

Australian Plants

Registered by Australia Post
Publication No. PP226253/00017

September, 2007
Vol. 24, No. 192

\$3.95



Members of the Canberra Region have written and compiled this edition of Australian Plants. It was decided that the editorial would look at an issue - namely the Australian National Botanic Gardens (ANBG) in crisis.

Putting it in a nutshell, over the past two decades staff levels have been cut by 30%, the position of director downgraded from senior executive service to a managerial position, expansion plans shelved, capacity to do horticultural research lost, maintenance of the collection has deteriorated and matters have been finally brought to a head by the drought. The neglect of the ANBG has been because it is not a standalone entity like other national institutions but hidden away in Parks Australia, which is itself in the Environment portfolio. While spending on other national institutions was relatively lavish the ANBG was at a standstill, its budget frozen and the 'efficiency dividend' used to pare back recurrent resources.

The new government has cancelled the changes being planned for last year and there have been no further staff losses. Indeed it is somewhat like being in limbo, waiting with baited breath for the next instalment. An election promise last year was one and a half million dollars to allow infrastructure to be built so that water from the lake could be used for watering rather than the expensive potable water from ACT government. So far nothing has been heard of this. Another concern has been the threat of an increase in the efficiency dividend to be applied equally to all departments. If this happens ANBG will be back to where it was this time last year facing more cuts when what is needed is an injection of funds.

Canberra Region has placed material about this issue, that you can use to tell the politicians what you want the ANBG to be - a research and education oriented institution - not a glorified park, at: <http://asgap.org.au/anbg.html>.

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Front cover: *Themeda triandra* (Kangaroo grass). Photo: J Lindner, inset P Pike

Rear cover: *Calocephalus citreus* (Lemon Beauty Heads). Photo: J Lindner

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Vegetation Succession in the Brindabella Range

and the Canberra firestorm

Roger Farrow

On Saturday January 18 2003 my partner and I were having lunch with friends at my rural retreat about 40 km SW of Canberra City. All week a smoke plume had drifted across the ACT from fires that had been steadily burning in the Brindabella Ranges to the west of the Canberra. These had been ignited by lightning strikes during dry storms a week or so previously. It was a clear day and by early afternoon we could see that the smoke plumes had increased substantially. Quite suddenly the smoke plume spread, darkened and covered the afternoon sun and an eerie red glow appeared above the horizon. There was no wind at our place; the only sound was the whisper of charred eucalypt leaves and other debris falling on our roof and surrounds. By that stage we knew something was seriously wrong and we turned on the radio to hear the devastating news that several suburbs on the western edge of the City had been enveloped by a firestorm coming out of the ranges to the west.

The fire-front crossed the Murrumbidgee only 10 km from our place later that afternoon and was only prevented from crossing the Monaro Highway by a wind change from the east and the efforts of fire-fighters. Ninety percent of the forests and woodlands and all the pine plantations in the ACT to the west of Canberra were razed. Fires also occurred throughout the length of the Ranges to the south and burnt out most of the forests and woodlands of the Kosciusko Range. Only a small area in the south of the ACT at Mt Clear escaped the fire. This article reports on the recovery of the vegetation at some sites in the Brindabella Ranges in the following years and of what this shows us about vegetation succession in fire-climax vegetation.

The natural vegetation of the Brindabella Ranges, most of which is reserved in Namadji National Park, includes wet sclerophyll forest, dominated by *Eucalyptus dalrympleana*, *E. delegatensis* and *E. radiata* and an understorey of shrubs such as *Acacia* spp., *Bedfordia aborescens*, *Leptospermum* spp., *Olearia* spp. and *Tasmannia lanceolata*; among others; and drier forests dominated by *E. dives* and *E. rossi* with a grassy understorey. At higher altitudes these forests change to *E. pauciflora* woodland, with a low tussock grass/forb/heath understorey. Interspersed are frost-hollow swamps and bogs dominated by heaths such as *Epacris* spp., tussock grasses and *Sphagnum*.

In the first 6 months after the fire and during winter, the scene throughout the ranges and foothills of the Brindabella's was one of utter desolation with leafless trees, blackened trunks and a completely torched ground layer. West-facing slopes were the worst hit and were left bare of vegetation with the soil surface completely exposed. The boulder-strewn outcrops of the mountain summits suddenly came into view presenting whole new vistas of the ranges. Particularly badly hit was the Tidbinbilla Nature Reserve, which lost most of its facilities and its animals that were kept in enclosures.



Vegetation Succession in the Brindabella Range

All photos: R Farrow

Above: *Acacia obliquinervia* regeneration at Mt Ginini (p. 103)

Below Left: *Comesperma ericinum* at Ginini Flats (p. 103)

Below Right: *Eucalyptus delegatensis* regeneration in the Brindabellas (p. 102)

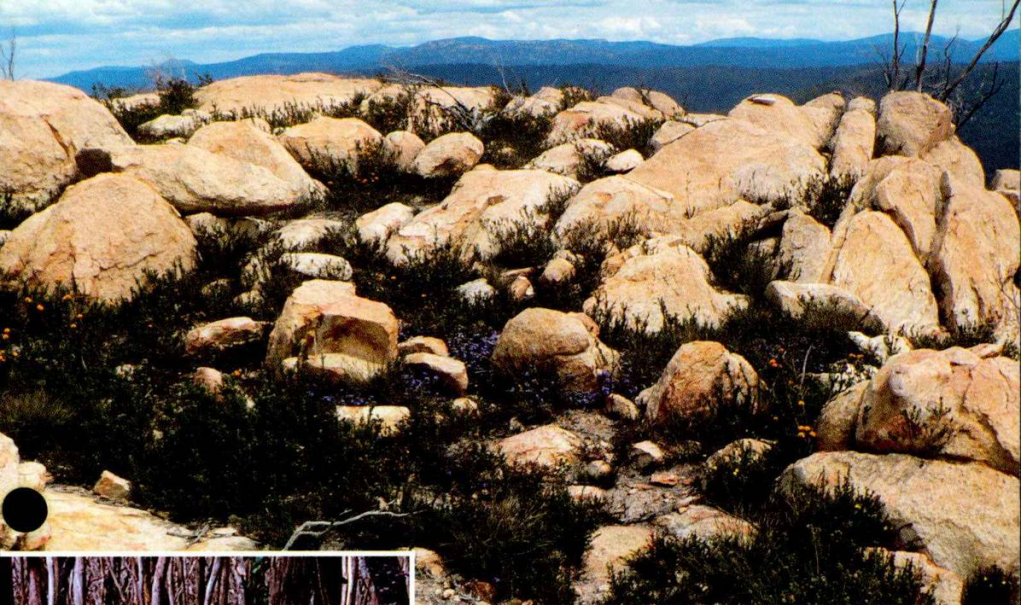
Opposite Top: Dampiera Rock Garden at Booroomba Rocks (p. 102)

Opposite Centre Left: *Stellaria pungens* in the Brindabellas (p. 102)

Opposite Centre Right: *Asterolasia trymalioides* at Booroomba Rocks (p. 103)

Opposite Bottom: *Dampiera fusca* at Booroomba Rocks (p. 103)





Some of the peat in the upland swamps continued to burn after the main fire had burnt itself out, as the swamps were very dry due to the continuing drought.

Spring 2003, 10 months after the firestorm hit, provided the first opportunity for Society members to visit the ranges along the road that follows the crest of the range from Piccadilly Circus to Mt Ginini. It was a remarkable site; vistas of blackened tree trunks with a silvery carpet of white flowers from massed flowering of *Stellaria pungens* (Stitchwort). Clearly, it was the year of the Stitchwort - it was everywhere. The landscape looked like a European woodland in spring with a carpet of wildflowers under a deciduous canopy of trees. At first glance all the eucalypts appeared to be lost but the first epicormic shoots were being produced along the branches and from the lignotubers but few shrubs showed any signs of regeneration. There were some gullies that the fire had skipped over or had just burnt the undergrowth and the trees were in reasonable shape. The snow gum woodland was a remarkable sight: apart from the dense cover of Stitchwort; there were massed flowerings of *Arthropodium*, *Bulbine*, *Brachyscome* and other Asteraceae and *Stylidium* under the skeletons of dead trees. The plants were taller and denser than we have ever observed and their flowers were larger. However, there was a total loss of the shrubby *Daviesia* spp. and *Grevillea* spp., among others and there were few tussock grasses visible at this time.

So what caused this remarkable resurgence of herbaceous plants just 10 months after the fire? It was not rainfall for there had been no significant rains since the fires. The most likely causes are boosted nutrition from the wood ash, more light reaching the ground, the lack of competition for soil moisture and the survival of seeds and underground bulbs of certain species. Why the seeds of Stitchwort survived and germinated so prolifically is unknown although it presupposes a pre-existing seed bank that was stimulated by the fire. We made several visits to this area over the summer as we were captivated by the flowering display and thought we were never likely to see such a phenomenon again in the Brindabella Range.

In the following summer of 2005/6 the ridgeline road was closed for over a year because of the supposed danger from falling limbs. However, I did travel along the Brindabella road into NSW where I was able to observe another aspect of regeneration. The *Eucalyptus delegatensis* (Alpine Ash) forms mono-specific, even-aged stands on the deeper soils of the ranges. It is a fire-susceptible species and like its relative the Mountain Ash, requires an intense fire to destroy senescing stands and create an ash bed into which a simultaneous seed drop can occur to start off the next generation of trees. There were concerns that the stands in the Brindabellas did not have sufficient seed to regenerate. True to form the stands of Alpine Ash were completely razed in the inferno with almost no epicormic reshooting. However by 2006, 2 years after the fire, we observed a carpet of Ash seedlings beneath the skeletons of trees. This showed that this Ash forest was regenerating although it will probably be a century at least before the trees reach their former size.

In late summer 2005 a party from the Canberra ANPS, known as the 'Wednesday Walkers', visited Booroomba rocks, an outlier from the Brindabella Range, which was opened up to visits again. Like the vegetation of the

Brindabellas there was complete destruction of the shrub layer near the summits: *Kunzea* spp, *Leptospermum* spp. and *Oxylobium ellipticum*, among other species, were just blackened branches with some plants completely dead, others sprouting from below ground and others germinating from seed. Most of the eucalypts were starting to resprout from the trunks although some were quite dead. However there was a dense carpet of *Trachymene humilis* between the boulders while the Stitchwort so obvious in the preceding summer had virtually disappeared.

The destruction of the formerly impenetrable shrubbery on Booroomba Rocks also enabled our party to explore various rocky summits to the south of the main peak (Fig 3). What we found was extraordinary for there among the granite boulders was a strange, blue-flowered shrubby plant that had never been seen before in the ACT. It turned out to be *Dampiera fusca*, recorded rarely in the Tinderry Range and a few places elsewhere. We followed the development of this population at Booroomba Rocks over the next two summers the last visit being in late October 2007. Each summer there appeared to be more recruitment in the bare ground left by the fire while the existing plants got bigger and there was indeed a blue haze over the ground. Over the same period *Boronia algida* and *Asterolasia trymalioides* populations also expanded among the *Dampiera* creating a veritable kaleidoscope of colour. All this in an area formerly covered by a dense shrub association of *Leptospermum* spp., *Kunzea* spp and *Oxylobium ellipticum*. The carpet of *Trachymene* seen in 2005 was as short-lived as the Stitchwort and not a single plant was to be seen by 2007.

When the Brindabella trail to Mt Ginini was reopened in 2007 and we paid a visit it was clear that regeneration was well on its way. Only occasional Stitchwort plants remained and the extensive clumps of forbs had been suppressed by tussock grasses, heaths and *Acacia* seedlings, mostly *A. dealbata* and *A. obliquinervia*, as well as Snow Gum suckers sprouting from lignotubers. Leguminous heaths such as *Daviesia* spp were regenerating well from seed. In the swamplands most of the heath shrubs such as *Epacris* spp were burnt to the ground and replaced by a resurgence of plants such as *Comesperma ericinum* not seen before the fire, and by tussock grasses.

Although the fires were very destructive they have presented us with a valuable opportunity to study succession and its importance in shaping the flora seen at any one instant. Following intense fires that destroy or burn-back mature shrubs and trees we observed a regeneration of small herbaceous plants and short-lived shrubs. Some of these species may not be observed at any other time in these plant associations. Such species thrive until out-competed by the regrowth of larger dominant shrubs. Some species such as the *Stellaria* seemed to have resurged from a seed-bank. Others such as the *Dampiera* may survive as a rare plant unobserved in the understorey and when the dominant shrubs are removed grow and multiply for a few seasons. However it is not clear why the *Stellaria* and *Trachymene* disappeared after only one season unless their seed went into dormancy. Another way of looking at fire-climax vegetation is that the inter-fire period is characterised by a succession of different species, many of which cannot persist in the environment without the occasional intervention of an intense fire.



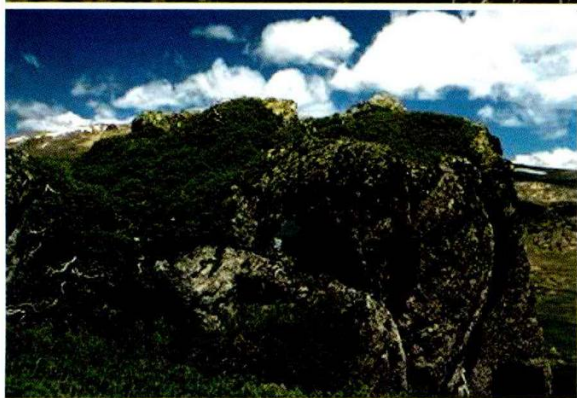
An Australian Habitat Garden

Photos: A Ford



Microseris lanceolata (p. 108).
The staple root vegetable of south-eastern Australia grows abundantly in Canberra and surrounding areas.

Photo: F Ingram



Podocarpus lawrencei
(Mountain Plum Pine) a slow growing alpine plant (p. 109).
The fruits were eaten by Aboriginal people.

Photo: F Ingram

An Australian Habitat Garden

Transforming a Garden in Suburban Canberra _____ Alan Ford

Imagine a front yard of Cotoneaster, Photinia and two large pine-trees. The ACT Government wanted to keep one of the pine-trees - can you believe it! Then, imagine it being taken out, it only takes a couple of days.

The Idea

The idea is to create an Australian habitat garden in the front, based on local plants from local seed. The only difficulty is a Mugga Ironbark in one corner. I have declared it exempt and it has been allowed to stay because it is a truly impressive beast. In the longer term it may have to go for safety reasons.

At the time the original vegetation became mulch the area was subject to mechanical intervention to remove root systems and raise the centre section of the yard and some rocks were placed at that point. A variety of local grasses and other herbaceous plants plus two shrubs were planted into what was intended to become a native grassland garden. Local native shrubs were placed along the front edge and on the other side of the driveway to provide screens and to enhance the range of habitats available. I have used only my own compost, commercial soil conditioner and/or commercial native potting mix around the plants. Otherwise, the area is basically that at the time the house was constructed.

The Problems

The front garden was initially planted in March to May 2003 and planting has been continuous since that time. Clearly, the process has been affected by the recent drought (mind you, if you asked the Kangaroo Grass it would respond - drought, what rot) and some plants have been lost during that time. Of course, you have to implement a weeding regime and stick with it as though it is a military operation.

I have come to the conclusion that some plants from Black Mountain do not survive very well on the plain. The same applies, unfortunately, to plants from the higher parts of Namadgi. It may well be that better soil preparation, water regime, protection and location may assist their survival rate.

Another factor is that the block slopes down from south-west to north-east. I haven't bothered about the drainage but it may affect plant growth patterns.

The Plants

Apart from these limitations plant selection does not present a problem. 'Burbidge and Gray' and the Paget CDs provide a huge variety and the local growers are most helpful. The front now has 5 grasses and the only difficulty is that the *Themeda triandra* (Kangaroo Grass) insists on trying to take over. (By the way, never plant *Themeda* under the drip line). *Poa sieberiana* (Poa Tussock) was chosen, as I am at mid-slope and thought that was more appropriate. There were a couple of the larger *Poa* that arrived, as escapees, with some of the material. I had forgotten that as I am just below Oakey Hill, there would be an effect. One of the two *Poas* is now trying to beat up a *Lomandra* (Mat-rush).

Ten daisy species have been planted and all have survived. The standard bearer is the *Chrysocephalum apiculatum* (Common Everlasting), which goes beserk. At the other end of the scale is the local version of *Leucochrysum albicans* (Hoary Sunray), which, as far as I can tell is really only bi-annual in most of the garden, although it appears to have a preference for certain conditions and in those it appears to be able to go on and on.

Arthropodium milleflorum (Vanilla Lily) and *Dichopogon fimbriatus* (Nodding Chocolate Lily) do equally well. You have to watch it with some of these things, they disappear for a large part of the year and you have to plan for that. Although they don't look nice, I have put white plastic tags next to where these have been planted so that, for the first two years, I have some time to get used to their placement in the landscape.

I need to digress to mention the shrub screen, which will help create diversity. There is *Acacia rubida* (Red-leaf Wattle), a number of *Cassinia quinquefaria*, which are truly impressive once they reach a metre or so and a few others, the local *Dodonaea viscosa* (Hop Bush) and *Grevillea lanigera* (Woolly Grevillea) scattered along the lines.

The Landscape

I am trying to create a messy looking landscape and you have to plan for that. You have to get used to the idea that it is not going to look neat and you can ensure that by scattering different types of plants, utilising grasses and daisies as a base, over the available space. You are going to get relatively small flowers in a variety of colours across that landscape and they will often go on where the surrounding exotic gardens are dead. This is a key because you are trying to create a diverse habitat that will attract a variety of native creatures. You have to look for these and the discoveries can make the hard work really worthwhile. After a while you discover just how subtle this garden is, you constantly find something small in flower that you have forgotten about.

What Happens

What happens in an Australian Habitat garden? If you put in a pond, (and I haven't) you could get frogs. However with my variety of plants I get a range of creatures and other things.

The other things are a slime mould and a number of fungi. (We have people in the ANBG that are experts in fungi and they are going to be asked to identify these, eventually.)

The creatures that you notice (apart from the birds) are the insects and related invertebrates. The butterflies are the most noticeable and their response to the new conditions meant 6 or 7 species in or around the garden. Then there are the little black ants, the various forms of insects and a load of spiders - at least I can identify the wolf spiders. The developing garden may have had an effect on the paper nest wasps as there were two operating early in 2007.

I think the evolving garden is gradually having an effect on the birds. The local Magpie family really enjoys itself and there is now a visiting Superb Fairy-wren family. The difficulty is the Common Myna presence and that may affect the situation.

Continued on page 129

Indigenous Food Plants

and Cultural Connections of the Australian Capital Territory and the Snowy Mountains _____ Frances Ingram*

White fellers look at the bush and say to themselves 'What a beautiful view... gosh, there's an interesting plant...'. Blackfellers will look at the same bit of bush and say to themselves 'I think I'll just go and get some lunch... gosh, here's a patch of tasty Murnong... Nice view, too'. Two totally different world-views, one based on intimate knowledge of the land and its capacity to support life, the other somewhat removed from the scene.

An appreciation of the variety of food plants that exist in any area of Australia helps to engender respect for the land and the Aboriginal people who live in it. It adds interest to one's appreciation of the native flora, including those plants growing in your own garden at home.

Important Note

This knowledge about plant use comes from the accumulated empirical knowledge of thousands of years of use by local Aboriginal people. It is their knowledge. I only reproduce it here in the hope that it increases respect for and appreciation of Australian Aboriginal tradition.

If I am aware of which mob the information comes from I will mention that in the text. I acknowledge the local Ngunawal people as traditional custodians of this knowledge in the Canberra region.

Aboriginal People of the High Country of Southern NSW and the ACT

The Aboriginal language groups, culture areas or tribes who inhabit the high country are: Ngarigo (Monaro tableland and plains), Bidawal (far south coast of NSW to the southern Monaro), Jjaitmathang and Djilamatang (western slopes of the Snowy Mountains), Walgalu (headwaters of the Murrumbidgee and Tumut Rivers to near Queanbeyan), Ngunawal (Limestone Plains area, from Queanbeyan to Yass, Tumut to Boorowa and Goulburn). These groupings are those according to the lists and maps drawn up by Norman Tindale, which are the more commonly used in Australia. However, regarding the actual group occupying the A.C.T., there is some debate. AW Howitt's maps have the Wolgal people occupying the larger area of the ACT and more recent research by A Jackson-Nakano would indicate that a group identified as the Ngambri have an ancient prerogative to the area around Canberra. It is true to say that Ngambri families never left this area and still reside in Canberra.

The Native Diet

The pre-contact native diet comprised 70% plant foods and 30% animal-based foods on average. This proportion would ensure good health, given that the plant foods available were generally available and varied.

* Frances Ingram was born and raised on the Southern Monaro. She has an Advanced Diploma of Herbal Medicine, and has been researching Bush foods and medicine for over 10 years. She is currently producing a manuscript that focuses on Aboriginal medical plant use in the arid and temperate zones of Australia. She has lectured and run workshops on Bush food and medicine in Adelaide and Canberra for both Aboriginal and non-Aboriginal groups.

Observations made by early contact Europeans indicate that Aboriginal people were very healthy, with few endemic diseases and a great capacity for enjoyment of life. So, the diet available was more than adequate to sustain life and health.

Root Vegetables

Root vegetables are a valuable source of carbohydrates (starch and sugars), vitamins and minerals. Some notable root vegetables occurring in the local region are:

Arthropodium spp. (Scented Lilies): *Arthropodium milleflorum* (Vanilla Lily), *Arthropodium fimbriatus* (Nodding Chocolate Lily). Tapering tubers available in late summer, for several seasons. Roasted before eating.

Microseris lanceolata (Murnong - originally from the Kulin languages of Victoria) - Yam Daisy. Mewan = yam (Ngarigo), *Microseris scapigera* (Alpine Murnong). Staple food throughout its range. Eaten raw or cooked. Placed in woven baskets and cooked overnight in earth ovens. Stored in mounds near winter quarters. Cultivated in parts of Victoria (e.g. the Murnong hillocks around Sunshine). Available most of the year but is less palatable in winter.

Orchids: 15 Orchid genera occur in the ACT: *Gastrodia*, *Prasophyllum*, *Dipodium*, *Microtis*, *Corybas*, *Eriochilus*, *Cyrtostylis*, *Caladenia*, *Glossodia*, *Spiranthes*, *Diuris*, *Chiloglottis*, *Calochilus*, *Thelymitra* and *Pterostylis*. Orchids are abundant inhabitants of the grasslands and forests of the area. It is debatable as to what proportion of the diet they would have occupied as the yield can be very small in some species, however *Gastrodia sesamoides* tubers were a staple in Tasmania. The bulbous rootstock is a good source of complex carbohydrate and other nutrients. The tubers were eaten either raw or cooked. Tubers available all year round.

Nectars

Reliable sources of sugars, vitamins and minerals. Some local genera include the local Banksias, Hakeas and Grevilleas. Pirruka = Banksia (Monaro). Potential nectar producing plants are widespread in this area. Grevillea species are particularly abundant.

Some local Banksia species are: *Banksia marginata* (Silver Banksia), *B. ericifolia* (Heath Banksia) and *B. spinulosa* (Hairpin Banksia).

Some local Hakeas are: *Hakea decurrens*, *H. lissosperma* (Needle Bush), *H. microcarpa* (Small-fruit Hakea) and *H. salicifolia* (Willow-leaved Hakea).

Local Grevillea species include: *Grevillea alpina* (Mountain Grevillea), *G. australis* (Alpine Grevillea), *G. rosmarinifolia* (Rosemary Grevillea) and *G. victoriae* (Royal Grevillea).

Other potential nectar plants are: *Bursaria spinosa* (Sweet Bursaria) and *Melichrus urceolatus* (Urn-heath).

Nectar production depends on several factors, including the amount of water available to the plant at flowering time. Nectar is gathered by soaking the flowers in a container of water (until the water is a dark colour, and well flavoured), then straining the liquid through a suitable sieve. In Central Australia, the liquid is strained through a mat of *Amphipogon caricinus*

(Greybeard grass). Some nectars also have tonic or medicinal uses (*Hakea divaricata* and *H. subarea*; Arrente, NT, Kukatja, WA), a factor which may have applied to local species.

Fruit

There are a number of interesting fruiting plants found in the area. Although the yield may be small in some species, the fruits are very tasty and high in concentrated nutrients, especially antioxidants, sugars and vitamins.

Billardiera scandens (Hairy Apple Berry): There are other local species of *Billardiera*, but this is probably the most rewarding Apple Berry to grow, as the fruit is reliably tasty and this species is less invasive than some others. Apple Berries will fruit in spring to summer. When ripe the berries are 1–3 cm. long, are a translucent brown colour and fall from the vine. They are edible at this stage. Berries eaten raw when they have fallen from the bush, or lightly roasted if they are still slightly green.

You can't mention native fruits without giving the nod to *Exocarpos cupressiformis* (Native Cherry). Mummadya (Monaro district). There is another local species, *E. nanus* (Alpine Ballart). Fleshy pedicels of fruits were eaten from the tree when it turns a dark red. A spring/summer snack food eaten while foraging. The wood was used to make woomeras (spear throwers) and bulroarers. The sap, bark and twigs used in traditional medicine (Jaara, Bendigo area, Vic., Bunganditj, south-eastern SA, Jaralde, S.A.).

Astroloma humifusum (Native Cranberry): Ripe fruit eaten raw. Sweet and fleshy.

Lissanthe strigosa (Peach Heath). The fruit is edible with a sweet honey flavour. Related to the Native Cranberry, *Lissanthe sapida*.

Persoonia spp. (Geebungs): *Persoonia chamaepeuce* (Dwarf Geebung), *P. rigida* (Rigid Geebung) and *P. subvelutina*. The fruit is eaten raw. Considered to be an important food. Geebungs fruit prolifically. The fruits ripen on the ground and are best eaten when yellow-brown and soft. The skin is discarded and the soft pulp around the seed is eaten.

Podocarpus lawrencei (Mountain Plum Pine) Flowers and fruits between summer and autumn. The edible, succulent red berry-like 'fruit' occurs on female plants. It is locally abundant but there is a small yield. Its temperate rainforest relative, *Podocarpus elatus* (Illawarra Plum) is in cultivation and may be found in 'Bush Food' products.

Rubus parvifolius, *R. triphyllus* (Native Raspberries). The fruits are eaten raw. They are quite large and juicy. The flavour is characteristically 'raspberry', sweet and acidic. Fruit quality is very variable within and between species.

Coprosma quadrifida (Prickly Currant Bush, Native Currant). Maranggang = Currant bush (Ngarigo): Fruit eaten raw. Fruits sweet and juicy with one or two seeds large enough to have to be spat out.

Sambucus gaudichaudiana (White Elderberry). Related to the European Elder (*Sambucus niger*), which is used for food and medicine. The white berries may be eaten raw.

Solanum linearifolium (Mountain Kangaroo Apple), *Solanum vescum* (Kangaroo Apple). The fruit of both species is eaten, only when fully ripe when the outer skin bursts. Fruit may be eaten raw or roasted. It must be thoroughly ripe because the unripe fruit is toxic (high solasodine content). May be used as a sweet fruit or as a vegetable. Best harvested once it has fallen from the plant, the fruit will then have lost its unpleasant acidity.

Seeds

Seeds are difficult to harvest. However, they contain sufficiently high levels of nutrients in proportion to the amount of effort expended in obtaining them, and are often found to constitute an important part of the native diet. Seeds are very good sources of both major and minor nutrients, especially essential fatty acids, which are otherwise lacking in the native diet. Due to little direct evidence, there is some debate as to whether Acacia seeds were widely used outside Central Australia.

Precautions: Acacia seeds contain protease inhibitors i.e. inhibit digestion of protein in the gut. Cooking deactivates these substances. Many Acacias contain toxic compounds. Do not eat Acacia seeds of unknown species. Always cook green or dried seed before eating.

Some local Acacia species, i.e. *Acacia implexa* (Hickory Wattle, Lightwood), *Acacia mearnsii* (Black Wattle), *Acacia melanoxylon* (Blackwood), have edible seeds and it is likely that they were exploited as food. Seeds were often harvested when green (e.g. *A. melanoxylon*). They may be 'popped' in a dry pan like popcorn. Gently roast until the green pulp inside is a pale cocoa colour. Grind and then use in cooking.

In Central Australia, the seeds are collected by gathering the seed laden branches and laying them in designated areas e.g. a stone circle on hard ground. The branches are left for some time and the seeds fall to the ground as they open. They are then collected, cleaned and either ground first and cooked, or cooked first and then ground into a paste.

Linum marginale (Native Flax, Wild Flax). Warruck, Brangara: 'flax plant' Tumut River, NSW - has very nutritious seeds. The small seeds were eaten and the stems were made into string.

Themeda triandra (Kangaroo Grass). Mallak: 'Kangaroo Grass' Monaro district. The seeds, gathered in wooden bowls (coolamons) were eaten by being ground to flour, mixed with water and baked into an unleavened cake. Highly nutritious seeds, containing up to 12.4% protein. If they were a significant food source, some efficient harvesting technique must have been used as the seeds, although abundant, only ripen simultaneously and fall in small amounts. There are records of Aboriginal people from the Canberra region trading with the Yass people for *Themeda* seeds. Stems and leaves also used to make fibre for fishing nets (Yelta, Murray River).

Green Vegetables, Herbs and Shoots

Green leafy vegetables and plant shoots provide essential nutrients in the diet. In Central and Northern Australia, where greens are still a part of the native diet, green vegetables are often cooked as a condiment or stuffing for other foods such as duck, emu or kangaroo. The foods are assembled,

enclosed in a suitable wrapping (such as Paperbark from *Melaleuca viridiflora* and spp. as used in northern Australia) and placed in an earth oven to slowly steam roast. Some greens are eaten fresh from the plant. Herbs are used for flavouring and also appreciated for their medicinal applications.

Some notable local vegetables in this category are:

- The local Brassicas (*Cardamine*, *Lepidium*, and *Rorippa* spp.) would have provided both nutrients and flavour to the diet. Brassicas tend to concentrate minerals and are also high in vitamins and contain very valuable antioxidants.
- The leaves and stems of *Cardamine* spp. are recorded as having been eaten. They are available all year round. It is also possible that *Lepidium* and *Rorippa* spp. were also eaten. These last two genera contain some important exotic members such as *Lepidium meyenii* (Maca), *L. sativum* (Garden cress) and *Rorippa nasturtium-aquaticum* (Watercress), used in South American and European cooking. There are many members of the Brassica family endemic in the area, including: *Cardamine astoniae* (Spreading Bitter-cress), *C. microthrix* (Eastern Bitter-cress), the endangered *Lepidium ginninderrense* (Ginninderra Pepper-cress), *Rorippa dictyosperma* (Forest Bitter-cress) and *R. laciniata* (Perennial Marsh Cress).
- Native mints such as *Mentha australis* (River mint) and *M. diemenica* (Slender Mint) were used as flavourings for foods, especially fatty foods such as emu. They were also used extensively in traditional medicine. The uses are remarkably similar to non-Indigenous uses for *Mentha* spp.
- *Sonchus hydrophilus* (Native Sowthistle). The leaves and stems of young plants are eaten raw in spring as an important spring vegetable and tonic food (antiscorbutic and blood tonic). This was a very widespread practice, with recorded uses from South Australia, Victoria and N.S.W. Also used medicinally in Victoria and South Australia.
- The dried fruits of mature female *Tasmannia lanceolata* (Mountain Pepperbush) shrubs are grown commercially as a bush food delicacy. They are a substitute for pepper. This species and another, *Tasmannia xerophila* (Alpine Pepperbush), both occur locally.

References:

1. Young, M, 2005, *The Aboriginal People of the Monaro*. DEC. p. 23.
2. Ibid. p. 25.
3. Jackson-Nakano, Ann. *Ngambri Ancestral Names: For geographical places and features in the Australian Capital Territory and surrounds*.

Recommended Reading:

1. Burbidge, N & Gray, M, *Flora of the Australian Capital Territory*. ANU Press.
2. Cribb, AB & JW, 1974, *Wild Food in Australia*. Collins.
3. Cribb, AB & JW, 1981, *Wild Medicine in Australia*. Collins.
4. Flood, J, 1980, *The Moth Hunters*. Australian Institute of Aboriginal Studies.
5. Flood, J, 1996, *Moth Hunters of the Australian Capital Territory: Aboriginal Life in the Canberra Region*.
6. Hardwick, RJ, 2001, *Nature's Larder: A Field Guide to the Native Food Plants of the NSW South Coast*. Homosapien Books.

Continued on page 119

Our Garden 51:

10 Wickham Crescent, Red Hill, ACT

Rosalind and Benjamin Walcott

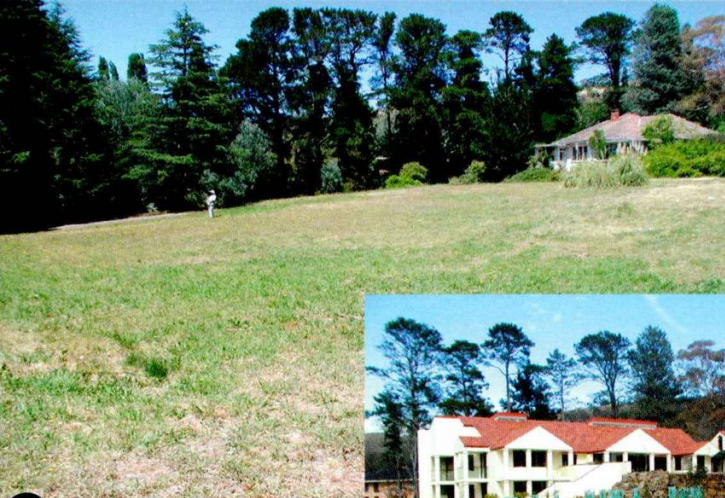
Our garden is located quite close to Parliament House in the centre of Canberra. The site was first developed in 1926, when a small house was built on the 9300 square metre block, which slopes 9 metres from top to bottom. *Pinus radiata* were planted around the perimeter of the block in the early 1930's and other conifers, such as *Cupressus lusitanica* (Portuguese Cypress), were planted at the front of the property. When we purchased the house and land in 2001 we removed a bedraggled hedge of cotoneaster along Wickham Crescent and replaced it with *Callistemon salignus* (Willow Bottlebrush), which grows to 9 metres tall and will eventually provide complete privacy from the street as well as food for nectar eating birds.

The trees on the block had received no maintenance for decades and needed attention. With advice from Dr. Robert Boden, former Director of the Australian National Botanic Gardens, a number of decrepit trees were removed from the block. We trimmed up the 70-year old pines both for safety and to allow us to grow new plants under the shade and frost protection provided by the branches.

We decided to make a predominantly Australian native garden to suit the soil and climate, and to attract wildlife, especially birds. The garden would also provide a sharp contrast to the American garden we developed over thirty years on Long Island, near New York City. The garden there was on acid sand, with ample rainfall (1,200 mm or 48 inches), very cold winters with lots of ice and snow, and hot, humid summers. We were located on a salt marsh connected to Long Island Sound and so had to cope with salt spray and high winds. This Canberra garden is quite protected from wind by Red Hill, has pH neutral clay soil, and only half the annual rainfall (625 mm) that we were accustomed to on Long Island.

Over a period of two years, while still resident in the US, we negotiated by e-mail and phone between New York and Canberra to develop a set of garden principles for Helen Cohen, our landscape architect, to apply to the property. The garden would contain almost all-Australian native plants. We were prepared to make some exceptions where we needed deciduous trees. There would be little lawn, just enough for the whippets to use. Where we needed open space we planned a meadow of native grasses, forbs and lilies. The garden would be attractive to birds and other wildlife, and we would attempt to retain all rainwater for use in the garden in a series of ponds. The garden design would emphasise naturalistic rather than formal shapes.

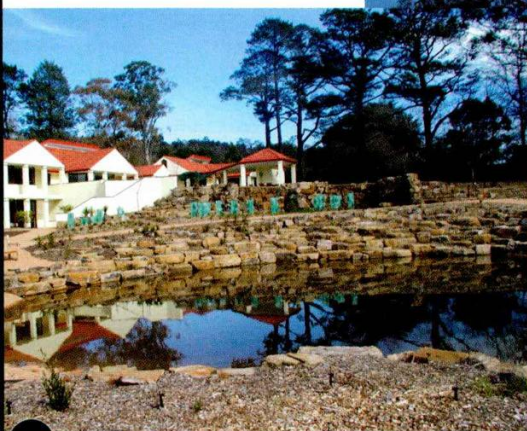
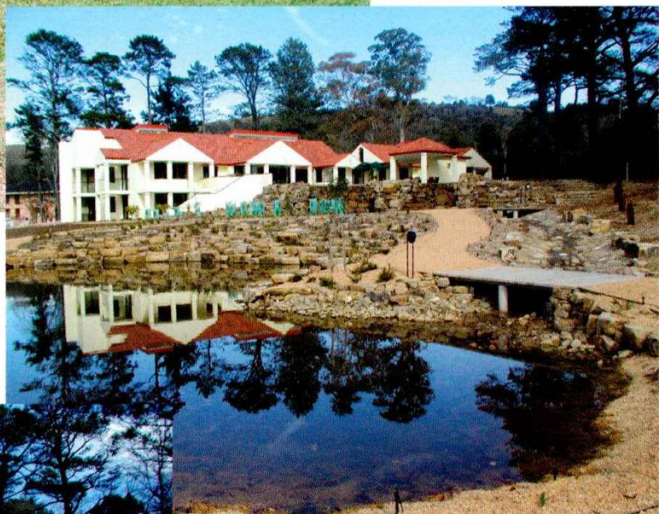
All areas of the garden, except the meadow, received extensive soil improvements, including addition of open soils and generous applications of Dynamic Lifter to help cope with the clay soils. All beds were mulched with wood chips just after planting and we have continued to add 'forest litter' at



**10 Wickham Crescent
Red Hill, ACT**
All photos: R & B Walcott

Above: The original land and house in 2001 - a bare canvass to work with

Right & below: Planting undertaken in 2003



Above: 2006



the rate of 10 truckloads (15 cubic metres per truckload) each year. Another unexpected soil improvement is the addition of about 15 Straw Necked Ibis for 4 months per year who aerate the soil to a depth of 20 cm and remove most Scarab beetle grubs.

The original planting was completed over six months from July to December 2003 during one of the driest periods ever recorded in Canberra's history. The planting list included about 5,000 plants, many of them bird-attracting, but only half of them were available at this time. Planting has continued at a reduced rate over the four years since, and we now have over 4,000 plants representing 500–600 different species and cultivars.

The planting of the 1100 square metre meadow was completed in three days in November 2003. Over 20,000 seedlings of grasses, lilies and forbs were planted by a team of three meadow planters. The soil was not amended in this part of the garden, as ripping the ground would have encouraged more weeds. The planters used a drill to make a hole, squirted in a gel containing water and nutrients, then planted the seedling in an amazingly quick time.

We use drip irrigation where practical, a microjet irrigation system for the plant areas and large jets for the meadow. All rainwater from the roofs and extensive paving areas is collected into the three pond system. The irrigation system drains water from the largest pond (500 square metres), which is topped up when necessary by a bore. Pumps run several hours every day to aerate the water, circulate the water through the series of ponds, and mix rainwater with bore water. We have fish, turtles and many birds using the ponds, including herons, egrets, cormorants, ducks and kookaburras. We have attracted over sixty species of birds so far to the property and hope to add to our bird list as the garden matures.

We have learned a lot about our climate, plants and soil in the four years that we have lived here. We have lost very few plants to cold and frost. Over twice as many plants have succumbed during the hot months of January and February than in all other months combined, not from lack of water, but from excess heat. We are addressing this problem by planting more trees, (we have over fifty species already), to create the protected microclimates that we need for our plants to thrive. Our garden contains a wide variety of plants which prosper in different parts of the garden. We have considerable success with over fifty species of eremophilas and acacias in the drier parts of the garden, together with over eighty species of callistemon, melaleuca and leptospermum in the wetter parts of the garden. Locally developed plants, such as Peter Ollerenshaw's 'Bywong Selections', have performed particularly well. Leptospermums 'Aphrodite', 'Mesmer Eyes', 'Pageant', 'Merinda', 'Outrageous' and 'Rudolph' are mainstays of the garden. Some Western Australian plants have grown well for us, *Anigozanthos flavidus* and several species each of *Adenanthos*, *Banksia*, *Callistemon*, *Chamelaucium*, *Hakea*, *Kunzea* and *Melaleuca*, while others have disliked our less than perfectly drained conditions and died.

We show our garden as part of Australia's Open Garden Scheme and welcome all interested readers to see our garden for themselves in Spring 2008.

Farrer Ridge Nature Reserve

Julie Lindner

Canberra, before settlement, comprised vast tracts of lightly wooded grassland, bordered by eucalypt woodland/forests. As Canberra grew, whether for pastoral activities or housing, it expanded outwards towards the surrounding hills and enveloped most of the grasslands and the gentle slopes of grassy woodland containing *Eucalyptus pauciflora* and *E. stellulata* (Snow Gums) but stopped at the base of the woodland/dry forests.

The most common species of trees found today in these remaining woodlands are *E. melliodora* (Yellow Box), *E. blakelyi* (Blakely's Red Gum), *E. bridgesiana* (Apple Box), *E. dives* (Broad-leaved Peppermint), *E. polyanthemos* (Red Box), *E. rossii* (Scribbly Gum), *E. mannifera* (Brittle Gum), *E. nortonii* (Mealy Bundy) and *E. macrorhyncha* (Red Stringybark). Fortunately, many of these areas have now been designated as nature reserves and they are interspersed in and around many Canberra suburbs quite often forming a type of bushland corridor.

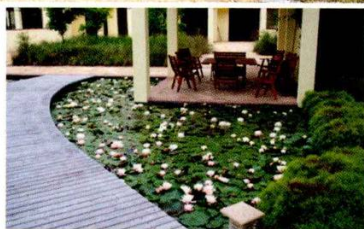
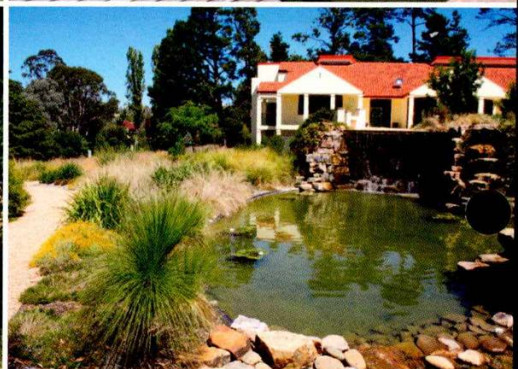
Farrer Ridge is one such reserve. It is located in the southern part of Canberra at an elevation of 600–700 metres. It is 7.5 kilometres in circumference and is surrounded by suburbs and a dual carriageway. It is classed as secondary grassy woodland because of lost diversity due to clearing of some trees and introduction of exotic grasses for pasture use. Sheep grazed until the mid 1980s, so it is hard to ascertain the true characteristics of the lower parts that are now lightly wooded with many small rocky outcrops, and has a variety of small shrubs, exotic grasses, native grasses and forbs. The grassy woodland gradually changes to dry forest as the slopes become rocky and steeper in all, providing a diverse range of flora to discover.

Surveys over a number of years by the Australian Native Plants Society's Wednesday walking group and Friends of Farrer Ridge have identified 48 different plant families comprising 170 native species.

There remain excellent examples of old growth trees although over 95 percent of the Farrer Reserve that was severely burnt in the January 2003 bushfire. Yellow Box, Red Box, Scribbly Gum, Mealy Bundy and Broad-leaved Peppermint are the dominant species with some Blakely's Red Gum, Apple Box, *Exocarpus cupressiformis* (Cherry Ballart), *Brachychiton populneus* (Kurrajong) and several types of acacias scattered amongst them.

Of the seventeen native grasses identified in the Farrer Reserve, *Austrostipa scabra* (Corkscrew), *Joycea pallida* (Redanther Wallaby Grass), *Themeda triandra* (Kangaroo Grass), and several *Austrodanthonia* species (Wallaby Grasses) are the most dominant. Several different *Lomandra* species are widespread throughout providing green and blue colour contrasts amongst the grasses.

There is a wonderful array of flowering understorey shrubs that transform the Reserve in spring and summer, unfortunately too numerous to include.



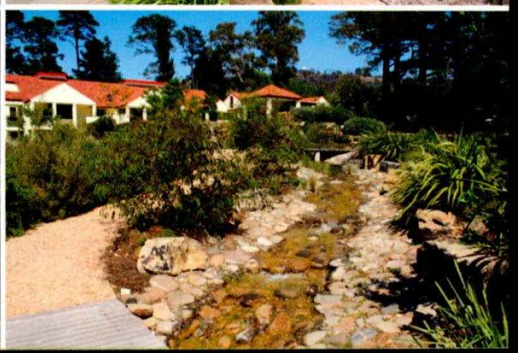
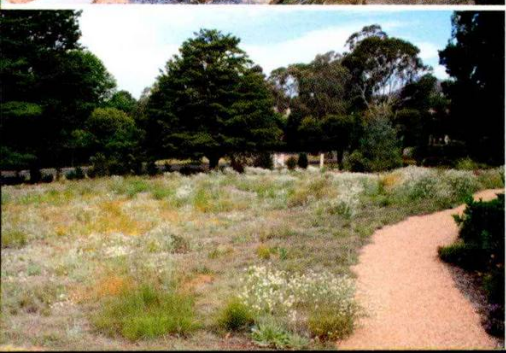
10 Wickham Crescent, Red Hill, ACT

Top Left: 2005

Top Right & Above: 2006

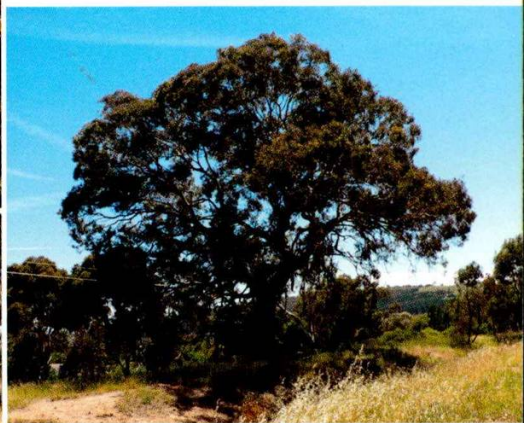
Left and Below: 2007

All photos: R & B Walcott





Farrer Ridge Nature Reserve (p. 115)
Left: *Eucalyptus rossii* (Scribbly Gum)
Below: *Eucalyptus melliodora* (Yellow Box)
Centre Left: *Joycea pallida* landscape



Below: *Austrodanthonia* spp. (with
Wahlenbergia and *Chrysocephalum*
apiculatum) All photos: J Lindner



Featured here are *Kunzea parvifolia*, *Bursaria spinosa* ssp *lasiophylla* (Blackthorn), *Indigofera australis* and *Hardenbergia violacea*, the latter two mentioned because of colour variations in the flower.

Blackthorn is widely spread throughout the park and prefers to hug the outer and inner perimeters of the woodlands. Insects and butterflies are strongly attracted to the strong perfume and sweet nectar of the flowers in early summer, followed later by King Parrots who love to dine on the seeds.

Kunzea parvifolia is less common and found mainly in lower woodland drainage areas. Growing in dense thickets, its slim attractive dark grey-brown foliage and beautiful pink flowers in mid-spring contrast gently with the backdrop of eucalypts. Interestingly, although classed as a woody weed in NSW, it has taken three years to regenerate and reappear after being severely burnt in the 2003 fire.

Indigofera australis with handsome slim brown stalks and sparse blue green leaves is wide spread throughout the park. It remains virtually unnoticed until early spring when its delicate pink pea flowers suddenly make an appearance.

Hardenbergia violacea is found in abundance throughout the park. It heralds the coming of spring with its dainty mauve, magenta, pink or white pea flowers rambling everywhere.

There is a network of walking trails within the Reserve. The small south facing forest is the most beautiful and has a lovely selection of delicate shrubs. Even in the driest of years, masses of flowering *Pimelea linifolia*, *Hardenbergia violacea*, *Indigofera australis*, *Stypantra glauca*, *Hibbertia obtusifolia*, *Daviesia mimosoides*, *Gompholobium huegelii*, and *Dillwynia sericea* make a delightful display in an otherwise stark surrounding. A wet spring brings the addition of a variety of terrestrial orchids and lilies.

The diversity of forbs, lilies and orchids scattered around the Reserve is evidence of their resilience to agricultural practice given time to recover. For many months of the year several species of the Asteraceae, Campanulaceae, Epacridaceae and Fabaceae families are flowering in the open grassy areas.

Less widespread species featured are a white *Eryngium rostratum* (Blue Devil). Flowering in December, it is usually a metallic blue colour and scattered through the grassy areas. *Utricularia dichotoma* (Fairy Aprons) only appears in drainage areas where dampness persists for a prolonged period. *Wurmbea dioica* (Early Nancy) appears in early spring, and it is hard to avoid underfoot if early spring rains occur. Conditions have to be perfect for *Thelymitra nuda* (Slender Sun Orchid) to flower, but it is well worth the wait when it finally decides the time is right. *Arachnorchis tentaculata* (Spider Orchid) is dependent on early spring rains, if dry, the numbers reduce from hundreds to less than a handful. *Stegostyla congesta* (Black tongue) is rare but a regular visitor each October. Although, technically not located in the Farrer Reserve it is less than a stone's throw away. *Dichopogon fimbriatus* (Chocolate Lily), aptly named for its chocolate perfume, flourishes in ideal summer conditions thus numbers vary markedly from year to year. There are no problems with *Calocephalus citreus* (Lemon Beauty Heads) although only

found on the west facing slope in a small area, whether wet or dry, it flowers every December without fail. *Thysanotus tuberosus* (Fringe Lily) pops up unexpectedly around the edges of the wooded areas usually in November/December among tufts of *Joycea*. Each bud flowers for one day only. *Caesia calliantha* (Blue Grass Lily) with tufted grass-like foliage is almost impossible to find even when flowering as it only becomes visible after midday when masses of blue purple flowers open out. It flowers for extended periods starting late November through to January choosing to be in damp sites. *Swainsona recta* is a threatened species only known to be in a small number of sites in the ACT and adjacent NSW. Each October two or three delicate multiple stemmed purple pea flowers appear. In the late afternoon sun the petals change from purple to a magenta colour. Two other species of this family, *Swainsona sericea* and *S. behriana* are also found in the Reserve. Although not endangered in the ACT they are also fairly uncommon. *Tricoryne elatior* is wide spread in the grassy areas. It has wiry foliage with multiple bright yellow flowers that each day open only for the duration of the sun. A similar plant to the Blue Grass Lily, they flower for most of the summer.

Farrer Ridge Reserve is a reminder of the dramatic change to the natural landscape due to the development of Canberra. Apart from *Hardenbergia violacea* virtually none of these beautiful local plants are to be seen in the inner parks and gardens of Canberra. It highlights the importance of the role the Australian Native Plants Society plays in promoting, propagating and providing native plants to the community. It is pleasing to see the interest and enthusiasm of people attending the ANPS biannual native plant sales in Canberra.

Names of flowers and trees sourced from:

1. Wood, D & Wood, B, 2005, *Flowers of the ACT & region: a field guide*.
2. Eddy D, Mallinson D, Rehwinkel R & Sharp S, 1998, *Grassland Flora - a field guide for the Southern Tablelands (NSW and ACT)*.
3. Jones, D & Jones, B, 2000, *Native Orchids of Southern Australia*.

Indigenous Food Plants

Continued from page 111

Recommended Reading Continued:

7. Latz, P, 1995, *Bushfires and Bushucker: Aboriginal Plant Use in Central Australia*. IAD Press.
8. Young, M, 2005, *The Aboriginal People of the Monaro*. Department of Environment and Conservation.
9. Zola, N & Gott, B, 1992, *Koorie Plants, Koorie People: Traditional Aboriginal Food, Fibre and Healing Plants of Victoria*. Koorie Heritage Trust. (Anything by Beth Gott is worth reading, actually).
10. The Australian National Botanic Gardens website has a number of useful resources concerning Aboriginal plant use, including bibliographies and databases. The AIATSIS library also holds a range of valuable resources regarding Aboriginal plant use.
11. Jackson-Nakano, A, 2005, *Ngambri Ancestral Names: For geographical places and features in the Australian Capital Territory and surrounds*. Ann Jackson-Nakano, Canberra.



Left: Top to Bottom

All photos: J Lindner

Caesia calliantha (Blue Grass Lily)

Dichopogon fimbriatus (Nodding Chocolate lily)

Thysanotus patersonii (Twining Fringed Lily)

Swainsona recta (Small Purple Pea)

Right: Top to Bottom

Stegostyla congesta (Black Tongue)

Thysanotus tuberosus (Fringed Lily)

Tricoryne elatior (Yellow Rush Lily)





Left: Top to Bottom

Stypandra glauca (Nodding Blue Lily)

Caladenia (Arachnorchis) tentaculata (Spider Orchid)

Eryngium rostratum (White blue devil)

Right: Top to Bottom

Glossodia major

Wurmbea dioica (Early Nancy)

Goodenia pinnatifida

All photos: J Lindner



Pomaderris – Multipurpose Plants

Jo Walker

Pomaderris is the largest genus in the Rhamnaceae family: at last count, there were 77 *Pomaderris* consisting of 65 species and their subspecies and varieties. There are 7 *Pomaderris* in Western Australia, 7 in South Australia, 7 in Queensland, 12 in Tasmania, and 12 in the ACT, but the majority of them occur in New South Wales and Victoria. There are 63 *Pomaderris* (including subspecies and varieties) in these two states, many of them occurring in both states.

Members of the Rhamnaceae Study Group have been growing *Pomaderris* for many years now, and, although some of the species would be most suitable as background or shelter-belt plants, others produce spectacular displays of flowers ranging in colour from deep golden yellow, through lemon and cream, to white. Many species have attractive new growth - rust-coloured, reddish or silver and others retain calyces that redden after flowering. Some *Pomaderris* bear copious quantities of seed capsules covered in coppery or silver hairs, which have a flower-like appearance when the sunlight shines through them. All of these factors mean that *Pomaderris* have a longer period of attractiveness than those plants that rely only on a brief flowering time.

Pomaderris habitats range from the coast to mountain areas and from river-banks to rocky ridges. All of the species the Study Group has grown have proven frost-hardy and drought-tolerant - although, like most plants, they grow to more pleasing proportions if regularly watered. Given their range of habitats, there should be at least one member of this genus suitable for most gardens.

For small gardens, one of the most attractive plants is *Pomaderris obcordata* (photo p. 128). This is a compact South Australian species with glossy dark green, heart-shaped leaves. Buds are pale to dark pink, followed by profuse clusters of white flowers and, on Kangaroo Island, seed capsules are often pink to blackish-red.

Another smallish plant is *Pomaderris aurea* (photo p. 129), a Victorian species. Its bright green, oval leaves contrast well with the large pyramidal panicles of bright golden-yellow flowers it bears and the later hairy seed capsules. This one seems to do best in dappled shade and moist, heavy soils.

Another low-growing plant is *Pomaderris pallida* from the NSW Southern Tablelands. Its flowers are pale cream and the leaves are small and densely covered in short pale hairs which gives them a greyish appearance. Although not as eye-catching as some of the other plants mentioned here, it makes a nice small contrast plant.

For larger gardens, some of the 2-3 metre plants would make a good display. One of the hardiest of these is *Pomaderris andromedifolia*, which occurs from south-eastern Queensland, along the Great Dividing Range, to Victoria. It has a neat, upright form, dark green ovate leaves, striking rusty

new growth and conspicuous brown-bracted buds. The flowers range from cream to golden-yellow and are followed by dense clusters of silver-haired capsules.

A slightly larger shrub, with a bushier habit, is *Pomaderris elliptica*, which carries its yellow flowers in conspicuous terminal panicles. A similar species is *Pomaderris discolor* (photo p. 125) with usually deeper yellow flowers and smaller panicles. Other similarly sized species worth growing are:

- *Pomaderris intermedia* (photo p. 128), an often rather spindly plant with dark green, glossy leaves and large flower panicles,
- *Pomaderris lanigera*, which has softer, hairy, bright green leaves and a good display of flowers, and
- *Pomaderris ferruginea* (photo p. 125), which gets its name from the rusty hairiness of the new growth and undersides of its leaves and has usually profuse creamy white flowers (although there is a form near Tarago in NSW with bright yellow flowers).

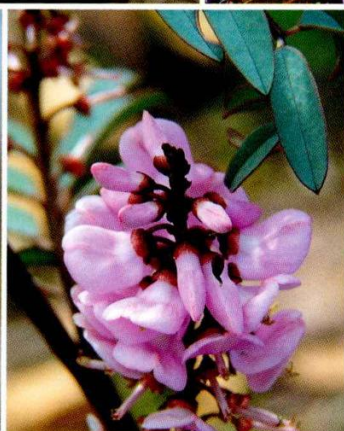
Two species with calyces that redden after flowering are *Pomaderris halmaturina* (photo p. 128) from Kangaroo Island and *Pomaderris paniculosa* ssp. *paralia* (photo p. 128), which occurs in Victoria, South Australia and Tasmania. After a heavy flowering, this reddish aftermath gives these shrubs an extended period of attractiveness.

Another *Pomaderris* that contrasts with the surrounding greener foliage is *Pomaderris cinerea*. This species grows in open forest on the coastal ranges of south-eastern NSW. Its flowers are pale cream in weeping panicles and the leaves are a beautiful bluish grey-green. It can eventually grow to the proportions of a small tree and would make a sizeable contrast plant for a large garden.

A species that would be suitable for shelter-belt planting on larger land areas is *Pomaderris eriocephala*, a dense bushy plant that can grow to 3 metres. Ovate, bright green leaves, densely rusty new growth, tan bracts covering the buds and silver hairs on the capsules are the main attractions. The cream flowers are borne in tight axillary clusters and are not as conspicuous as those of the more floriferous species.

Pomaderris angustifolia (photo p. 125) is another similarly large shrub. This is one of the smaller-leaved species with narrow linear leaves. It grows densely (and possibly suckers), and, although its flowers are small and pale, can be a spectacularly beautiful plant in a good year. Locally, they can flower so densely that they resemble cream clouds, and an added bonus is the delicate, sweet perfume given off by the flowers. The capsules are small and glabrous, and, when ripe are eaten by Crimson Rosellas. Not many Australian plants have been used as hedges, but this one would be an ideal plant for this purpose.

Pomaderris species are easy to grow from seed, collected just as the dry capsules dehisce and immersed in just-boiled water before sowing. *Pomaderris* withstand frosts, tolerate drought conditions and germinate thickly after bushfires. They are tough, but also very beautiful plants - an attractive addition to any garden.



Top: *Hardenbergia violacea* (left: pink form)
Above: *Indigofera australis* - middle: a variation in colour, right: white form
Right: *Kunzea parvifolia* (Violet Kunzea)
Below: *Bursaria lasiophylla* All photos: J Lindner





Pomaderris – Multipurpose Plants

Top Left: *Pomaderris aurea* (p. 122)

Top Right: *Pomaderris angustifolia* (p. 123)

Above: *Pomaderris aurea*

Left: *Pomaderris ferruginea* (p. 123)

Bottom Left: *Pomaderris discolor* (p. 123)

Bottom Right: *Pomaderris discolor* in bud

All photos: J Walker



Canberra's Weed Swap Initiative

Rosemary Blemings
Australian Native Plants Society Canberra Region Inc.

The first WEED SWAP activities were organised by ANPS Canberra Region in October 2001 and April 2002, developing from a scheme in nearby Queanbeyan called 'Pull-a-privet'. Both initiatives aimed to encourage residents to remove woody weeds from their gardens and receive, in exchange, free Australian native plants.

Among the target weeds for WEED SWAP in the ACT region are cotoneaster, privet, pyracantha (Firethorn) and broom. Often used for screen and hedge plants, cotoneaster, privet and pyracantha were, ironically, issued decades ago as free plants by 'the Government' to encourage new householders to green their bare suburban blocks as the garden city of Canberra developed into its bush hinterland. The invasive nature of these and other environmental weed species was less obvious 25-30 years ago. Many species of birds from Silvereyes to Currawongs, enjoy the weeds' berries and transport them into the bush, or into other gardens through their droppings.

The ACT's Weeds Officer, Geoff Butler, was instrumental in raising awareness of the threat weeds pose locally, regionally and nationally. His persistence, together with that of the ACT Weeds Working Group, has borne fruit as nurseries and plant retail outlets have ceased selling invasive species. Many have become accredited 'Bush-friendly nurseries'.

Capable of growing to tree proportions, cotoneaster and privet produce thousands of berries and are not easy plants to destroy once mature. Pyracantha, though smaller, has vicious thorns as a deterrent. In many cases they have been left to grow because of their vigour. Householders or non-gardeners have understandably left these plants growing, along with ivy, honeysuckle and periwinkle, because 'at least they're green and hardy'. During WEED SWAP activities we've found that periwinkle and ivy are the most-malignant and ubiquitous garden weeds.

Government agency staff and numerous Parkcare and urban Landcare volunteers have spent countless hours removing invasive weeds from the ACT's Nature Reserves and open spaces. The WEED SWAP initiative supports these efforts by educating the public and encouraging woody weed removal from residential gardens. It aims to reduce the annual crop of weed seedlings germinating in bushland since the seedlings grow rapidly, successfully competing with local native species and reducing biodiversity by their presence.

Initially a dedicated team of ANPS members pooled their ideas, discussed the concept with Environment ACT and ACT Parks and Conservation Service personnel and sought to base the actual exchange at two main Green Waste recycling sites near the Territory's tips. ANPS (then SGAP) applied for grants from the Natural Heritage Trust to buy young Australian native plants from member-growers and the Society's propagators.

The Society's WEED SWAP organisers still receive significant assistance from Departmental officers, even though there have been changes within the Department and Service over the years, since the grant money from the Australian Government's Natural Heritage Trust is administered through the ACT Government.

At least ten local organisations and Government agencies, including ANPS, produced a pamphlet *Are Your Garden Plants Going Bush?* This most valuable brochure is illustrated with colour photographs of garden and aquatic environmental weeds, together with a comprehensive text explaining the problems of invasive species, and lists horticultural and contact details.

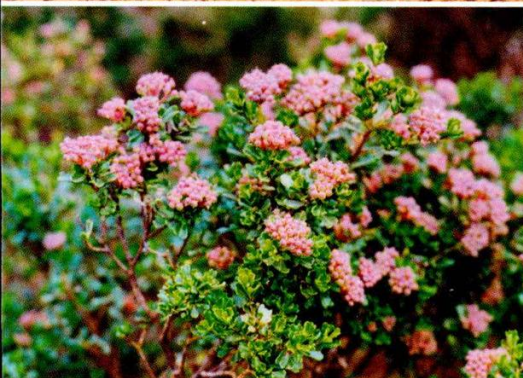
The WEED SWAP committee has a periodically reviewed list of Australian native species for the swap which satisfy the following criteria:

- they are not potentially invasive,
- they are hardy enough for the local growing conditions,
- they grow well in a range of garden situations,
- some have potential as screen plants, and
- they enhance the Bush Capital environment by being of value to wildlife, especially birds.

An A4 triple-folded brochure was produced explaining the WEED SWAP, describing the woody weed target species and listing some of the free replacement plants likely to be available. The two venues for the swap are detailed along with the Swap's weekend dates and times. The WEED SWAPs are usually held in late March and late October, a weekend or two after the Society's increasingly popular Autumn and Spring sales.

Canberra hosts the Floriade spring flower festival in September-October, which attracts thousands of local and interstate visitors. For many years it has included display gardens which feature the environmental weeds which are problems in the region. Suggested non-invasive alternative species are also on show. WEED SWAP brochures and *Are Your Garden Plants Going Bush?* brochures are handed out to visitors to these display gardens. Seeing the problem plants growing, and liaising with a team of volunteer explainers, has proved to be an effective way of informing the public about problems from inappropriate garden plantings.

An illustrated article in *The Chronicle*, a free home-delivered weekly newspaper has been the most successful advertising medium as it is published about a week before the six-monthly events. Given contact details participants can phone up for more information. This service has presented opportunities for explanations, follow-up contacts and PR about weeds and the Society. Support given by the local ABC Radio's Gardening Show has been successful in spreading the idea throughout the community. Environment ACT's email network, radio stations' community announcements and environmental groups' networks also make appreciated contributions towards informing the public. Over the years 'word-of-mouth' has been effective, with action against weeds triggered by hearing the forthcoming Swap dates.



Top Left: *Pomaderris obcordata* (p. 122)

Above Left: *Pomaderris obcordata* seed capsules

Below Left: *Pomaderris intermedia* (p. 123)

Top Right: *Pomaderris paniculosa* ssp. *paniculosa* leaves and buds

Above Right: *Pomaderris paniculosa* ssp. *paralia* (p. 123)

Below Right: *Pomaderris hamaturina* new growth (p. 123)

All photos: J Walker



On the WEED SWAP weekends members of the Society volunteer to be rostered at the Green Waste sites between 8:30am to 4pm each day, for sessions of about two hours. There they check garden waste donations, and if target invasive species are being discarded the donor is offered the chance to select free native plants before leaving. *Are Your Garden Plants Going Bush?* brochures are given out. Allocation or choice of free plants is based on the space that weed-removal has now created in the garden and on the number of species removed.

The plants are grown by members of the Society in forestry tubes. As with plant sales, smaller but well-established plants grow most successfully when planted correctly. Each plant is labelled with data from the Society's database and instructions on care and planting are given to each recipient.

WEED SWAP events are invaluable in spreading information about Australian native plants to people who might otherwise not realise the Australian species' potential. Copies of informative brochures developed by the Society are available. Especially popular are the lists of members' nurseries, those on 'low-water-gardening' and local plants of the ACT Region.

The WEED SWAP concept received recognition, together with The Bush Friendly Scheme and the Weedbuster Garden at Floriade, in the 2006 ACT Sustainable Cities Awards and some publicity through the local and National Landcare Awards in 2003.

Given the monumental problem environmental weeds pose, the WEED SWAPs are a modest but essential contribution in the fight against invasive plants, specifically those that were once fashionable and escaped from gardens. Responses from participating members of the public continue to be very positive and encouraging. Many more now enjoy Australian native plants in their gardens thanks to this initiative.

An Australian Habitat Garden Continued from page 106

It is probable that the bird response will not become significant until the shrubs in the front and the back are more developed and the back becomes more of a jungle.

In early January 2006 I finally found a lizard, probably a striped skink. I was quite surprised as I am a fair way into the suburb and I thought it too far for a small creature to come, particularly when it would have to find its way through a number of unfriendly back yards. In late 2007 I discovered a Common Bluetongue - a very special find.

There is a nature strip, which is now largely the local *Bothriochloa macra* (Red Grass). That is the subject of the next transformation. Then there is a back yard, a separate saga-and when I say saga, I **mean** it.

There are a huge number of people to thank, particularly from the ANPS Wednesday Walkers and the Grasses Group. Without their help, it wouldn't have happened.

Phytophthora cinnamomi in NSW

The recent history of *Phytophthora cinnamomi* in NSW and a case study of its impact near Eden

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The Department of Environment and Climate Change in NSW is about to release a Statement of Intent (Sol) for the Key Threatening Process '*Infection of Plants by Phytophthora cinnamomi*'. The Sol describes the nature of the threat, the key challenges and management initiatives that will aid in the abatement of this threat to biodiversity. In itself, the production of a document such as this is unremarkable - most States and the Commonwealth have plans for the management and control of this disease. What is remarkable about the Sol is that 10 years ago no one in NSW would have believed that such a document was necessary. This note describes the recent history of knowledge about *P. cinnamomi* in NSW and highlights the threat of this pathogen with a case study of its impact near Eden.

Phytophthora cinnamomi, which has commonly been called Cinnamon Fungus, is not a fungus at all but a type of water mould. *Phytophthora* species have been responsible for significant plant deaths world-wide and still cause problems in many important crops (e.g. avocados, tomatoes, soybeans, ginseng). The potato famine in Ireland in the mid-19th Century, attributable to *P. infestans*, caused major cultural upheaval. A recently identified species, *P. ramorum*, threatens many forests in the northern hemisphere and may one day reach our shores with unknown but potentially catastrophic consequences. *Phytophthora cinnamomi* is one of many species of *Phytophthora* in Australia but the one that has greatest impact on native plants. It affects plants by invading and damaging water-conducting tissue (mainly in roots and the plant collar), causing water stress and in some cases death. If *P. cinnamomi* were simply a lethal pathogen it might be less insidious. Unfortunately it may persist in the roots of species that are physically unaffected. Once introduced to a site it is therefore unlikely to leave in a hurry and species that are especially susceptible to infection stand little chance of re-colonising successfully.

Following the association of plant deaths with *P. cinnamomi* in Western Australian forests in the 1960s, there was a flurry of activity across the country to determine the extent of the impact. In NSW, there was considerable sampling for *P. cinnamomi* in coastal forests because it was feared that forest production would be affected. Curiously, the conclusions reached after the sampling differed with location. In southern States (WA, Victoria, SA and Tasmania), *P. cinnamomi* was recognised as an introduced pathogen with the capacity to cause great damage to native plants and, in some cases, forest production. In NSW and Queensland on the other hand, *P. cinnamomi* was regarded as a native pathogen that occasionally caused damage to native plants. As an easily spread micro-organism with little respect for State boundaries, it is not surprising that this thinking has now been questioned.

Recent genetic studies of Australian populations of *P. cinnamomi* indicate a low level of genetic diversity, suggesting that it is a recent introduction and almost burying the belief that *P. cinnamomi* was somehow a natural component of the Australian environment. Although there are still some who doubt the exotic origin of *P. cinnamomi* in Australia, the prevailing view is that it is an introduced species, which may well have reached our shores not long after European settlement.

In 1998 I was asked to look at an unhealthy plant of the endangered mallee *Eucalyptus imlayensis* near the summit of Mt Imlay and determine if it was being affected by *P. cinnamomi*, which had been isolated at the summit during an environmental impact assessment for a communications tower. The task was given to me because I had just moved from Western Australia where I had been working on the disease ecology of *P. cinnamomi* in the jarrah forest. Having read the literature on *P. cinnamomi* in NSW (although being skeptical about it being native) I doubted that it was the cause of the poor health of the eucalypt because *P. cinnamomi* is just one of many factors that can affect plant health and eucalypts are rarely affected by it. It was with great surprise that, on my walk to the summit, I passed through a patch of vegetation showing symptoms remarkably similar to those present in the worst affected parts of the jarrah forest in WA. Most of the shrub and *Xanthorrhoea* layer of this patch was dying with a distinct front between healthy and unhealthy. I sampled the roots of several of the apparently diseased plants. The material was sent to Murdoch University in WA, who confirmed the presence of *P. cinnamomi*. The patch has been monitored since its discovery. A diverse heathy understorey dominated by *Xanthorrhoea australis*, *Epacris impressa*, *Monotoca* sp. and *Tetratheca subaphylla* is being changed into a grassy understorey dominated by *Tetrarrhena juncea* and *Lomandra confertifolia*. The canopy of *Eucalyptus sieberi* is apparently largely unaffected. Since 1999 I have recorded many other patches of dying understorey in these forests. Whilst there is sometimes regeneration of susceptible species (as has been observed in Victoria and Western Australia), especially *X. australis*, the regenerating plants appear to be short-lived. The path of the disease appears to be in one direction – from high diversity heathy understorey to low diversity grassy understorey.

At about the same time, my colleagues Linda Broome and Fred Ford began investigating the habitat and dietary preferences of the Smoky Mouse (photo page 137), an endangered marsupial of the *Eucalyptus sieberi* forests. Curiously, the Smoky Mouse was found to preferentially inhabit patches with a diverse heathy understorey and the fruits of several shrub species were found to be important components of their diet. While monitoring the habitat of the Smoky Mouse for the possible impacts of logging in State Forest, deaths in several species and especially *X. australis*, were noted. Sampling and analysis of root material of affected plants has again implicated *P. cinnamomi* in the deaths. There may be several reasons for the decline of the Smoky Mouse in south-eastern NSW (including predation by cats) but *P. cinnamomi* is certainly causing a major decline in habitat quality and the abundance of important food plants.

Work continues on the threat of *P. cinnamomi* in south-eastern NSW. Some rare plant species (e.g. *Daviesia wyattiana*, *Grevillea irrasa*, *Leionema ralstonii*) have been found to be very susceptible to infection and others (e.g. *Boronia imlayensis* and *Philotheca virgata*) may well be susceptible based on their predominant occurrence on sites where there are no disease symptoms.

So, in the space of a decade, *P. cinnamomi* has gone from being an apparently innocuous native pathogen of *Eucalyptus sieberi* forests to being an exotic pathogen, which is a major determinant of understorey structure, and a threat to many plant species and at least one animal. And, in that time, nothing has changed in the behaviour of *P. cinnamomi*. In fact, the recent drought has probably been unfavourable to *P. cinnamomi* activity. The change has come about because of careful observation, monitoring and research. These are now required in other parts of NSW where *P. cinnamomi* may be having an impact. Our work in the south-east has highlighted the complexity of the disease. It is often subtle, affecting obscure understorey species rather than canopy species. Its impacts go far beyond the patchy death of a few understorey plants and include animals reliant on susceptible plants.

Because of the belief that *P. cinnamomi* was native in NSW, the disease caused by it has received little attention. We know almost nothing about its hosts in NSW (i.e. which are tolerant and which are killed) and we know little about its distribution, especially where it is likely to be absent. From what we do know about its distribution, however, it is safe to say that it is widespread in areas with an annual rainfall above 700 mm though not ubiquitous.

Although it is currently not possible to eradicate *P. cinnamomi*, application of the chemical phosphonate can dramatically slow its spread, and where targeted, protect particularly important plants (as is being done now with the Wollemi Pine). Hygiene, however, is the most important tool in combating *P. cinnamomi*. Keeping this pathogen out of disease-free areas will remove the need for using chemicals. Hygiene and chemical control are extremely difficult if you don't know where *P. cinnamomi* is and you don't know which species are affected. This information is slowly being gathered by the Royal Botanic Gardens Sydney with the support of Catchment Management Authorities.

And what of the sick plant of *Eucalyptus imlayensis* that triggered the interest in *P. cinnamomi* in NSW? Well, it died, but it is still uncertain if *P. cinnamomi* was the cause of death. The single population of *E. imlayensis* was subsequently found to contain about 80 plants, most of which are clonal. They grow amongst rocks on Mt Imlay and it has not been possible to obtain root material for testing for the presence of *P. cinnamomi* in affected plants. Instead, seed was obtained recently by the Australian National Botanic Gardens. Plants are being grown and some will be used for experiments to test for susceptibility. If *P. cinnamomi* is the culprit, periodic stem injections of phosphonate may be used to protect the population.

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The Occurrence and Cultivation of Native Figs (*Ficus* sp.) in Southeastern Australia

Ian Anderson

Native figs are not usually at the top of the list of plants to be purchased for the home garden. They are rarely available in nurseries. They are usually wasp pollinated and do not have colourful flowers. Some species can grow into enormous trees over time, far too large for the average suburban garden. *Ficus* is largely a genus of tropical plants. Most species struggle in cold and particularly frosty conditions. Yet there can be an imposing majesty about the architecture of a huge native fig tree growing in a park or large garden. The ability of some native figs to establish themselves by 'strangling' trees of other species may arouse interest, fascination or even revulsion. Native figs can be an important source of food for a number of bird species and for flying foxes, as well as for humans as bush tucker. Native figs can be grown in containers. They make suitable indoor plants and are sometimes grown in bonsai form. Perhaps there is therefore scope for using more native figs in some types of garden in south-eastern Australia.

According to the *Flora of Australia* "The fig is the single essential morphological attribute of the genus without which *Ficus* would have long since been split into numerous genera". There is often a lot of morphological variability both within and between some *Ficus* species.

Native figs, of which there are 42 species in Australia according to the *Flora of Australia*, are usually not considered to be of Gondwanan origin. Unlike Banksias, for example, they are believed to have colonised Australia from Asia when Australia moved within reach as a result of continental drift and periods of low sea level. Fig seeds can be carried for considerable distances, including across water, in the stomach of birds or fruit-eating bats. The striking giant native fig, *Ficus microcarpa* var *hillii*, which has been widely planted in and around Newcastle as a specimen tree (see photos page 140) occurs naturally not only in north-eastern Australia but also in parts of Indonesia, New Guinea and New Caledonia. Interestingly at least one other variety of *Ficus microcarpa* occurs naturally in India. India and Australia were once both a part of the ancient super-continent of Gondwana.

A number of species of *Ficus* appear to have evolved in Australia over time. One example appears to be the rock fig, *Ficus platypoda*. According to the *Flora of Australia* this is a highly variable species with considerable integration between five varieties. It extends to the Lesser Sunda Islands in Indonesia. It occurs from north-western Western Australia through northern parts of the Northern Territory and eastern Queensland to north-eastern New South Wales and northern South Australia.

It can survive in dry rocky sites. (Photo page 140 shows *Ficus platypoda* growing on a dry rocky ridge in the Olive Pink Memorial Gardens at Alice Springs.) This plant could be worth attempting to grow more in south-eastern Australia. It does not seem to grow as large as some other *Ficus* species and needs relatively little water to survive. It is a bush tucker plant for Aboriginal people. It has some tolerance to frost but may not thrive in places like Canberra where the frost can be severe.

The Australian National Botanic Gardens in Canberra, which has quite an extensive collection of native figs, had considerable difficulty I understand, in establishing some species, particularly before the rainforest gully with its extensive protective overhead canopy was fully developed. (Photo page 140 shows a *Ficus rubiginosa* (Port Jackson Fig) growing in the Botanic Gardens in Canberra in the centre of the canopy.) *Ficus platypoda* has not, I understand, fared quite so well in the Gardens in Canberra because of the winter cold.

Ficus macrophylla (Moreton Bay Fig), another Australian endemic, was quite widely planted as a street or specimen tree in earlier times outside its natural range, much like *Araucaria bidwillii* (Bunya Pine), *Grevillea robusta* (Silky Oak) and on the coast, *Araucaria heterophylla* (Norfolk Island Pine). The natural range of this native fig extends along the east coast of Australia from the latitude of the Atherton Tablelands to the Illawarra district south of Sydney. It has been introduced to Hawaii and New Zealand.

In the coastal town of Mallacoota in East Gippsland in Victoria, close to the border with New South Wales, is a striking example of a Moreton Bay Fig 'strangling' another tree (photos pages 140 & 141, taken in 2007). The tree is an *Angophora floribunda*. Croajingalong National Park, which surrounds Mallacoota, marks the most southerly natural occurrence of this *Angophora* species in Australia according to the distribution map in Costermans. Local knowledge suggests that this strangler established from one of two Moreton Bay Figs planted in the grounds of nearby Karbethong Lodge in Mallacoota, well before 1950. The planted trees were removed some years ago. In the article 'Victoria's Native Figs' by N A Wakefield in a publication circa 1960, *Naturalist's Diary* (my copy courtesy of the Mallacoota District Historical Society), Mr Wakefield wrote:

"A seed had evidently been deposited high up in the fork of this huge *Angophora* by a fruit-eating bird...that little fig tree is only two or three feet high, and it was not until quite recently that I thought to look more closely at it for signs of the aerial roots that fig seedlings develop when they have germinated in such situations. I was not surprised to see that there was a root - about as thick as one's finger. But I was rather amazed to find that it extended, sometimes under the bark and sometimes exposed, for thirty or more feet, right into the ground at the base of the *Angophora*. I wondered if that little parasite will eventually form a lattice of roots around the trunk and finally strangle its huge host tree, as the jungle figs do in the tropical north."

The most likely *Ficus* species to survive in gardens in the Canberra region from the climate point of view appear to be *Ficus coronata*, the Sandpaper Fig

and *Ficus rubiginosa*, the Port Jackson Fig. The middle left photo on page 141 is of a Sandpaper Fig growing at the Hunter Wetlands Centre near Newcastle. The edible fruits are visible. The Port Jackson Fig can grow as a strangler, while the Sandpaper Fig does not. No native figs appear to occur naturally on the Southern Tablelands of New South Wales to a significant extent although *Ficus coronata* has been recorded from the region according to *Flora of New South Wales*, perhaps from the northern part only. Certainly none are thought to occur naturally in the southern part of the Southern Tablelands Botanical Division, around Canberra and further south. According to Costermans, the range of *Ficus coronata* and *Ficus rubiginosa* in south-eastern Australia is very similar. Both species occur not only along the east coast of Australia from Queensland south but in New South Wales, north of Nowra, extend to the Tablelands in sheltered sites.

Interestingly and probably coincidentally, a host plant in Mallacoota for strangler figs, *Angophora floribunda*, appears to have a somewhat similar kind of distribution in New South Wales, occurring only on the coast in the south of the State, but extending to the central and northern tablelands (and even the northwest slopes and plains in places) as well as the coast north of Sydney.

In the northern part of New South Wales, the two fig species can also extend west of the Tablelands. The Port Jackson Fig in particular can extend as far west as the Warrambungles, Nandewar Range and Narrabri district, where it often prefers rocky sites on dry hills in open forest. The variability of some *Ficus* species has meant that in the north of New South Wales, *Ficus rubiginosa* can quite closely resemble *Ficus platypoda*, the Rock Fig, especially in northern inland sites. It is stated in the *Flora of New South Wales* that further studies are required (especially in the field) to ascertain if all these variations should be included in the same taxon.

Costermans refers to a third species of native fig in coastal south-eastern Australia, *Ficus obliqua*, which is shown in his book to have a similar distribution to *Ficus rubiginosa*. It differs mainly in the size of the leaves which are relatively small compared to the standard leaves of *Ficus rubiginosa* and also in the relatively small size and almost orange/red colour of the fruits. There is at least one large specimen labelled *Ficus obliqua* currently growing in the Sydney Botanic Gardens though it may be that *Ficus obliqua* is regarded now as a variation within *Ficus rubiginosa*.

The known southern limit of native figs growing naturally on the coast of south-eastern Australia has extended over time. In September 1860, Dr Ferdinand von Mueller, the Government Botanist of the colony of Victoria, made an excursion to Eden in south-eastern New South Wales. There, in the vicinity of Twofold Bay, Mueller collected specimens that he identified as *Ficus aspera*, a name applied in those days to one of the group of sandpaper figs (now *Ficus coronata*). So in 1873 in *Flora Australiensis*, the English botanist George Bentham noted that Twofold Bay was "the most southern point reached by any *Ficus*".



Phytophthora cinnamomi

Left: Disinfecting boots to prevent the spread of *Phytophthora cinnamomi* at Mt Imlay

All photos: K McDougall

Right: Evidence of *Phytophthora cinnamomi* infection



Left: Endangered mallee *Eucalyptus imlayensis* near the summit of Mt Imlay

Right: Smoky Mouse - an endangered marsupial of the *Eucalyptus sieberi* forests (see p. 131)



When the *Australian Encyclopaedia* was published by the Grolier Society of Australia Pty Ltd in 1958 (a further edition was published in 1963), it contained the statement that "no species of fig trees grow spontaneously in either Victoria or Tasmania". But according to the article by Norman Wakefield, only a few months after the first edition was published in 1958, specimens of Sandpaper Fig (now known as *Ficus coronata*) were identified from the northern side of Mallacoota Inlet in far-eastern Victoria. Late in 2007 I was informed in a personal communication that this fig also grows further south in the Shipwreck Creek area of Croajingalong National Park, although I have not seen this recorded in any document. *Ficus coronata*, according to *Flora of Australia*, is endemic in Australia. It occurs widely in eastern Queensland and New South Wales and is rare in the Northern Territory. According to *Flora of New South Wales* it often occurs along creeks, in rainforest and open country and occasionally in sheltered rocky areas on the Western Slopes.

It appears to be a similar story with southern limits of the other far south coast fig, the Port Jackson Fig. In *The Trees of New South Wales* by R.H. Anderson, Chief Botanist and Curator at the Sydney Botanic Gardens, published in 1956, the southernmost limits of the Port Jackson Fig in New South Wales are described as Mount Dromedary (near Narooma). Norman Wakefield in his article states that "near Bellbird Creek a few miles beyond Eden, not far from the road, on a small cliff there are trees of ... the Port Jackson Fig (*Ficus rubiginosa*) Bellbird Creek is a mere 30 miles from the New South Wales/Victoria border so perhaps one day this species too will be found in the Cape Howe district of eastern Victoria" (near Mallacoota).

Photos at the top of page 141 show what appears to be to be a Port Jackson Fig, growing in Mallacoota itself. There is no sign that this fig tree established by strangling another tree. This could be taken as evidence that the fig was planted. But perhaps the host tree was totally consumed over time. Perhaps the Port Jackson fig does not always require a host tree to establish. Seeds may germinate on the ground. The domestic fig, *Ficus carica*, originally probably from the Middle East, certainly seems capable of establishing in this way. The Mallacoota tree is now growing on the nature strip of a recent subdivision, as a result of which it was significantly lopped on one side. This land was once part of a property 'Raheen', owned by the late EJ Brady, a writer who settled in Mallacoota in the early 1900s. He died in the 1950s.

Family and historical records suggest he had an orchard as part of his property. The fig may have been planted as a part of this, although the fruits of the Port Jackson Fig are rather dry and not very palatable compared with the domestic fig. A descendant can recall EJ Brady telling his grandchildren to keep away from the fig tree as there were often bats in it (and it could be unhealthy). It must therefore already have been old enough to fruit when he was alive. Port Jackson Figs were sometimes planted in New South Wales for ornamental purposes although probably not as much as Moreton Bay Figs. If EJ Brady did plant the fig, where did he obtain the seed or seedling? Perhaps from the population near Eden, given that the nearest nursery stocking such a species was likely to be a long distance away in the early 1900s? The location where the fig is growing in Mallacoota seems typical for

this species of fig occurring naturally - a dryish open slope. How far can birds or flying foxes carry viable fig seeds? Could a seed have been transported by birds or flying foxes from Eden? Perhaps someone has the answer.

A survey of the vascular flora of the National Parks of East Gippsland carried out by A Clifford Beauglehole and Eugene W Finck in 1969 listed the Sandpaper Fig as an indigenous species and the Moreton Bay fig as an exotic. There was no mention of any Port Jackson Fig. Mr Finck in a recent personal communication said that the survey was only able to physically check about ten percent of the flora of this vast area in detail.

In any case the 'Raheen' fig is no longer the most southerly growing Port Jackson Fig in this part of Victoria. The centre right photo on page 141 was taken in late 2007 in the Mallacoota Camping Ground and Caravan Park, a kilometre or two south of the site of the old 'Raheen' property. It seems to show that in the fork of a magnificent *Angophora floribunda* overlooking the lake, a Port Jackson Fig is starting to exhibit its strangler fig qualities. What was its origin? The 'Raheen' fig? The population near Bellbird Creek across the border in New South Wales?

As a further contribution to the story of native figs and their contribution to Australia's flora and to fit in with the objectives of the Australian Native Plants Society (Canberra Region), additional study of their outdoor performance in the greater Canberra area seems appropriate. Photo page 141 is of a recently planted *Ficus coronata* (Sandpaper Fig) in my front garden in suburban Canberra. Photo page 141 shows a young *Ficus rubiginosa* (Port Jackson Fig) planted in a woodland setting not far from Canberra.

It would be interesting to know of the experience of others in cultivating these plants.

A number of people contributed information used in preparing this article. Their help is greatly appreciated.

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Top Left, Top Right & Left: *Ficus microcarpa* var. *hillii* growing in central Newcastle

Below: *Ficus platypoda* growing at the Olive Pink Memorial Gardens in Alice Springs

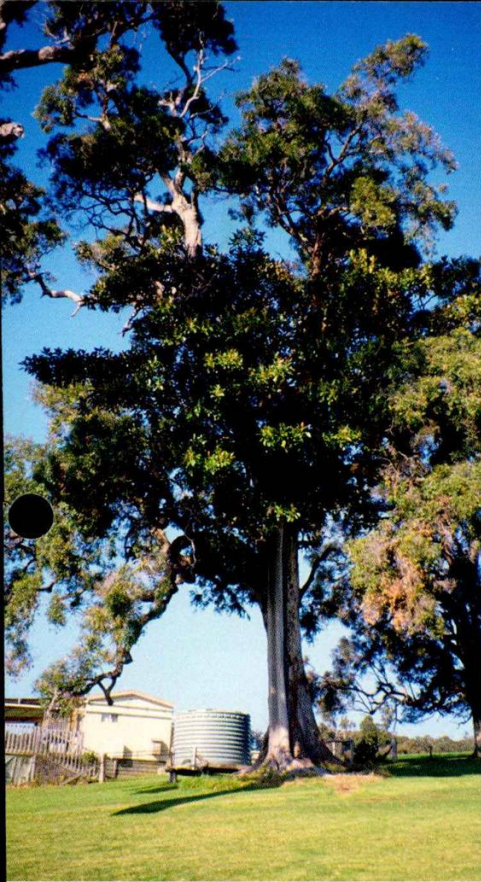
All photos: I Anderson



Above: *Ficus rubiginosa* growing in the centre of the foliage at the Australian National Botanic Gardens in Canberra

Below: *Ficus macrophylla* growing in Mallacoota. Host tree *Angophora floribunda*





Above (both): *Ficus rubiginosa* growing at Mallacoota

Left: *Ficus macrophylla* growing in

Mallacoota. Host tree *Angophora floribunda*

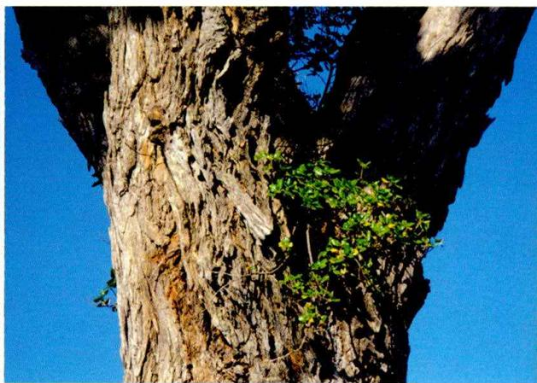
Middle Left: *Ficus coronata* (Sandpaper Fig)

Middle Right: *Ficus rubiginosa* starting to strangle its host tree, *Angophora floribunda* at Mallacoota

Bottom Left: *Ficus rubiginosa* planted in a woodland near Canberra

Bottom Right: *Ficus coronata* planted in a Canberra garden

All photos: I Anderson



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PUBLISHED BY THE AUSTRALIAN PLANTS SOCIETY NSW LTD

Under the direction of the PUBLISHING COMMITTEE

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PUBLISHING COMMITTEE: M Wagner (Convenor), J Caldwell, C Liber

All publication correspondence / feedback to: Publishing Committee, PO Box 744, Blacktown NSW 2148

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