BOTANICAL SOCIETY

OF OTAGO

Newsletter Number 68 February 2013

BSO Meetings and Field Trips

Wednesday 6th March 12 noon Botany Department Seminar *Union St Lecture Theatre, Cnr Union St West & Great King St.* ***Snowfields, Plant Functional Traits, and GLORIA*** *Associate Professor Martha Apple Department of Biological Sciences, Montana Tech, University of Montana, Butte, Montana.*

Sunday 10th March 9.30 am Photographic excursion and workshop at the Dunedin Botanic Garden
A photographic walk combining members from the Botanical Society and the Camera Club. By mixing the two clubs botanically minded people can help identify plants and photographically minded people can offer tips on capturing the plants on camera. A useful trip for those thinking of entering this year's photographic competition. Assemble at 9.30am in front of the Croque and return there for coffee when weary or desperate. Foul weather back up date of 24th March at 9:30 Contact: Nicola Baines, email: ndbaines@gmail.com phone: (03) 454 5044.

Wednesday 13th March 12 noon Botany Department Seminar *Union St Lecture Theatre, Cnr Union St West & Great King St.* ***Are GM Plants Really a Threat to a Clean Green Image?*** *Associate Professor John Knight, Department of Marketing University of Otago.*

Wednesday 27th March 5.20 pm High Arctic Hijinks; Flora, Fauna and Darkness
A talk by Lorna Little. Ph D Student, University of Otago and University Center of Svalbard, Longyearbyen, Norway. Lorna has visited the archipelago of Svalbard (72°N to 81°N) as part of her PhD studies. Her presentation will describe some of her PhD work looking into flower colour, and will share some of the interesting botanical aspects of her fieldwork, as well as what life can be like in this Arctic region. At 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, Rm. 215, 2nd floor. Please be prompt as we have to hold the door open.

Saturday 20th April 9.00 am Tunnel Beach
Half-day visit to the dramatic coastal sandstone cliffs, caves, tunnels and arches just south of Dunedin. It's a short 20 min walk down to the mouth of the tunnel, where a stunning natural arch is still covered in a close mat of coastal turf plants, despite continued grazing and trampling. Look out for; tiny selliera (*Selliera radicans*), sea primrose (*Samolus repens*) and tiny button daisy (*Leptinella dioica*) and their low-growing companions. A hand lens and kneeling pad would be handy. Dress for the weather and wear shoes or boots with a good grip - the drop-offs are sheer! Meet at the Botany Car Park for car pooling, or at the Tunnel Beach carpark 20 min later. Contact: John Barkla, phone: (03) 476 3686.

Wednesday 17th April 12 noon Botany Postgraduate Presentations *Union St Lecture Theatre, Cnr Union St West & Great King St.*

> ***Digging for diazotrophs: uncovering the diversity and role of nitrogen-fixing bacteria in New Zealand grasslands.*** *Jocelyn Chua PhD Candidate*
> ***Alfalfa mosaic virus invades New Zealand: where, how many times?*** *Aiko Lignon, MSc Candidate*

Wednesday 17th April 5.20 pm BSO AGM and 2013 Photo Competition
Come and see all the fabulous photos of fascinating plants on the big screen, and vote for the print you like the best - it could end up in next year's calendar. There are always lots of tips on how to take even more stunning botanical photos. Always a fun and informative evening.

Saturday 11th May 9.30 am Visit to Ferntree Lodge Gardens, Ferntree Drive, Wakari
Ferntree Lodge was the home of the Thomson family for 60 years. The house was bought in 1898 by Alexander Thomson (1846-1904) a well known Dunedin soft drink manufacturer, and it was during the Thomson's ownership that many of the existing trees were planted. Over 6,600 square metres of lawns, gardens and trees were planted. Most were natives, particularly North Island varieties rarely seen in the lower South Island. Two of Alexander Thomson's sons, William Alexander (Bill - the eldest) and John Scott (Jack - the fourth) became distinguished amateur botanists. William Thomson lived at Ferntree Lodge until his death in 1950. The Lodge and garden have had a chequered history since then with the property being subdivided and the gardens neglected. The property is now owned by Tim Vanderhaegen and his wife Sofie who wish to restore it. They have issued an invitation to the BSO to view the garden which in its time was one of the more notable gardens in the Dunedin area and still contains many of the trees planted by the Thomsons. Rain date 12th May Sunday. Meet 9.00 am at Botany Department Car Park, 464 Great King Street Contact: David Lyttle, phone: (03) 454 5470, email: djlyttle@ihug.co.nz

Wednesday 15th May 5.20 pm Above the Treeline and Beyond
A talk by David Lyttle on a series of botanical excursions around the South Island in the latter part of 2012 and beginning of 2013. The talk will cover visits to Mt Cook, the Craigieburn Range, Arthurs Pass and will include a trip down the West Coast to Haast that was undertaken as one of the Southern Connections pre-conference tours. The talk will be illustrated by photos featuring botanical and ecological highlights of New Zealand's mountains and forests.

Saturday 15th June 9.30 am Banks' Florilegium at the Hocken Library
Banks' Florilegium is a collection of copperplate engravings of plants collected by Sir Joseph Banks and Daniel Solander while they accompanied Captain James Cook on his voyage around the world between 1768 and 1771. They collected plants in Madeira, Brazil, Tierra del Fuego, the Society Islands, New Zealand, Australia and Java. See here for more information: [http://en.wikipedia.org/wiki/Banks%27_Florilegium]
Meet at the foyer of the Hocken Library at 9.30 am. Contact: Robyn Bridges, phone: (03) 472 7330.

Thursday 20th June 5.20 pm Botany in the Deep South (Note Thursday date)
Brian Rance, a botanist and ecologist in the Science and Technical section of Department of Conservation based in Invercargill will provide a shorter version of the Druce Memorial talk that he gave to the Wellington Botanical Society AGM last year. Tony Druce botanised extensively in Inland Otago and Northern Southland. This botanically rich and geographically diverse area covers the drylands and block mountains of Central Otago to the mountains, wetlands and forests of Northern Southland. The talk will discuss Tony's work and will revisit some of the places and plants that Tony studied. It will also visit other places through Fiordland and Stewart Island including some alpine, wetland and dune areas.

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 Botany 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

As we start a new year and look forward to a full programme of botanical talks and field trips I would like to reflect on two events that have taken place in the recent past that have involved members of the Society.

At the end of November 2012, a symposium celebrating the achievements of John Buchanan the noted 19th Century New Zealand artist, botanist and explorer was held in Dunedin. To coincide with this an exhibition of John Buchanan's work entitled "Art in the Service of Science" curated by Linda Tyler was held at the Hocken. The organizing committee for these events was lead by David Galloway who is well known to BSO members. Besides being New Zealand's pre-eminent lichenologist David has always maintained a keen interest in the historical and cultural aspects of science. This symposium and exhibition shed a considerable amount of light on the early botanical exploration in Otago, the achievements of John Buchanan and the conduct of Colonial science. The symposium talks were well attended by a very diverse group of participants who found the presentations informative and enjoyable. All credit is due to David and the organising committee for the success of both these events.

A second event that should be celebrated by BSO members was the publication and launch of Emeritus Professor Sir Alan Mark's new book "Above the Treeline: A Nature Guide to Alpine New Zealand" in January of this year. As well as having a very distinguished career as a researcher, teacher and author Alan has been a staunch advocate for conservation and environmental causes over many decades. The book lists over 750 taxa of vascular plants as well as chapters on lichens (David Galloway), birds (Rod Morris), fungi (David Orlovich), invertebrates (Brian Patrick) mosses (John Steel) and lizards (Mandy Tocher). Sixty eight photographers contributed images to the book a number of whom are members or have close links with the BSO. I claim myself amongst that number and am particularly gratified the way the photos have turned out. This promises to be a landmark book as it sets a high standard both in terms of scientific scope and production values that is a tribute to the hard work of Alan and the editor, Jane Connor, from Craig Potton Publishing.

I would like to think that the BSO fosters some the botanical knowledge that feeds into the collective effort that eventually finds expression such publications; the annual photographic competition encourages people to refine their technique as the standard is now very high. We have the Audrey Eagle Fund available to assist in publishing works of botanical interest. I am anticipating that in the near future we will see more work originating from Otago in print.

Secretary's Notes

Allison Knight

One of the more interesting things about being secretary is the emails that come out of the blue, like the Siberian Botanic Garden sending a copy of their seed exchange list! The following recent requests revived memories and required follow up.

Growing *Ixerba brexioides* (tawari)
In November Rachel Thomson (ret12@students.waikato.ac.nz), a Masters student at the University studying the ecology and reproductive biology of *Ixerba brexioides* (tawari) asked if it would be possible to get hold of an article from the BSO newsletter that is not available on the website: Landis, C. 2003: *Ixerba brexiodes* and Arbuscular Mycorrhizal Fungi. BSO Newsletter 40 (12). This article deserves to be more widely read, as Chuck's observations on companion plants that stimulate the growth of this beautiful but difficult to grow tree could be very pertinent.

Voting for NZ's 10 favourite plants and 10 worst weeds
The NZ Plant Conservation Network wrote in December asking us to encourage everyone to vote for the New Zealand's 10 favourite plants and 10 worst weeds.
Kauri (*Agathis australis*) took out the top spot for favourite plant and the weed with the un-politically correct name 'wandering Jew' (*Tradescantia fluminensis*) took out the inaugural first place for worst weed. The NZPCN website is stacked full of botanical information and well worth visiting at www.nzpcn.org.nz.

Information about Geoff Baylis' garden at Threave'
Early January brought a letter from Sally McIntyre (staticmansion@gmail.com), who is researching the garden of Professor Geoff Baylis at Threave, his house at 367 High St, and looking for documents and taxonomies related to it. Prof. Baylis was Head of the Department of Botany at Otago University for many years and the first patron of BSO. The annual Baylis Lecture, jointly sponsored by the Botanical Society of Otago and the Botany Department, is in his honour. David Galloway, who had a flat at Threave from 1966 – 1969, and knew Geoff well, has such an extensive knowledge of the history of the place that I hope he will share it with us at a later date. The task of looking through all the back issues of the BSO newsletter to find reports of our visit there was rather daunting, and I did wish that the NZPCN had included all the back issues we scanned for them when they did their website makeover. They do have searchable archives of the NZ Botanical Society Newsletter the Wellington Bot. Soc. Bulletin and the Auckland and Rotorua Bot. Soc. Journals and, of course, the NZPCN Newsletter Trilepidea.

Information about Jeanette West
Gordon Sylvester (southcol@xtra.co.nz), of the NZ Native Orchid Group, wrote from Kumara asking for information about Jeanette West, to be archived along with a herbarium she created. Janet Ledingham was able to put him in touch with Jeanette's son Ian. Do contact Gordon if you have any relevant information about Jeanette's botanical activities.

Japanese Knotweed Wake-Up call
The biggest bombshell arrived right at the end of January, when Stuart Desjardins (sd226@leicester.ac.uk), a PhD student from the University of Leicester, wrote from the UK. Stuart is researching the origin of Japanese Knotweed (*Fallopia japonica*) in Australasia. He thinks that Chinese working on the Central Otago goldfields may have introduced it to New Zealand, and requested a sample from that area. As the NZPCN website didn't record this highly invasive plant south of NW Nelson and a DOC botanist did not think it occurred in Otago we didn't send this request out to members. Imagine my horror then, when I was crossing the Dundas St. bridge over the Leith and looked down to see a large patch that looked identical to the photo Stuart had sent! I rushed off photos and a sample to Stuart, who

confirmed my identification. Lars Ludwig had a look and said it is a big problem in Europe. So if you see any about do let NZPCN and DCC, Otago Regional Council or DOC know of the site. Further information can be found here: (http://en.wikipedia.org/wiki/Japanese_knotweed)

Revamped NZ Plant Conservation Network website *(reprinted from NZPCN publicity)*

The plant life of New Zealand has never looked so good as in the online makeover of the hugely popular New Zealand Plant Conservation Network website (www.nzpcn.org.nz). This recent makeover has increased the size and clarity of the images, widened the website viewing window and optimised web searches using tablets such as the iPad. Feature plants have been added to the home page and a navigation bar has been included to help users explore the site. It is nearly 10 years since the NZPCN's website was launched and in that time it has grown to become an invaluable resource for anyone studying, growing, restoring and learning about native and exotic plants in New Zealand. Close to half a million visits are made to the website each year. The website now has 7,600 species pages, more than 23,000 photographs and over 1.4 million plant observations (and growing!). The website now includes vascular plants, liverworts, macroalgae, mosses and fungi. The most recent additions are the charophytes thanks to work by NIWA, funded by the government's TFBIS (Terrestrial and Freshwater Biodiversity Information Systems) programme.

Japanese Knotweed in the UK (Photo: Stuart Desjardins)

Editor's Notes

Please submit copy for next newsletter by 31st May 2013.

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: (imaginarycrayfish@gmail.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.

CORRECTION/APOLOGY

The Trip Report for Chapman Road and Springvale Reserves printed in issue 67 was written by John Steel, not David Lyttle as stated. Our apologies to John for this error.

Message from the Treasurer

ELECTRONIC PAYMENTS

You may prefer to pay your membership by Direct Bank Transfer to the Botanical Society of Otago's bank account rather than pay by cash or cheque. We realise these days that direct debit transfer payments seem to be the 'norm' for most people.
If you choose to pay by direct debit/paypal please ensure you include:
Your Name in particulars/ reference **and** what you are paying for e.g**. Membership** or **Calendar**.
That way we can keep our database up to date.
Our Bank is Westpac Moray Place, Dunedin

Account No. 030905 0029158 00
Botanical Society of Otago

Many thanks

Mary Anne Miller, Treasurer

Correspondence and News

2013 John Child Bryophyte and Lichen Workshop- Preliminary notice

The 2013 workshop is to be based in Ohakune from Friday 22 November (arrival day) through to Tuesday 26th Nov. (i.e. departing on Wednesday 27th a.m.). Backpacker accommodation will be in the Station Lodge, Ohakune. Other accommodation is available.

To receive further information as arrangements are determined contact Graham Pritchard at g.pritchard@inspire.net.nz

UN International Year of Water Cooperation

(*reprinted from Otago Conservation Volunteers Newsletter Dec 2012)*

2013 is the UN International Year of Water Cooperation. The objective of the year is to raise awareness, both on the potential for increased cooperation, and on the challenges facing water management. The year will highlight the history of successful water cooperation initiatives, as well as identify burning issues on water education, water diplomacy, trans-boundary water management, financing cooperation, and national/international legal frameworks. Check the website for more information and to download resources: http://www.unwater.org/watercooperation2013/

Seaweek features in March

Seaweek will take place from 2 - 10 March 2013.
The theme for Seaweek 2013 is "Toiora te Moana - Toiora te Tangata, Healthy Seas - Healthy People". The theme highlights our many connections with the sea and calls on Kiwis from all walks of life to tackle issues such as pollution, pest species and illegal harvesting of the sea's bounty, and to keep our seas healthy for all.
The NZ Marine Studies Centre will be launching Marine Metre Squared during Seaweek 2013. Marine metre squared is a national project to mobilise an army of "citizen scientists" to monitor the biodiversity of many small sections of the country's intertidal coast. It is hoped the collection of marine data over time will encourage communities to assess changes in their local shoreline and encourage stewardship and restoration projects.
If you, your organisation, group, company, family or community would like to participate in Marine Metre Squared or other Seaweek events contact the local Seaweek coordinator, Tessa Mills (New Zealand Marine Studies Centre) on 03 479 5845 or tessa.mills@otago.ac.nz. You can also follow Seaweek on Facebook: http://www.facebook.com/sea.week

Presentation of Tom Moss Award to Lars Ludwig

Congratulations to Lars Ludwig, who won the Tom Moss Award for the best student speaker at the annual John Child Bryophyte and Lichen Workshop, which was held on Stewart Island at the end of November 2012. Students from the Botany Department at Otago University have won this award for the last 4 years in a row, bringing great credit to the Botany Department and to themselves. With prize money of up to $400 it's a competition well worth entering, so research projects on lichens, mosses or liverworts can be doubly rewarding! Lars' prize and his lichen discoveries also featured in a large article in the Otago Daily Times. In December Kath Dickinson, Head of the Department of Botany, presented Lars with an impressive prize certificate at a special afternoon tea in his honour.

It was an appropriate time to make a presentation to Kath, as well. She was presented with a 2013 BSO Calendar in appreciation of the support that the Department of Botany has always given to the John Child Bryophyte and Lichen Workshop as well as to the Botanical Society of Otago. The use of microscopes, in particular, is critical for the continuation of community outreach and increased botanical

awareness that these two groups provide. Kath pledged her continued support, and promised in addition to pass on details of these longstanding and mutually beneficial arrangements to the next head of department – and to include the national Fungal Foray as well.

150th Birthday of the Botanic Garden

When Dunedin Botanic Garden opened on 30 June 1863 it became the country's first botanic garden. This year's 150th anniversary will be celebrated through exhibitions, talks, displays and other events. Most of these will be free, making it easier for you to be part of these celebrations. The following are selected botanical highlights from the Botanical Garden's birthday calendar.

MARCH

Hort Talk: A World of Plants in 28 Hectares
Learn about Dunedin Botanic Garden's beautiful plant collections with Barbara Wheeler, Dunedin Botanic Garden Collections Supervisor.
Friday 1 March - 12.00 noon Botanic Garden Centre: Upper Lovelock Ave

Exhibition Launch
Ngā Kākahu by Roka Cameron
Cultural use of native plants.
Saturday 2 March - Launch 10.00am Runs until Sunday 31 March - 10.00am - 4.00pm Information Centre, lower botanic garden

Workshop: Ngā Taonga
Weaving with harakeke, pīngao and kiekie to make kete/kono and putiputi with Roka Cameron.
Saturday 2 March - 1.00pm Information Centre, lower botanic garden ENTRY: $10. Bookings essential*

Backstage with the Friends: Plants in the Raw
A tour of native plants like those used in the information centre exhibitions of Māori cultural use of plants, led by Shirley Stuart, Collection Curator of native plant collection.
Sunday 3 March - 2.30pm - 3.30pm Meet at upper garden carpark by aviary entrance

Backstage with the Friends: Around the World
Tour of plants from around the world thriving in Dunedin led by Dylan Norfield, Collection Curator of geographic plant collection and arboretum.
Sunday 10 March - 2.30pm - 3.30pm Meet at upper garden carpark by aviary entrance

Backstage with the Friends: Magical Mystery Tour
Explore the lower garden with Marianne Groothuis, Collection Curator of camellia collection and theme borders.
Sunday 17 March - 2.30pm - 3.30pm Information Centre, lower botanic garden

Workshop: Propagation of Native Plants
Presented by Alice Lloyd-Fitt, Propagation Services Officer.
Saturday 30 March - 10.00am - 12.00 noon Meet at upper garden carpark by aviary entrance ENTRY: $10. Bookings essential*

APRIL

Hort Talk: Food Forest Frenzy
Jump onto the food forest train that is speeding across New Zealand! Presented by Jason Ross, Sutherland Nursery and Edible Garden Design.
Friday 5 April - 12.00 noon Botanic Garden Centre, upper Lovelock Ave

MAY

Hort Talk: Gardening in Guinea
The ultimate African adventure. Join Sarah Manning, home gardener.
Friday 3 May - 12.00 noon Botanic Garden Centre, upper Lovelock Ave

Plant Sale
Run by the Friends of the Dunedin Botanic Garden.
Saturday 18 May - 9.00am Upper garden carpark

Workshop - Cultivation of indoor plants
Stephen Bishop, Collection Curator of winter garden glasshouse.
Saturday 25 May - 10.00am - 12.00 noon
Meet at upper garden carpark by aviary entrance ENTRY: $10. Bookings essential*

JUNE

Hort Talk: How It Was
Plants and vegetation of Dunedin 150 years ago with Dr Peter Johnson, botanist.
Friday 7 June - 12.00 noon Botanic Garden Centre, upper Lovelock Ave

150th Birthday Anniversary
Join the Friends of the Botanic Garden to celebrate the 150th anniversary of the Dunedin Botanic Garden at the unveiling of a commemorative sculpture.
Sunday 30 June - 11.00am Tea kiosk lawn, lower botanic garden

Exhibition: Botanical Artists acclaimed in New Zealand & Abroad
All month - Daily 10.00am - 4.00pm
Information Centre, lower botanic garden

Tours of the Botanic Garden

I would like to draw your attention to the new tours of the Botanic Garden organised by the Friends of the Botanic Garden. These tours commenced at the beginning of February 2013, an important year in the life of the Garden which celebrates the 150th of anniversary of its founding this year. The tours are conducted by friendly, trained guides who are local gardeners. The aim is to increase people's knowledge and interest in the Lower Garden, draw people's attention to significant trees and features and generally promote an increased awareness and appreciation of one of Dunedin's most treasured assets.

For any queries please phone Annette Riley on 4772 445 or 021 0613 109.

Tours 50-55 mins
Terrain is flat with sealed paths
Tours depart from the information centre in the Dunedin Botanic Garden

2.30pm Saturdays and Sundays from 2nd Feb until further notice
10.45am on Cruise Ship visitor days 2nd Feb – April 5th
Feb 1,2,6,9,12,14,16,20,22,24,25,27,28
Mar 2,5,11,12,13,14,21,23,24,25
Apr 4,5

$7.00 per person
Group bookings by arrangement $50.00
Maximum number of people 12

Bookings
Information Centre
Dunedin Botanic Garden
Tel 471 9275
Open 10.00am till 4.00pm

Or

Dunedin I-site Visitor Centre
26 Princes Street Dunedin
Tel 474 3300
Email: visitor.centre@dcc.govt.nz

Botanical Society of Otago
2013 Photographic Competition
Support the Competition and the Calendar
Entries Due March 20th 2013

BSO photo competition

The BSO photo competition has been a popular event. This year the categories are:

1. plant portrait
2. plants in the landscape
3. plant interactions
4. photomicrography of a botanical subject

This year a new category, photomicrography, has been added to the competition. It is designed to cater for photos of a technical or illustrative nature taken using optical magnification. Photos taken through a microscope in the course of a scientific study would be suitable for entering in this category.

Each member can submit up to four photographs in total. Each photograph needs to be at a resolution of 6 × 8 inch (30.5 × 20.3 cm) and ideally 300 pixels/inch and can be in landscape or portrait orientation. A glossy print of the same size must also be submitted.

The closing date is 20 March 2013. Prizes include category winners, top student photograph, and overall winner. Entries will be judged on technical and artistic merit by three judges. There will also be a members' choice prize for the photograph voted the best on the night of the awards. Each prize is $50 (and yes, if you're one of the few students who usually enter you could win $300!)

Entry forms can be picked up from the display shelves outside the secretary's office in the Botany Department or downloaded from the downloads section of the BSO web site. Contact: David Lyttle Ph (03) 454 5470, email: djlyttle@ihug.co.nz

Articles

Art in the Service of Science: Dunedin's John Buchanan. A review of the exhibition of John Buchanan's work as a draughtsman.

Belinda Smith Lyttle

The content of John Buchanan's work was dictated by his employment as an illustrator, first for the Otago Provincial Geological Survey, then for the Colonial Museum and Geological Survey of New Zealand. The execution of his illustration was informed by his early training designing textile patterns in Scotland. The demands on his talents in the course of his service were diverse. Buchanan's duties at the Colonial Museum in 1865 were described thus:

> *Lithographs Institute, Maps geological. Arrangement of Herbarium comprising plants New Zealand and Foreign collected during past 10 years. Work at Botanical Garden from time to time surveying roads, etc. Miscellaneous work in connection with Museum and Geological Survey.*

The variety of his creative output is reflected in the small but representative selection of Buchanan's work on display at the Hocken.

Landscapes, painted in watercolour, while employed by the Otago Provincial Geological Survey record the bones of the South Island. The exhibit included Lake Wanaka looking south towards the flats, the Otago harbour looking north and an iconic view of Milford Sound. In these watercolours, Buchanan is depicting **landforms;** there isn't a bucolic dream in the lot. He is drawing the structure of the land that he is viewing; the mountains, the islands, the hills and the rivers; with very little foreground to distract the viewer. A characteristic in these landscapes shared by Buchanan's more lyric floral paintings is a strong focus on the main feature and little ornament.

John Buchanan, Ranunculus buchanani 1865, pencil and watercolour on paper, 277 x 202mm.

Grouped together in the exhibit was a selection of land and sea bird profiles. Buchanan provided detailed pen and ink profiles of Blue Duck and Plover and a beautifully rendered Tui, conveying the iridescence and texture of its feathers, for Buller's 1882 *Manual of the Birds of New Zealand*.

Further evidence of Buchanan's eclectic output are a series of bijou watercolour illustrations of alpine plants painted in 1865, probably recording a collection of plants held at the Herbarium from the previous field season. These are drawn to show structure; stems and flowers rather than the whole plant or its environment, however, Buchanan's depiction of the fine hairs on the leaves of *Anisotome imbricta* or the lovely delicate stems of *Forstera sedifolia* is confident, spare, and quite charming.

The paintings that I returned to for repeated viewing were of larger and more common plants. *Coprosma lucida* watercolour and ink

c.1865 is a graceful painting of a branch bearing familiar orange fruit and *Ranunculus lyallii* watercolour 1860. In this Buchanan shows the simple elegant shape of the flower by the curl of a petal and subtle shading. Profuse flowering allows him to illustrate flowers from various angles. It is a good depiction of the plant showing the organisation of the leaves and stems. And both are beautiful paintings.

When Buchanan left Scotland in 1851, he was 33 years old, a fabric designer and already studying the flora of his homeland. His training was in a field that required novelty and decorative appeal, but he also had to create patterns that could be reproduced with the technology of the day. I see signs of his design background in Buchanan's decisive clean line work, deft but spartan use of shadow to convey form and almost total lack of unwarranted background in his images. In the years he worked in New Zealand, Buchanan's interest in and knowledge of the New Zealand flora led to accolades for his work and scientific publication in his own right as well as his enormous contribution to colonial science as an illustrator in diverse disciplines. I look at the work of John Buchanan and see a great draughtsman. This is no slur. I see a technical mastery of his medium. I see an elegance and clarity of composition demonstrated in plant portraits of small alpine specimens and large lithographic prints of grasses. I see Buchanan's ability to render his subject matter with accuracy and beauty.

Orchids of the Silverpeaks

John Barkla

On a trip through the Silverpeaks during December 2012 Marilyn and I were pleasantly surprised at the diversity and abundance of terrestrial orchids. During a round trip from Mountain Track Road that took in Green Ridge, Silver Peak, Camp Creek, ABC cave, The Gap, and Yellow Spur we recorded nine species (see Table 1), most of which were flowering. Orchid nomenclature is notoriously dynamic and here we use names currently adopted by the New Zealand Plant Conservation Network http://www.nzpcn.org.nz/

Most conspicuous and abundant was the blue-flowered striped sun orchid (*Thelymitra pulchella)* which occupied sunny banks and open clay pans alongside the track from Mountain Track Road until high on Green Ridge. In more shaded situations, beneath the forest and scrub leading to the old Green Hut site and beyond, the white-flowered *Stegostyla lyallii* was more common. On the steeper climb through the heath-like scrub leading towards Pulpit Rock was a small cluster of beak orchid (*Waireia stenopetala*) and numerous odd-leaved orchid (*Aporostylis bifolia*). A stop amongst the narrow-leaved tussock on the ridge crest leading to Silver Peak revealed a few plants of southern greenhood (*Pterostylis australis*).

Waireia stenopetala (Photo: John Barkla)

Once down the Devils Staircase into Camp Creek, damp shaded streamsides under silver beech had small colonies of spider orchid (*Nematoceras macrantham*). On the ridge leading from the old Jubilee Hut site toward ABC cave were occasional leek orchid (*Prasophyllum colensoi*) and white sun orchid, the latter with flowers that remained steadfastly closed in the foggy conditions that prevailed at the time. On the ridgeline near The Gap were clay banks festooned with odd-leaved orchid. On entering the mixed beech-broadleaved forest on Yellow Spur, above the new Philip J Cox Memorial Hut, were several stems of black orchid (*Gastrodia cunninghamii*) with flower buds just beginning to open.

We looked for but did not see epiphytic orchids on the descent to Waikouaiti River South Branch. These and other species of terrestrial orchids are likely to also be present.

Table 1. *Orchid taxa recorded in Silverpeaks 29th –31st December 2012*

Taxa	**Synonyms**
Aporostylis bifolia	*Caladenia ?bifolia* Hook.f.; *Chiloglottis traversii* F.Muell.; *Caladenia macrophylla* Col.; *Chiloglottis bifolia* (Hook.f.) Schlechte
Gastrodia cunninghamii	none
Nematoceras macranthum	*Corybas macranthus* (Hook.f.) Rchb.f., *Corysanthes macrantha* (Hook.f.) Hook.f.
Prasophyllum colensoi	*Prasophyllum pauciflorum* Col.
Pterostylis australis	none
Stegostyla lyallii	*Caladenia lyallii* Hook.f.
Thelymitra longifolia	*Thelymitra alba* Colenso, *Thelymitra nemoralis* Colenso, *Thelymitra angustifolia* Hook.f., *Thelymitra aristata* sensu Hatch nom. inv., *Thelymitra forsteri* Sw., *Thelymitra grandis* F.Muel. ex Benth., *Thelymitra longifolia* var. *alba* (Colenso) Cheeseman, *Thelymitra longifolia* var. *forsteri* (Sw.) Hatch, *Thelymitra megcalyptra* R.D.Fitzg.
Thelymitra pulchella	*Thelymitra concinna* Col., *Thelymitra fimbriata* Col., *Thelymitra pachyphylla* Cheeseman, *Thelymitra caesia* Petrie
Waireia stenopetala	*Lyperanthus antarcticus* Hook.f., *Thelymitra stenopetala* Hook. f.

Aporostylis bifolia (left) and Thelymitra pulchella (right) (Photos: John Barkla)

Craigieburn - A Case Study in Colonial Conservation in Nineteenth Century Dunedin

Paul Pope

Introduction

The nineteenth century colonial environment has been well documented as period of rapid environmental transformation. That transformation still dominates our appreciation and perception of New Zealand's endemic landscape today. European settlers brought their social and physical baggage along with their Victorian industry to "tame" and manipulate a new landscape. Settlers both admired and mistreated this new landscape simultaneously and private conservation was often through the energetic efforts of individuals. In most cases those efforts were often undertaken by larger landowners with relative wealth and tenure security. The voluntary preservation of Craigieburn in the nineteenth century is unique in a conservation context because it was undertaken by people of very modest means and on a property developed as a subsistence farm in the nineteenth century. This article sets out the historical, botanical and social history of Craigieburn and looks at the legacy left for visitors today.

The Craigieburn Cultural Landscape

Craigieburn has a rich vegetation history that traces historical and biological changes that have influenced its shape and composition through its plants and trees. It's a biological portal to understanding landscape and environmental change through the historical events that have had a significant impact on our city and society.

William and Elizabeth Rankin arrived in Dunedin with their daughter Elizabeth from Scotland in 1860 as assisted immigrants on the Robert Henderson. The Rankin's arrived with a small amount of money and purchased a 7.2 hectares bush block as a subsistence farm. Subsistence properties were common in early Dunedin where local authorities kept property prices high and wages low. This was a deliberate policy of the provincial authorities to ensure that working men could not afford to buy land, and would be forced to supply labour to larger landowners and businesses at a cheap rate.

The Rankin's initially cleared the kanuka (*Kunzea ericoides*) from around the entrance to the site between Tanner and Wakari Roads up to the present location of the stone wall and beyond. Firewood was at a premium in Dunedin in the 1860's because there was no reliable local coal supply until 1870, and firewood lots were worth £200/acre. To earn extra money Elizabeth and William felled the trees together and while William took the wood to the city for sale by bullock sled, Elizabeth would cut and split the logs ready for the next load. It was hard physical work and Elizabeth Rankin is recorded as wearing "breekit" drawing her skirts up between her legs like trousers and holding them up with a leather belt.

The track entrance at the corner of Tanner and Wakari road was cleared as the "home paddock" adjacent to the stone house. Red beeches (*Nothofagus fusca*) were planted in 1950 and the home paddock and adjacent track were replanted by endemic native species in the early 1970's. The western paddock around Tanners View began as an open paddock and has been completely restored in native tress in 1995-2004. The success rate has been high (90%) and now includes totara (*Podocarpus totara*), matai (*Prumnopitys taxifolia*) and miro (*Prumnopitys ferruginea*). Since 2004 further planting has been undertaken in the western paddock fringes to repair the historic grazing damage to the bush edge and suppress weed growth, and this planting should be completed by 2015.

Where the name "Craigieburn" comes from is uncertain, but most likely it was a place in Scotland of significance to William and Elizabeth Rankin which they brought with them to New Zealand to remind them of their Scottish heritage.

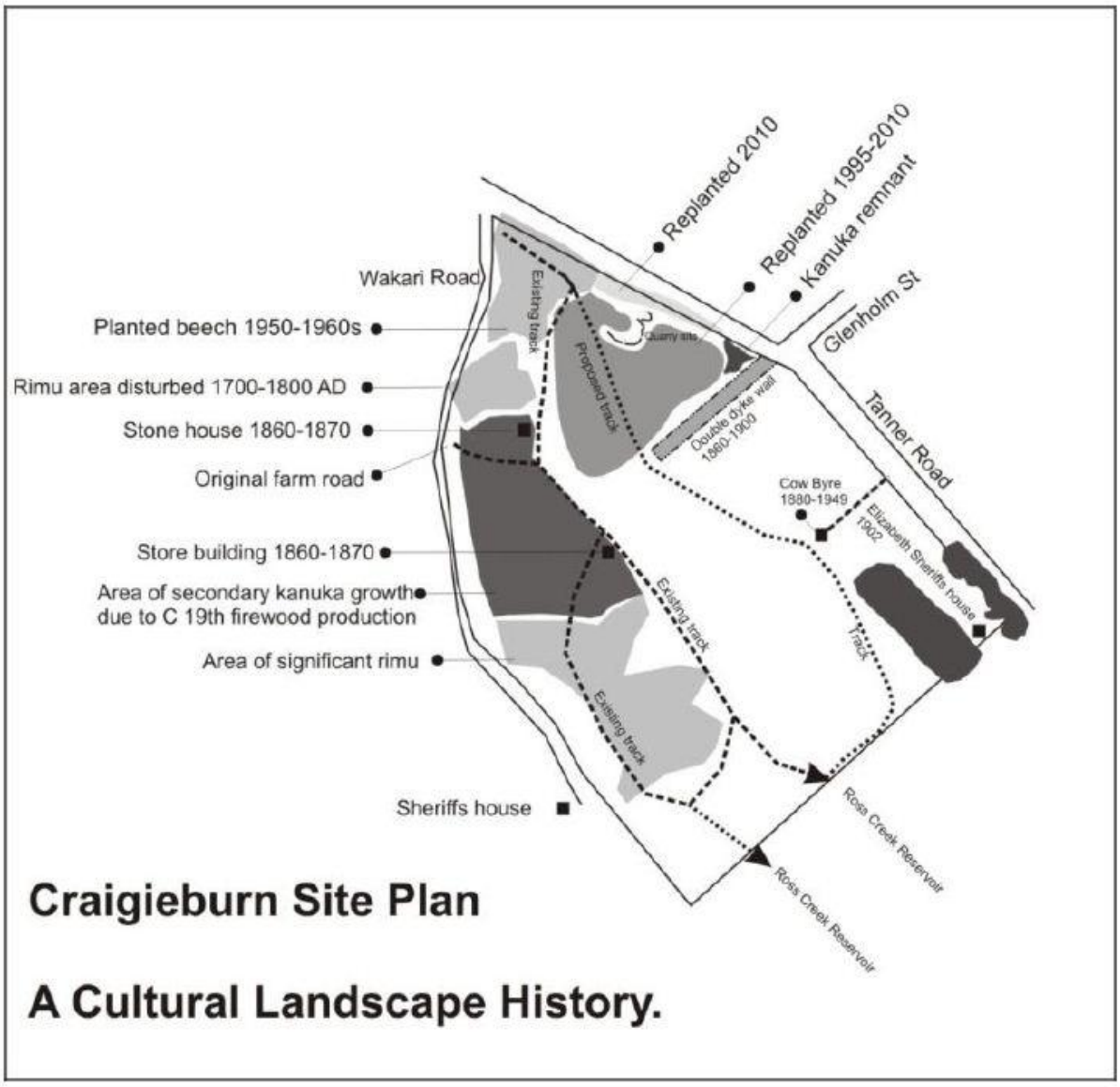

Figure 1 *Craigieburn is a cultural landscape that reflects the changes and conservation of the property made in the colonial period.*

There are 52 mature rimu (*Dacrydium cupressinum*) within the remaining forested area of approximately 4 hectares. The rimu form two distinct areas, the upper western area where the rimu are distinctly smaller and younger. Their establishment suggests that either a storm event or fire around 200-300 years ago created a canopy opening for the rimu to establish in the current stand. The lower section of rimu forest below the little ruin has significantly larger trees which appear to have been established earlier than the Wakari Road group. Rimu around Dunedin will live from 700-800 years and beyond in the right conditions and the trees in this area of Craigieburn are likely to be 550-650 years old.

Colonial Conservation

William Rankin died in 1872 and Elizabeth Rankin remarried Edwin Tanner in 1879. Her daughter Elizabeth married local farmer Robert Sherriff in 1875. Edwin Tanner is said to have placed a ban on further tree clearance at Craigieburn in the early 1880's. It's very likely he did, but not without the influence of his wife Elizabeth who was the original settler and owner of Craigieburn. However, there

Figure 2 *There are 52 rimu in the forest area of Craigieburn that are separated into two distinct areas by a pre-colonial period of disturbance in the forest canopy.*

was clearly a very deliberate decision made by the family to retain the trees on the property.

Their daughter Elizabeth Sherriff was widowed with 9 children in 1902 and her step-father and mother passed away in 1909 and 1920 respectively. She died in 1949 at the age of 93 after having lived at Craigieburn for 89 years. Life would have been tough for Elizabeth Sherriff, as a relatively young widow she had a farm to run and a family to raise. There are reports that she received offers to sell the rimu trees for timber, but she remained loyal to the wishes of her mother and step-father as she struggled to keep farm and family together.

The Role of the Dunedin Amenities Society & Restoration

The Dunedin Amenities Society is New Zealand's oldest and longest running conservation society and was established in October 1888. It has played a pivotal role as conservationist, political lobbyer, project

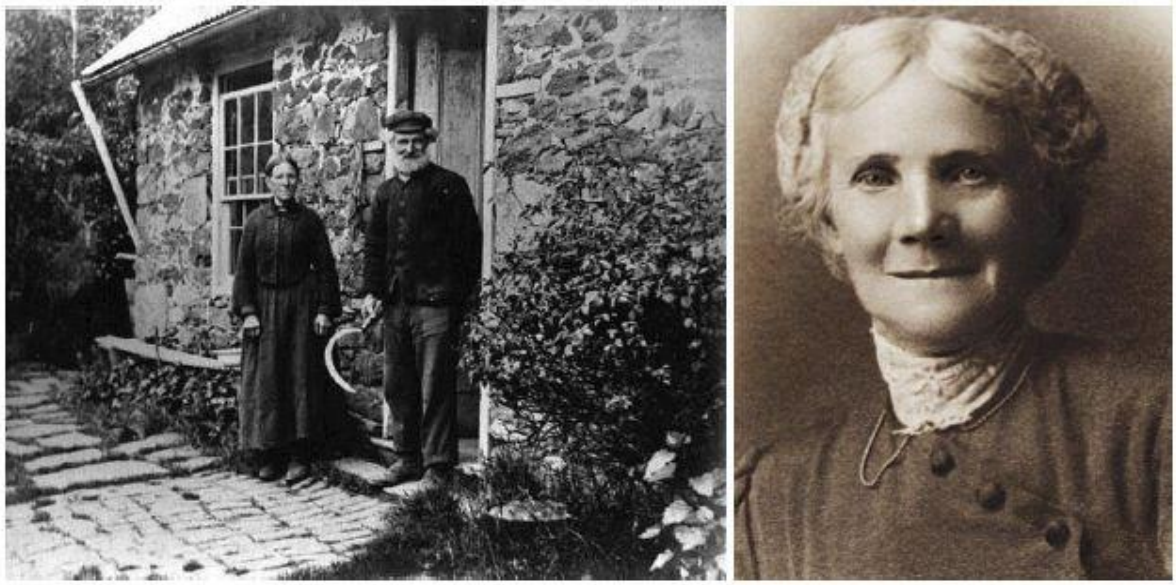

Figure 3 & 4 *Elizabeth Tanner (formerly Rankin) and her second husband Edwin Tanner outside their stone house at Craigieburn (circa 1890) and daughter Elizabeth Sherriff who lived at Craigieburn for 89 years and gave the Dunedin Amenities Society the first right of purchase. (Courtesy of the Otago Settlers Museum and Nora Burgess)*

developer and funding organisation in the city for nearly 125 years. It recognised the conservation values of Craigieburn at some period during the late 1940's and approached Mrs Sherriff to see whether she would sell the property. She agreed to give the Society first right of purchase on her death and left instructions in her will. The purchase was finalised in 1950 and managed under a deed of trust to protect the property in perpetuity. The replanting faded in the early 1970's and the project was revitalised in the 1990's when much of the historical material was rediscovered and researched. Since 2006 the Society have now completed a major archaeological survey and restoration of the stone structures on the property as well as initiating interpretation and linking the site to Ross Creek Reserve.

Conclusion

It's difficult to know what the motivation for preserving the rimu forest at Craigieburn was for Mrs Tanner and later her daughter Elizabeth Sherriff. That proposition is made even more difficult because they left no written records describing their thoughts on the proposal. We can only surmise from scraps of information about their characters what their intentions were. Perhaps Elizabeth Rankin simply ran out of energy to break more of the land in with the death of her husband William in 1872. Certainly her second marriage to Edwin Tanner may have influenced her thinking. However, this discounts the powerful personality of his wife, who remained the sole owner of the property despite her marriage to Edwin. The other motivation may have been purely utilitarian and the retention of the forest was viewed as an economic protection for the family in the future. However, this discounts the long widowhood of Elizabeth Sherriff from 1902-1949. So if the trees were an economic resource surely she would have used that resource to provide more comfortably for herself and her children. The other possibility is that the retention of the forest was an opportunity to advance in the small but hierarchical colonial Dunedin Society. Did retaining Craigieburn create social mobility and status not afforded to other poor subsistence landowners? Whatever their reason's their foresight and loyalty to one another has left a living conservation legacy within a vibrant cultural landscape for the benefit of Dunedin and New Zealand.

Paul Pope is an environmental consultant based in Dunedin who has project managed the Craigieburn project for Dunedin Amenities Society for the last 17 years.

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Figure 5 & 6 *the excavated cow byre was part of the colonial farm development of Craigieburn. Otago Polytechnic horticulture student's plant trees to strengthen the bush edges of the original cleared paddock. The Amenities Society has combined the forest preservation values with the colonial history to create a unique conservation area.*

Meeting and trip reports

Presentations and end of year dinner 5th December 2012

Allison Knight

The end of year was celebrated in style over a sumptuous Chinese banquet at the Golden Harvest Restaurant. David Lyttle spoke in appreciation of the tremendous support that Mary Anne Miller and Trish Fleming have given the Botanical Society of Otago since its inception in 1986, and presented them each with a large bunch of garden flowers and a 2013 BSO calendar. It's the end of an era, and we'll miss their friendly, helpful presence in the Botany Department. Everyone wished them well for the future and we all hope they will keep in touch.

Jean Bretherton handed in her resignation as treasurer, for health reasons. This was accepted with regret, as she has done sterling service for several years. Mary Anne generously agreed to step into the breach (perhaps it was the wine) and was welcomed on to the committee. It was a night of celebrating the generosity of the past and looking forward to new helpful associations and new botanical adventures in the future.

Interesting Local lichens. Talk by Lars Ludwig, 14 Nov. 2012

Allison Knight

We were fortunate indeed to have such a talented young lichenologist give an in depth talk to the Botanical Society in advance of his winning the Tom Moss Award and featuring in the local newspaper. Lars kindly began by explaining how a lichen is actually a symbiotic relationship between a unique fungus associated with an algal partner. As the central subject of his PhD study is the reproductive ecology of *Icmadophila splachnirima* he proceeded to enlighten us on the intricate details of the sex life of this rare and threatened subalpine lichen. (It is very timely to note that it is one of the precious species growing on the Denniston Plateau, where Lars found it during the BioBlitz in March 2012.)

This lichen reproduces sexually, via fungal spores made in the attractive pink apothecia. But Lars was the first to report that in certain conditions it also reproduces asexually by producing soredia, which are readily dispersed vegetative propagules containing both algal and fungal cells. His ongoing reciprocal transplant experiments are helping unravel the environmental conditions that stimulate each kind of reproduction, and the change from one to the other. He has shown that a plug of sterile sorediate lichen transplanted into the midst of a fertile patch produces distinctive pink apothecia in a remarkably short time, while fertile lichen transplanted into a sorediate patch begins to produce vegetative soredia.

Given that lichens grow very slowly, usually less than 5mm/year, it is remarkable how quickly *Icmadophila splachnirima* can respond to environmental changes. Lars has observed significant reproductive changes in only 12 months. He assumed that it was contrasting micro-environmental conditions that induced the development of either sexual or vegetative reproductive structures. Now he is in the process of demonstrating that the most significant factor triggering these reproductive changes is not temperature, rainfall or sunshine hours, but soil moisture content. This directly affects the hydration status of soil-dwelling lichens, and hence their metabolic activity, because lichens, unlike most plants, can only photosynthesize when they are moist.

The next section of the talk dealt with some rather complicated molecular genetic studies, covering a population genetics approach and an analysis of the 'mating' system. The population genetics will eventually show how much gene flow there is between the very disjunct populations of *Icmadophila splachnirima* found so far, while the mating type analysis will determine whether the

species is capable of self -fertilization. Pulling together Lars's diverse research strands will lead to a much greater understanding of the reproductive ecology of this threatened lichen and have important implications for future conservation strategies.

Along the way, as he seeks to record a more precise national distribution of *Icmadophila splachnirima*, Lars has made several other interesting discoveries, including a tiny undescribed fungus about 4 mm tall and parasitic on moss. It consists of a short, pale stalk topped by a single disc-shaped orange apothecium, and is an entirely new genus, growing quite widely right here in our back yard, beside the road to Swampy Summit, and at the top of Mt. Cargill. In the same area, he discovered a new species of *Coenogonium*, with orange apothecia and a thallus covered with isidia (tiny, cylindrical vegetative propagules), which he has since spotted on Botanical Society trips to Mihiwaka and to Mohua Park in the Catlins. Also on Swampy, Lars discovered a most intriguing lichen, also a new genus, which may be the 'peripatus' or 'missing link' of the lichen world. Its cupped fruiting bodies appear to be a transition between campylidia, which produce asexual fungal spores by budding, (mitosis) and apothecia, which produce sexual spores by meiosis.

As if two new genera and a new species wasn't enough, Lars has made even more world-first discoveries since his talk. It's an exciting time for lichenology in Otago! Thank you, Lars, for sharing the excitement.

Mohua Park Trip 3rd November 2012

David Lyttle

Mohua Park is an 8 ha property owned by Mary and Fergus Sutherland located near Tawanui, a former timber milling settlement in the Catlins. The house on the property is situated on top of a rise and was originally the mill manager's house. It is set amongst lawns and a large cottage style garden where some of the original plants still survive. Compared to the more modest workers dwellings that have long since disappeared, the house is perhaps the Catlins equivalent of a stately mansion. Fergus and Mary operate the property as an eco-tourism venture and have built several small cottages tucked away in the bush to accommodate their guests. The bush setting with the views across the Catlins Valley make it a particularly appealing place to visit. There is a network of tracks through the forest allowing visitors to explore at will and experience the diversity the forest has to offer. Over 100 species of indigenous vascular plants have been recorded making it very rich considering the small size of the area.

The forest contains two of the original forest types of the Takahopa Ecological District, mixed podocarp forest and beech forest. It has been logged in the past and now is mainly secondary growth with a few of the original podocarps remaining. The forest is regenerating strongly and contains a rich and diverse understory of shrubs and ferns, tree ferns being prominent in places. Non-vascular plants (mosses lichens and liverworts) are abundant. The beech forest is dominated by the only beech species present in the Catlins, silver beech, (*Nothofagus menziesii*) and has its own characteristic suite of understory species the most noteworthy being *Raukaua edgerleyi*. This plant is in gradual decline throughout its range but a good healthy population containing all age classes is flourishing at Mohua Park due in part to Fergus' and Mary's careful management of their forest. The vegetation has been surveyed by Brian Rance and John Barkla (Mohua Park Vegetation description and significance Report April 2007) and a species list compiled (Vascular Plants of Mohua Park Tawanui, Catlins November 2006). The single additional species that we recorded was *Olearia lineata* where a single plant was identified growing on the Loggers Track near the main entrance.

We are indebted to Fergus and Mary for their kind invitation to visit Mohua Park.

Unfortunately Mary was not able to be present on the day but our thanks must go to Fergus for his hospitality and for guiding us round the Park.

Lichens of Mohua Park
Allison Knight and Lars Ludwig

Even the visitor room at Mohua Park was dripping with lichens, and it was apparent that the endangered Mohua prefer to nest in lichen-covered trees. Perhaps this is because lichens harbour a large number of potential food species. Tiny native snails and many mites graze on the lichens, providing food for sheltering spiders, all of which could help sustain the Mohua.

Out in the park there were so many interesting lichens that Lars and I only managed to cover two of the network of forest walks. The Beech Track displayed a good collection of classic NZ large foliose *Pseudocyphellaria* and *Sticta* species, and many crustose lichens. Some, like *Thelotrema lepadinum* with its miniature volcano shaped fruit, and pale grey, felted, filamentous *Sagenidium molle* in dry overhangs are markers of old-growth forest. Associated with the powdery yellow *Chrysothrix candelaris* we found *Opegrapha niveoatra*. This species is new to New Zealand. Lars first discovered it near Powder Hill, and it is also at Ross Creek and Tuapeka West.

We identified at least 5 different microscopic lichens living on the leaves of pepper tree, *Pseudowintera colorata* or the fern *Pyrrosia eleagnifolia*. This is very interesting, because in the world literature leaf-living lichens are considered characteristic of tropical and subtropical forests. Jennifer Bannister thinks this anomalous association of foliicolous lichens on leaves in New Zealand may possibly be a carry over from warmer, sub tropical periods during the Cenozoic Era. A quick survey of the garden showed that even in this isolated place there were many lichen species characteristic of urban areas, including the bright orange *Xanthoria parietina*, which DNA tests have shown is definitely introduced.

The list of 70 species is not particularly representative, as Lars and I were more interested in looking for curiosities and may well have bypassed many obvious, common lichens in favour of less well known microscopic crusts. Our most curious finds, all growing on bark in the forest, included a species of *Mycoblastus* that glows bright white under UV light, an unidentified pale green warty crust with orange apothecia that is possibly a *Coenogonium* and an entirely new isidiate species of *Coenogonium* that Lars first discovered on Swampy Summit. Thank you, Fergus, for giving us a glimpse of a forest full of so many interesting and seldom seen lichens.

Sticta filix, Mohua Park, showing the green finely divided upper surface and the pale lower surface with distinctive stalk (Photo: Allison Knight)

Field Trip to the St Marys Range, North Otago, 8th-9th December 2012.

Cushla Gilbert

After a variety of vicissitudes, in particular not being able to get through a padlocked gate though the key was dangling before our eyes, the six of us eventually assembled at the Awakino Skifield Lodge. When we had eaten lunch our intrepid drivers took us up to the skifield base. In view of the weather predictions for the Saturday afternoon, we decided to explore the area close to the ski base huts (just under 1500 m) and work our way down the road to the accommodation lodge (1200 m), and on Sunday when it was anticipated the snow would be sufficiently melted from the tops, to climb higher and find the recently described scree buttercup, *Ranunculus acraeus*, a species restricted to North Otago and South Canterbury.

We spent an exhilarating afternoon of discovery, recording our finds in a range of photographic styles. Some of the plants that we had tantalizing glimpses of in flower on the way up earlier were still only in bud at this altitude. But *Pimelea oreophila* was flowering. Among patches of snow were the white delicate flowers of *Caltha obtusa*. These flowers are formed before the winter and come out immediately the snow melts. Among the other plants we found were *Kelleria villosa* var. *villosa*, *Ranunculus gracilipes*, *Aciphylla dobsonii*, *Anisotome aromatica*, *Chionohebe thomsonii*, *Hebejeebie densifolia*, *Leptinella pectinata* var. *villosa*, *Hebe pinguifolia*, *Hebe epacridea* and *Viola cunninghamii*.

Back at Awakino Lodge we used the books we had brought to further identify the plants we had seen and photographed. It was interesting to compare the Nancy Adams drawings of the book she and Alan Mark had produced some years ago with the possibilities of Alan's forthcoming book with its photographed illustrations. Both Janet Ledingham and David Lyttle have contributed to these. It was interesting to hear the observations of John Conran from Adelaide on the comparative botany of Australia and NZ. John was visiting Dunedin specifically to work with Daphne Lee in the related field of palaeobotany. He has an awesome knowledge of New Zealand botany, having previously learnt the flora of his own South Australia and also those of several other Australian regions. It was good too to meet two new members, Rosemary Clucas who works for DOC researching Didymo, and Zuni Steer from Oamaru.

After tea some of us took advantage of the evening sunlight and balminess to clamber up the scree slope west of the hut. Here we found *Myrsine nummularia*, *Brachyglottis lagopus*, *Coprosma fowerakeri*, *Luzula traversii* and *Ourisia glandulosa*.

It had become clear that it would be fruitless to try to find *Ranunculus acraeus* due to snow lying later in the season than expected and more fresh snow that had arrived earlier in the week so on Sunday morning we packed up and drove back down the road stopping a couple of times to explore. Along the side of the road we found *Coriaria plumosa* in flower. By crossing the swift running Awakino Stream we gained access to a bluff and some steep sided gullies where we found a fascinating range of plants. Our finds included the clubmoss *Lycopodium fastigiatum*, the ferns *Blechnum penna-marina, Polystichum vestitum* and *Polystichum cystostegia*, and a variety of other plants including *Gaultheria crassa*, *Acaena caesiiglauca*, *Muehlenbeckia axillaris*, *Aciphylla aurea*, *Aciphylla scott-thomsonii*, *Cardamine bilobata*, *Melicytus alpinus*, *Geum cockaynei*, and *Celmisia densiflora*.

After boiling the billy and some food, and being screamed at by a pair of falcons way above us, David and John set off north-west to show John more of the botanical delights of New Zealand, Rosemary headed north too for some fish analysis, Zuni returned to Oamaru, and Janet and I headed for Dunedin, turning off at Duntroon on an alternative route and

then out to the coast at Kakanui where we saw a huge assembly of black back gulls with their young fluffy chicks.

In spite of the small number of participants and the unavailability of *Ranunculus acraeus*, it was a most interesting and enjoyable weekend. Many thanks to the organisers.

Chairman's travels around the South Island, December 2012.

David Lyttle

I have had an interesting summer that has involved several trips and a lot of travel. In December I hosted John Conran on a jaunt that initially started at Awakino with the BSO on the 8th and 9th of December and continued on to Mt Cook with stops at the Quailburn and Lake Ohau retuning back to Dunedin via the little Omarama Saddle and East Manuherikia. John is from the University of Adelaide and was in Dunedin working with Daphne Lee on Cenozoic paleobotany. Daphne described some of this work in her 2009 Baylis lecture. John has been instrumental in interpreting plant fossil material from the local sites and placing it in a broader Australasian context and is a fount of botanical knowledge extinct and extant. John was keen to see New Zealand mistletoes and compare them with fossil material that had been recovered from Foulden so with this object in mind we headed for the Quailburn. The beech trees around the old woolshed were ablaze with *Peraxilla tetrapetala*. More plants were located in the scrub on the adjacent hillside growing on *Aristotelia fruticosa* and *Coprosma propinqua* respectively. This observation indicated that *Peraxilla* mistletoes and by inference their fossil progenitors need not necessarily have been restricted to *Nothofagus* hosts. Besides the mistletoe, matagouri (*Discaria toumatou*) was also flowering heavily. This spiny shrub is the bane of pastoral farmers but is an important pioneering plant colonising alluvial fans as it has the ability to fix nitrogen with the help of symbiotic bacteria of the genus *Frankia* in its roots. Later on we were to encounter some large, old specimens of matagouri on the Hooker moraine at Mt Cook. These trees have enormous character and sit well in the landscape of which they are a part.

Diving along the shore of Lake Pukaki the first views of Mt Cook that may be seen from Pete's Lookout are framed by a chaotic mess of wilding conifers, some standing, some in the process of being flattened and others seeding up the hill obliterating the tussock grassland and glacial features that make this landscape noteworthy. We have a sad record in this country of extirpating the native vegetation and replacing it with exotic weeds that provide no ecosystem services and render vast tracts of land useless for any other purpose including agriculture.
Mt Sefton (which is the one you see first approaching the Hermitage from the Tasman Valley) and Mt Cook are the subject of a thousand postcards and tourist brochures but on a clear day are still a sublime sight. From the track up the Hooker Valley the glacial landscape unfolds with each twist and turn. Icefalls from Mt Sefton plunge down into the lake at the terminus of the Mueller Glacier. Every where there is moraine left by the retreating glaciers; in some places softened by vegetation and in other places piles of boulders, still raw and unstable, unsupported, after the ice that carried them there melted. The vegetation is very diverse with pioneering species on the gravel and fresh moraine; *Coriaria plumosa, Muehlenbeckia axillaris, Stellaria gracilenta, Geranium brevicaule, Parahebe decora*. The more stable sites support extensive shrublands with *Gaultheria crassa, Griselinia littoralis, Podocarpus nivalis, Aristotelia fruticosa, Dracophyllum longifolium, Dracophyllum rosmarinifolium, Phyllocladus alpinus.* Interspersed with these are the large herbaceous plants and snow tussocks. *Celmisia semicordata* is prominent as is the great mountain buttercup *Ranunculus lyallii***.** Notwithstanding the fact that this plant is a buttercup and is found in alpine regions throughout the South Island it is still referred to as the Mt Cook lily (ODT Saturday, Feb

2nd, Auckland Botanical Society Journal 67(2) December 2012). The name Mt Cook Buttercup would more accurately applied to *Ranunculus grahamii,* which is confined to the Mt Cook region. The peak of flowering of *Ranunculus lyallii* was over but there were still a few plants to be found in flower. Two large *Aciphylla* species, *Aciphylla scott-thomsonii* and *Aciphylla aurea,*were present and flowering. The flowers of *Aciphylla scott-thomsonii* are yellow and those of *Aciphylla aurea* are white. I was particularly interested in photographing *Dracophyllum kirkii* but unfortunately most of the flowering was over but we did manage to locate a small cluster of flowers on one plant. This species has glaucous foliage that colours red in winter and grows as distinctive rounded cushions. The Hooker Glacier ends in a lake with chunks of ice floating in it. The scene is not particularly picturesque as the retreating ice is covered in piles of rubble. The track up the Hooker Valley has been re-routed to avoid traversing round a bluff that is prone to rockfall. Two new massive suspension bridges spanning the Hooker River have been built to cater for the thousands of tourists who visit the valley.
Not being satisfied with seeing *Peraxilla tetrapetala* in the Quailburn John was intent on finding *Alepis flavida* at Lake Ohau as he had found an historical record from there. So we headed back down the road and around to Parson's Creek on Lake Ohau where there is a small isolated pocket of beech forest. As in the Quailburn the trees were ablaze with *Peraxilla tetrapetala* but a single plant of *Alepis flavida* was located a few metres from the carpark. A second plant was found in a little grove of trees down on the lakeshore. The final plant on John's wish list was *Herpolirion novae-zelandiae.* We found this at the end of the day by a kettle hole tarn on the way back to Twizel. It was a white-flowered form rather than the usual blue.

Next day we headed back to Dunedin via the Little Omarama Saddle and East Manuherikia Valley. We did a little botanizing on the saddle and found *Aciphylla montana* var. *gracilis,* another unidentifiable *Brachyscome* and *Ranunculus crithmifolius* in flower. This latter plant has very cryptic colouration and is easy to overlook as it grows on bare stony ground. The final plant of note found growing in the East Manuherikia Valley was *Coprosma intertexta,* an uncommon species confined to eastern South Island dry intermontane basins where it is a component of grey scrub. It has narrow leaves similar to *Coprosma elatirioides* and *Coprosma brunnea* but is a robust upright shrub rather than trailing or lianiod and grows on dry sites rather than the poorly drained bogs favoured by *Coprosma elatirioides*. In all it was a great trip and I hope John enjoyed it as much as I did. Trans Tasman dialogue expands ones botanical horizons.

Wellington Botanical Society field camp, Arthurs Pass, 30th December - 6th January.

David Lyttle

The annual Wellington Botanical Society field camp was held at Arthurs Pass over the New Year period. Initially there were three BSO members in the group, myself, Allison Knight and Alf Webb. On the evening we arrived it started to rain and it did not stop until four days and over 500 mm of rain later. The majority of people who elected to sleep in tents out of bravado soon abandoned them and sought more comfortable quarters on the Outdoor Centre where the camp was based. The trip diary is quite simple;

Sunday 30th December Walked to Jack's Hut in the rain. Got wet and cold.

Monday 31st December Raining at Arthurs Pass, Headed east down the Waimakariri Valley to the Wilderness Lodge at Cora Lynn where it was not raining. Spent the morning botanising at Broad Stream in the grey scrub "moa forest", photographed a beautiful specimen of *Alepis flavida* in flower and the curious sprawling grey shrub *Helichrysum depressum* growing in the stream bed. Drove further east to Castle Hill Basin where we were given a conducted tour of the Lance

McCaskill Nature Reserve set up to protect the habitat of the rare Castle Hill buttercup (*Ranunculus pauciflorus*). The reserve is a basin surrounded by limestone outcrops. The specialized plants found within it grow on a limestone scree. The reserve has been pillaged over the years and many specimens of the buttercup removed. A number of plants were visible and were photographed but none were in flower. Other plants that grow in this harsh environment are *Poa acicularifolia, Lepidium solandri, Myosotis colensoi, Gingidia enysii, Raoulia hookeri, Chaerophyllum novae-zelandiae, Senecio glaucophyllus* subsp. *discoideus* and the plantain *Plantago spathulata* which I had not seen before. Two plants that were flourishing at Castle Hill were *Myosotis colensoi* which is restricted to limestone substrates and *Lepidium solandri* (smaller populations are found in Central Otago at Springvale and Pisa Flats).
A New Years Eve celebration with the Wellington Botanical Society is a unique cultural experience; someone should do a radio programme on it before all the protagonists fade away. A spirited rendition of La Marseillaise during the evening brought a tear to Pascale's eye.

Continuing the narrative. Tuesday January 1st Raining at Arthurs Pass. Eventually Alf and I became sufficiently motivated to join the rest of the group at Bealey Spur on the other side of the Waimakariri bridge where it was raining only some of the time. Did not bother taking a camera so got no photographs of *Parsonsia capsularis,* which was flowering or the little pinnate-leaved *Brachyscome* that was growing up on Bealey Spur or the *Alepis flavida* that was flowering in abundance on the roadside through the Bealey Spur village. Still raining at Arthurs Pass on our return.

Wednesday January 2nd Raining a lot at Arthurs Pass. Allison left for Dunedin. To everyone's surprise the DOC staff who were going to supervise the working bee removing wildling pines that was scheduled for that day cancelled. Did not go anywhere but watched the lawn in front of the Outdoor Centre become a lake and then watched the local volunteer fire brigade come and pump it out. Arthurs Pass was cut off from the west due to flooding and for a period, from the east as well.

Thursday January 3rd A kereru appeared on the veranda of the Outdoor Centre holding a miro twig in its beak - it had stopped raining. We headed east to the Craigieburn Forest Park and spent the morning pulling out wildling Douglas fir growing along the side of the road. It is doubtful that we made much of an impact over the morning. As is the case in other parts of the country wildling conifers have become a major problem. Douglas fir planted on the Cragieburn Range is spreading out over the Castle Hill Basin. The seedlings of this species germinate anywhere; in bogs, in shade under beech and in the tussock grassland. Douglas fir grows rapidly and overtops the native vegetation replacing it entirely.
In the afternoon we headed up to the Mt Cheeseman skifield to find the scree plants for which Canterbury is renowned. At the ski huts we found a few very small specimens of *Notothlaspi rosulatum*. This species is monocarpic and can be locally abundant but is erratic in its distribution. The button daisy *Leptinella pyrethifolia* var *pyrethifolia* was very conspicuous with its large white flowers. On the crest of the ridge *Leonohebe tetrasticha* and *Raoulia mammillaris* were found growing on rock outcrops. The latter is distinguished from the similar vegetable sheep (*Raoulia eximia, Raoulia bryoides*) by the conspicuous blunt white tips of the inner bract scales of the flower heads. The true scree plants included *Leptinella atrata* var *atrata*, *Leptinella atrata* var *luteola*, *Stellaria roughii*, *Ranunculus haastii*, *Myosotis traversii* var *cantabrica* and the remarkable *Lignocarpa carnosula.* The high altitude screes are very sparsely vegetated and most of the specialised scree plants are found on the mid-altitude screes. The fourth scree I descended that afternoon seemed to be one scree too far as I stumbled out the bottom but I was rewarded by finding *Leptinella dendyi* in the middle of it. It has larger flower heads

then its close relative *Leptinella atrata.* It is virtually impossible to locate some of these plants unless you are standing on them.

Friday January 4th A fine clear day! The whole party headed up to Temple Basin to look at rich, diverse alpine flora growing there. The view across the valley to Mt Rolleston unfolded as we gained height. Noteworthy finds were *Hebe macrocalyx* var *macrocalyx* growing on the screes high up under Mt Temple, a superb specimen of *Anisotome pilifera* in flower, *Astelia petriei, Kelleria multiflora* and *Celmisia bellidioides.* This small mat forming *Celmisia* is quite happy growing on stream beds sometimes with water flowing over it.

Saturday January 5th Another fine clear day! Alf and I joined Neill and Barbara Simpson to go to the Broken River skifield with the intention of getting some more photographs of scree plants. Besides the species we had already seen at Mt Cheeseman, we found several more specimens of *Leptinella dendyi*, a plant of *Anisotome filifolia* and one stunning flowering specimen of *Notothlaspi rosulatum* growing amongst several ragged ones. As it was a clear bright day conditions for photography were very challenging.

Sunday January 6th Yet another fine clear day. Alf and I headed off by ourselves up the Otira Valley for a relaxed day of botanising and photography. Progress was slow as we were making a serious attempt to compile a comprehensive species list and get some good photos. The first plant we saw that warranted attention was the yellow-flowered *Euphrasia cockayneana*. Beech is not present on the western side of the Arthurs Pass and for this reason, the Otira Valley does not have a recognizable treeline. Shrubland continues up the valley and merges into tussock grassland and herbfield. I applied myself to getting good photos of the two large *Celmisias*; *Celmisia armstrongii* with its stiff leaves with prominent orange midribs and *Celmisia semicordata* subsp. *semicordata* which is very different to subsp. *aurigans* and subsp. *stricta* from Otago and Southland. The shrub daisy *Brachyglottis bidwillii* was present in the upper part of the valley replacing *Brachyglottis elaeagnifolia* which grew lower down towards the road where we recorded a hybrid tree daisy, *Olearia lacunosa* x *Olearia ilicifolia*. *Leucogenes grandiceps* was common in the upper reaches of the valley but tended to grow on screes rather than rock outcrops as it does in Otago. The final, and perhaps the most satisfying find of the day, was *Parahebe cheesemanii* subsp *flabellata*. This tiny grey plant was growing amongst stones on damp, gravelly scree and to a casual glance looked like a fragment of dead vegetation. Each one of the two plants I photographed had one flower.

It is not possible to conduct and run a field trip without the assistance and support of a lot of people. Special thanks to Chris Moore and Bev Abbott for organizing the Arthurs Pass Field Camp, Rodney Lewington for his gentle encouragement to compile plant lists every evening and to all the other Wellington Botanical Society people who hosted us and made the Arthurs pass camp such an enjoyable experience for me. Thanks Alf and Allison for being such good company in the field and Alf for finding yet another enigmatic *Melicytus* variant in a place where no one else would have thought to look. For the record the plant is a spindly shrub about 2 m tall and was found growing in mountain beech forest behind the Outdoor Centre at Arthurs Pass.

Trip to the Aramoana Salt Marsh, World Wetlands' Day 2 February 2013

Robyn Bridges

For those who had been active in the Save Aramoana Campaign of the 70s, standing on the salt marshes on the recent field trip to celebrate World Wetlands' Day, had special significance. It was gratifying to see that the salt marsh was alive and healthy, well mostly. The fight to maintain and preserve this wonderful wetland is not over yet!

Though no longer under the threat of a smelter (both nickel and aluminium had been proposed at different times) and it is now a DoC Conservation area, those looking after this salt marsh are fighting on two fronts; invasive plant species and human vandalism.

Thirteen of us gathered at the Aramoana Domain where Bradley gave us a thorough overview of the work he and the Friends of Aramoana are doing to maintain and protect this living ecosystem; the only intact system within the Otago Harbour. The group aims to do this by managing invasive weed species and restricting vehicle access.

The salt marsh is made up of a dune slack system comprising of ridges of coastal dunes with slacks between. The largest slack in the system is the one we followed down to the shore. In a paper written by two of our members, a slack is defined as, *'small nutrient enriched vegetative moist depression between shore dunes or a sandbank, especially those which periodically hold slack (scarcely moving water at times of highest tides).'* (Johnson & Rogers 2003 '*Ephemeral Wetlands and their turfs in NZ'* Science for Conservation 230, Wellington Department of Conservation).

The current invasive weed list includes the weedy rush *Juncus gerardii,* the weedy sea couch *Elytrigia pycnantha*, wilding pines and the Australian ice plant*, Disphyma clavellatum* (jelly beans), which had cross bred with the native NZ ice plant, *Disphyma australe* subsp. *australe.* The status of this ice plant is questionable. Is it a recent coloniser in NZ and should it be regarded as weedy or not? If it is self-introduced it would be classed as a colonizer, and if not, a weed. (Moira later found a reference to it being a garden escape from the Otago Peninsula).

The slack was made up of extensive salt meadows of native salt tolerant herbs and dominated by glasswort, *Sarcocornia quinqueflora*), sea primrose, *Samolus repens* var. *repens*, and *Selliera radicans*. There were patches of native sea blight, *Suaeda novae-zelandiae* and a small area of native three-square, *Schoenoplectus pungens*.

Bradley and his associates are passionate about this area and they are working with the local community to raise the awareness of the value of this saltmarsh and to protect it. It is hoped by looking after and maintaining this system the wetlands will not only give protection to fauna, but create a protective buffer zone against potential rising sea levels to Aramoana village (saltmarshes can absorb more water).

In terms of human threat, there are moves by some to reinstate a road down the side of the Spit and from others to maintain access onto the mudflats to do 'donut' wheelies in the sea primrose beds! Together with managing the on-going invasion of weed species, Bradley and his colleagues have their work cut out. They were off to a community meeting the next day, to talk about these issues.

Thank-you Bradley for a great field trip and the opportunity to celebrate a local wetland! It's an indication of its success that no one stopped for morning tea because we were all so absorbed!

Disphyma clavellatum, jelly beans (Photo: John Barkla)

Aramoana salt marsh patterns (Photos: Di Carter)

Botanists looking at the low growing plants of Aramoana salt marsh (Photo: Janet Ledingham)

Schoenoplectus pungens (Photo: John Barkla) Selliera radicans (Photo: Janet Ledingham)

Lichen List, Mohua Park, 3rd Nov 2012

Lars Ludwig and Allison Knight

LICHENS

Foliose - *flat lobes with a distinct lower surface*

Bunodophoron sp.	*B*
Collema sp.	*G*
Hyperphyscia plinthiza	*G*
Hypogymnia lugubris	*G*
Hypogymnia subphysodes	*G*
Leptogium crispatellum	*E*
Lobaria adscripta	*B*
Melanelia subglabra	*B*
Menegazzia neozelandica	*B, G*
Menegazzia nothofagi	*B*
Pannaria leproloma	*B, M*
Pannaria microphyllizans	*B, M*
Parmeliella aggregata	*G*
Parmelina pseudoreclina	*B*
Parmotrema perlatum	*B, G*
Peltigera membranacea	*E*
Peltigera polydactylon	*E*
Pseudocyphellaria dissimilis	*B*
Pseudocyphellaria episticta	*B*
Pseudocyphellaria glabra	*B*
Pseudocyphellaria gretae	*B*
Pseudocyphellaria multifida	*M*
Pseudocyphellaria pickeringii	*B*
Pseudocyphellaria rufovirescens	*B*
Punctelia subalbicans?	*B*
Sticta filix	*B*
Sticta latifrons	*B*
Xanthoria parietina	*G*

Fruticose - *'shrubby' or 'twiggy' lichens*

Cladonia darwinii	*E*
Cladonia fimbriata	*G*
Cladonia sp.	*G*
Ramalina celastri	*G*
Usnea pusilla	*E*
Usnea cornuta	*G*
Usnea inermis	*B*
Usnea rubicunda	*B*

Crustose - *flat, spreading crusts*

Arthonia radiata	*G*
Brigantiaea chysosticta	*B,G,M*
Buellia disciformis	*G*
Caloplaca subpyracea	*G*
Chrysothrix candelaris	*B*
Cliostomum griffithii	*B*
Coenogoniium luteum	*M*
Coenogonium implexum	*B, M*
Coenogonium sp. Nov (isidiate)	*E*
Enterographa pallidella	*M*
Graphis librata	*G, E*
Haematomma babingtonii	*B,G,M*
Lecanora carpinea	*G*
Lepraria lobificans	*E*
Megalaria grossa	*B, M*
Megalospora gompholoma	*M*
Mycoblastus sp.	*B*
Ochrolechia pallescens	*B, G*
Opegrapha niveoatra	*B*
Pertusaria novaezelandiae	*B*
Pertusaria sp.	*B*
Phlyctis sp. 1	*B, M*
Phlyctis sp. 2	*B, M*
Phyllopsora cf. *furfuracea*	*B, M*
Physcia adscendens	*G*
Pyrenula deliquescens	*B*
Sagenidium molle	*B*
Thelotrema lepadinum	*B*
Unidentified crust	

Foliicolous - *lichens living on leaves*

Calopadia subcoerulescens	*B*
Polycornum rubrofuscum	*B*
Porina sp.	*B*
Strigula sp.	*B*
Trichothelium alboatrum	*B*

Key: B, Beech Track; E, Entrance Drive; G, Garden; M, Matai Track

Alpine Plants of the St Marys Range, North Otago.

This list is based on a list originally compiled by Hugh Wood of Oamaru with additions and revisions by David Lyttle and others from the Botanical Society of Otago on the 12th-14th December 2008. Plants denoted with * were recorded on the Botanical Society of Otago field trip to the Awakino on the 8th -9th December 2012. On the most recent trip plants were recorded along the road from the gate (at about 900 m) to the ski base huts (at about 1500 m) and from a site above the ski base huts.

FERNS AND FERN ALLIES

*Huperzia australiana**

*Lycopodium fastigiatum**
Lycopodium scariosum

Blechnum montanum
*Blechnum penna–marina**

Gleichenia dicarpa
*Grammitis poeppigiana**

*Hymenophyllum?cupressiforme**
Hypolepis millefolium

*Polystichum cystostegia**
*Polystichum vestitum**

GYMNOSPERMS

*Podocarpus nivalis**

ANGIOSPERMS

DICOTYLEDONS

Abrotanella sp
Acaena glabra
*Acaena saccaticupula**
Acaena fissistipula
*Acaena caesiiglauca**
*Aciphylla aurea**
*Aciphylla dobsonii**
Aciphylla montana var. *gracilis*
*Aciphylla scott-thomsonii**
Acrothamnus colensoi
*Anaphalioides bellidioides**
Anisotome aromatica var. *aromatica**
*Anisotome brevistylis**
*Anisotome flexuosa**
Argyrotegium mackayi

*Brachyglottis bellidioides**
Brachyglottis haastii
*Brachyglottis lagopus**
*Brachyscome longiscapa**
Brachyscome sinclairii

*Caltha obtusa**
*Cardamine bilobata**
*Cardamine corymbosa**
Carmichaelia crassicaulis
Celmisia alpina
*Celmisia angustifolia**
*Celmisia densiflora**
Celmisia gracilenta
*Celmisia laricifolia**
*Celmisia lyallii**
Celmisia ramulosa var. *tuberculata*
*Celmisia sessiliflora**
Celmisia sp (aff *angustifolia*)*
Chaerophyllum colensoi
Chionohebe thomsonii
*Colobanthus acicularis**
*Colobanthus buchananii**
Colobanthus canaliculatus
Colobanthus strictus
Coprosma atropurpurea
*Coprosma cheesemanii**
*Coprosma fowerakeri**
*Coriaria plumosa**
Craspedia lanata

*Dracophyllum muscoides**
*Dracophyllum pronum**
*Dracophyllum rosmarinifolium**

Epilobium alsinoides var. *atriplicifolium*
Epilobium crassum
Epilobium porphyrium
Epilobium pycnostachyum
Epilobium tasmanicum
Euphrasia zelandica

Exocarpos bidwillii
*Gaultheria crassa**
Gaultheria depressa var. *novae-zelandiae**
Gentiana amabilis
Gentiana bellidifolia
Geranium microphyllum
*Geranium brevicaule**
*Geum cockaynei**
Geum leiospermum

Haastia aff. *sinclairii*
Haastia sinclairii
*Hebe buchananii**
*Hebe epacridea**
*Hebe lycopodioides**
Hebe odora
Hebe pinguifolia
Hebe subulata = Hebe hectori
*Hebejeebie densifolia**
Hebejeebie densifolia x *Chionohebe thomsoni ("Pygmea armstrongii")*
Helichrysum intermedium

Kelleria dieffenbachii
Kelleria paludosa
Kelleria villosa var. *villosa**

Lagenifera cuneata
Leptinella atrata
Leptinella pectinata var. *villosa**
*Leucogenes grandiceps**
*Leucopogon fraseri**
Lobelia roughii
Lobelia linnaeoides
Lobelia macrodon/glaberrima
Lobelia angulata

*Melicytus alpinus**
Montia sessiliflora
*Muehlenbeckia axillaris**
*Myosotis australis**
Myosotis aff. *pulvinaris*
Myosotis sp *(*recorded in 2008 as *pygmaea* var *drucei* but is not this)*
Myosotis sp 'cushion, tiny flowers'*
Myosotis traversii var. *cantabrica*
*Myrsine nummularia**

Nertera balfouriana
*Nertera scapanioides**

Ourisia caespitosa var. *gracilis*
*Ourisia glandulosa**
Oxalis magellanica
*Ozothamnus leptophyllus**

*Parahebe decora**
Pentachondra pumila
*Phyllachne colensoi**
*Pimelea oreophila**
Plantago lanigera

Ranunculus acraeus
*Ranuculus foliosus**
*Ranunculus gracilipes**
Ranunculus maculatus
*Ranunculus multiscapus**
*Raoulia grandiflora**
*Raoulia hectori**
Raoulia hectorii var. *mollis*
Raoulia petriensis
*Raoulia subsericea**
*Raoulia tenuicaulis**
Raoulia youngii

*Schizeilema hydrocotyloides**
*Scleranthus uniflorus**
*Stellaria gracilenta**
Stelleria aff. *roughii*

Taraxacum magellanicum

*Viola cunninghamii**

*Wahlenbergia albomarginata**

MONOCOTYLEDONS

Aporostylis bifolia

*Bulbinella angustifolia**

*Chionochloa rigida**

*Luzula pumila**
*Luzula rufa**
*Luzula traversii**

*Phormium cookianum**
*Poa colensoi**
Prasophyllum colensoi
*Thelymitra longifolia**
*Schoenus pauciflorus**

Elytrigia pycnantha, sea couch, Aramoana salt marsh (Photo: Moira Parker)

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