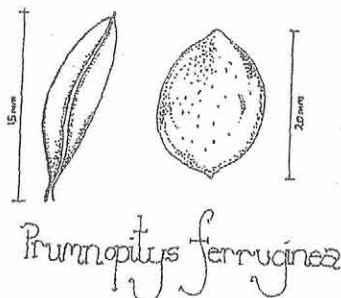


Botanical Society  
of Otago  
Newsletter.  
Number 22,  
September 2000.



### Botanical Society of Otago Meetings

Sunday September 17<sup>th</sup> **Garden visit.** With Professor Geoff Baylis. Prof. Baylis's garden provides a wonderful opportunity to see specimens of many species most of us would otherwise never have the chance to see other than in slides and books. His great love of the Three Kings Islands, a focus of his early Botanical work, is obvious in the many rare and wonderful specimens from these islands. Meet: 1.00pm outside 367 High Street.

Wednesday October 11<sup>th</sup> **Talk and supper** Zoology Seminar Room, 7.00pm. With Professor Alan Mark: *The History of New Zealand's Tussock Grasslands: Evolution and Management.*

29<sup>th</sup> December – 7<sup>th</sup> January: **Summer field trip.** with the Wellington Botanical Society to Borland Lodge. See details inside.

7<sup>th</sup> – 9<sup>th</sup> January: **Lichen Field Trip** Borland Lodge. See details inside.

Field trips and workshops are always the **third Sunday** of the month and Talks and slide shows the Wednesday or Thursday before the field trip.

All activities are advertised in the Wednesday Star preceding the activity.

**Cancellations** will be broadcast on Radio 4ZB and 4XO cancellation service! otherwise assume they are **ON!!**

## Note from Branch Office

We'd like to take this opportunity to thank Helen Clarke for leading the Peggy's Hill field trip and Dr Catriona Hurd for organising the Algae/Seaweed workshop.

As this will also be my (BJA) last newsletter for some time I would like to thank Trish, Alison Stringer, Mary-Anne, Vickey and Catherine for helping with the workshops, photocopying and all the unexpected glitches in between; all those who have helped with folding, stapling, sticking and stamping; articles and activities (you know who you are).

The October issue will be a special issue (at the end of October) with all the abstracts from the Botany Department (University of Otago) Colloquium –to be held on October 13<sup>th</sup> at Cargills Hotel. Any enquires about the colloquium can be made directly to Alison Stringer or David Burnett at the Botany Department, University of Otago.

Submissions to the Diary should be made to Trish and submissions to the newsletter 24+ should be made through Bastow Wilson at the Botany Department, University of Otago.

Barbara and Bastow

### Cover picture:

*Prumnopitys ferruginea* (D. Don) Laubenf.

Drawn by Inge Andrew. *Prumnopitys ferruginea* or miro is the subject of our plant profile and a popular article by Simon Johnson.

## Errata:

Apologies to Kelvin Lloyd and Molly Ward the authors of last months popular article "Cushion bog at sea level – but for how much longer?" In the final proofs six species and their abbreviations were deleted from the species list. The full list is reproduced below, missing species in bold, apologies also to everyone who was stumped by the missing abbreviations.

## Species list

Act. nov: <i>Actinotus novae-zelandiae</i>	Gun. den: <i>Gunnera densiflora</i>
Bau. hut: <i>Baumea huttonii</i>	Her. nov: <i>Herpolirion novae-zelandia</i>
Bau. ten: <i>Baumea tenax</i>	Hie. red: <i>Hierochloe redolens</i>
Ele. nov: <i>Blechnum novae-zelandiae</i>	Hyd. mic: <i>Hydrocotyle microphylla</i>
Car. app: <i>Carex appressa</i>	Iso. auc: <i>Isolepis aucklandica</i>
Cel. grc: <i>Celmisia gracilentia</i>	Lep. sco: <i>Lepiospermum scoparium</i>
Cel. grm: <i>Celmisia graminifolia</i>	Lot. ped: <i>Lotus pedunculatus</i>
Cer. fon: <i>Cerastium fontanum</i>	Lyc. ram: <i>Lycopodium ramulosum</i>
Col. mue: <i>Colobanthus muelleri</i>	Ner. dep: <i>Nertera depressa</i>
Copr. sp: <i>Coprosma</i> sp aff. <i>intertexta</i>	Ore. pec: <i>Oreobolus pectinatus</i>
Cya. emp: <i>Cyathodes empetrifolia</i>	Ore. str: <i>Oreobolus strictus</i>
Don. nov: <i>Donatia novae-zelandiae</i>	Ore. sub: <i>Oreostylidium subulatum</i>
Dra. lon: <i>Dracophyllum longifolium</i>	Pen. pum: <i>Pentachondra pumila</i>
Dro. spa: <i>Drosera spathulata</i>	Per. mac: <i>Pernettya macrostigma</i>
Emp. min: <i>Empodisma minus</i>	Sel. rad: <i>Selliera radicans</i>
Gen. lin: <i>Gentianella linearis</i>	Sph. cri: <i>Sphagnum cristatum</i>
Gle. dic: <i>Gleichenia dicarpa</i>	Sta. min: <i>Stackhousia minima</i>
Gon. mic: <i>Gonocarpus micranthus</i>	Thel. sp: <i>Thelymitra</i> sp.

## Botany Department Colloquium

13<sup>th</sup> October, Friday. The Botany Colloquium is held every year by the students and staff of the Botany Department, University of Otago. It is a wonderful chance for young botanists to present their work and proposals in an informal and friendly atmosphere. This year it will be held at Cargill's Hotel, 678 Geogre Street from 1pm till 6pm. The programme will be posted on the Departmental website closer to the time, and abstracts will be reprinted in the Botanical Society of Otago Newsletter following the colloquium.

The Botanical Society of Otago Award for the best student presentation will be presented at the end of the colloquium along with the prize for the best poster. Contact Alison Stringer or David Burnett by the 1<sup>st</sup> of October at 479 9065 or email Alison.stringer@botany.otago.ac.nz.

## **Summer Field Trips:**

### **Borland Lodge with Wellington Botanical Society**

29<sup>th</sup> December – 7<sup>th</sup> January. Summer Field Trip, based at Borland Lodge, Fiordland. Wellington and Otago Botanical Societies are combining forces, so it should be a doubly great trip. There will be opportunities to delve into wetland ecology in the Borland Bog with the expertise of Prof Alan Mark, if or when it rains, to get closer to Coprosmas on a transect from Lake Manapouri to Borland Saddle with Adrienne Markey (Jan 5) and to be introduced to the fascinating world of lichens by Dr David Galloway (Jan 6). Plans to explore further areas of interest are in the pipeline – look for more details and registration forms next month.

### **Lichen Field Trip**

7<sup>th</sup> – 9<sup>th</sup> January. Lichen Field Trip For those so intrigued by lichens that one day is not enough there will be 3 days of field trips from Borland Lodge immediately following the botanical summer field trip. Areas of interest we hope to study more closely include Lake Hauroko, the Clifden limestone and Borland Bog, with the aim of building up more comprehensive lichen lists for these areas. Numbers will be limited. Send expressions of interest and requests for registration forms by October 1<sup>st</sup> to: Allison Knight; email: alli\_knight@hotmail.com, or to Jennifer Bannister, Herbarium, Botany Department, Otago University, Box 56, Dunedin.

**“It was broadleaf that saw me right” –  
in praise of *Griselinia littoralis***

By Geoff Baylis

The University of Otago was founded before the University of New Zealand so it kept its name when it merged with colleges in Auckland, Wellington and Christchurch to form that federation. It was the UNZ that set the syllabus (in detail right down to *Pinus* and *Mucor*), did the examining using professors overseas, and awarded the degrees. When I sat my MSc the examiner was in Dublin, the exam papers had not been proof-read and not all the questions made sense, but this was trivial – one year all the scripts were lost at sea! An attempt was made to establish a PhD in the 1920's, but there were not enough good researchers willing to be supervisors so the degree was abandoned until 1947. So in the 1930's we went abroad to get a PhD. I chose London and made a bad start, losing confidence in the project and the supervisor. It was the shrewd and kind Professor William Brown FRS who helped me produce an acceptable thesis in the remaining eighteen months of my scholarship. Has this any bearing on broadleaf? A little because years later when I told Brown that I was beginning work on mycorrhizas he sighed and said, “More reputations have been lost than made in that field”. It was broadleaf that saw me right.

I was trying to find a better root for teaching anatomy when I sectioned broadleaf. It clearly hadn't a clue about classic root structure but I was fascinated by a fungus filling the cells of its wide cortex. For the first time I was confronted by *Rhizophagus* discovered some fifty years before, found in almost everything everywhere since and dismissed as a harmless symbiont. If it was more than this broadleaf would tell me. A critical experiment would stick as close to nature as possible, but I would have to steam the soil to run some non-mycorrhizal controls. The mycorrhizal plants would be best inoculated with their normal rhizosphere by growing them briefly in unsteamed soil. Then they

would be returned to the steamed Ross Creek soil in which they had been raised and a comparison run with seedlings that had been in this soil all the time. Broadleaf grows slowly in our hillside soils and the experiment ran for a year. Differences then were dramatic: plants with *Rhizophagus* were growing, those without it had stalled completely and as the inoculation period had been brief they included a few identical in history with the mycorrhizal plants. Arthur Campbell's Microanalytical Laboratory could quantify low levels of phosphorus and his analyses showed that a higher phosphorus content differentiated the M from NM plants. Mr J.L. Grigg and Invermay reported that the soil had only a quarter of the agricultural minimum of available phosphorus and it proved possible to match the growth of M and NM just by giving the NM plants phosphate.

Barbara Mosse at East Malling Research Station in Kent was actually the first to persuade the reputable journal, *Nature*, to publish a claim to have demonstrated a growth increase attributable to *Endogone* to which genus *Rhizophagus* was now assigned. She worked with apple, but failed to discover the significance of phosphorus uptake because there was no Arthur Campbell at East Malling. *Griselinia littoralis* being a "Who he?" it was after 1964, when Jim Gerdemann confirmed our results at Illinois using maize, that research on what by now was called VA mycorrhizas began to produce hundreds of papers per year, as it still does.

Broadleaf clearly was an extreme example of what today is called mycorrhizal dependency – MD. Maize and apple did not stop growing completely without mycorrhizas and ferns and liverworts grew as volunteers in our steamed soil, so a team of PhD students investigated the basis of mycorrhizal dependency (MD). Karen Cooper studied ferns, Conway Powell rushes and sedges, Jim Crush grasses, Ian Hall rata and kamahi, and Peter Johnson aspects of infection. We concluded that length and abundance of root hairs determined a plant's capacity for non-mycotrophic

uptake of phosphorus. It is pretty obvious why this should be. In a poor soil the phosphorus becomes immobile and to reach it the root system must closely pervade the soil. Only root hairs and fungal hyphae, both being extensions of single cells, do this economically. Even lengthening the hair-like rootlet of a heath involves extending some fifty cells.

We now accept that in mature soils phosphorus is the limiting nutrient and that its extraction is the primary function of mycorrhizas, the great majority being VA. The non-mycorrhizal families, rushes, sedges and crucifers being the most important, have copious root hairs. *Rhizophagus* has become a whole Order of fungi, the Glomales. Some species give more rapid growth response in their hosts than others and are available commercially as inoculum (irrelevant for cruciferous crops), but the resident VA fungi form as it were a powerful union that soon suppresses an alien. Inoculum at a low price could be profitable after crucifer crops or a long bare fallow have depleted the soil's inoculum.

Professor Philipson took a close look at the morphology and anatomy of *Griselinia* and decided it had little in common with the Cornaceae or with any other family but he rejected a Griselinaceae as a defeatist option and hoped more research would give it a place somewhere. Maybe it is time taxonomists paid attention to roots. Our flora is small enough to make a good starting point. There is a British ecological flora that does consistently describe root systems but never mentions their most significant feature – root hairs. A mistake to avoid!

*Griselinia littoralis* reached Britain in 1872. It must have travelled in a pot because each seed ripens in a small succulent fruit and is killed by drying. In the UK it is recommended only for mild districts. But provenance is important and I felt sure that seed from the top of Mt Cargill would provide my friends in Shetland with a hardy evergreen and that airmail would get it there alive. This has all come true.

## Range extensions of rare species

By Kelvin Lloyd

### *Epilobium purpuratum*

Earlier this year I discovered a single plant of the willowherb *Epilobium purpuratum* at Takahe Valley in the Murchison Mountains. The plant was growing on fine debris on a wet limestone ledge just below treeline, at about 1000 m elevation. Raven & Raven (1976) recorded *E. purpuratum* from only 5 sites: Barron Saddle (Mt Cook), Hector's Col (West Matukituki), Mt Earnslaw, Pisa Range and Rock & Pillar Range. They described it as "extremely local and rare", occurring on loose, fairly stable, fine-grained stony debris, from 1300-1850 m elevation. However a relatively large number of more recent collections in the OTA herbarium show it is locally common at several sites in the West Matukituki and the upper Dart valleys, and is also present in the Eyre and Livingstone Mountains. de Lange *et al.* (1999) list *E. purpuratum* as a "naturally uncommon, range restricted" species in their threatened plant lists. The Takahe Valley site extends its known southern range to the west. To my knowledge it is the first record of the species from a site below treeline, however the habitat is very similar to that described from other sites. *E. purpuratum* can be distinguished from other *Epilobium* species by its dark purple to black stems and dull green, very weakly toothed leaves that are bright purplish on the undersides. Interestingly, at Takahe Valley *E. purpuratum* grows at the same site as two other rare species, the snow tussock *Chionochoa spiralis* and the soon to be described *Hebe* "takahe".

### *Coprosma wallii*

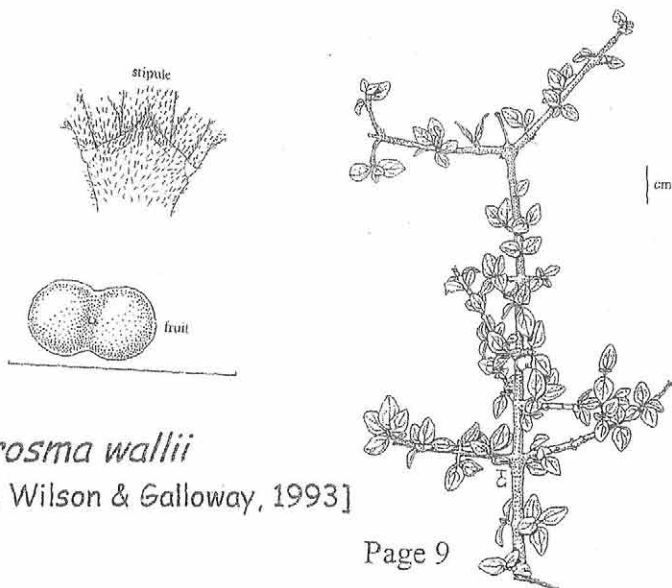
A small population of this species was recently discovered in the Fleming River valley at the Forest & Bird-owned Lenz Reserve in the Catlins. *C. wallii* has a reasonably wide distribution, being found locally in both the North and South Islands, but is listed as



*declining* in the most recent revision of the NZ threatened plant lists (de Lange *et al.* 1999). *C. wallii* is typically found on fertile river terraces, such as in the Lenz Reserve, but on Banks Peninsula favours open ridge crests on fertile volcanic soil (Wilson & Galloway, 1993). I am uncertain where the closest populations of *C. wallii* are to the Lenz site, as there are no local specimens of *C. wallii* in the OTA herbarium. However the species can be found on streambanks in the Dunsdale Scenic Reserve near Gore. *C. wallii* is characterised by almost spherical fruit (the fruit of most *Coprosma* species are markedly flattened on one side) and bright orange inner bark. The leaves are often densely-clustered, hiding the young stems.

### References:

- Raven, P.H. & Raven, T.E. (1976). The genus *Epilobium* (Onagraceae) in Australasia: a systematic and evolutionary study. *New Zealand Department of Scientific and Industrial Research Bulletin 216*, DSIR, Christchurch.
- de Lange, P.J.; Heenan, P.B.; Given, D.R.; Norton, D.A.; Ogle, C.C.; Johnson, P.J. & Cameron, E.K. (1999). Threatened and uncommon plants of New Zealand. *New Zealand Journal of Botany* 37: 603-628.
- Wilson, H.D & Galloway, T. (1993). *Small-leaved shrubs of New Zealand*. Manuka Press, Christchurch.



*Coprosma wallii*  
[from Wilson & Galloway, 1993]

# **The History of New Zealand's Tussock Grasslands: Evolution and Management: an abstract of his talk to be given on 11<sup>th</sup> of October.**

By Professor Alan Mark

Botany Department, University of Otago, Dunedin

Information is reviewed from the time grasses first appeared in New Zealand's fossil record, in the Eocene, to the present.

Grassland became widespread in the late Tertiary, as a result of the Kaikoura Orogeny and associated climatic deterioration, and was most extensive during the late Otiran Glacial. Contracting through the Holocene, it was restricted by 2500 yr BP largely to the alpine zone and the interior basins of the South Island.

Grassland expanded 2500-1500 yr ago through natural fires at 500-2000 yr intervals in the drier areas of the South Island and locally in the North Island, but then largely waned until fires lit by the first Polynesians increased fire frequency about ten-fold.

Grassland thus expanded rapidly in the South Island rainshadow region about 700 yr ago and periodic, perhaps accidental, fires maintained them until European settlement.

Initiated in the 1860's, pastoral farming began with an "eruptive phase" of heavy grazing by mammalian stock, a new phenomenon, plus frequent uncontrolled burning that adversely impacted on the grassland ecosystems. From an early concern for the pastoral practices of burning and grazing (Buchanan 1865), there have been frequent reiterations by scientists and others, up to the present, all to little avail in terms of condition and trend of the less responsive tussocklands. These concerns will be briefly outlined: 1910 (AH Cockayne; Commission on Canterbury Pastoral Runs Classification): 1912 (Petrie): 1919 (L Cockayne): 1920 (Commission to Report on the Southern Pastoral Runs): 1922 (Geo. Thomson): 1938 (Zotov): 1940 (Sheep-farming Industry Commission): 1945 (Gibbs & Raeside; Cumberland; Royal Commission to Inquire and Report on the Sheep-farming Industry in New Zealand): 1954 (Tussock Grasslands Research

Committee): 1956 (L Moore). The last two were largely instrumental in initiating a series of overdue autecological studies of the dominant species which clarified the important distinction between tolerances to the separate practices of burning (several positive effects revealed) and grazing (generally detrimental), plus the two combined (usually highly detrimental); (O'Connor & Powell 1963; Mark 1965a, b, c; 1968; Payton & Brasch 1978; Payton & Mark 1979; Payton *et al.* 1986). The degrading effects of pastoral management continued to receive attention from scientists and others: (Connor 1964, 1965; O'Connor 1981, 1982; O'Connor & Harris 1991; McKendry & O'Connor 1990; Basher *et al.* 1990; Treskonova 1991, Kerr 1992, Mark 1994, Floate *et al.* 1994, culminating with the "South Island High Country Review" commissioned by the Ministers of Conservation, Agriculture and Environment, which confirmed the generally deteriorated condition of the rangelands (Martin 1994).

Legislative responses also occurred: the 1941 Soil Conservation and Rivers Control Act established catchment boards which arranged subsidised assistance for lessees to implement run conservation plans; the 1948 amendment to the Land Act gives pastoral lessees greater security of tenure; the 1991 Resource Management Act promotion of sustainable management of natural and physical resources; the 1998 Crown Pastoral Lands act facilitates lessees freeholding "productive" land while allowing land with high conservation/recreation values to transfer to Crown ownership/management. It also allows some discretion by the Crown in relation to conservation values on pastoral land. The effectiveness of this legislation will be discussed, particularly in relation to the Consultative Draft Code of Practice for burning vegetation in Otago, recently released by the Otago Regional Council.

## Miro seed dispersal and NZ Pigeon

By Simon Johnson

Contact: %o Botany Department, University of Otago, P.O. Box 56, Dunedin,  
email [johsi416@student.otago.ac.nz](mailto:johsi416@student.otago.ac.nz)

Have you ever wondered about the importance of seed dispersal by the New Zealand pigeon (*Hemiphaga novaeseelandiae*) for the regeneration of large-fruited woody plant species such as miro (*Prumnopitys ferruginea*)? Does a decline in pigeons cause a decline in regeneration of miro? Is pigeon presence or absence related to seedling dispersal patterns? Finding the answer to these questions is the focus of my masters thesis supervised by Janice Lord.

Spatial patterns and distances of seed dispersal for indigenous New Zealand woody plant species have not been well quantified (Table 1). There is almost no literature quantifying descriptive statistical measures or non-randomness of distribution.

Birds may disperse large-fruited seeds in non-random patterns and over greater distances than seed dispersal by gravity, wind, rain or stream. This is considered important for effective regeneration for two reasons. First, bird dispersal is more likely to enable seedlings to escape high mortality under the parent tree. Secondly it is more likely to enable seedlings to disperse to favourable sites (Howe and Smallwood 1982).

As the New Zealand pigeon is the only bird with a gape size large enough to disperse the seed of some indigenous large-fruited plant species, the decline of the New Zealand pigeon may result in less effective regeneration of those species (Clout and Hay 1989).

Studies to date (Table 1) have not stated the hypothesis in the form of testable predictions. The studies have not collected enough data to test the components of the hypothesis.

Consequently there is no study that successfully demonstrates an adverse effect on forest and plant regeneration caused by absence of seed dispersal by the New Zealand pigeon.

Table 1. A summary of the existing literature on fruit size and dispersal in selected New Zealand tree species. <sup>1</sup>Clout & Hay 1989, <sup>2</sup>McEwen 1978, <sup>3</sup>Clout & Tilley 1992 (unpub. data)

Plant	Fruit diameter <sup>1</sup>	Pigeon dispersed Observed	Bellbird, tui, other dispersed Observed	Dispersal distance from source	Sample size n Mean x standard deviation <i>sd</i>
Karaka <i>Corynocarpus laevigatus</i>	>14 mm	Y <sup>2</sup>	N <sup>2</sup>	?	?
Puriri <i>Vitex lucens</i>	>14mm	Y <sup>2</sup>	N <sup>2</sup>	?	?
Tawa <i>Beilschmiedia tawa</i>	>10 mm	Y <sup>2</sup>	N <sup>2</sup>	?	?
Tawapou <i>Planchonella costata</i>	>10 mm	Y <sup>2</sup>	N <sup>2</sup>	?	?
Miro <i>Prumnopitys ferruginea</i>	>10 mm	Y <sup>3</sup>	N <sup>3</sup>	35%<10m 40%>10 &<30m	<i>n</i> = 1 pigeon seeds ? <i>n</i> = 1 tree
Maire <i>Syzygium maire</i>	>10 mm	Y <sup>1</sup>	N <sup>1</sup>	?	?
Kohekohe <i>Dysoxylum spectabile</i>	>10 mm	Y <sup>2</sup>	N <sup>2</sup>	?	?

My research question is therefore “Does the absence of New Zealand pigeon result in less effective seed dispersal, seedling recruitment and regeneration of miro?” I have selected miro because of its South Island range and because of the size of the fruit. Only the NZ pigeon can disperse miro seeds (Beveridge 1964; Clout and Hay 1989). In winter miro is a major part of the pigeon’s diet (McEwen 1978). However passage through a pigeon is not crucial to germination (Clout and Tilley 1992).

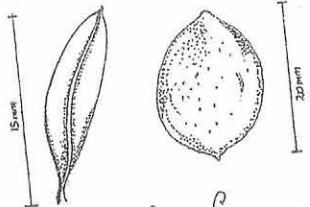
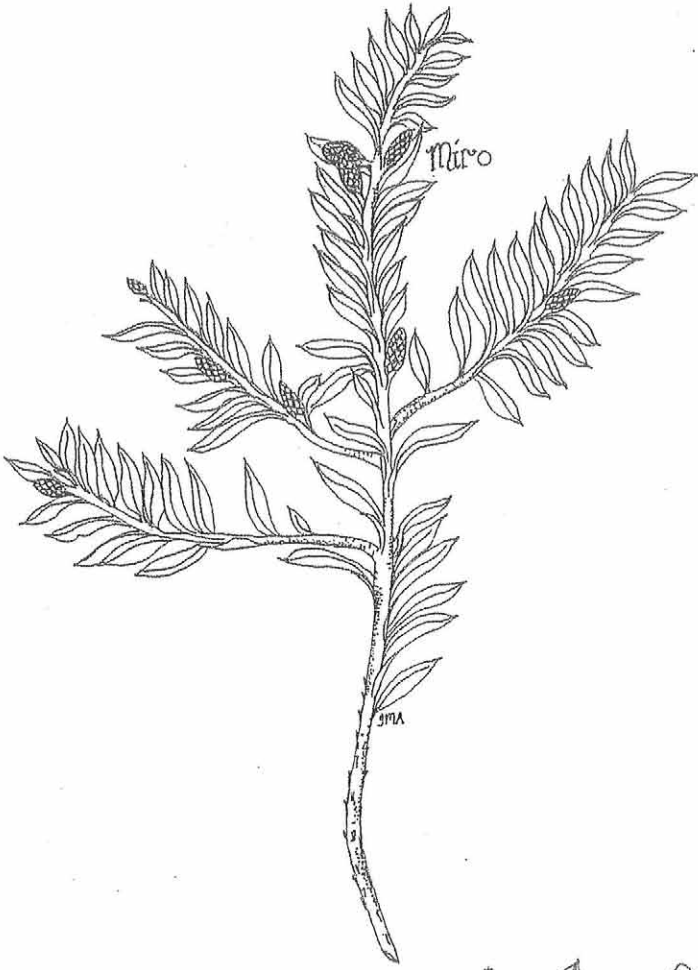
My approach to the question is to quantify spatial patterns indicating effectiveness of regeneration in sites with pigeons and sites without. The patterns are density and height of seedlings, distance from female adult miro, and canopy composition above seedlings. I will be looking at relationships with canopy species and I will be attempting to derive a cumulative distribution function for the dispersal pattern of seedlings.

I sample for these patterns along transects by looking for patches of miro seedlings in forest fragments. When I find a patch I record the number of seedlings and their height within a 5 by 5 m plot. I record the canopy species present above the plot and which species are dominant. I then measure the distance from the seedling plot to the nearest adult female-tree. That is the minimum distance that the seed must have been dispersed. The prediction is that average distance from seedlings to nearest female adult miro will be greater with pigeon dispersal than without.

My study sites are typically scenic reserves in the Catlins. These usually are lowland kamahi-broadleaf-podocarp forests with good numbers of pigeons. So far I have found one site with miro and without pigeons, in the upper Rakaia River.

### *References:*

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- Clout, M. N.; Hay, J. R. 1989. The importance of birds as browsers, pollinators and seed dispersers in New Zealand forests. In Rudge, M. R. (Editor). Moas, mammals and climate in the ecological history of New Zealand. *New Zealand Journal of Ecology* 12 (supplement) 27-33.
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- Howe, H. F.; Smallwood, J. 1982. Ecology of seed dispersal. *Annual Review of Ecology and Systematics* 13:201-228.
- McEwen, W. M. 1978. The food of the New Zealand pigeon (*Hemiphaga novaeseelandiae*). *New Zealand Journal of Ecology* 1: 99-108.



*Prunopitys ferruginea*

**Plant Profile: *Prumnopitys ferruginea* (D. Don) Laubenf.  
By Barbara Anderson**

Family: Podocarpaceae

Genus: *Prumnopitys* Philippi

Common Names: Miro, Brown pine

The timber is used for cabinet-work and the gum is said to have medicinal value (Mabberley 1997). According to *Te Rongoa Maori* (Williams 1996): “An infusion of the leaves and bark was used by bushmen as an antiseptic and insecticide. ... The gum from the bark was applied to wounds and ulcers, and an infusion of leaves and bark was taken to treat gonorrhoea and stomach aches.”

**References:**

- Mabberley, D. J. (1997). *The Plant-Book. A portable dictionary of the vascular plants.* (2<sup>nd</sup> Ed)  
Cambridge University Press, Cambridge  
Williams, P. M. E. (1996) *Te Rongoa Maori.* Reed Publishing, Auckland

**Trip report: Peggy's Hill Field Trip – Sunday July 16  
By John Barkla**

A keen band of 20 including several children braved wet and misty conditions on the afternoon trip to Peggy's Hill (Otago Peninsula). A 15 minute walk uphill through farmland led to the fenced perimeter of the 1.79 ha conservation covenant. The forest remnant is owned by Mr Jim Morris and has been fenced since about 1991. Fencing was carried out by the Highcliff Conservation Corps under the supervision of DOC and was funded in part by the conservation group Save the Otago Peninsula (STOP).

Armed with a species list prepared by Pat Enright of the Wellington Botanical Society, the party split into several small groups to explore the covenant. Some confined themselves to the margins while others headed for the higher interior.



The dense margins were dominated by *Pseudowintera colorata* and several species of *Coprosma*. Once through this the group found a low forest of Hall's totara, miro, fuchsia, broadleaf and three-finger. The abundance of ground ferns had many putting their 'Key to the Ferns of Dunedin' to good use. The seven filmy ferns (*Hymenophyllum* spp) on the list proved elusive though, with the paucity of large trunks no doubt restricting suitable habitat. Lichens were plentiful and over 30 species have subsequently been identified.

A special feature of the remnant is the presence of mountain holly (*Olearia ilicifolia*), *Raukaua simplex* and *Coprosma foetidissima*, all species that have disappeared from most other parts of the Peninsula.

Although once heavily browsed by goats the understorey is now in good condition with an abundance of palatable ferns and herbs. With the exception of Darwin's barberry there are few weeds of conservation concern. Darwin's barberry however is well established on the margins and numerous seedlings were noted within the forest. Control of this serious shrub weed is desirable while this is still a practical option.

The group reunited after a couple of hours botanising and slid back to the vehicles and hot drinks. Special thanks to Helen Clarke for leading the trip and to the landowner, Jim Morris, for granting access.

### **Vascular species list:**

Original list compiled by Pat Enright. Exotics are marked with an (\*).

#### **Trees and shrubs:**

*Aristotelia serrata* (makomako,  
wineberry)

\**Berberis darwinii* (Darwin's  
barberry)

*Carpodetus serratus*

(putaputaweta, marbleleaf)

*Coprosma* aff *parviflora*

*Coprosma crassifolia*

*Coprosma foetidissima*  
 (stinkwood)  
*Coprosma propinqua* subsp.  
 propinqua  
*Coprosma rigida*  
*Coprosma rotundifolia*  
*Dracophyllum longifolium* agg.  
*Fuchsia excorticata* (Fuchsia,  
 kotukutuku)  
*Gaultheria antipoda* (false beech)  
*Griselinia littoralis* (broadleaf)  
*Hebe salicifolia* (koromiko)  
*Melicope simplex*  
*Melicytus ramiflorus* (mahoe)  
*Myrsine australis* (red matipo)  
*Myrsine divaricata* (weeping  
 matipo)  
*Neomyrtus pedunculatus*  
*Olearia ilicifolia* (mountain holly)  
*Pittosporum eugenioides* (tarata,  
 lemonwood)  
*Pittosporum tenuifolium* (kohuhu)  
*Podocarpus hallii* (Halls totara)  
*Prumnopitys ferruginea* (miro)  
*Pseudopanax colensoi* (mountain  
 five finger)  
*Pseudopanax crassifolius*  
 (horoeaka, lancewood)  
*Pseudowintera colorata* (horopito)  
*Raukaua simplex*  
*Schefflera digitata* (pate)  
 \**Ulex europaeus* (gorse)

### Lianes, climbers, and parasites

*Clematis paniculata*  
 (puawhananga)  
*Neostylus micranthus* (mistletoe)  
*Metrosideros diffusa* (akatea)  
*Muehlenbeckia australis*  
 (pohuehue)  
*Parsonsia heterophylla* (akakiore)

*Rubus cissoides* (tataramoa, bush  
 lawyer)

### Ferns

*Asplenium bulbiferum* (manamana,  
 hen and chicken fern)  
*Asplenium flaccidum* (makawe,  
 hanging spleenwort)  
*Asplenium gracillimum*  
*Blechnum chambersii*  
*Blechnum discolor* (piupiu, crown  
 fern)  
*Blechnum fluviatile* (kiwakiwa)  
*Blechnum novae-zelandiae*  
 (kiokio)  
*Blechnum penna-marina*  
*Blechnum procerum*  
*Ctenopteris heterophylla* (comb  
 fern)  
*Cyathea smithii* (katote)  
 \**Dryopteris filix-mas* (male fern)  
*Grammitis billardierei*  
*Histiopteris incisa* (mata, water  
 fern)  
*Hymenophyllum bivalve*  
*Hymenophyllum demissum*  
*Hymenophyllum flabellatum*  
*Hymenophyllum multifidum*  
*Hymenophyllum pulcherrimum*  
*Hymenophyllum rarum*  
*Hymenophyllum sanguinolentum*  
 agg.  
*Hypolepis ambigua*  
*Hypolepis millefolium*  
*Hypolepis rufobarbata*  
*Microsorium pustulatus*  
 (kowaowao, hounds tongue  
 fern)  
*Polystichum richardii* (pikopiko)  
*Polystichum vestitum* (puniu)  
*Pteridium esculentum* (rauaruhe,  
 bracken)  
*Pyrrosia eleagnifolia* (ota,  
 leather-leaf fern)

*Rumohra adiantiformis*  
*Tmesipteris tannensis*  
*Trichomanes venosum*

### Monocotyledonous herbs

*Astelia fragrans* (karearea)  
\**Carex ovalis* (oval sedge)  
*Earina mucronata* (peka-a-waka)  
*Juncus gregiflorus*  
*Juncus novae-zelandiae*.  
*Pterostylis banksii* (tutukiwi,  
greenhood orchid)  
*Pterostylis graminea*  
*Uncinia rupestris*  
*Uncinia uncinata* (watu, hook  
grass)

### Dicotyledonous Herbs

*Acaena anserinifolia* (bidibidi)  
*Acaena juvenca*  
*Anaphaloides bellidioides*  
*Anaphaloides rupestris*  
*Cardamine* sp. (*C. debilis* agg.)  
\**Digitalis purpurea* (foxglove)  
*Epilobium atriplicifolium*  
*Helichrysum filicaule*  
*Hydrocotyle heteromeria*  
*Nertera depressa*  
*Nertera villosa*  
*Ranunculus multiscarpus*  
*Ranunculus reflexus* (maruru, hairy  
buttercup)  
*Schizeilema trifoliolatum*  
*Senecio biserratus*  
*Senecio minimus*  
*Stellaria decipiens*  
\**Stellaria graminea* (stitchwort)  
*Viola filicaulis*

## Lichen list from Botanical Society of Otago visit to Peggy's Hill DoC covenant, Otago Peninsula

By Allison Knight

In a brief 90 min visit on a cool damp winter afternoon two of us found over 30 lichens representing 26 different genera. Some, such as the pixie-cup *Cladonia*, the orange *Teloschistes*, beard-like *Usnea* and grey-green *Ramalina* are characteristic of high light habitats and were found on the margins of the forest remnant, or high in the canopy. Others, more characteristic of low light habitats, such as the nitrogen fixing *Collema*, *Psoroma* and *Parmeliella*, were found further in, under the low, dense and surprisingly dry canopy. In a depression by the spring near the centre of the covenant was a moister area, with a higher canopy shading fallen remains of the original mixed podocarp forest cover. Here, along with an increased density of filmy ferns,

mosses and liverworts, were several big foliose *Pseudocyphellaria* more typical of a larger forest. Overall, an encouraging nucleus for future regeneration was seen and a more thorough investigation would no doubt reveal many more species.

### **The lichen list:**

List compiled by Allison Knight with the help of Jennifer Bannister. Lichens collected with the permission of John Barkla and the help of Peter Bannister and Robyn Bridges. Specimens lodged in the OTA herbarium.

<i>Bacidia</i> sp	<i>Physcia</i> sp
<i>Cladonia</i> spp	<i>Pseudocyphellaria corbettii?</i>
<i>Collema</i> spp	<i>P. dissimilis</i>
<i>Everniastrum sorocheilum</i>	<i>P. glabra</i>
<i>Graphis librata</i>	<i>P. multifida</i>
<i>Hypogymnia subphysodes</i>	<i>P. rufovirescens</i>
<i>Megalaria grossa</i>	<i>Psoroma leprolomum</i>
<i>Megalospora gompholona</i>	<i>Psoroma microphyllizans</i>
<i>Melanelia glabratuloides</i>	<i>Punctelia subflava</i>
<i>Menegazzia subpertusa</i>	<i>Ramalina celastri</i>
<i>Parmeliella nigrocincta</i>	<i>Ramalina inflexa</i>
<i>Parmelina</i> sp	<i>Sticta martinii</i>
<i>Parmelinopsis</i> sp	<i>Teloschistes chrysophthalmus</i>
<i>Parmotrema chinensis</i>	<i>Thelotrema circumscriptum</i>
<i>Pertusaria</i> sp	<i>Thelotrema lepadinum</i>
<i>Phlyctis sordida</i>	<i>Thelotrema</i> sp.
<i>Phlyctis subuncinata</i>	<i>Usnea</i> spp.
<i>Physcia stellaris</i>	

### **Other cryptogams:**

List compiled by John Steel.

#### **Fungi:**

*Weraroa erythrocephala*  
*Xylaria castorea*

#### **Liverworts:**

*Frullania patula*  
*Hymenophyton flabellatum*  
*Plagiochila strombifolia*

#### **Mosses:**

*Camptochaete arbuscula*  
*Cyathophorum bulbosum*  
*Hypnum cupressiforme*  
*Neckera pennata*  
*Thuidium furfurosum*  
*Weymouthia mollis*

## Diary of upcoming events:

- 8<sup>th</sup> September, Friday: Zoology Department Seminar, Zoology Annexe Seminar Room, 3.30 pm. Representatives of the Rakiura Titi Islands Committee: *Co-management of bicultural research projects: the Titi project as a case study*
- 13<sup>th</sup> September, Wednesday: Botany Department Seminar. Botany School Lecture Room, 12 noon. Dr Nigel Perry (Crop & Food Research Unit, Chemistry Dept, University of Otago): *Extracts from New Zealand lichens*
- 15<sup>th</sup> September, Friday: Zoology Department Seminar, Zoology Annexe Seminar Room, 3.30 pm. Nisikawa Usio: *Direct and indirect effects of koura (crayfish) in stream communities*
- 17<sup>th</sup> September, Sunday: BSO Garden visit. With Professor Geoff Baylis. (see front cover for details)
- 19<sup>th</sup> September, Tuesday: Botany Department Seminar. Botany School Annexe seminar Room, 12 noon. BSc. Hons/Dip. Sci. students' presentations:  
12 noon Jessica Armstrong: *The role of the acf genes in flowering*  
12.25 pm Nina Hesom-Williams: *Evolutionary relationships of the lichen genus Ramalina*
- 20<sup>th</sup> September, Wednesday: Botany Department Seminar. Botany School Annexe Seminar Room, 12 noon. BSc. Hons/Dip. Sci. students presentations:  
12 noon David Horgan: *Phytoremediation - the use of willows to clean up toxic metals*  
12.25 pm Rebecca Lodge: *In the poo: the diet of the alpine weta*  
12.50 pm Kit Macgillivray: *In the peatlands of south-east South Island: a comparison of predictive models*  
1.15 pm Norman Mason: *Canopy structure and the light environment of a stable community*
- 21<sup>st</sup> September, Thursday: Botany Department Seminar. Botany School Annexe Seminar Room, 12 noon. Dip. Sci./Hons presentations:  
12 noon Maia Mistral: *Lost and found in space: volume occupancy in grass and shrub communities*  
12.25 pm Anne-Maree Oliver: *A preliminary study of Gymnopilus Karsten in New Zealand*
- 22<sup>nd</sup> September, Friday Zoology Annexe Seminar Room, Department of Zoology, 3.30 pm. Ian Jamieson (Department of Zoology,

- University of Otago): *Increased egg infertility in translocated island populations of takahe*
- 26<sup>th</sup> September, Tuesday. Botany Tennant Lecture Botany School Annexe Seminar Room 6pm. Dr Ross Beever (Landcare Research, Auckland): *Phytoplasmias, a new threat to New Zealand plants?* Light Refreshments will be served in the Dept of Botany Staff Room at 5.30 p.m.
- 27<sup>th</sup> September, Wednesday: Botany Department Seminar, Botany School Annexe Seminar Room. MSc research proposals:  
 12 noon Stephen Belsham: *Development in the Myrtaceae*  
 12.25 pm Matt Scott: *The ecology of soil arthropods in alpine patterned grounds*
- 28<sup>th</sup> September, Thursday Entomological Society of NZ Otago Branch talk. Hutton Theatre, 7.30pm. Dr Ian Jamieson (Dept. of Zoology, University of Otago); *Rock 'n' rolling with the alpine tree weta: does size really matter?*
- 29<sup>th</sup> September, Friday: Zoology Department Seminar, Zoology Annexe Seminar Room, 3.30 pm. Christine Hunter, (Department of Zoology, University of Otago): *Balancing complexity and simplicity in modelling harvest impacts on Titi*
- 4<sup>th</sup> October, Wednesday: Botany Department Seminar. Botany School Annexe Seminar Room, 12 noon. Emeritus Professor Alan Mark: *Vegetation patterns, plant distribution and life forms across the alpine zone in southern Tierra del Fuego, Argentina: some apparent anomalies*
- 11<sup>th</sup> October, Wednesday: Botany Department Seminar. Botany School Annexe Seminar Room, 12 noon. Julia Phillips: *Intertidal seaweeds: making the most of a limited nitrogen supply*
- 11<sup>th</sup> October, Wednesday: BSO Talk and supper. Zoology Seminar Room, 7.00pm. With Professor Alan Mark: *The History of New Zealand's Tussock Grasslands: Evolution and Management.*
- 18<sup>th</sup> October, Wednesday: Botany Department Seminar, Botany School Annexe Seminar Room. MSc research proposals:  
 12.00pm Alison Stringer: *Molecular identification of the edible ectomycorrhizal fungus Boletus edulis (Porcini)*

Zoology Department seminars contact Ronda Peacock ph: 479 7976

Entomological Society of NZ Otago Branch contact:

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Cheques to "Botanical Society of Otago".

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Submissions for the newsletter or

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For information on activities:

the trip leader

or Trish (contact above),

or Bastow,

or see our webpage: <http://www.botany.otago.ac.nz/bsa>

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