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Australian Plants

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Cover: front: *Dillwynia sericea*; back: *Podolobium ilicifolium*; photos by Shirley McLaran

Australian Plants articles

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Editorial

Merle Thompson OAM

We tend to describe issues of *Australian Plants* as “themed” or “miscellaneous”. The words convey the difference. In a themed issue all, or most, of the articles are on a related topic. A miscellaneous issue has articles covering a variety of topics. This current issue is very much in this latter category. It contains a very varied “miscellany” of articles.

We start with a rather scientific article by Ann Young on vegetation communities and the mosaics they form in the environment depending on factors such as soil and climate. Ann, however, also provides information for the gardeners with ideas on how to assess the soil in your own garden and the implications for what you grow.

Technically, fungi are not plants but most of us think of them as though they are. Their fascinating shapes and colours intrigue us. With thanks to the Australian Plants Society Alice Springs, we have included an article by Jenny Purdie on the fungi of the Top End.

Shirley McLaran's article on the Australian Pea Flower Study Group covers the gamut – whether you are interested in plant identification, exploring where plants grow or growing them yourselves there is something of relevance to you.

Greg Kirby also writes of both ecology and growing with a different kind of pea – Sturt's Pea. Did you realise how many colour variations there are – and the challenges in growing this iconic species?

For those interested in propagation, Emma Braume's article on germinating that most difficult of species, persoonias, may be an eye opener.

The calming nature of water may provide a contrast to these challenges. Mark Abell gives some guidelines for including a pond in your garden. In a later issue Mark will provide a follow-up article on plants to include in your pond.

It started as a joke when I found a 1998 article by Harry Loots on walking in the Tasmanian highlands. Readers enjoyed his article in the last issue, so we decided to include this one, even though it is more focused on place names than plants.

There are also a couple of “follow ups” from Sarah Cains and Maree McCarthy.

I hope you enjoy this ‘eclectic group’ of articles and that ‘there is something for everyone’.

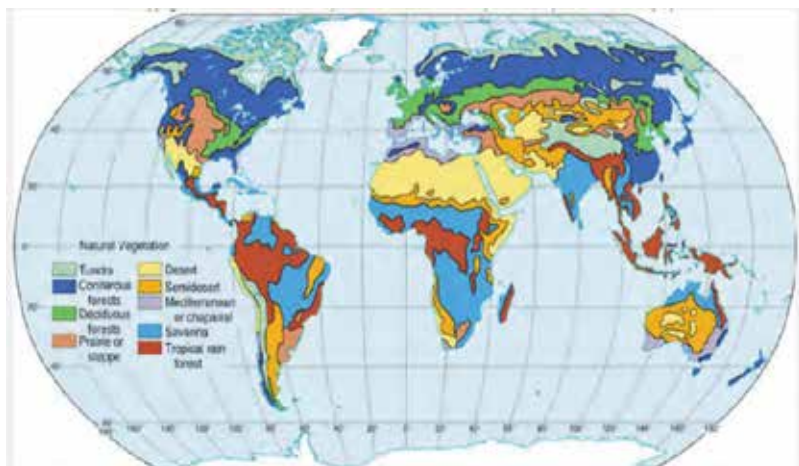
Mosaics of vegetation – the rocks and dirt story

Ann Young

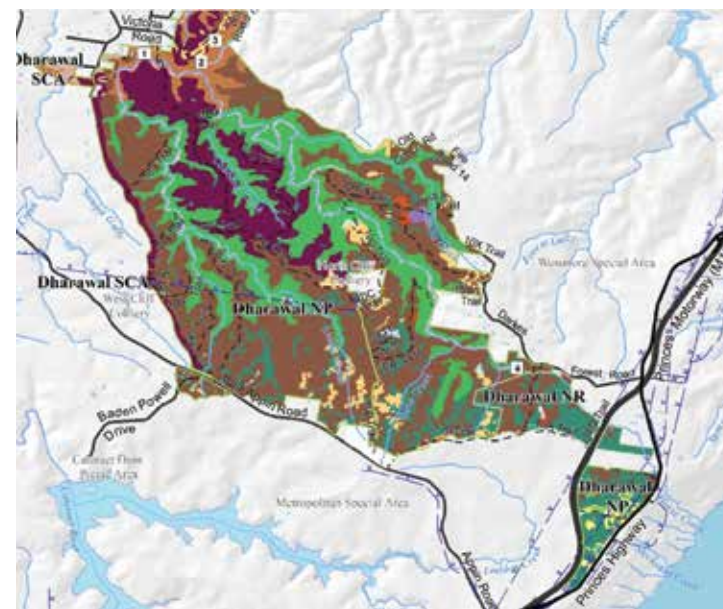
Ann Young is a retired academic, based in the Wollongong area of NSW. She has published, mostly with her husband, Bob, books on soils in the Australian landscape, sandstone landforms worldwide, understanding the scenery in Royal and Morton National Parks, and upland swamps in the Sydney region.

Vegetation in any area forms a mosaic, a pattern, and the boundaries between different vegetation communities can be sharp but often are transitional. Why is this? How do different rock types and different soils affect these patterns? How do we read the landscape to understand these beautiful and often intricate patterns? And how do we bring these understandings to the level of our own gardens?

If we look at a global vegetation map, there are three major controls – climate, continentality and topography. In equatorial regions with warm temperatures all year and high rainfall, growth is luxuriant and tropical rainforest dominates. In cold polar regions, which are also windy and have low precipitation, vegetation is low and sparse. We often think of deserts as being hot, but very cold areas usually have sparse vegetation cover too. In the centre of continents, away from coastal areas with moist onshore winds, it is dryness that leads to the formation of deserts. Mountain ranges block onshore winds so deserts form on their leesides. And at high altitudes, the vegetation mimics polar vegetation (for example, on the high parts of the Andes mountains in South America; or on a local scale, the soils and vegetation at Mt Canobolas near Orange in central western NSW closely mimic those in the Australian Alps).



Looking over smaller areas, we see that similar controls operate but the influence of soils and rock type add a further dimension. Dharawal National Park near Wollongong is about 14km long, is on a single rock type (the Hawkesbury Sandstone) and rainfall/ temperature conditions vary only minimally across the Park. Yet there are 16 different plant communities mapped.



For example, the deep valleys with shaded slopes and well-drained soils support eucalypt forest (see the bright green stream pattern on the map). In that topographic position, microclimate (eg shade and cool air drainage) and soils (derived from sediment accumulating during erosion of the slopes and well-drained because of the steepness) are the major controls. Looking now at the broad ridges in the southeastern area, we see three communities – woodland (brown), heath mallee (yellowish brown) and damp heath/wet swamp (dull green). Here the topographic influences are quite subtle and are linked to soil type. Where sandstone crops out above the general level of the ridges, soils are pale-coloured, thin and sandy and support woodland with a shrubby understorey.

Across most of the ridges, heath with some mallee eucalypts grows on yellowish deeper moister soils. And in shallow headwater valleys, where sandy sediment accumulates and traps runoff, sedges and hydrophilic shrubs grow in grey/black silty/clay wet soils with high organic matter content.

Note here that we are discussing vegetation structure. Clearly within any structure-based community, there can be also interesting species differences.

What is the influence of rock type? Looking across Barren Grounds, west of Kiama, there is low woodland on the ridges and heath and swamp in the shallow valleys. Beyond are cleared hills on the Wianamatta Shale with outcrops also of Robertson Basalt. Prior to clearing, these slopes supported temperate rainforest and wet sclerophyll forest. They were cleared because the soils on both these rock types (especially those weathered on the basalt) are clayey and fertile. A small area of Robertson Brush survives near Robertson township. The red clayey soils are famous for potatoes here and for dairying around Gerringong on the coast.

It is no accident that the repositories of native vegetation, that is, many of our national parks, are usually on infertile soils or steep topography that is poorly suited to agriculture and hence remained undeveloped except for forestry.

In fact, the most productive soils in NSW, the self-mulching cracking clays of the Liverpool Plains, are derived from basalt, with sediment from weathered basalt being washed off onto the floodplains. In this area, rainfall is lower than on the coast near Robertson so nutrient leaching from the soils is not as great, and the soils are also very dark, indicating



Looking across Barren Grounds towards Robertson

high organic matter contents. Almost all the native vegetation has been cleared here but because of the different climate to the Robertson area, the area would have been covered not by forest but by savannah (low very open woodland).



Liverpool Plains, NSW

Where limestone is the main rock type, it is perhaps surprising that the soils are not grey like the rock but deep red. In some parts of the world they are called after their colour – ‘terra rossa’. Yet we know that limestone is predominantly calcium carbonate and is dissolved by naturally slightly acidic rainfall so that caves, potholes and runnels are formed. So why are the soils red and clayey? It is simply because all sediments have at least some clays and iron minerals in them, and these are not very soluble. So as the calcium carbonate dissolves and is removed from the rock surface in runoff or flow down through the soil, the iron oxides and clays are left behind to form the soil.

As we look at these variations due to climate, topography and rock type, and the influences those have on soils, it is helpful also to ask – what are the soil characteristics most important to plants?

Nutrient level is an obvious answer – yet vegetation communities with high species diversity thrive on sandstone-derived soils with very low nutrient levels. Many Australian plants have adapted to the low nutrient status of the soils on our old and geologically stable continent where the soils have been leached by rain over millennia.



Limestone at Bungonia, NSW

Sedges and Proteaceae, such as *Banksia*, have cluster roots. Proteoid roots are dense mats of fine roots that develop mainly when it is wet weather and they can explore 30 times the volume of soil than an ordinary root of equivalent weight could.

Myrtaceae species often have mycorrhizal fungi associated with them – both fungi and cluster roots increase nutrient uptake from the soils. Casuarinaceae, Mimosaceae and Proteaceae also have symbiotic relationships with fungi that extend their fine webs of hyphae around and sometimes into the plant roots. With this much greater surface area and mini-root length, they access nutrients from very small pore spaces. This is especially important for phosphorus which is not easily soluble.

Other plants have different strategies. *Drosera*, sundews, are an example of plants that respond to the low nutrient status of soils by getting part of their nitrogen from animal prey.

Soil structure is another major influence. Roots can easily penetrate sandy soils or soils which are friable; water can move freely through these, so they don't become waterlogged and there is enough air between grains or small clumps of soil to allow root respiration. In very sandy soils, such as on coastal sand dunes, water moving through



Drosera sp.



Sand dune

leaches out nutrients and organic matter and these soils may be very pale to white in colour especially near the surface.

Soils that are dense and/or waterlogged have low oxygen levels available for plant roots – but of course swamp vegetation thrives in such soils. Swamp soils are usually grey to black in colour, because organic matter from dead vegetation does not break down efficiently but accumulates in the soils.

In short, while agriculturalists may look for friable well-drained soils with relatively high levels of nutrients and organic matter, native vegetation has adapted to a wide range of soil conditions and almost any variation in soils is reflected by a variation in the species or structure of the vegetation cover.

However, if your interest is in native plants, then obviously the trick is to match the plants to the soils and niches that they are adapted to. In the Sydney region, many of the easily available plants would normally be found in the bush on the sandstone plateaus. Because the shale and basalt areas were cleared for farming before real interest in Australian native plants developed, there are relatively few commercially available native plants suited to the clayey soils in the gardens of the houses that have spread across former agricultural land. And of course, many plants in other than specialised nurseries are hybridised not only to grow in a range of soils and climates but to flower profusely for much of the year. As APS members would know only too well, this produces gardens that are 'native' only in the sense that the plants are not introduced, such as camellias and roses. Also, they can favour the territorial honeyeaters much to the detriment of smaller insectivorous birds.

Whatever your aim in the garden, understanding your soils is important.

There are some very simple ways to understand what soils are like.

1. Toss a small spadeful of soil onto the ground.
 - a. Stick together in a lump? If it does, then it's a 'massive soil'. Roots will find it hard to work their way through and it may be 'sour' soil with very little oxygen available to the roots.
 - b. Break into stable small lumps (these are called peds)? This is friable soil, and good for most plants. Water and air can move through the soil and so can roots, so nutrient takeup from the soil is efficient.
 - c. Fall apart into sandy grains? Sandy soil allows air and water and roots to penetrate the soil. However, because the soil drainage is

so good, nutrients released from dead vegetation can be leached (washed out) before they are trapped again by the roots for plants to re-use.

2. Rub some moist soil in your hands. Enjoy the feel! If it's gritty and sandy, it's likely to be well-drained. If it makes your hands dirty, there's enough clay to hold some nutrients while roots extract them. If it feels greasy, it is clayey and may be poorly drained and oxygen-poor.
3. Smell it! If it smells sour, very few plants are likely to do well in it. If it smells earthy and fresh, start planting.
4. Get a pen or pencil and push it into the soil, using the soft palm of your hand. If this hurts and the pencil is hard to push through, then roots also will find it hard to work their way through the soil.
5. Dig a small trench and look at the soil profile.
 - a. Is there a top layer which is greyish but friable? This is the layer where organic matter is accumulating from dead vegetation or the mulch you have used. It is likely that many fine roots will be penetrating along this layer to grab nutrients.
 - b. Do deeper roots suddenly turn sideways? If so, there may be a hard or dense layer that needs treatment by digging it over and adding gypsum and compost.
 - c. What is the colour? Dark grey or brown usually indicates quite fertile soils. Grey soils can indicate poor drainage especially if the soil is clayey. Red and yellow soils are coloured by iron oxide but many native plants are adapted to and thrive in these soils. Very pale soils are likely to be nutrient-poor.
6. Water gently, especially after a long dry spell. Does the water quickly run away off the surface? The soil may be water-repellent. The breakdown of many native plants can produce organic compounds that are hydrophobic and coat the soil particles, so that water doesn't easily penetrate the soil. Add a very small amount of biodegradable detergent to your watering can. Gently fork over the topsoil to see whether the water is getting down to the roots.
7. Remember that in very wet periods new roots grow near the surface to get some air. So your newly planted stock may get dehydrated very quickly when the dry weather comes.

Fascinating fungi of the Top End NT

Jenny Purdie

Jenny Purdie is a long-time resident of the Northern Territory and worked as a technical officer in the NT Herbarium (Alice Springs and Darwin) for 20 years. She then moved into the Animal Health section for 11 years and finally was the Regional Director for Primary Industry in Tennant Creek where she participated in pasture surveys and set up a plant reference collection. After retirement she has been on several boards, including Olive Pink Botanic Garden and Greening Australia NT, Landcare Council of the NT and volunteered in the Alice Springs Herbarium. Jenny maintains an interest in the NT flora, enjoys photographing it and has produced or coproduced several flora publications. She now lives in Katherine in the NT.

In the 18th century Carl Linnaeus classified living organisms into two Kingdoms:

- Animals – those that moved
- Plants – those that didn't move.

Until 1969 fungi were considered to belong to the Plant Kingdom but were then given their own kingdom. Currently there are about 148,000 species of fungi around the world that have been described (there are about 391,000 species of plants), but the estimate of total species of fungi is considered by some to be more than 5 million. Fungi include yeasts, rusts, smuts, mildews, moulds and mushrooms. Slime moulds are often considered to be fungi but actually belong to a separate kingdom. Fungal fossils have been found dating to 400 million years ago but a recent fossil found in a South African rock that was once under the sea could be as old as 2.3 billion years!

In the Top End Wet Season the fruiting bodies of fungi are regularly seen but they quickly decay. Sometimes they are in groups, sometimes singly, sometimes arising from the ground, other times attached to living or dead wood.

I am certainly no expert on fungal identification and rely on the generosity of people on iNaturalist Australia and the Facebook NT Field Naturalists Club to identify my photos though I still have some unidentified ones.

Species unknown – pictured right

These prolific fungi were seen growing in leaf and bark litter.



Lepiota sp.

Ground-dwelling saprotrophs with a preference for rich, calcareous soils. There are about 400 species worldwide, many of which are poisonous, some lethally so.

A saprotroph is an organism which lives off dead or decaying organic matter.



Macrolepiota procera (Parasol Mushroom)



Has a large prominent fruiting body resembling a parasol. It is fairly common on well-drained soils and is found solitary or in groups resembling fairy rings. It is widespread in temperate regions across the globe and is a popular edible fungus in Europe.

Amanita hemibapha (Half-dyed Slender Caesar)

My photo is of a young specimen which eventually becomes a typical mushroom shape and becomes deep orange in colour with a yellow margin. It is edible but is closely related to other species which are deadly poisonous.



Chlorophyllum molybolite (False Parasol, Green-spored Lepiota, Vomiter)



Chlorophyllum molybolite is a widespread large mushroom. As one of the common names suggests, it is poisonous and produces severe gastrointestinal symptoms of vomiting and diarrhoea. The hemispherical cap is 8–30cm in diameter with a flattened top. The spores are green and the gills usually turn a dark green when mature, which can just be seen in my photo (previous page).

***Favolus tenuiculus* (Honeycomb Fungus)**



The shape is variable and the texture can be smooth, have minute hairs, stiff tufts or spiny scales. The underside is angular and deeply pitted resembling a honeycomb. It is edible but apparently not very pleasant.

***Calocera* sp. (a Jelly Fungus)**

Found on dead logs and twigs they have a consistency like jelly. They are edible but often with an unpalatable taste.



***Podaxis* sp. (Termite Inkcaps)**

A common inhabitant of soil and termite mounds throughout the drier regions of the tropics and subtropics of the world.

***Coprinopsis aramentaria* (Inky Cap)**



The grey-brown cap is initially bell-shaped before opening and then flattens and disintegrates. It is widespread across North America, Europe, Asia and also occurs in Australia, New Zealand and South Africa. It is commonly associated with buried wood and the fruiting bodies have been known to push their way up through asphalt and even tennis courts. It is edible but becomes poisonous when combined with alcohol!

***Cyathus striatus* (Fluted Birds Nest Fungus)**



These are tiny, 7–10mm high and 6–8mm wide. The “eggs” in the nest are peridioles – lens-shaped bodies that contain the spores. The photos are by Geoff Newton who found the fungus growing in some potting mix and when he gave it to me I could hardly believe how small it was.

***Schizophyllum commune* (Split Gill)**

Resembles undulating waves of tightly packed corals as the creamy yellow to pale white gills are longitudinally divided. They are found on decaying trees and occur throughout the world. They are eaten in Mexico and India and other tropical countries but have been suspected of causing fungal infections of the lungs.



***Fuligo septica* (Scrambled Egg, Slime, Dog Vomit)**

It's edible!! Indigenous people in parts of Mexico collect it and scramble it like eggs! This is actually a slime mould but I thought it interesting enough to include here.

***Lycoperdaceae* (the True Puffball Family)**

A family of about 160 species found around the world. The fruiting body has 1 or 2 layered skin forming a ball-like structure with the spores enclosed inside. They are white and firm when young but gradually turn to a mass of brown powdery spores as they mature and dry. The spores are released through a pore in the top or when the out skin crumbles. The spores have been used as a coagulant to help stop bleeding.



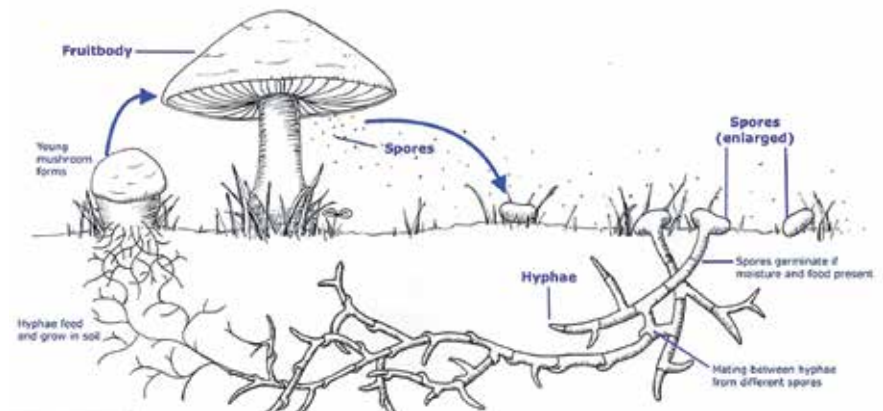
***Ganoderma* sp. (a Bracket Fungus)**



Woody leathery brackets with or without a stem that grow on trunks of living or dead trees.

iFungi AU is an app of Australian fungi. It is available for \$4.99 and has a lot of excellent photos.

NB: FUNGI ARE NOTORIOUSLY DIFFICULT TO IDENTIFY SO I DO NOT RECOMMEND EATING ANY FUNGUS UNLESS IT HAS BEEN IDENTIFIED BY AN EXPERT.



Life Cycle of a Mushroom from the "Science Learning Hub – Pokapu Akoranga Putaiao, University of Waikato, www.sciencelearn.org.nz"

Reviving the Australian Pea Flower Study Group

Shirley McLaran

Shirley is the leader of the the Australian Pea Flower Study Group. In this article she tells how she became interested in native plants, and pea flowers in particular, as well as about re-starting the study group

About 27 years ago I decided to do a horticultural course at TAFE to learn about soils and nutrients. I grew up on a small crops farm on the outskirts of Brisbane but only became interested in gardening when I acquired my own home. A passionate bush regeneration teacher at TAFE encouraged me to attend the Society for Growing Australian Plants (SGAP) spring flower show. The tables of cut flowers on display at the show were a sight to behold and I was hooked on Australian native plants from that day. I joined the Pine Rivers Branch on the spot and quickly became obsessed with the desire to know which family each species belonged to, and why.

Before long, I became a biennial conference (ANPSA formerly ASGAP) junkie, where I eagerly learned from other ‘plant people’. I was amazed by the diversity of pea-flowered plants and even more amazed how a friend I met at a conference could name the genus of each pea flower. They promised to give me a spare copy of Dorothy Woolcock’s ‘A Fieldguide to Native Peaflowers of Victoria and Southeastern Australia’ (1989) when I joined the Fabaceae Study Group. I still treasure that publication.

Ten years ago, my passion for plant identification and classification led me to undertake a Bachelor of Science, majoring in botany, at the University of New England. One of my proudest moments was being accepted to participate in the Volunteer Botanical Training Program at the Australian National Herbarium. One of the requirements for the program was to choose a plant, research its horticultural potential and contribute to the Australian National Botanic Garden’s ‘Growing Native Plants’ web page. I couldn’t look past the Swan River Pea, *Gastrolobium celsianum*. [Pictured right]



Photos by author unless otherwise specified

At the ANPSA biennial conference in Albany 2019, I volunteered to revive a group to study pea flowers. A dozen pea enthusiasts expressed interest in joining the group previously known as the Fabaceae Study Group. The group now numbers over 100.

You may be wondering why this study group has been restarted with the name Australian Pea Flower Study Group. Why not Fabaceae Study Group as it has been named before? The name has been changed to accentuate the focus of the Group on only those legumes that have pea-flowered plants, rather than the entire legume family.

Fabaceae is the legume family, the plants of which are generally recognised by their seed pods. It is also commonly referred to as the pea and bean family and the scientific name Fabaceae is interchangeable with Leguminosae and Papilionaceae (in reference to the butterfly-like flowers). Although three distinct families are recognised by some authorities – Fabaceae (pea flowers), Mimosaceae (Acacia and relatives), and Caesalpiniaceae (Senna, Cassia and relatives) — it is widely accepted that all legumes belong to the Fabaceae family of which Faboideae, Mimosoideae, and Caesalpinioideae are subfamilies. The latter classification has been adopted by Australian herbaria and is used on the ANPSA website. The subfamily Faboideae comprises the legumes with pea-shaped flowers and is the largest group of legumes.

Faboideae	Caesalpinioideae	Mimosoideae
<i>Platylobium formosum</i>	<i>Petalostylis labicheoides</i>	<i>Acacia terminalis</i>
'All of these plants are in the Fabaceae family (legumes) but only <i>Platylobium formosum</i> is a pea flower'.		

Hence, as the group is focusing on those Australian plants with ‘pea’ flowers, and Faboideae isn’t a familiar term, the group is being revived as the Australian Pea Flower Study Group. Even though as a subgroup of the ANPSA it may seem unnecessary to add ‘Australian’ to the name, the purpose is to make it clear to plant enthusiasts globally that this group is purely about Australian Pea Flowers.

Do you have or know of a 'pea patch' near you? I don't have pea flowers growing in my garden, but I do like to wander through the reserve near my home, and after tallying them up, was surprised by how many peas were growing there. I think of it as my 'pea patch'. Your 'pea patch' might be a balcony garden, a suburban garden, a farming property, a regeneration project, or a local reserve. Pea patches featured in the first newsletter of the study group included gardens in Wyoming, NSW; Montrose, VIC; an avocado farm in WA; and bush peas being cultivated in the United Kingdom. What does your pea patch look like?



Chorizema varium

Leading the study group is both challenging and rewarding. I enjoy sharing my knowledge with others and continue to learn about this diverse group of plants.

In August 2023, the study group held its inaugural 'Pea Forage' on New South Wales' Central Coast.



Indigofera australis (H. Miles)



Hardenbergia violacea (H. Miles)

Germinating persoonias

Emma Brame

Emma has been working as a horticulturalist at the Sutherland Shire Community Nursery in southern Sydney for over 7 years. The nursery propagates plants indigenous to the area, all of which have local provenance. A portion of the plants are planted back out into the local reserves and bushland areas. Some plants are used for the Green Web initiative, which aims to widen green corridors in the local area. Plants are also for sale to the general public and contractors. Emma has a passion for experimenting all things propagation, in particular experimenting on introducing new species to the nursery including ferns and experimenting with improving the success rates on harder to grow species.

Germinating persoonias is notoriously hard and successful germination is something in which to be proud of participating. I have been fortunate enough to work alongside some very experienced and passionate people that have shared their understanding and knowledge on growing native plants. Persoonias are proving to be one of the harder genera to master and propagate successfully. The Sutherland Shire is home to a number of Persoonia species and the nursery has had success with four different species, *Persoonia pinifolia*, *P. lanceolata*, *P. linearis* and my favorite (if not one of my favorite native plants) *P. levis*.



P. pinifolia and *P. lanceolata*
germinated



Persoonia pinifolia

For those not familiar with the genus *Persoonia*, there are thought to be over 100 species in the genus endemic to Australia. Persoonias are in the Proteaceae family and are generally an understory shrub to small tree. They have yellow flowers followed by a fleshy drupe. Persoonias are commonly referred to as “Geebung”, which is derived from an Aboriginal word “Jibbong”. This refers to the eatable fruit/drupe of some of the species.

The shape of the leaves varies tremendously throughout the species. Flakey bark with red undertones can be an amazing feature of some of the species.



Persoonia levis – flakey bark with red undertones

When it comes to propagating the *Persoonia* genus from seed, time is by far the main factor to consider. The first process itself takes 12 months alone and is primarily to remove the exocarp (outer layer/skin of fruit) and mesocarp (the fleshy part of fruit) to reveal the endocarp (hard layer that covers the actual seed). Another important factor to consider when propagating persoonias is knowing the climate conditions of each species. Observation from when they naturally germinate is particularly helpful, especially at what temperatures, as some seed in this genus have physiological dormancy and require specific temperatures to break dormancy and germinate. In the nursery we have had success due to mimicking these natural germination processes.

Germination Process

The first process is collecting the fruit when it is ripe and fully formed. More often than not, fruit will be ripe when it has fallen off the plant and onto the ground. For most of the species grown in the nursery, collection time starts from November. Collection of a substantial amount of fruit will vary with each species as some produce many more flowers and thus fruit than others. It will also vary on each individual plant as flowers and fruit form at different speeds along spikes.



Persoonia lanceolata

On stock plants in the nursery, fruit is collected over a few days and even weeks to build up bulk seed quantities (out in the field, it is recommended that 20% or less is collected from any one plant so that we do not deplete the natural area of seed and natural regeneration.)



Persoonia sp. fruit

Once the fruit has been collected, it is ready to be fermented. This is simply done by placing fruit into a plastic bag with some regular potting mix (we use a free draining mix), and a splash of water in it. The bag is then sealed and labeled with the genus, species, collection date and location of where the fruit was collected from. It is then placed under the benches in the glass house for 12 months, where it is humid and warm temperatures are constant over the 12 month period.

Fermenting the fruit this way replicates the fleshy fruit being processed though the digestion system of an animal. The flesh and skin of the fruit (exocarp and mesocarp) will be stripped away to reveal the hard layer (endocarp) that protects the seed. The seed, still with its hard outer layer protecting it, is retrieved 12 months later. This is done by placing the contents of the bag into a suitable sized sieve (ensuring seed will be caught by the sieve) and the potting mix is washed away through the sieve.

With the hard layer/endocarp still protecting the seed and making it impervious to water, further treatment is required to help increase successful germination. Some studies have shown that up to 50% of the endocarp must be removed for germination to occur. Scarifying by abrading, pretreatment with boiling water and/or nicking the endocarp with a sharp knife or secateurs have all been suggested. In previous years at the nursery, all the endocarp would be nicked with sharp secateurs one by one. As you can imagine, this was very time consuming and fiddly work to say the least. In recent years, we have not only saved time but have had great success by using a different scarification technique. We now use sandpaper to scarify a large amount of seed at once. This is done by placing the seed into a suitable sized sieve. Again, the sieve should not be big enough for the seed to fall through, but not small enough that the seed will move around like on a flat surface, but rather be held in place by each hole of the sieve. Sandpaper over a sandpaper block is then used to scarify seeds.



Persoonia lanceolata
germinated with
endocarp still
attached

After this process it is now time to sow the seed. It is very important that the seed needs to be able to absorb water, so the seed raising mix needs to stay moist and not dry out. Water absorption will allow seed to swell and become soft and germination to happen. For this reason, a 50:50 mix of perlite and vermiculite is used (and is what the nursery uses for all its seed sowing). It works well as it allows for an excellent air and water flow. Perlite allows for air which is particularly important for good root formation and so that excess water can drain away. Vermiculite is used for its water-holding capacity, as it can hold up to four times its volume.

Seeds are sown the same as other seeds in a normal seed sowing tray. Once the seeds have been sown, labeled and recorded, the trays are placed into the Poly tunnel where the environment is controlled with regular irrigation and protected from harsh conditions.



Persoonia levis

The trays are left and monitored for months before they begin to germinate. It isn't until approximately six months later, usually in April when temperatures have dropped and we have our first real frosty night of the year, that the seed starts to germinate. The cotyledons start to emerge and then the first true leaves develop. A combination of time and temperature change has allowed the seed dormancy to break and begin germination. The persoonia seedlings are tubed up approximately three months later, when they are big enough (usually when they have two sets of leaves or more), into a free draining potting mix with a slow release native fertiliser. The seedlings are then placed into the shade house for a minimum of 2–3 months, where they will continue to put on new growth and develop a stronger root system. The shade house will protect young seedlings from harsh elements such as full sun, wind and heavy rain. After the shade house, seedlings will go out into full weather conditions to harden off.

Persoonia seeds can remain viable for many years and for this reason, the seeds that do not germinate are not thrown out. They are picked and cleaned from the seedling tray. When they dry, they are then re-scarified and re-sown. From excellent record keeping in the nursery, we have learnt that seed can still remain viable for up to five years.



Persoonia linearis

Space, is however, a hot commodity in a nursery, so on average, treated seed is kept and re sown for around three years and replaced with fresh seed (if we are lucky enough to collect in reasonable quantities).

Generally, at the nursery we always have persoonia on the go at each stage of the germination process. It is a very long continuous cycle taking a minimum of 18 months to get a reasonable sized persoonia seedling. We are about to tube up the seedlings that started germinating in April. We have fruit fermenting from collecting in

November 2022 and our stock plants are finishing up flowering and will hopefully produce fully formed fruit. Now that we have good cycle going, we are starting to get good stock level, particularly with *Persoonia pinifolia* and *P. lanceolata* and are hoping to build up our *P. linearis* and *P. levis*.



Persoonia pinifolia in full flower

Swainsona formosa: Sturt's Desert Pea

Greg Kirby

Greg has spent over 30 years collecting, studying and breeding Sturt peas. He has run field trips across much of the outback regions of Australia and bred Sturt peas at Flinders University for cut flowers and pot plants. He is past president of the Australian Plants Society South Australia.

Swainsona formosa (Sturt's Desert Pea) is one of the most widely distributed native plants in Australia, growing from the west coast of WA on Cape Range National Park to central western NSW around Goolgowi and Lake Cargelligo, covering about 32° of longitude. Large populations occur in areas with high soil fertility, particularly with high levels of N, P, K, Ca and Fe. There is considerable geographic variation in many characteristics. The eastern populations are very prostrate, with narrow runners, good resistance to root rot diseases, few flower colours and flower mostly in the spring whereas the western plants are often upright growing, with thick runners, poor resistance to root rots, many flower colours and flower at any time of the year. Most populations are in grazing lands, but the eastern-most populations are on roadsides surrounded by paddocks of cereals and canola.



Sturt peas on Koonamore Station (eastern South Australia)

History

The first known collection of plants from Australia was made in 1699 by William Dampier from the Dampier archipelago (WA) and included a specimen of a Sturt Pea. The next collection was from near modern day Lake Cargelligo in 1817 by Alan Cunningham. Sturt's discovery was made north of Broken Hill a few years later. By the late 1830s, plants were being cultivated in Europe and the species quickly became known as 'a most capricious plant' because of the frequent failure to survive. By the late 1800s, at least one German nursery had mastered the technique of grafting onto disease resistant rootstocks and English gardeners reported growing grafted plants outdoors in the summer and bringing them into pots in heated greenhouses in the winter.

Ecology

The largest populations of Sturt Peas mostly occur on clay pans, along stream beds and on roadsides. Sometimes they grow on sand hills (eg Kokatha sand hills in SA) but more often in the inter dune swales.

The main pest species is the Pea Blue butterfly (*Lampides boeticus*) which lays eggs on buds and flowers. The caterpillars are voracious eaters of the flowers and young pods. In cultivation, aphids and spider mites can cause problems until predator and parasitoid populations build up enough to control them. When growing Sturt peas in pots in a plastic tunnel house from spring to autumn with a winter break, I found it best to buy some spider mite predators each spring as soon as the first mites were observed. In pot cultivation, mealy bugs can become a severe problem and you need to soak the pot in a suitable systemic insecticide to control them.

Mildew occurs on leaves when plants are grown without adequate ventilation. In wintertime it is very tempting to close up a green house or tunnel house to hold the sun's warmth for as long as possible, but mildew is almost inevitable and can kill plants by defoliation.

Sturt peas are part of the ephemeral flora. Across southern WA, SA and NSW seed germination follows heavy rains in late summer to early autumn when soil temperatures are over 20°C. The plants grow through autumn and winter and start flowering late winter/early spring. Most of the ephemeral flora will set seed and die in September whilst the Sturt peas will keep flowering and maturing pods until late spring/early summer, reaching a spread of 3 to 4 metres. In wet summers, plants can survive the summer and regrow the following autumn to produce a second crop of pods and seeds.

Honeyeaters quickly recognise the flowers as a source of nectar. I was always surprised by the arrival of New Holland honeyeaters only a few days after the first flowers opened in the outdoor garden that I used at Flinders University. These normally very noisy birds are surprisingly quiet when they fly down to feed. They cross pollinate the peas as they flit from one plant to the next. Honey bees also learn to feed from pea flowers, but they do not help with cross pollination as they rob the nectar and not the pollen by biting into the back of each flower.



Roxby flowering patch
South Australia.

Sturt peas appear to coexist quite well with sheep and cattle in the grazing zone. However, sometimes I have seen patches that have been severely grazed and trampled and I have been told by locals that camels will do this. Seedlings (but not mature plants) are consumed by rabbits, which is not usually a problem if a good season follows a drought, but can be devastating when two or three consecutive good seasons allow rabbit numbers to build up.

Seed dispersal was a puzzle to me for a long time. A large pod can carry about 90 seeds. Mature pods do not explode and throw their seeds away like many other legumes, but clamp down on the seeds and lock them away. Sometimes the suture line down the axis of the pod will split and leave two half pods with the seeds locked inside. If you try to remove the seeds from mature pods, you will discover that it is very difficult to get them out. I did not work out how dispersal happened in nature until I experienced a storm front with heavy overnight rain followed by a windy day on a field trip. The rain softened the pods and one end opened up enough to allow seeds to come out. The wind blew the half pods across the ground and they spun like little boomerangs, throwing seeds out of the open end. The seeds were being scattered across the landscape,

probably for some distance from the parent plants. Seeds locked inside a pod appear to be well protected against most animals that might feed on them, although stockmen have told me that emus will sometimes eat whole pods. Seeds have some chemical protection from being eaten as they contain L-canavanine, a toxic non-protein amino acid found in many legume seeds.

Cultivation

In the late 1980s, in a burst of interest in cultivating native plants, a few people tried growing Sturt peas in cultivation, including an Israeli group. The results were mostly disappointing, but it became clear that nutrients were important as plants grew spectacularly in hydroponic systems. However, recycling hydroponics systems spread root rot diseases very rapidly and many cases of 100% mortality occurred. Growers were selecting for bigger flowers and stems for the cut flower industry or compact growth and abundant flowers for the pot plant industry and not for disease resistance.

I started experimenting with Sturt Peas in the late 1980s. I had previously had an interest in plant disease resistance genes so my attention was on finding plants with resistance to the root rot disease(s). Some plants showed excellent resistance but after three years of growing plants in the same garden area, I was wiped out by 100% mortality due to the very high level of fungal inoculum. In future years I sterilised the garden with methyl bromide about four weeks before planting out to control the root rot disease. Plants would still die of root rot after starting flowering, so I could select for plants that showed the best longevity. Selection for long flower stems (peduncles) quickly raised the average stem length from about 14cm to 22cm, but this was not enough to encourage growers to grow the plants for the cut flower market. They kept pointing out that they needed 40cm stems to compete with carnations.

I changed to breeding for pot plant cultivation. This involved selecting for compact growth, early flowering and upright growth. I decided to try to breed F1 hybrids for uniformity and quality but eventually had to give up when none of my inbred lines was sufficiently fertile to produce enough seed to be economic. A visit from a commercial pot plant wholesaler encouraged me to change tack to breed for cutting propagation. This has the great advantage that a good quality plant can be cloned and multiplied up to a large number of pots. The first product of this breeding program was given the name "Flinders Flame" and became a commercial product for several years until unsolved problems with propagation in the winter caused too many losses and the cultivar was withdrawn from sale.



Left: 'Flinders Flame'; the first cultivar



Cultivation: in a garden

A good preparation is required for growing in a garden. Choose the sunniest patch of ground. The soil must be enriched with compost and fertilisers (both organic and mineral) at about twice the rate recommended on the bag. Competition from neighbouring trees and shrubs needs to be minimised by removing all roots from the planting area. When soil temperatures are above 20°C, seeds can be nicked with a sharp knife or razor blade and planted 1 to 2cm deep in groups of three or four seeds about 40cm to 50cm apart. Seed packets often recommend pouring boiling water over seeds to stimulate germination, but a series of careful experiments by a student showed that conditions have to be very carefully controlled or else most seeds are cooked or not stimulated. Nicking seeds is tedious but much more successful: just shave a little of the brown/black outer layer off so that a little of the white tissue underneath can be seen. This allows water to enter the seeds and stimulate germination.

Keep the seedlings protected against snails and slugs. Water regularly until the seedlings are growing well and then water deeply about once a week. Liquid mineral fertilisers can be applied as a foliage treatment to encourage quick growth.

Cultivation: in a pot

Sturt peas are large and quick growing plants, so they need a large pot. Half wine barrels are great but my preference is for large “water well” pots because you can fill up the water well once a day and be fairly confident that the plant has enough water to last until tomorrow. (Hint: always use rainwater when filling water well pots. In places like Adelaide the water is too salty in the summer unless you rinse the pots every week).

Obtain the best quality potting mix with added nutrients and then add more nutrients. Slow release pellets based on chicken manures are good but you have to be careful with your choice of resin coated controlled release fertilisers (CRF). Some (such as Osmocote) are optimised for commercial growers who can keep their pots in the mid 20°Cs and will “dump” their minerals in a short time in a hot pot in the mid to high 30°Cs. So a fertiliser that is sold as having a useful life of nine months can be finished in a few weeks. I used to use MacroCote 8–9 months Release plus Trace Elements for pot plant cultivation at Flinders University but this is too expensive for home cultivation. For home growing, I usually buy a CRF with micronutrients that claims a 12 month release life and use a couple of table spoons per large pot. My

main fertilising is based upon liquid fertiliser with all nutrients applied every week or two. Do not bother with organic liquid fertilisers, they do not provide enough nutrients for hungry Sturt peas.

Well grown plants usually need some grooming every few weeks. Runners that are too long can be cut back to two or three nodes, runners with browning leaves can be trimmed to remove unsightly leaves and all pods should be removed apart from a couple of pods to provide seed for next year.

I do not know of any insecticides approved for home gardeners that will control Pea blue butterfly caterpillars. You will have to frequently check the flowers and squash all the caterpillars by hand.

Reference: If you want more information, I highly recommend the book about Sturt peas: “*STURT PEA A most splendid plant*”. By David Symon and Manfred Jusaitis



An early trial with a grafted Sturt pea in a water well pot, shown off in a bed of Sturt peas at Flinders University in the early 1990s.

Guidelines for a Native Pond

Mark Abell

Mark has been involved with the APS since childhood. He has completed a Science degree (Botany and Computing). He is an APS NSW Life Member, has served on the Board, been President of North Shore and Newcastle Groups and is currently involved in Newcastle and Hunter Valley Groups. Mark also has an interest in Australian Native Fish and was an active member of ANGFA NSW (Australian & New Guinea Fishes Association).

A native pond / water feature can be not only an attractive part of your garden, but a haven for visiting wildlife and an interesting small ecosystem. This article is not intended as an exhaustive pond construction manual, but rather a reminder of some things to consider when planning and building your pond.

Before starting...

Before actual construction begins, please take a little time to consider the purpose that you intend for your pond. This will guide many of the subsequent decisions that you make. Also consider the needs and requirements of any inhabitants (plants, fish, tadpoles and invertebrates) that will occupy the pond. Often these inhabitants and their comfort can be an afterthought.

As many of us prefer to do it ourselves, below are a few points to consider in the planning stages.

Location...

- Try to avoid locating the pond directly under large trees. This can help to avoid root problems and minimise the problem of leaves falling in. Unless removed these can decay and lead to poor water quality.
- It is also worth trying to avoid the pond being in full sun (as this can cause it to overheat on hot days). Preferably locate the pond in a semi shaded location with good light and protected from the hot mid-afternoon sun.
- If the pond is likely to attract frogs, you might want to avoid locations where the frogs may disturb you and your neighbour's sleep, that is, avoid just outside of your bedroom window as frogs can be quite noisy in the warmer months.

Design Features...

- If keeping fish is an important purpose, try to make the pond as large and as deep as practical to minimise temperature extremes in the pond – check with your local council as to the maximum depth

allowed. Local regulations may require pool fencing if greater than a certain depth (often 30cm). Also, the greater water volume helps in keeping the water chemistry more stable.

- Remember when designing your pond to consider water supply and drainage as well as electricity supply for lights, pumps and filters.
- The pond should have an overflow area (a place a little lower than the height of the rest of the pond) included. This will help control where the water overflows to (either through heavy rain or from overfilling).
- All overflows should be screened to prevent the escape of plants, snails and fish during heavy rain events. As well as keeping your fish and plants in the pond, this serves to protect the local waterways from any potential escapes (especially important if non-local fish are in the pond).
- If you are in an area where cane toads are present, you should place a barrier around your pond. Cane toads are not good jumpers or climbers, so a barrier around 50cm high will be sufficient. If using a wire mesh the holes should be 1cm or less.



A screened overflow in a commercial aquaculture pond.



A native pond in North Queensland with a cane toad exclusion fence.

Preparation...

- Fish and tadpoles are very sensitive to contaminants, so new ponds should be well rinsed out before use.
- If filling with tap water remember to allow time (at least 24 hours) for the chlorine and chloramine in the water to dissipate, or use a commercial chlorine neutraliser from a pet shop.
- Before adding plants and fish, ensure that all equipment such as filters, fountains and waterfalls are working satisfactorily.
- Allow at least a week for plants to settle in and begin growing before adding fish. If possible, remove any obviously dead leaves as they will decay and add unwanted excess nutrients to the water.

Plants...

- There are a number of native plant nurseries and water garden nurseries that will have a range of suitable native plants for planting in and around the pond.
- Consider keeping the plants in pots. This can make cleaning easier, as you can remove the plants from the pond first. It also makes it easy to change the arrangement and location of any plants.



A native water feature at the Territory Wildlife Park near Darwin.

- Allowing for shallow areas around the edges will allow the inclusion of moisture loving marginal plants. In addition to improving the appearance of the pond, it provides valuable habitat areas for any inhabitants of the pond.

Fish and Frogs...

- Care should be taken in selecting the fish for your pond. Native fish local to your area are best. (Goldfish, Koi and Gambusia have no place in a native pond).
- Fish should be of a size that is suitable for your pond. This can restrict the available choices and may make fish more difficult to obtain. A good specialist shop (Aquarium, water garden supplier or native plant nursery) should be able to advise on suitable local native options.



Rhadinocentrus ornatus – Ornate Rainbowfish – a good pond fish from the coastal drainages between Rockhampton and Coffs Harbour

- If you want to attract and keep frogs (and tadpoles), further consideration around fish types is needed. Most fish will eat tadpoles. This can be limited by including plenty of water plants for cover, plus selecting fish that are less aggressive and stay small.
- For frogs you should include a gently sloping side so that any non-climbing frogs can enter and exit easily.
- Avoid overfeeding the fish – all food should be consumed within 10 minutes or so. Uneaten food can rot and degrade the water quality.



Limnodynastes peronii – Striped Marsh Frog pair.

Maintenance...

- Periodic cleaning out of any dead leaves and other vegetation that may have fallen in the pond is needed. This “mulm” can be scooped out by hand and added to your compost heap. A good time to do this is early spring before the temperatures start to rise and the mulm starts to break down more rapidly.
- Periodically the pond water will need to be topped up, and you may also need to do a partial “water change”. If using chlorinated tap water, try to keep the amount of “fresh” water added to less than 25%.



A natural sub-alpine pond near Mt Kosciuszko showing a good diversity of plants

Between Jerusalem and the Acropolis

Harry Loots

Editor's note: In the Autumn issue of "Australian Plants" we published a story by Harry about his love of walking in the Tasmanian highlands and of the plants he encounters there. In the process of sorting boxes in my garage in the one with information on Tasmania I found this article by Harry in the June 1998 newsletter of Harbourside, his then district group of SGAP NSW. We decided to share it with readers, although in this story Harry writes more about the walking experience and his fascination with names and there is less emphasis on plants. His photos at that time were slides so we have used later ones or sourced other photos. Plant names and science have not been updated.

Rain made the highlands of Tasmania into a natural wonder. Highland plants, rivers, lakes and peats are a result of the usually wet climate. Rain, wet days, wet nights has been the Tasmanian experience. I prepared for the January 1998 bushwalk to be taken by myself and Lindy, my companion, by waterproofing the tent and my rainjacket. Lindy spent a small fortune buying a new rainjacket. However, this time, instead of being soaked most of the time we suffered from sunburn and some heat exhaustion. In January 1998 Tasmania suffered a severe El Nino induced drought. We enjoyed ten mostly dry days walking between the Walls of Jerusalem and Lake St. Clair on the Central Plateau of Tasmania. Much of the usually soggy squelchy black peat had dried out. Our boots were dry. This was more pleasant than our usual experience of putting cold heavy wet boots onto cold feet in the mornings. Finding water, in this drought, was not a problem as our path led us past lakes and streams. The refreshing water was always cool and pure and there were plenty of opportunities for a swim.

We crossed a land called the Lake Country. It has over 4,000 lakes. Between 20,000 and 10,000 years ago, during the last. Ice Age, an ice sheet smoothed the landscape to leave indentations filled with water. Bluestone, which is dolerite, forms the high mountains and cliff faces. This volcanic rock breaks off in large flat planes. Jointing in the bluestone causes sheer cliff walls or jumbles of fractured rocks resembling giant building blocks. During the Ice Age the peaks were exposed, like pimples on a pale skin, on a sea of ice to form nunataks and ice gouged rock away from their base. Now this landscape has lakes scattered between mountains that project steeply from ice scraped planes. Bluestone blocks lie in giant jumbles on their summits and bluestone cliffs form sheer walls hundreds of metres high and just as long.

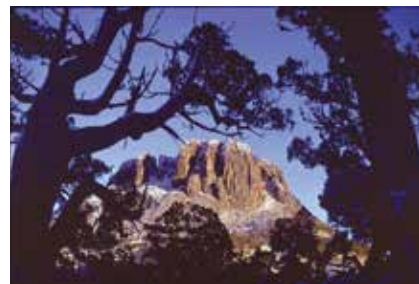
We followed tracks and camped at spots that have been well patronised by bushwalkers since the 1930s. They celebrated this other world, the reflections on its lakes, the cubed shaped bluestone on its bare mountains and the ancient pencil pines that grow among velvety green cushion plants in this alpine environment, with names of another world. Place names were borrowed from ancient history. We walked from the Biblical names of the Old Testament into the world of the gods of Classical Greece. After passing a string of lakes called Solomon's Jewels we walked through the pass, Herod's Gate, under the giant bluestone monolith of King David's Peak into the Walls of Jerusalem. Lake Salome is the placid centre-piece of a green plane of grass and cushion plants with small stands of ancient Pencil Pines ringed by the dark Walls.



A Pencil Pine in front of Lake Salome below King David's Peak.

More of the Holy Land was encountered at the Pencil Pine encompassed Pool of Bethesda which was under a pyramid shaped hill called The Temple. To escape the flies, rather than the heat we had a swim in the shallow Pool of Siloam before climbing Zion Hill from Ephraim's Gate. The breeze on Zion held the flies at bay while we viewed Zion Vale, Lake Sidon and Lake Thor (the Scandinavian god of war). Not all the names are from the Bible. After crawling down a steep gully off Zion Hill we walked through a Pencil Pine forest before disturbing a Bennett's wallaby on the swampy meadows of the Gate of the Chain. It was easy to navigate without tracks in this open country with its well defined landmarks. It wasn't until we had passed through the high pass of Damascus Gate and walked through a very large Pencil Pine forest down Jaffa Vale before we had seen the last Biblical reference.

Editor's note: Dick Burns, a long-term member of APS Tasmania and previously an avid bushwalker, has visited these areas and completed similar walks since the early 1970s. Dick has experienced very different climatic conditions. His photos depict the beauty of the area and the diverse climate.



Damascus Gate



Pool of Siloam



School students ice skating on the Pool of Bethesda



The Pool of Bethesda in warmer weather.

The land of Greek myths was entered from the Never Never. We walked to Pelion (home of the centaurs) Gap before climbing Mount Ossa (Greek Mountain). From Tasmania's highest elevation, exhausted, we rested on giant bluestone blocks to contemplate the world below. After walking down the Narcissus River we went up Cephissus (river god) Creek to enjoy Lake Ophion (Greek for snake place) on an exposed plateau with a maze of lakes called the Labyrinth. Last year we had climbed the Acropolis with its summit of fallen bluestone pillars and organ pipe like structures. We had also gone to the Parthenon and camped on Lake Petrarch (an Italian Renaissance poet) behind Mount Olympus. I should mention the end point of our walk – Cynthia (goddess of the moon) Bay.

In between the Walls of Jerusalem and the area dominated by Mount Ossa and the Acropolis we were able to spend many days alone. Although I have no proof, I think that ten days in the wilderness had a soothing effect on our souls. Many religious types such as Indian



Walls Lake Salome and Zion Hill. Photo: Dick Burns OAM



Vegetation of Mt Olympus Photo: Harry Loots

sadhus and Christian hermits go into the wilderness to seek God or enlightenment. Alone, we experienced the majesty of nature. Alone, we could look, listen and feel nature's earth, insects, plants, winds, heat and cold undistracted by others. It was an opportunity to experience how vulnerable and small we are against the forces of nature. After ten days in the wilderness when I looked into the mirror I did not recognise the person staring back. I had momentarily forgotten my own appearance. I was very conscious of the clouds as they dictated whether it would be wet or dry. The wind was also important. It blew away pesty flies which were in plague proportions in the warm weather, made loud roars in nearby forests and kept us awake at night as it buffeted our tent and made it flap as a gale blew down Lake Adelaide. We didn't experience snow on this walk but it can be bitterly cold in this area without much warning.

During the three days when we walked between the popular Walls of Jerusalem and Hartnett Falls we saw only two other people. Few walkers come this way to pass Lake Ball, Lake Adelaide, Lake Meston and then Junction Lake to walk down the Mersey River through the Never Never. In this beautiful country of heaths, scrub and tall forests we walked for days without meeting another soul.

We found an enchanted world filled with many botanical wonders. Alpine vegetation that is slow to grow but easily destroyed has not been disturbed by fire or man. We walked through large ancient forests of Pencil Pines (*Athrotaxis cupressoides*) in the Walls of Jerusalem. One of the largest remaining Pencil Pine forests is on the southern wet slopes of The Temple. Duck-boards now protect the soggy track as it winds its way down from Damascus Gate to Dixon's Kingdom Hut. Elsewhere these forests have been burnt out or died when introduced soil fungus (*Phytophthora cinnamomi*) has attacked their roots. Fungus can be fatal to these water loving pines.

Some of the pines are over 1,000 years old. The oldest have thick trunks above their root systems. In exposed situations a horizontal spread of lateral trunks usually sprout from the central trunks and a mini forest of up to 25 metres in diameter appears as erect trunks grow from these horizontals. These are typically very short forests but in more protected situations Pencil Pines may grow to a height of 18 metres. Unfortunately, some of these pines have been felled. In the 1930s trapper and later grazier Reg Dixon built a simple hut out of pine logs on the edge of the forest. Dixon's Kingdom Hut, as it came to be known, was renovated in the 1980s for the filming of the movie "The Tale of Ruby Rose". My memory of this film about a trapper's life in the Tasmanian Highlands is

of storms with attendant strong winds and snow which enveloped this hut dwarfed by the mountain and its forest.

Further along the track on Mayfield Flats between Junction Lake and Lake Meston we came upon extraordinary large mounds of sphagnum moss. Mayfield Flats is an ice scrapped flat boggy area. Here moss has grown over hundreds of years into round light green to yellow furry hillocks up to 50 metres across and a metre and a half high. These are the genesis of dry islands that will support plants needing well drained soil in a sea of soggy peat bog.



Walking out of the Walls of Jerusalem past a giant moss mound at Junction Lake.

We encountered the wildest country in the Never Never as we walked down the Mersey River. The track was difficult to follow. After descending into the valley next to the 20 metre high Clarke Falls we had the choice of walking along an overgrown river bank, through thick scrub on the river flats, through buttongrass where the track became a quagmire or through a rainforest that was a wet log jam. We made reasonable progress until we had passed McCoy Falls where we lost the track completely. I found out later that we were supposed to proceed through the rainforest next to the river. But the rainforest was very unappealing. It was a dark maze of large fallen logs covered with moss and various layers of slime. Copious layers of leaf litter and dark shadows obscured any pad which may have existed.

To escape the hard slog of the rainforest we climbed the valley side into a tall eucalypt forest. Higher up the fallen logs were even larger than those below and more difficult to pass because of the steepness of the valley's walls. At least it was brighter than the darkness of the rainforest and the sunshine raised our spirits. A thick litter of fallen branches, leaves and bark covered the ground to knee height. Each step was a giant step to get through this thick mulch. There was no evidence of fire and the trees were enormous. Those on the ground had been blown over, split apart at the base; to form rotting timbers decomposing with yellow fungi oozing from their sides. This is an old growth forest but we did not realise how old until we had to pass a stand of waratah (*Telopea truncata*). These plants usually grow as two metre high shrubs. Here the waratahs were 10 metres high with half metre thick trunks. We could not imagine the age of these 'shrubs' grown into trees but they were yet



Cradle Mountain, Photo: Harry Loots

another obstacle to our progress which had been intolerably slow. We descended back to the rainforest along a ridge formed by the valley's intersection with Campfire Creek. Although we had smeared on layers of Aeroguard to all exposed skin our lunch by the creek was cut short by the discomfort of mosquitoes buzzing around our ears. We soon found the track running along a boundary between buttongrass and two metre high Melaleuca scrub. Then 'bang!' Quite suddenly we had come across duckboards. We were back in 'civilization'. At Hartnett Falls we were on the Overland Track with its 100 walkers a day population. That evening we camped with twenty others at Kia Ora Hut. Our time alone was over.



Narcissus River at Lake St Clair

Southern Highlands garden

Sarah Cains

Editor's note: In the Spring 2022 issue of Australian Plants, which featured small Australian native gardens, neighbours Sarah Cains and Kristine Gow wrote of their gardens in Bowral in the Southern Highlands of NSW. Sarah has now written of her experience in sharing her garden with the broader community.

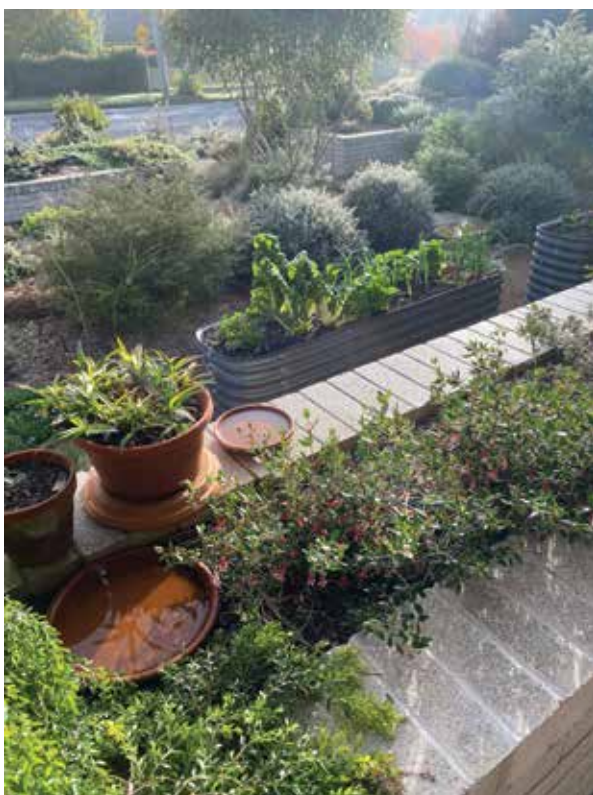
In April we were asked by both the National Trust and Southern Highlands Botanic Garden (SHBG) to open our garden to visitors. Since the weekends were back to back we agreed to do both. The weather was a bit shaky, but Bowral managed a bit of sunshine and only a little rain. Visitor numbers turned out to be HUGE! Around 1,500 visitors over three days! My husband, Geoff, and I spent all the visitor hours outside discussing plants and garden design.



Despite weather-imposed plant losses and the inevitable gaps, the little garden turned many heads and hearts towards natives. For the SHBG weekend, volunteer supervisors had a book for visitors to record their responses. Comments were many and overwhelmingly favourable, showing enthusiasm for the beautiful plants and for the way it is possible to make a small town garden using only natives – this is unusual in our very traditional Southern Highlands where copies of European gardens are the order of the day!

Of particular interest was our little back garden which is planted as an urban forest using *Eucalyptus gregsoniana*.

It was hard work smartening ourselves up! But altogether, the events felt like a hugely worthwhile effort.



Views of Sarah Cains' Southern Highlands garden.



Gardens for Life

Australian Plants Society Victoria (APS Vic) will host the biennial national conference of the Australian Native Plants Society (Australia) (ANPSA) on 30 September to 4 October 2024.

The theme for the conference is *Gardens for Life*. It will be held at the Melbourne Conference and Exhibition Centre in Docklands. The garden theme for the conference fits well with the public gardens in and around Melbourne that we will be visiting. Holding the conference in Melbourne also simplifies travel for interstate and international attendees.

Venue

The Melbourne Conference and Exhibition Centre is well set up to host our conference. It is a central venue with ready access to public transport, hotel and Air BnB accommodation options within walking distance and access to all that inner Melbourne has to offer for dining and free time. There are also plenty of parking opportunities, if so desired, although we would recommend public transport given the range of options available.

It is also becoming apparent that the CBDs within large cities all around the world are adapting to the lasting effects of the COVID pandemic on work life practice. People are working at home more and for CBDs to survive they must pivot to becoming entertainment and living areas. This transformation is taking place within the Melbourne CBD.

Formal bookings for the Conference and Tours are expected to open in early 2024.

For more details visit apsvic.org.au/anpsa-biennial-conference-2024/

To register your interest and receive updates about the conference interest at apsvic.org.au/anpsa-biennial-conference-2024

Contact Details: Email: anpsa@apsvic.org.au

Australian Native Plants Society (Australia) and member societies

Australian Native Plants Society (Australia) Inc. (ANPSA)

President: John Aitken

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INSECTS: GIFTS OF THE GODS follow up

In the Autumn issue of *Australian Plants* in her article of this name Maree McCarthy wrote of the co-evolution of insects and plants and how insects are camouflaged to evade predators. She challenged readers to find the moth in this photo. How did you go?



