand Plant Conservation Network conference in Dunedin last October. Spirited bidding led to it selling for $2000. Marcia has generously donated half of this to the NZPCN. She has requested that the other half be given to BSO since the painting was originally intended to be auctioned for our cause at the Botany Department 90th Celebrations.

The final trip of the year to the Old Man Range led by David Lyttle was also a highlight of last year. In conjunction with Forest and Bird, a convoy carrying over 30 people wound its way up to the herb fields and snow banks around Hyde Rock. Alan Mark outlined the history of the historic sheep graveyard, his long-term snow fence and tussock transplant plots while I was delighted to discover an assortment of Data Deficient lichens.

At last year's John Child Bryophte and Lichen Workshop, Jon Terry drew attention to the astonishing number, 975 (54%) of lichens that so little is known about they were classified in 2012 as Data Deficient. He set up the nucleus of a group to work towards improving this situation. This is where all Bot. Soccers can really help. The first lichen we are tackling is the quite striking and beautiful (at least to a lichenologist) *Dibaeis absoluta*. It is easy enough to keep an eye out for and the more photos and records of distribution that come in the closer we will get to understanding its real distribution and conservation status. There are more details in an accompanying article.

Also keep an eye out for more details about the forthcoming Wild Dunedin event which is running over ANZAC weekend. This is

designed to encourage everyone to discover and celebrate Dunedin's natural heritage. It is a good chance to help showcase BSO and to raise the understanding of all the special local flora.

Already 2016 is shaping up to be another exciting botanical year.

Treasurer's Note

Mary Anne Miller

2016 subscription fees are now due. A membership form can be found on the inside back cover of this issue. Since we've recently changed to annual subscriptions you may be unsure if you're a paid-up member. Please contact me if wishing to confirm your status. maryanne.miller53@gmail.com.

Editor's Notes

Kate Caldwell

On behalf of everyone in the BSO I would like to extend a warm thank you and a round of applause to Marcia Dale who has stepped down as our newsletter editor. Marcia has been editing the newsletter since February 2013. Passing on this role will allow her more time to spend with her growing family.

Thank you also to Gretchen Brownstein, who edited the previous issue of the newsletter and assisted with the current one. And a big thanks to everyone who has given their time to provide reports, articles and photographs for this issue – keep 'em coming! The three artists who have contributed the beautiful drawings that are dotted throughout this newsletter deserve a special mention. The cover painting of *Fuchsia excorticata* is by Lucy Parsons.

Please submit copy for the next newsletter by 13th May 2016.

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 kate.caldwell@dcc.govt.nz 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.

Pseudopanax ferox, *drawing by Marie Baelen*

New Members

A warm welcome is extended to the following new members:

Monica Tromp

Sue Murray (visiting from Highland, Scotland for the summer)

Correspondence and News

Peter Bannister Student Field Grants Reports

Reports from two of the inaugural Peter Bannister Student Field Grant recipients are presented below.

Grants are awarded annually to suitable applicants studying botanically related topics at the University of Otago. In 2014 Amy Clarke (Department of Geography) was awarded $1000 for a vegetation survey at two alpine field sites, Bryce Kahlert (Department of Botany) was awarded $500 to undergo a tree-climbing course to assist collecting canopy mycorrhizal samples and Matt Desmond (Department of Marine Science) also received $500 so he could collect macroalgal samples off the Otago coast.

Bryce and Matt's reports indicate how their grants were used and how grateful they were to the Fund which was established by Jennifer Bannister in memory of Professor Peter Bannister. Amy's report will be in the next issue of the newsletter.

Microbial diversity in kahikatea and silver beech canopy soil

Bryce Kahler

PhD Candidate, Department of Botany, University of Otago

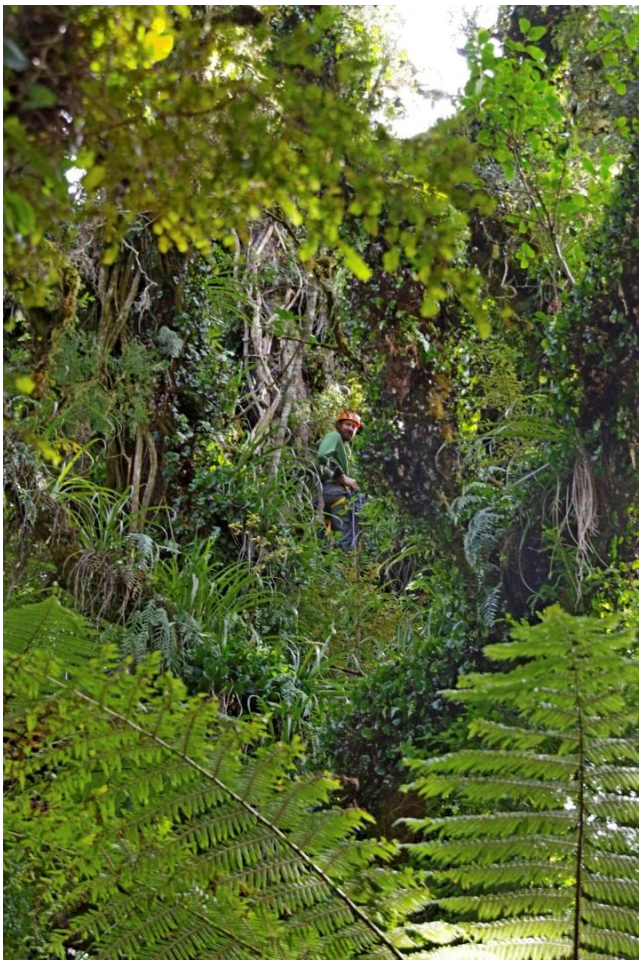
Funding provided the means to attend a canopy access training session from one of the few instructors offering purpose built training for researchers. The training covered basic tree climbing procedures, with safety and rescue manoeuvres demonstrated. This allowed me to carry out a successful soil sampling program over five days in early November 2014.

Soil was sampled from a total of 16 trees in the three sampling sites. Sites one and two were just over 30 km south of Haast at the confluence of the Jacksons river, the Arawhata river and at the Lake Ellery trailhead. Site three was beside the Moeraki River 25 km north of Haast. Three samples were taken from each tree, one from the base, and two from the canopy at separate heights.

DNA and RNA isolated from the soil samples was used to create a set of 200 indexed sequence libraries for fungi and bacteria. After processing and running through a bioinformatics pipeline, the sequence data provided just over a million fungal reads from 2470 operational taxonomic units (OTUs) or species hypotheses. The bacterial sequences resulted in 2.6 million reads and 8766 OTUs. Various forms of data visualisation and analyses have shown some interesting patterns from the data. That in addition to the host species having a significant effect on the fungal diversity in the canopy only, an interplay of age — using diameter as a rough proxy — and pH, among other attributes, contribute to a gradient of changes in microbial diversity patterns.

These appear to result in a reduction in dominance of collectively dominant genera from the Phylum Proteobacteria and increasing dominance of the fungi *Trichoderma*. These effects are muted in the terrestrial samples by comparison. Currently we are making attempts at model construction to detangle the various factors involved.

It is not until experiencing the canopy habitat that its extent and richness can be truly appreciated. Through the provision of the Peter Bannister Field Grant, I was able to fully engage with my topic, discovering that the canopy soil microbial diversity matched or exceeded that of the larger, visible epiphytes.



Bryce gathering canopy soil samples from one of his sites in Westland, November 2014. (Photo: Bryce Kahlert)

The effect of light limitation on macroalgal communities

Matthew Desmond

PhD Candidate, Department of Marine Science, University of Otago

With the assistance of the Peter Bannister Student Field Grant an extensive and valuable field trip was made possible. This trip involved a three day expedition aboard the RV Beryl Brewin to a number of subtidal reef sites along the Otago-Catlins coast. A team of four divers, including a cameraman working on a separate project, and the skipper were present on the cruise. Over the three days, sample collections and light data logger installations were conducted via SCUBA at six sites, spanning from Green Island (offshore of Brighton) down to White Head (north of Waikawa Harbour). The samples collected allowed for high resolution, taxonomic classification of the subtidal macroalgal communities at each site. This information provided an estimate of macroalgal diversity and biomass production across a number of comparable reef systems.

Data of this nature has never been obtained from this area of coastline and therefore forms a valuable baseline assessment of the region. The data will also form part of a wider study that includes sites from Stewart Island and North Otago and investigates the link between catchment land-use and macroalgal productivity on adjacent subtidal reef systems. Following the retrieval of light data loggers an understanding of how catchment land-use influences coastal turbidity via sediment runoff will be gained. This information can then be related to the macroalgal diversity and biomass data to demonstrate how changes to land-use practices may influence rocky reef communities through the modification of the underwater light environment. On the

completion of this project results will be published in internationally recognised, peer-reviewed journals and acknowledgement of the PBSF Grant will be made.

This work could not have been completed without the assistance of the PBSF Grant and I am extremely appreciative for the support.

Primary Supervisor: Dr. Christopher Hepburn.

Steaming south on the RV Beryl Brewin looking north towards Nugget Point. Matt had three days of perfect weather for sample collecting, which is almost unheard of off the Otago-Catlins coast. (Photo:Matt Desmond)

Botany Department Colloquium, Friday 9th October 2015

Gregory T. Nelson

This year's student colloquium was a great success. In total there were 12 student presenters, which accurately represented the wide range of research topics being investigated in the department. From the genetic and physiological mechanisms involved in environmental stress responses of cyanobacteria, environmental determinants of soil microbial communities, climactic and geographic determinants of alpine community similarity and flowering phenology, improving bean crop seedling survivability, to understanding the implications of biome shifts in diversification, the colloquium truly had something of interest for everyone. Angela Brandt from Landcare Research was the guest speaker and she explored the implications of priority effects (or time since colonisation of New Zealand) on community assembly dynamics, providing an evolutionary backdrop for New Zealand's rich ecology. BSO President David Lyttle and Head of the Department of Botany Steven Higgins judged for the best three talks which won prizes supported by BSO. Below are the winning presentations' abstracts. Thank you everyone for coming and I hope to see you at the 2016 Colloquium!

Phenotypic variation in international strains of the canonical *Synechocystis* sp. PCC 6803 'wild-type'

Jaz Morris

The cyanobacterium *Synechocystis* sp. PCC 6803 is a model species for the study of the regulation, function and genetics of photosynthesis, due to its ability to grow in photo-autotrophic, -mixotrophic and -heterotrophic conditions, and its capacity to be readily transformed by exogenous DNA. Recently, the advent of affordable whole-genome sequencing technology has revealed genotypic variation in the canonical *Synechocystis* 'wild-type' strain, which has been passed haphazardly among research facilities around the world. We have previously reported the genome sequence of the 'Glucose-Tolerant - Otago 1' (GT-O1) strain, and a substrain 'GT-O2', that displayed several unique mutations. Here we demonstrate a comparison of the major genetic variations between GT-O1/GT-O2 and an important European lab wild-type, the motile 'PCC-Moscow' strain, and the non-motile 'GT-Kazusa' strain; in 1995 this was the

original *Synechocystis* strain to have its genome sequenced. Importantly, we reveal for the first time major phenotypic variation between all four strains, and highlight the need not only to know the genome of the wild-type strain being studied, but its phenotype as well.

Variation in flowering patterns and flowering phenology in alpine environments in response to microclimate

Daniel Basubas

High topographical heterogeneity in alpine environments can result in fine-scale thermal variations. The aim for this research is to quantify the impact of fine-scale topographical heterogeneity on microclimate, flowering phenology and flowering patterns. The study was performed on the Rock and Pillar Range, New Zealand, focusing on the fine-scale environmental differences between north-facing and south-facing slopes. Microclimate was measured using iButton data loggers and camera stations set up at five locations on north-facing and south-facing slopes. The south-aspect was 2.3°C cooler (ground surface) than on the north-aspect, had an 8.7% greater proportion of snow pictures and 24.9% higher soil moisture content. Flowering phenology and flowering patterns for two alpine cushion species, *Dracophyllum muscoides* and *Phyllachne colensoi*, were analysed using pictures taken from the camera stations. Results indicate that patches on north-facing slopes were four times smaller in size, had 20% lower proportion of flowering *P. colensoi* patches and flowered twelve days and nine days earlier for *P. colensoi* and *D. muscoides* respectively. Implications for this research are that large-scale temperatures models may not account for the fine-scale environmental variation and omit important information. Variation in flowering phenology and patterns at fine-scales may indicate how cushion species respond to climate change

Expression of the low-oxygen-induced psbA1 gene results in the assembly of light-sensitive D1'-containing PS II reaction centre complexes in *Synechocystis* sp. PCC 6803

Tim S. Crawford

The genomes of many cyanobacteria contain a small psbA gene family which encode the reaction centre D1 protein subunit of photosystem II. This protein is the site of light-induced photo-damage to reaction centres and is rapidly turned over in the light to maintain PS II activity. Cyanobacteria respond to stress conditions such as high light intensities by regulating the transcription of different psbA genes and exchanging D1 isoforms. Under low-oxygen conditions a subset of psbA genes is up-regulated in several cyanobacteria. The representative of this group in *Synechocystis* sp. PCC 6803 encodes a less efficient isoform known as D1'; however, the role of these proteins is not understood. In this project, the transcriptional regulation of psbA1 and a downstream cluster of genes during transitions between aerobic and low-oxygen conditions are investigated. In addition, a set of psbA mutants in which the psbA1 or psbA2 genes were expressed from either the low-oxygen responsive psbA1 promoter or the constitutive psbA2promoter are constructed and used to characterise the activity and assembly of D1'-containing PS II reaction centre complexes in aerobic, low-oxygen and high-light conditions. We find that the abundance of reaction centres produced using the low-oxygen promoter to drive D1 or D1' expression were insufficient to

support photoautotrophic growth, and that the D1'-containing centres have conserved chlorophyll a fluorescence characteristics indicative of altered forward electron transport and back charge-recombination. The strains expressing D1'-containing centres display lower levels of assembled reaction centres and perturbed fluorescence induction characteristics and an altered turnover of the D1'protein resulted in an enhanced susceptibility to photoinhibition in aerobic conditions. We hypothesise that the D1'protein represents a more light-sensitive evolutionary prototype for the standard D1 protein of oxygenic photosynthesis.

Aciphylla kirkii *Coal Creek, Crown Range. This speargrass is common in mixed Chionochloa tussock grassland/herbfield from about 1400 m to the summit (1700 m). It has been flowering profusely this year. (Photo: David Lyttle).*

Support the Competition and the Calendar

Entries Due March 31st

Categories are:

1. **Plant Portrait**
2. **Any Subject of Botanical Interest**
3. **Special New Members Category; Best Photo of a Botanical Subject**

Photographs must be submitted in digital format (JPEG file). Each electronic photo needs to be at a resolution of 6 × 8 inch (30.5 × 20.3 cm), ideally 300 pixels/inch and can be in landscape or portrait orientation. **A glossy print of the same size must also be submitted.** Pictures in landscape orientation are more suitable for the calendar. Each member may enter up to five photos in total. There will be a prize of $50 for the winner of each category. Entries will be judged on technical and artistic merit by a panel of three judges. A separate prize of $50 will be awarded for members' choice on the night. Entry forms available: on the BSO website http://www.otago.ac.nz/botany/bso/, opposite BSO noticeboard in a rack in the corridor just inside main door of Botany Department and, at the February & March BSO meetings.

Entries for the **Special New Members Category**, Best Photo of a Botanical Subject, will be accepted only from people who have not previously joined the BSO or submitted entries to the BSO Photographic competition. **All entrants meeting these criteria will be eligible for one year's free membership to the BSO**. A first prize is $50 will be awarded in this category.

Post entries to Botanical Society of Otago, PO Box 6214, North Dunedin 9059 or hand to the Office Administrator, Department of Botany, University of Otago (before 3.00 pm).

One of the more unusual finds from the Old Man Range field trip

John Steel

Dr. Mahajabeen Padamsee of Landcare Research, Auckland, was pleased to receive a collection of the rust fungus, *Aecidium westlandicum.*

Duncan Nicol spotted this on the BSO trip to the Old Man Range growing on *Caltha novae-zelandiae* in a boggy patch on the summit. Dr. Padamsee has only ten collections of this fungus, two of which were from the Old Man Range, the later being twenty years ago.

There is a sorry tendency to ignore, or just plainly not see, such tiny contributors to our environment, especially when they don't have pretty flowers, so it can pay a just reward to look more closely for whatever little gems are hiding right under our noses.

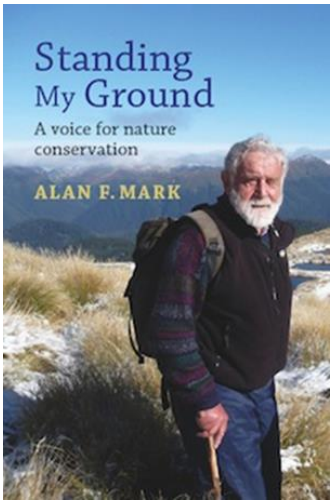
Rust fungi are common enough and I suspect their small size allows them to go unnoticed by those unfamiliar with them. However, they are beautiful in their own right as attested from a quick Wikipedia search on *Aecidium* which has a photograph of a beautiful, old, 3-D model of one; well worth a look and might just bring another dimension to your field trips.

Book review

Standing My Ground: A voice for nature conservation. Alan F. Mark.

Otago University Press, Dunedin, New Zealand. October 2015. 312 pages. $45

Gretchen Brownstein



In October 2015 Emeritus Professor Sir Alan Mark published his autobiographical work detailing his involvement in New Zealand's conservation movement. 'Involvement' isn't the right word really as his well-written book shows. Alan isn't and wasn't just a member of a couple of environmental groups; Alan is a leader, a researcher and a speaker, which is shown throughout the book.

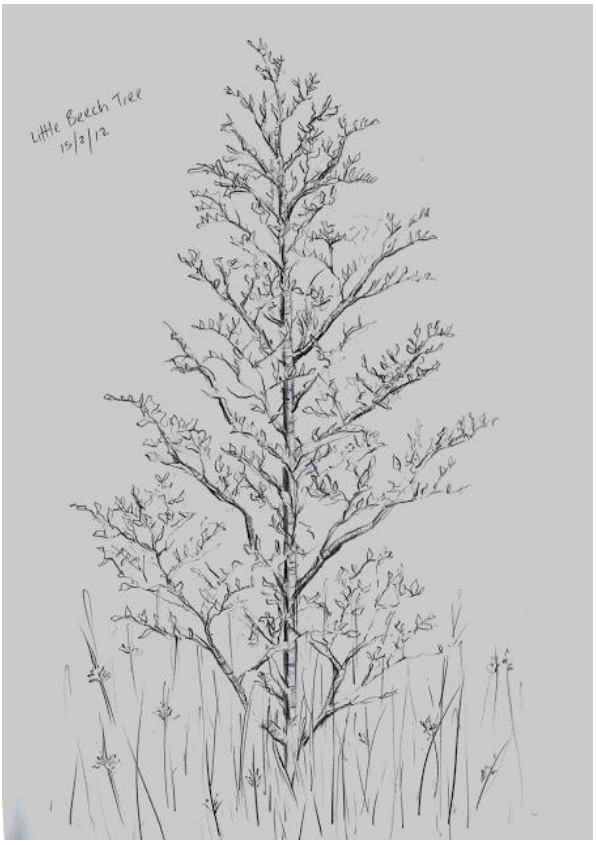
There are numerous illustrations of how he used data from his research of ecological systems to push for effective conservation. For example, Alan's research on snow tussock showed these plants are critical for water-gathering; he then successfully used these data to push for conservation of the high country. Another example of a successful data-driven approach to conservation discussed in the book was the Manapouri Lake campaign, the first environmental campaign to successfully challenge economic development.

The book illustrates well how Alan continues to raise questions of the value and use of natural resources, making not only the general public seriously consider the environmental impacts and implications of their actions, but also law makers.

This book gives the reader a unique insider's perspective into conservation in New Zealand and the South Island in particular over the last fifty years.

The book is written in clear, matter of fact prose so those of us wanting an edge of your seat thriller or a behind closed doors tell-all will have to wait for the 'A Voice for nature conservation: the uncut' addition.

Alan's book is an engaging read and details how one person and solid science can change policy and strengthen the conservation movement.



Fuscopora *seedling, drawing by Lucy Parsons*

Articles

Have you seen this lichen??

Allison Knight

Dibaeis absoluta *pink apothecia, green thallus*

The search is on for *Dibaeis absoluta*, one of the 975 lichens (54%) that were classified as Data Deficient[1] in 2012, since not enough is known to assign a meaningful category.

At last year's John Child Bryophte and Lichen Workshop, Jon Terry drew attention to this shocking deficit. He set up the nucleus of a group to work towards improving this situation. *Dibaeis absoluta* is the first lichen we are tackling. It is quite striking and beautiful (at least to a lichenologist!) and is easy enough to recognize, with its distinctive sessile, pale candy-floss pink apothecia. These have a faint white powder coating when dry and are brighter pink when wet. The apothecia are sessile and lie flat against the thallus, which is pale to bright green when wet, fading to pale grey as it dries. I suspect this lichen is relatively common (though often overlooked or unrecorded). It grows on shady disturbed ground around tracks and uprooted soil mounds in the forest, spreading over soil banks or damp rock.

You could help address this data deficiency by keeping an eye out for *Dibaeis absoluta* and noting date, location, substrate, size of thallus and number of thalli seen. If possible take photos and send all these details to us and, ideally, put them on NatureWatch where the identification can be confirmed and they will provide a permanent record for all to see. Please send copies to : alli_knight@hotmail.com and jon@jonterryecology.com.

The more photos and records of distribution that come in, the closer we will get to understanding the real distribution and conservation status of this striking lichen.

Two other crustose lichens with pink or pinkish apothecia are the common *Dibaeis arcuata* and *Baeomyces heteromorphus*, but in both of these species the apothecia are distinctly stalked. *Icmadophila splachnirima*, in the same family as *Dibaeis*, also has sessile candy-floss pink apothecia, but it has a glaucous green, distinctly foliose thallus. Images of all these species can be found by searching on NatureWatch: http://naturewatch.org.nz/observations and in *Lichens of New Zealand: an introductory illustrated guide*[2]:

http://www.nzpcn.org.nz/page.aspx?flora_non_vascular_lichens.

Dibaeis absoluta *habitat: clay bank in forest*

Dibaeis absoluta *on soil and rock bank*

Dibaeis absoluta *on dry soil bank*

References

1. de Lange, PJ; Galloway, DJ; Blanchon, DJ; Knight, A; Rolfe, JR; Cowcroft, GM; Hitchmough, R.2012. Conservation Status of New Zealand Lichens. *New Zealand Journal of Botany* 50 (3): 303-363

2. Knight, A. 2014. *Lichens of New Zealand: an introductory illustrated guide.* Botanical Society of Otago, Dunedin.

Images of *Dibaeis absoluta* : Allison Knight

Problem vines on Otago Peninsula: please look out for their colourful flowers

Moira Parker

Save The Otago Peninsula (STOP) members manage several revegetation projects and areas of protected native bush on the Otago Peninsula. This involves fencing to prevent grazing by farm stock to allow regeneration of native species, but unfortunately gives weed species the opportunity to establish. Two climbing, perennial vines of particular concern are *Bomarea caldasii* and *Tropaeolum speciosum*. Both have fruits dispersed by birds.

If you are out and about on the Otago Peninsula and spot either of these two weedy vines STOP would like to know their precise locations. Please email us at stopincsoc@gmail.com.

Bomarea caldasii

(Photo: Google Images)

Trumpet-shaped flowers in drooping clusters are tinged red on the outside, bright yellow with red spots on the inside. Leaves are thin, pale green and pointed – see John Barkla's photo on NatureWatch, Otago Peninsula Biodiversity project.

Chilean flame creeper, *Tropaeolum speciosum*.

(Photos: Moira Parker)

A perennial vine with soft, dull green and often five fingered leaves on slender stems and fine underground rhizomes. The flowers are a brilliant red, often in the canopy and therefore can be hard to spot.

Under the Otago Regional Council Pest Management Strategy 2009 property owners (and that includes DCC) are required to destroy Bomarea caldasii on their land .

Please contact Richard.Lord@orc.govt.nz with Bomarea caldasii locations. Give a street address for vines on private property and a

description of the site for vines on DCC or DoC land. Unfortunately Otago Regional Council decided not to include Chilean flame creeper in their Pest Management Strategy, so STOP is the only group working to eradicate this weed species on the Peninsula.

These vines are not difficult to control if found at an early stage and STOP is determined that they do not become established in our precious bush remnants.

We are making progress, but need all the help we can get!

Pseudowintera colorata, *drawings by Marie Baelen*

Meeting and trip reports

Field Trip to Silverstream, 3rd October 2015

Guy Randall

The trip to the McRaes Weir track could not have had a better day. The small group of Jim Fyfe, Duncan Nicol, Guy Randall, Torea Scott-Fyfe, John Steel, Bridget Thomas and Alfred Webb, led by Kate Caldwell explored this fascinating piece of native bush right on our doorstep. Here is what Guy had to say about it.

It was a bright, sunny, Saturday, Dunedin morning as, slowly but surely, members of the Botanical Society of Otago and interested non-members began to arrive in preparation for a sharp departure at 0900, heading straight for Silver Stream to begin an extremely exciting and interesting day exploring this piece of beautiful forest.

Silver Stream had an important history in the development of Dunedin in the late 19th century with an increased need for fresh water and in 1881 the Silver Stream Water Race was completed. A devastating flood in 1957 left it damaged and ultimately led to its closure. Since then it has been left alone and the native bush is beginning to grow back among the ruins scattered throughout it. It wasn't until the late 1980s that the Track Clearing Group began to clear and reopen Silver Stream as a public hiking trail.

Everyone split into two car loads and set off straight for Silver Stream which was only really a stone's throw away. We regrouped and parked the cars at the Powder Creek carpark and quickly set off to follow the McRaes Weir

Track. Once away from the stream and deeper into the bush, the abundance of different species becomes obvious; fungi, lichens, liverworts, mosses, ferns, lycophytes, various other species of *Coprosma*, *Pseudopanax* and more are all scattered throughout this amazing piece of bush. Hearing the names of different species is exhausting, especially when you are only just beginning to learn the correct Latin names of the plants about us.

South Island robin, Petroica australis – *The forested areas in the Silverstream catchment shelter one of the few remaining populations of black robins on the east coast (Photo: Guy Randall.)*

As the trip continued, I began to feel comfortable with the basic understanding and identification of coprosmas, blechnums and aspleniums. *Fuchsia excorticata* with its brown paper-thin bark, which peels off the trunk of the tree, became another common sight and name to remember as the trip progressed. The constant chatter of different species; how to correctly pronounce their names; and having hybrids pointed out and explained, made for a fascinating experience.

In areas closer to the running stream, the species of mosses, liverworts and hornworts became more numerous with pale green beds of fertile liverworts with their ivory white stalks with black spheres that sit at the top. A large variety of fungi littered the forest bed and on rotting logs that overhung the dirt track that we were following.

The location for lunch was on the track just after we had crossed a stream near a water run. It was a tranquil spot with the presence of birds a constant reminder with their songs being heard as we all silently ate and reflected on the day so far. After lunch it was straight into an easy walk back down McRaes Stream, past the ruins of old aqueducts to the Silver Stream itself and following it back to the Powder Creek Carpark. Once everyone had been checked off and accounted for, it was over and everyone departed safely.

Bot. Soccers lunching in the forest. (Photo: Kate Caldwell).

Exit across Silver Stream. (Photo: Guy Randall).

The BSO field trips are a true pleasure to take part in; the vast wealth of knowledge that goes on these trips and the willingness to share that freely is the best part. New students should be encouraged to attend and to take part as everything that I learned from the field trip is applicable to my current studies.

Anyone wanting a copy of the species list for the field trip, contact John Steel john.steel@otago.ac.nz.

Liverwort sporangia (Photo: Guy Randall).

Products of history: Immigration timing of New Zealand plant ancestors affects present-day communities, a talk by Dr. Angela Brandt, 14th October 2015

Esther Dale

Dr Angela Brandt spoke about her fascinating work on how the timing of arrival of plant lineages in New Zealand affects plant communities that are present today. Her talk was engaging and filled with beautiful pictures of study sites and alpine plants. Angela outlined how earlier arriving plant groups were more dominant in present-day plant communities than later arriving lineages. This pattern was true for both alpine and forest plant communities. What I found particularly fascinating was that these evolutionary priority effects still held for secondary grassland. Dominance of genera in primary grassland

(above historic treeline) and secondary grassland (below historic treeline) were both related to the length of time genera had been in New Zealand. It's amazing to think that these priority effects remain despite a relatively recent (in plant terms) and drastic change from forest to grassland! I look forward to hearing about Angela's future research findings in this fascinating field.

Botanical adventures in the Russian Far East, from Japan to the High Arctic, a talk by Dr. Alex Fergus, Wednesday 4th November 2015

Kate Caldwell

There was a fantastic turnout for this talk. Perhaps the crowd was lured by Dr Fergus' promise to take us on a botanical adventure along the entire eastern coastline of Russia….or perhaps it was the hint at free vodka?

Alongside his usual job as leader of a biodiversity monitoring team for the Department of Conservation, Alex is employed by Heritage Expeditions, guiding tourists for weeks at a time as they explore remote regions of the world.

Having followed Alex on many a real-life botanical adventure, I knew this talk would not disappoint. Alex used his eye for detail and analytical mind to distil a vast selection of Russian flora into this presentation full of his own stunning photographs and some very slick infographics. He delivered it to the audience in a lively and humorous style, finishing off with a cup of Labrador tea for anyone curious to experience some Russian botany via their taste buds.

The talk began with an introduction to the climate and landscape of Russia – a huge region, covering nine time zones. After getting a feel for the place, we were whisked through an assortment of gorgeous plants and flowers, representing many different plant families, and adapted to a vast range of unique habitats. Throughout his talk Alex conjured up a feeling for the dynamic nature of the place, by explaining the associations between plants and their environment – with the occasional cute animal shot thrown in for good measure.

To see some of Alex's photos from Russia and other far-off places, visit his Facebook page www.facebook.com/shipsbotanist.

Siberian aster, Aster sibiricus. *(Photo: Alex Fergus).*

Arctic ground squirrel, Spermophilus parryii. *(Photo: Alex Fergus).*

Field Trip to Black Rock Scientific Reserve, 28th November 2015

John Barkla

Eleven people enjoyed a trip to the slopes of the Lammerlaw Range to explore Black Rock Scientific Reserve. The reserve was set aside in 1971 to preserve an area of low altitude snow tussock grassland. Since then the Trustpower Mahinerangi wind farm has been built near the boundary and our botanising was carried out in the towering presence of 12 nearby turbines and their giant sweeping blades.

BSO members in Chionochloa rigida *tussock grassland with Mahinerangi wind farm in the background. (Photo: John Barkla).*

The reserve consists of gently rolling ridges (690 – 770 m above sea level) dominated by narrow-leaved snow tussock (*Chionochloa rigida*) associations and with shallow gullies containing *Sphagnum* bog and other vegetation communities. A road runs through the reserve and there was much to keep our interest in just a small part of its 144 ha extent.

Halocarpus bidwillii. *(Photo: John Barkla).*

For our first foray we drifted north down from the road. Dry banks had occasional blue-flowered grass lily (*Herpolirion novae-zelandiae*) while damper gully sides supported abundant mountain astelia (*Astelia nervosa*), many with distinctive purple flowers. The wetland fen at the gully bottom had mounds of *Sphagnum* moss intertwined with flowering *Gaultheria macrostigma*, sundew (*Drosera arcturi*) and *Kelleria dieffenbachii*. Yellow-orange fruit bodies of *Lichenomphalia* sp. attracted special attention as there are several undescribed species of this basidiolichen in New Zealand.

John Barkla provides some scale for the enormous Aciphylla scott-thomsonii *(Photo: David Lyttle).*

Near the boundary were some fine examples of our largest speargrass *Aciphylla scott-thomsonii*, resplendent with tall flowering spikes that were attracting clouds of small flies.

Aciphylla scott-thomsonii *flowers (Photo: John Barkla).*

Robyn and Marilyn enjoying Black Rock Scientific Rerserve (Photo: John Barkla).

After lunch we explored another gully fen to the south. This had large conspicuous shrubs of bog pine (*Halocarpus bidwillii*) and clumps of a prostrate *Dracophyllum* whose identity was the cause of some debate. Further down the gully were occasional shrubs of *Olearia bullata* and around a small rock outcrop we were pleased to see the dainty flowers of the orchid *Caladenia lyallii.*

On our return to the road up through tall tussock slopes we encountered a population of New Zealand anemone *(Anemone tenuicaulis*), their orange flowers hidden deep in the tussock understorey. Closer to the road were several clumps of flowering *Celmisia prorepens*.

A full plant list is available from John Steel.

Presentation of Allan Mere Award to Sir Alan Mark, 10th December 2015

Robyn Bridges

At a special meeting in December we celebrated the presentation of the 2015 Allan Mere Award to Sir Alan Mark in recognition of his outstanding contribution to botany in New Zealand. In front of an enthusiastic audience of botanical friends and colleagues, Anthony Wright, President of the New Zealand Botanical Society, presented the precious mere to Alan.

The Allan Mere. (Image Retrieved 30 January 2016,http://www.nzbotanicalsociety.org.nz/pages/Allan_Mere_Award.html.)

The greenstone/pounamu mere, a traditional Maori hand club, is made from Westland pounamu carved in Hokitika, was 'originally presented to the former DSIR Botany Division by the late Dr Lucy Moore in 1982 to commemorate the 100th anniversary of the birthday of Harry Howard Allan – the first Director of the former DSIR Botany Division, and author of the first volume of the DSIR New Zealand Flora series. It was Lucy's intention that the award be presented – not necessarily annually – to those staff members who had

made the most significant contribution to New Zealand Botany.

(http://www.nzbotanicalsociety.org.nz/pages/Allan_Mere_Award.html has more information and a list of all the recipients).

Honouring this important occasion were three presentations given by members showing places and images, some of which were used for Alan's book, 'Above the Treeline'. David Lyttle's, 'Images and Adventures' covered field work he did as a student with Alan through to the present. An early photo of Alan botanising by horseback gives an indication of the timeline!

David highlighted too an earlier recognition of Alan's work, with a photo of *Celmisia markii*: "The species is named after Professor Alan Mark its discoverer, in recognition of his contribution to our understanding and appreciation of alpine ecology in the southern South Island"

Janet Ledingham and John Barkla, both having spent many hours in the hills above treeline botanising with Alan, shared more splendid photos and stories of Alan and alpine botany, many of which again feature in Alan's book.

It was a very appropriate way to celebrate a lifetime of distinguished botanical work. From us all, congratulations Alan! The award presentation was followed by our annual Christmas dinner at the Vogel St Kitchen.

Celmisia markii *(Photo: Rowan Hindmarsh-Walls)*

Aciphylla scott-thomsonii, *Black Rock Scientific Reserve (Photo: John Barkla).*

Aciphylla aurea, *Black Rock Scientific Reserve (Photo: David Lyttle).*

Field Trip to the Old Man Range, 19th December 2015

Gregory T. Nelson

On Saturday, December 19th the Botanical Society of Otago had a joint field trip with the Dunedin Branch of Forest and Bird to the Old Man Range in the Central Otago region. The weather was nothing short of spectacular - all sunshine all day. There were many cool plants, insects, geology, and science discussed while we explored the area.

Professor Emeritus Sir Alan Mark was along for the trip as our naturalist guide. He provided a number of interesting stories, as he has been conducting field research on the range for many years. The oldest field experiment in New Zealand is an introduced snow bank treatment using a snow bank fence. The fence creates a drift area, so a snow bank is present behind it long after the spring sun has melted the surrounding cover. The snow cover creates different environmental conditions which result in a different plant community beneath it. This suggests that there is a group of species specially adapted to snow bank-creating areas though the exact environmental factors and associated plant traits that involved in this are unknown as I understand.

Alan Mark and his snow bank (Photo: Greg Nelson).

Another interesting example of environmental conditions affecting plant community structure was observed at a site where 60 sheep died due to an extreme weather event ~80 years ago. Much of their skeletons are still present at the site, but that is not the only legacy they have left. Soil analyses have demonstrated that soil nitrogen and phosphorus concentrations are higher where the sheep died than in surrounding areas. This is because the nutrients from the sheep leeched into the soil and have since been stored in the soil microbial community or in the plants that have soaked them up. These altered soil conditions have also created a distinct high fertility plant community with plants that have higher nutrient content and faster growth rates replacing the typical residents.

Decades-old sheep bones continue to influence the surrounding plant community (Photo: Kate Caldwell).

Historic indicators of the last glaciation event are evident in the Old Man Range in the forms of massive deposited boulders, glacially etched chasms and sculpted topography. But ice still works to shape the landscape. Depicted is a field of hummocks, or little soil mounds, that have formed naturally through the freeze-thaw cycle. Measurements show that the hill tops, which freeze through during winter, are on average colder than the hollows which are insulated with snow pack and do not freeze completely. This temperature difference, oscillating through summer and winter conditions, creates a soil wave action effect which drives the shape and movement of the hummocks like waves through water, but on a much longer time scale. The hummocks also create microclimate conditions similar to the snowbanks.

The hummocks, or soil "waves". Their depth ranges from around 0.2 – 0.6 m which is enough to create different microclimates within the hollows and hill tops.(Photo: Greg Nelson).

We spotted many insects enjoying the summer feast of plants. There were mostly grasshoppers and beetles, but also arachnids like mites and spiders.

All in all it was a great day to be outside with cool people.

Anyone wanting a copy of the species list for the field trip, contact John Steel john.steel@otago.ac.nz.

Sue Murray

I am a new and overseas member of the Otago Botanical Society and jumped at the chance of joining the field trip to the Old Man Range. I have been interested in New Zealand alpine plants and have tried to identify them on many tramps.

The ride in the four wheel drive cars was longer than I had expected but eventually we emerged in a tundra-like landscape with huge boulders standing starkly all around. I was thrilled to discover that Alan Mark was with us. It was a great privilege to hear and meet the author of my "bible" ...his book which I was clutching. The first stop was by a snow fence erected in the 1950s where we observed the difference in the flora on either side of it.

People were very friendly and encouraging. Those with knowledge were keen to share it, to spell the words and tell all they knew. This attitude made the whole day a wonderful experience. Hunting in the hollows and finding little gems and seeing how many could be intertwined in a small space was exciting.

The sheep "cemetery" which had altered the chemistry of the soil and therefore had significantly different plants growing near the bones was fascinating. I was nearly the last to get back to the cars as there was so much to absorb. The day was a highlight of this visit to New Zealand. I hope to return for more treats another year.

The famous Obelisk, a 26.6 metre high tor at the top of the Old Man Range (Photo: Greg Nelson).

Botanical Society of Otago

Patron: Audrey Eagle

Website: http://www.otago.ac.nz/botany/bso/

Email: bso@otago.ac.nz

Committee 2015–2016

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Fuchsia procumbens
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