



Gardening with Native Plants



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Contents

Editorial	<i>Merle Thompson</i>	3
Garden Design with Australian Plants	<i>Angus Stewart</i>	4
The Walcott Garden in Canberra	<i>Ben and Ros Walcott</i>	9
Black Stump Garden	<i>Tony Sexton</i>	15
"Panrock Ridge"	<i>Neil Marriott</i>	18
"Jahnsville" 1983–2015	<i>Max and Pam Jahn</i>	30
Inverawe Native Gardens: A Garden with Attitude	<i>Bill and Margaret Chestnut</i>	36
Chingarrup Sanctuary: Revegetation of cleared bushland	<i>Eddy Wajon</i>	41

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Australian Plants articles

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Layout: Lachlan McLaine

Contributions and offers to produce an issue are welcome. Please contact:

Editors, *Australian Plants*

PO Box 5026, Old Toongabbie NSW 2146

E-mail office@austplants.com.au

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Editorial

Merle Thompson

In the editorial in the Autumn 2014 issue I wrote that all the authors "enthuse on their theme, they love to share their knowledge and enthusiasm and, for those who are writing about their own home and its garden, they regard their personally created space as a 'Garden of Eden', 'Paradise' or 'my own patch at the Centre of the Universe'."

In this issue we are giving another group of native plant enthusiasts the opportunity to write of their special place.

For Eddy Wajon the special place about which he writes is a natural area, not a totally created garden. He and his wife, Donna, purchased large tracts of land in order to conserve and revegetate them. As with gardens, seeding and planting are involved in order for the process to be somewhat faster.

The other authors are writing about their own gardens – their approach or "philosophy", their successes and their failures and, of course, the beauty they have created. While some of these gardens are considerably larger than those of many, or even most, readers it is possible for all to learn from their experiences.

Four of our gardens – the Walcotts in Canberra; the Sextons in outer south-west Sydney, the Chestnuts near Hobart and the Marriotts in the Grampians – are in areas which are subject to both heat and cold and, in most instances, to dryness. The Jahns in suburban Adelaide have a different clime to deal with. How do they manage their own climates? Are you able to glean ideas for yourself? We don't in this issue cover tropical gardens nor Western Australia from a landscaping perspective.

Neil Marriott takes the matter of dealing with geography and weather further and makes observations on what he has noted in his garden which he considers are telling lessons about climate change. The natural areas of the Grampians have experienced increased frequency of wildfire with the potential for loss of ecosystems, species and diversity.

To set the scene Angus Stewart explores the idea of whether there is a distinctively Australian garden style. He suggests that this is the case and describes it as the 'Bush Garden'. He considers that this has resulted from Australian gardeners increasingly wanting to create a 'sense of place' as a landscape statement.

We hope that you enjoy reading of other gardens and are inspired to consider your own 'sense of place'.



Garden Design with Australian Plants

Angus Stewart

Angus is a professional horticulturist and presenter on "Gardening Australia". He has written several books on Australian plants including "Creating an Australian Garden" and is passionate about bringing native plants into Australian gardens with innovative garden design ideas.

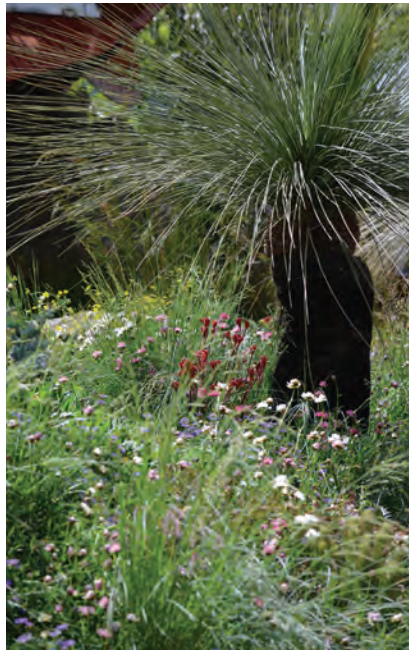
Is there such a thing as a distinctively Australian garden style? I would certainly argue the case, and if there is such a thing as a distinctively Australian garden design concept, it would be best described as the 'Bush Garden'. The hallmark of this design idea is an emphasis on the use of Australian plants, particularly the iconic genera such as Eucalyptus, Melaleuca, Banksia, Grevillea and Xanthorrhoea to name but a few. The distinctive textures and shapes of these plants create an unmistakably Australian landscape when they are used in mass plantings. A naturalistic informal layout that mimics a wild bushland landscape is usually combined with the use of water features (such as frog ponds) to encourage wildlife to not only visit the garden but to actually live there as well. Distinctively Australian sculptures made from materials such as corrugated iron and often with a rustic theme feature in many bush gardens as well.

There have been some notable pioneers of the 'bush garden' style such as Gordon Ford and Ellis Stones, and some excellent examples of their work can be found in Melbourne, particularly around the Eltham district. The use of mudbrick houses that blend beautifully with the 'bush garden' landscape are a wonderful additional feature, with the house often designed to be in sympathy with the garden. In recent years a new wave of garden designers has emerged, with a good example being Phillip Johnson who took out the 'Best in Show' award at the 100th anniversary Chelsea Flower Show in 2013. Phillip Johnson's striking achievement in winning the top award at such a prestigious Royal Horticultural Society show gave international recognition to the 'bush garden' concept and it showed that international designers were being strongly influenced by the 'naturalistic' style ahead of the neat geometrically themed gardens of box and yew hedges that have prevailed in Europe for hundreds of years.

The overwhelming themes of Phillip's winning garden were sustainability and reconnection of the gardener with the natural world, right down to the frog sound effects (recorded in Phillip's garden in the Dandenong's near Melbourne) that greet the visitor. The crystal clear fresh water pond that was the centre piece of the design represented a natural Australian



This page and next: Philip Johnson's exhibit at the 2013 Chelsea Flower Show – awarded 'Best in Show'. All photos by Angus Stewart.



billabong, and was partially fed by the capture and conservation of storm water from the site. Other features of the design were the use of recycled materials and solar power, bushfire retarding systems and plantings as well as an underlying theme of biodiversity and habitat creation for local wildlife. The garden was an unashamed celebration of the Australian landscape and one of Phillip's ambitions was to create a garden that will inspire Australians to bring our natural environment into urban gardens.

The plantings in the award-winning garden at Chelsea ranged from mature flowering grass trees (*Xanthorrhoea* species) to bottle trees (*Brachychiton rupestris*) and snow gums (*Eucalyptus pauciflora*) of varying maturity to foreshadow the development of a garden like this over time. A stunning array of flowering annuals and perennials was used to create the wow factor including everlasting daisies in yellows and oranges from the Sundaze range of *Xerochrysum* (synonym *Bracteantha*); the soft whites and pinks of an annual everlasting daisy (*Rhodanthe chlorocephala* subspecies *rosea* hybrids); the fluffy mauve flower heads of the mulla mulla (*Ptilotus exaltatus*), native daisies (*Brachyscome* 'Mauve Mystique'). The fresh water swimming pond simulated a natural billabong and was planted with a variety of water plants to demonstrate natural filtering of the water and to provide habitat for birds, fish, frogs and insects.

I would argue very strongly that the bush garden style has resulted from Australian gardeners increasingly wanting to create a 'sense of place' as a landscape statement. Early European settlers clearly favoured a gardening style that echoed that of their homeland, but over a couple of hundred years we have come to recognise that soils and climatic conditions over most of the continent are not conducive to the traditional European style garden. Add to that dynamic the apparent effects of climate change and we are developing a garden style that is less and less reliant on inputs of water and fertiliser.

The development of better cultivars of Australian plants has also increased the palette of plants available to gardeners such that the shapes, textures, sizes and colours can match it with the traditional exotic plant offerings. The trend towards smaller gardens in suburban areas has led to the development of a fantastic array of dwarf native plants such as the many compact cultivars of hairpin banksia (*B. spinulosa*) and river wattle (*Acacia cognata*). The recent increase in interest in growing edible plants of all descriptions in modern gardens has led to a great increase in the availability of 'bush food' plants also.





The Tony and Rae McLellan garden, Southern Highlands, New South Wales.

As well as the 'bush garden' style, most Australian gardens now feature at least some native plants such as grevilleas, but often their use is rather random and lacks any sense of design. Australian plants are sometimes used as part of other garden styles such as Japanese gardens where plants such as *Westringia fruticosa* adapt very happily to the closely clipped form that is required of plants in a Japanese garden. Herbaceous native plants such as scaevolas and everlasting daisies lend themselves brilliantly to the cottage garden style that is often a feature of European gardens. Given that Australia is a multicultural society it is to be expected that well-travelled Australians will wish to incorporate design styles from around the world but will give them a local flavour by using native plants where they will fit the design brief.

Whilst I would never seek to discourage gardeners from incorporating Australian plants into a garden based on exotic species I believe that we can encourage a much better result by demonstrating good design principles with Australian plants. In particular, the continued evolution of a distinctive Australian garden style as outlined above will encourage gardeners to create garden landscapes that are much more in sympathy with the landscape of our unique continent.

The Walcott Garden in Canberra

Ben and Ros Walcott

Ros and Ben Walcott have been gardening for many years starting with a large garden in New York for 30 years before moving to Canberra in 2003. Here they established a new native garden and became active in the ANPS Canberra Region. Ben is leader of the Garden Design Study Group and Ros is the editor of the quarterly GDSG Newsletter.

The garden that we started in 2002–2003 was described in the September 2007 issue of *Australian Plants* (Vol 24, No. 192). The reader is referred to that article for the beginnings of this process. The 9,300 square metre property was a real 'tabula rasa' when we purchased it in 2001 and we have developed it into a predominantly native garden. We feel that the following design principles that we developed in the beginning are still relevant today and most have worked well:

- the garden would contain mostly plants native to Australia
- there would be little, if any, lawn. Where we needed open space we would have a meadow of grasses, forbs and lilies
- the garden would be attractive to birds and other wildlife
- plant foliage and shape would be more important than flowers, even though flowers were needed to attract many of the nectar feeding birds
- we would attempt to retain all rain water on the property for use in the garden
- there should be some open water in the garden to attract wildlife
- we did not want a series of enclosed garden rooms, rather different areas that flowed into each other
- there would be more emphasis on the natural rather than the formal in the garden design, including wide paths in curved shapes
- while most native plants require trimming, they should only be trimmed to enhance their natural shape, not to create any formal shapes.

In this article we describe the evolution of the garden over the eight years since the previous report. The garden is now almost completely screened off from the road by a large dense hedge of *Callistemon salignus* which is kept trimmed to a height of about 3 metres.

It is remarkable how much change has occurred in the past few years. Some plants have grown much too big for their space and have had to



The pink new growth is attractive, appearing in spring and after rain.



The front entrance with pots of Wollemi Pine (*Wollemia nobilis*), and Banksias with *Grevillea* 'Lady O' on either side.

be removed. Others such as *Grevillea* 'Scarlet Sprite' never flowered very well and, as they were in prime locations, were removed.

We have over 100 different *Grevilleas* in the garden and 'Lady O' is one of our favourites as it blooms all year and is very hardy in our

conditions. It is one of local plant breeder Peter Ollerenshaw's hybrids created at Bywong Nursery.

Other large flowered *Grevilleas* such as 'Peaches and Cream' (below) and 'Billy Bonkers' among others do well in protected positions.



Grevillea 'Lady O' (L) and *Grevillea* 'Peaches and Cream' (R).



In this view down the drive way from the house entrance, the different foliage colours and textures are apparent. In the distance the blue of the *Acacia covenyi* contrasts against the dark green of the Portuguese Cypress (*Cupressus lusitanica*). Just to the left of the *Acacia* is *Eucalyptus gregsoniana*, an attractive small mallee gum. On the left are the new garden beds created in late 2014.





Originally, this area had been a native meadow with grasses and forbs. It was very hard to maintain this meadow as weeds were a constant problem. Surrounding the property were a number of very large *Pinus radiata* that had been planted in the 1930s. Many of these trees were becoming senescent and had to be removed. That meant driving a 100 tonne crane onto the meadow to cut the trees a section of trunk at a time. This effectively destroyed a large part of the meadow so we decided to convert it to garden beds. We poisoned the existing plant material then removed the top layer of soil with the plant material and broke up the clay underneath both mechanically and with Dynamic Lifter. Curved paths were created and new soil with a high sand content was placed on top of the new beds which were mulched with gravel. We have started planting these beds this spring with low growing *Eremophilas*, *Banksias*, *Grevilleas*, *Leuchtenaultias*, *Xerochrysums*, *Chrysocephalums* and other plants. The key design objective is to use spreading plants that are below one metre in height so that the original concept of a low garden in front of the house is maintained.



We planted the trees in the 'meadow' seven years ago to provide shade during the summer months and protection from frost in winter. In the foreground right is *Eucalyptus polyanthemus*, further back towards the house is *Eucalyptus sideroxylon rosea* and to the left of that is *Eucalyptus stricta*.

On the other side of the driveway is a garden area that was created from a pond that was not successful. It received runoff from one side of the house and was either dry or overflowing. We decided therefore to punch



holes in the liner and to fill in the pond with sandy soil. A *Melia azedarach* var. *australasica* was planted in 2007 with an under planting of *Rhagodia spinescens*. The *Rhagodia* is clipped to form grey-blue waves indicative of the former pond. At the lower entrance to this garden, we have used *Olearia lanuginosa* 'Ghost Town' which has developed a wonderful shape and colour (seen in the foreground). On the right is one of two grafted *Grevillea* 'Poorinda Royal Mantle' which form a soft green pillar.

When the garden was first designed we wanted to have rain water tanks to irrigate the garden. At that time (2002) these were illegal in Canberra (now compulsory) and so we decided to have a series of ponds that would collect the runoff from the hardscape of the house. The lower pond was lined from the existing clay on site and was planted with native sedges and reeds.





This view of the top edge of the ponds shows two *Acacia pendula* and on the left of them is an *Acacia argyraea* which forms a very dense small bush. The purple flowers are *Lythrum salicaria* which has naturalized around the pond edge. We have finally found



a successful hedge plant that will tolerate the heavy wet clay of the pond edge. This plant, *Callistemon subulatus* 'Brogo Overflow', can be trimmed into a hedge and flowers at least twice per year. Even when not in flower it makes an attractive edge to the lower pond.

The garden is continuously evolving. Looking back at photos taken even two years ago shows, in many places, quite a different garden. Native gardens grow quickly but sometimes plants also die or senesce after five or so years and need to be replaced. Also, during that time, new plants have become available from nurseries or through friends so the character of an area changes.

The garden is going to be one of several that will be visited by those of you who are attending the ANPSA Biennial Conference held in Canberra 15–20 November this year.



Left is a garden bed in January 2015 and on the right the same bed in September 2013.

Black Stump Garden

Tony Sexton

Tony and Penny Sexton are members of the Macarthur District Group in New South Wales. Their garden is located in a semi-rural area near Camden, south-west of Sydney.

After outgrowing our small project home in Narellan, we moved into our newly built home on 1 ½ acres (0.6 ha) 5 kms west of Camden, over Christmas 1981. It was an exciting time with our young family. It was a lovely block with a North-Easterly aspect, gently sloping to Sickles Creek, the back boundary.

The soil was heavy loam to 10 cm on top of 50 cm of clay. With work and family commitments taking up our time, gardening wasn't even a consideration at this stage.

It wasn't until seven or eight years later that any garden was started. This happened without any real plan, either in the head or on paper. A few plants were purchased randomly. This mixture of exotics and natives remained for the next six to eight years, until I was given a copy of *Birdscaping Your Garden* by George Adams. Native birds have always been special to me, being one reason we purchased a rural block. At about the same time, I joined the Australian Plants Society.

From that point on, the emphasis was on native plants. With each new planting the passion grew, to the point where I now can be quite truthfully called a native plant nut!



Acacia conferta



Brachychiton bidwillii

The garden was gradually transformed from haphazard to become more orderly. Many mistakes were made along the way. Previous plantings were given the axe and others were transplanted to more suitable locations. I raised the garden beds using any organic matter I could get hold of, used gypsum to break up the clay and imported loads



of coarse sand and crushed granite mix. I used sandstone rocks for borders and put on lots of mulch, both organic and inorganic.

After a visit by Jeff Howes, fellow APS member and Australian Open Garden Scheme volunteer, we became part of the Open Garden Scheme in 2008. We open on two consecutive years and have the third one off. Jeff asked our garden's name, so I positioned an ironbark stump on our verge, burnt it black and so saw the birth of Black Stump Natives!



A formal area in the garden dominated by Grevillea 'Golden Lyre'.

After first being a bit reluctant about opening to the public, this is now a weekend I look forward to every year. The months and weeks leading up to Open Day are full on – I'm flat chat. Spreading fresh mulch is a great way to dress up a garden. It's one of the must-do jobs most years, as well as pruning, fertilising, weeding and filling in any vacant spots. Preparing, cooking and freezing food for morning teas and light lunches sold on the day are other time-consuming jobs.

All the hard work is rewarded ten-fold from the moment visitors start arriving. Black Stump Natives is well received by most visitors. The positive comments from them are certainly a big confidence booster and they ensure I keep going and try even harder next time.

But will there be a next time? The Open Garden Scheme, in its present form, is finishing at the end of the season. One of our astute Native Plant members said that this could be an opportunity for our Society. We could take over the opening of gardens showcasing predominately Aussie plants – Advance Australian Flora!

To really appreciate what lies beyond the Black Stump, pay us a visit. We are open in autumn, on 2nd and 3rd May 2015. However, fellow APS members are always welcome to drop in – just give us a call beforehand.

To give you an insight to the garden, there are over 700 trees, shrubs and groundcovers representing over 50 different species. By far the dominant species is Grevillea. There are lots of lillypillys, banksias, eremophilas, brachychitons and some xanthorrhoeas. A personal favourite is Mount Spurgen brown pine (*Prumnopitys ladei*), a lovely rare pine native to the Atherton Tableland in Queensland. A cabana and small water feature, planted with native aquatic plants is a nice place to relax. Our covered barbecue area is another popular feature. It was built using recycled timber from a disused wool store and is fitted out with old tools from the timber industry – axes, adze, crosscut saws and broad axes. The shed often gets more accolades than the garden – a bit deflating!



View of the cabana and part of the water feature.

The saying goes "a garden is never finished". This is certainly the case with my garden – replacing shrubs for different reasons, starting a new bed, mulching, fertilising and pruning. I try to prune most plants every year, usually about spring, after frost danger has passed. There is always something to do and it certainly is a labour of love.

Living in this wonderful country we have much to celebrate – growing our native flora is a great way of doing that.



'Panrock Ridge' Black Range, Stawell, Victoria

Neil & Wendy Marriott

Neil is the co-author with Peter Olde of the three-volume The Grevillea Book and author of the Field Guide to Grassland Plants of South-east Australia. He runs an Environmental and Horticultural Consultancy business with his wife Wendy. He has carried out extensive flora surveys and created many beautiful garden landscapes. Wendy specialises in native grassland management and restoration, landscape planning and rare plant propagation. In this article Neil writes of the delights but also many set-backs in their own large garden.

After 12 years running 'White Gums Nursery' on hard, gravelly soils at Deep Lead, I was lucky in 1991 to purchase 200 acres of hilly granite country in the Black Ranges, south of Stawell. The area is about 200 kms inland, just north of the Great Dividing Range, with a Mediterranean-type climate (cool, wet winters and warm to hot dry summers). The land had been grazed by sheep for maybe a hundred years, but had superb views out over the plains directly at the nearby Grampians Ranges some 20 kms to the west. When I bought the property the average annual rainfall was around 600–650 mm per year, and there were fifteen permanent freshwater springs along the hillsides.

The first three years were spent eradicating rabbits and erecting rabbit-proof fences to keep them at bay! I also had built a very large dam and wetland in the valley for wildlife and reticulated a water supply to the areas where I was planning to establish gardens.



'Panrock Ridge' as it was when first purchased in 1991. Photo: Ken Marriott



First plantings around the new house. Photo: Neil Marriott

The First Plantings

By 1994 I felt I had done enough rabbit control to begin planting. Throughout that year I planted thousands of indigenous trees and shrubs across the entire property, had a large and extensive wetland installed in the valley and the Department of Environment planted 12 acres of native timber trees as a 'break of slope' trial beside the wetland.

That same year I also began on my first Grevillea Garden; the site chosen for the Grevilleas was on the north-east aspect of our hill where extensive rabbit warrens had been deep ripped. I had also ripped with my tractor numerous other sites and they were all planted out in winter. Initially, I planted straight into the rip lines and, due to the warm sheltered site, loose friable soil and good rainfall, the plants established rapidly.

However within 12 months there were signs that many of the plants were suffering with brown and dead lower leaves spoiling their appearance. A soil analysis revealed hyper-acidity (pH 4.2–5.0), with a corresponding high level of manganese, causing toxicity to my plants. Hyper-acid soils also block the uptake of iron, exactly the same as alkaline soils do, resulting in chlorotic leaves and stunted new growth. The problem can be exacerbated by the use of organic mulches which further increase the acidity as they break down. The solution was to apply lime and dolomite at the rate of around 1 tonne of lime and 0.5 tonne of dolomite per hectare!! I started doing this for all further plantings and top dressed all original plants with lime and dolomite and the problem was slowly but steadily cured!!



View in early Grevillea Garden featuring *Grevillea magnifica*, *G. rigida* and *G. excelsior* set amidst natural granite boulders. Photo: Neil Marriott



View in early Grevillea Garden featuring *Grevillea excelsior* in front of *Grevillea magnifica subsp remota*. Photo: Neil Marriott

The Grevillea Garden

This was divided up roughly on a state basis with the tropical species on the highest and warmest frost-free sites against large granite boulders that acted as heat banks. Below them in the very hot upper areas I grew Western Australian Grevilleas. Then came Queensland species, then New South Wales species and down the bottom came the Victorian and Tasmanian species. This seemed to work extremely well with most gardens taking on the feel of their particular state and, to enhance this, I interplanted the Grevilleas with a selection of other natives from that particular state.

In those days we used to get reliable winter-spring rainfall and, as a result, it was not long before I established many more gardens, including a Rainforest Garden in the gully below the Grevillea Gardens. This was an area of deep chocolate loam with springs at the top that flowed out and down the hill throughout that area. Within months the plants, including extensive varieties of *Syzigium*, *Backhousia*, tropical *Grevillea*, *Polyscias*, *Elaeocarpos* etc, were all thriving and establishing rapidly under a canopy of fast growing Manna Gums. *Eucalyptus viminalis*, (for the local Koalas), Blue Gum, *E. globulus*, and Spotted Gum, *Corymbia maculata* etc. The rainforest Grevilleas in particular grew superbly, flowering well within a few short years.



The same valley as first photo with new wetland and timber plantations. Photo: Neil Marriott



A variety of Grevillea species in the Western Grevillea Garden. Photo: Neil Marriott

Mixed Gardens

As well as the large Grevillea Garden, I made several other areas of mostly smaller and showy Grevilleas and hybrids in mixed beds and differing microclimates around the house. I tried to imitate the dense, low heathland that I love, and feel I succeeded as, near the crest of the hill, two built-up beds curve away from the house looking crammed full of small and rare species.

My Grevillea collection became the registered official collection of the Garden Plant Conservation Association of Australia, as well as the living collection of the Grevillea Study Group. With assured rain, good free-draining soils and our own propagating, we soon had a very large and diverse collection of Grevillea. In fact, I even supplied Kings Park and Mt Annan Botanic Gardens with many of the rare and endangered species for their collections. Peter Olde and I were travelling all over Australia at the time, collecting and researching the genus Grevillea for our upcoming three volume set *The Grevillea Book*. As a result there were very few species that were not collected and trialled in my gardens.

Cut Flower Garden

Down in the central valley a large area with deep granite sand proved to be ideal for cut flowers. This area was spread with lime and dolomite which was then deep ripped before being planted with several hundred Scarlet Banksias *Banksia coccinea* and Waratahs *Telopea speciosissima*. These thrived and within a few years we were picking hundreds of bunches of both for the wholesale market.



This page and next: the Terraces Garden. Photos: Neil Marriott

The Terraces

In another large open area of sloping hillside we deep ripped and limed the soil and designed a series of built-up beds up to 1 m in height and 2 – 3 metres wide. The slope allows views of all the terraces but metre wide mown paths between permit easy maintenance. The terraces were planted with a large range of Banksias, Dryandras, Grevilleas, dwarf Eucalypts, Correas and many more genera that needed very well drained soils.

Most species selected were only small shrubs at maturity, with the largest being only 1–2 m in height, giving the terraces a distinct low heathland effect. The site is in full sun, so again most plants thrived and were soon flowering prolifically. However a spring deluge resulted in a wave of water running across and through the terraces, washing away the mulch. We realised that installing a dry creek-bed would help cope with heavy rain events and enhance the walk-through experience. The creek was landscaped with tufted Lomandras and tussocky grasses and lined with washed river pebbles, but since its installation it has hardly ever flowed!





The Drought

All gardens thrived up until 1997 when for the first time at 'Panrock Ridge' we had a very dry year. In fact 1996 turned out to be the last "normal" year weather-wise we would have. Each following year gradually became dryer and dryer to the point where in 2012 and 2013 we got less than 400 mm of rain per year!

To cope with this drying climate we began to change the way we constructed our gardens. Instead of simply building up beds to improve winter drainage, we built them so they would harvest water in swales, allowing it to soak into the subsoil. Tracks also were designed to harvest winter water so it can be used by the plants during dry summers.

Climate Change

Gradually the realisation came that we were not in the grips of a long drought but climate change! This has resulted in a complete re-think of the species selection for our gardens; where we had a large collection of Correa, Phebalium, Eastern states Grevillea etc we now have to choose those species that are adapted to living in a dry and hot climate. This has meant the selection of a very large range of inland and Western Australian species in particular.

It is rather sad that we can now grow Western Australian plants far more readily than our very own indigenous species! Already species such

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Australian Native Plants Society (Australia) and member society contacts

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

President: Lawrie Smith AM: E-mail: ANPSAexec@sgapqld.org.au
Secretary: Jane Fountain
Email: ANPSAexec@sgapqld.org.au
Website: <http://anpsa.org.au>

Australian Plants Society NSW Ltd

President: vacant
Vice Presidents: Graeme Ingall, Mark Abell
Secretary: John Aitken
PO Box 5026, Old Toongabbie NSW 2146 Tel. (02) 9631 4085.
Email: office@austplants.com.au
Website: www.austplants.com.au

The Australian Native Plants Society, Canberra Region Inc.

President: Alison Roach
Email: president@nativeplants-canberra.asn.au
Secretary: Jeanette Jeffry
Email: secretary@nativeplants-canberra.asn.au
Website: nativeplants-canberra.asn.au

Society For Growing Australian Plants (Queensland Region) Inc.

President: Trevor Bacon
Secretary: Beth McRobert: PO Box 586 Fortitude Valley QLD 4006
Email: secretary@sgapqld.org.au Website: www.sgapqld.org.au

Australian Plants Society, S.A. Region Inc.

President: John Murphy E-mail: president@australianplantssa.asn.au
Secretary: Ms Ali Ben Kahn, PO Box 304, Unley, SA 5061.
Email: secretary@australianplantssa.asn.au
Website: www.australianplantssa.asn.au

Australian Plants Society Tasmania Inc.

President: Riitta Boevink
Secretary: Mary Slattey, PO Box 3035 Ulverstone 7315
Website: www.apstas.com

Australian Plants Society Victoria Inc.

President: Greg Brown
Email: president@apsvic.org.au
Secretary: vacant
Email: apsvicsec@yahoo.com.au Website: www.apsvic.org.au

Wildflower Society of Western Australia Inc.

President: vacant
Secretary: Kerry Smith, PO Box 519 Floreat WA 6014.
Office: Perry House, 167 Perry Lakes Drive
Tel. / Fax: (08) 9383 7979
Email: wildflowers@ozemail.com.au
Website: <http://members.ozemail.com.au/~wildflowers/>





Biennial ANPSA Conference to be held in Canberra 14–21 November

The program will explore the genesis of the Bush Capital and its development as a Garden City. We will also investigate current research on native plant systems and habitat recovery. Featured speakers include: David Headon, David Lindenmayer, Ian Fraser, Angus Stewart, Penny Olsen and David Watson. The program will emphasise the work of Study Groups with reports from their leaders.

Program:

Saturday, 14: Optional (extra expense) day trip to the Brindabella Range with Ian Fraser

Sunday, 15: Free culture bus from AIS to Parliamentary Triangle institutions

Monday, 16 – Friday 20: Morning talks and lunch followed by afternoon bus trips to the ANBG, National Arboretum, nature parks and private gardens.

Saturday, 21: Optional (extra expense) day trip to the Brindabella Range with Ian Fraser

Field trips:

Pre- conference trip to the coast visiting nature reserves and private gardens.

Post conference trip to the subalpine areas of Namadji National Park

Expressions of interest: To receive updates please send your contact information to conference2015@anpsa.org.au or mail to Conference 2015, P.O. Box 187, Deakin West, ACT 2600



The Australasian Native Orchid Society draws its members from all Australian states, New Zealand and other countries in the Australasian region.

If you are interested in extending your interest to a more specialist knowledge of Australian orchids, then consider becoming a member of ANOS Inc which covers the four issues of our journal, *The Orchadian*, published each year.

Membership costs are: Australia \$50 pa (or \$85 for a two year introductory sub) / Asia/Pacific \$60 pa / Rest of World \$70 pa

Membership queries should be directed to the Treasurer's e-mail: agroffen4@bigpond.com

Further information is also available from our website: www.anos.org.au and queries directed to Councillors under the information tab.

as *Banksia marginata*, *Isopogon ceratophyllus*, *Hakea decurrens* and even many of our wonderful Acacias are now dying out right throughout the entire Black Range!

Bushfires

In 2006, just as we were sitting down to celebrate New Year's Eve, a large bushfire that had been threatening our Black Ranges all afternoon turned with a wind change and came up over our hills and engulfed our property. We battled to save our house and sheds but sadly lost most of our gardens including our Grevillea Gardens.

I was so devastated by this that I struggled to even go into the blackened gardens and look at the mess. So in early 2007 we shifted to Dunkeld where I managed the re-development of the spectacular Royal Mail Hotel native gardens designed by Paul Thompson. This was a wonderful challenge and took my mind off 'Panrock Ridge'. The Royal Mail Hotel gardens had been neglected for many years, and also badly affected by climate change. The plan was to retain Paul's original wonderful layout, while re-making and re-planting the gardens to be better able to cope with the changed climate.

We would return to 'Panrock Ridge' on weekends, and after a few months I began to recover from my depression. Wendy and I wanted to record the effects of the fire on our collections. Of the approximately



Grevillea Garden after being burnt out New Years Eve 2006. Photo: Nancy Marriott



330 species and subspecies we had in the gardens, around one-third survived the fire. Of the two thirds burnt, 18% recovered from re-shooting lignotubers and epicormic buds, 15% recovered from seedling recruitment and the rest were lost. This left many, many gaps in our collection including a lot that we still have not been able to acquire again.

Many of our plants were collected during field trips right across Australia while carrying out *Grevillea* research; it will undoubtedly take more of these long and expensive trips to re-collect and re-propagate many of the missing species, as sadly many were not in any other collections. Fortunately both Kings Park and Mt Annan Botanic Gardens, as well as many wonderful members of the *Grevillea* Study Group, have provided material from species that I had lost.

Sadly the Cut Flower Plantation was almost destroyed in the bushfires, and since then, we have replanted the area three times now, but continue to lose many of the plants in our extreme summers, even after installing drippers for all new young plants. Despite the setbacks we are gradually building up an extensive collection of *Banksias*, *Dryandras*, *Isopogon* and other showy natives suitable for cut flowers.

Floods

“A land of droughts and flooding rains” aptly describes much of Australia, and amazingly in 2010 we had a big rain in December followed by huge rains in January 2011. This was just too much for many of the Mediterranean type plants in our gardens and as a result we lost around two-thirds of our extensive *Correa* collection, many *Phebalium*, and nearly all our collection of *Banksia* and *Dryandra* in the gardens on the top or sides of the hill. The soils here became saturated during the hottest days of the year, rotting the roots of all sensitive plants.

Amazingly, most of the *Grevilleas* survived, although many of those from dry country succumbed. The majority of our *Banksias* in the Cut Flower Garden survived as the soils here are so deep; the *Waratahs* absolutely loved it!

A Garden for our Wildlife

I had become interested in Australian native plants as a boy through my love for insects and birds, and the creation of a habitat for our wildlife has always been a high priority in my garden design. Sadly, the bushfire wiped out our Southern Brown Bandicoots that used to live on our property, and when I was offered a couple of pairs of these beautiful animals from Hall's Gap Zoo I jumped at the opportunity.

With the help of the Ararat Prison Landmate Scheme, we decided



Verticordia Garden with *Prostanthera magnifica* and massed *Lechenaultia biloba*. Photo: Neil Marriott

to lash out and buy enough rabbit netting, star pickets and posts to enclose an area of roughly 15 hectares. This was to include the house and all our gardens and plantations, and took quite a while and lots of help. The benefits were for the wildlife but now Wendy and I both love the complete freedom from rabbits, hares, foxes and feral cats. The fence is 2 m high with outriggers and a floppy overhang so any clever cat or fox that thinks it can climb up cannot get over the overhang. There is also a half metre of netting pinned at the base on the outside, so nothing can dig in either.

Almost immediately we noticed an increase in wildlife inside the enclosed area; over this spring-summer we have had five successful clutches of Painted Button-Quail as well as dozens of baby Diamond and Red-Browed Firetail Finches, loads of baby Eastern Spinebills, baby Gould's Sand Monitors and many more. They are now common throughout the gardens and are becoming quite tame when we wander around weeding and watering.

Today's Gardens

The bushfires, drought, climate change and floods have all taught us many lessons. We no longer use organic mulch – it burns ferociously during fires, killing even the toughest of plants, and becomes waterproof in dry summers. We still build up all our beds, but use swales and pathways to harvest the erratic rains we get. We have to ensure that all



plants we put in are drought tolerant and grafted plants are on a drought hardy rootstock – many sold today are not!!

Fellow member of the Grevillea Study Group, John Edmonds-Wilson from Coonalpyn in South Australia, introduced me to a big range of Verticordia, and so began our Verticordia Garden. This now supports at least 30 different species of Verticordia, as well as many dwarf Western Australian genera including Acacia, Grevillea, Dampiera, Calytrix, Lechenaultia and Chamelaucium. Most of these have thrived and are now putting on a spectacular display over many months of the year. The Verticordias are wonderful as they flower right throughout summer when there is not a lot else flowering, and it has so enhanced our views from the house.

'Preservation By Cultivation'

This old aim of our society, penned over 50 years ago, is today even more important than ever, as we still allow the clearing of our precious flora for open cut coal mines, gas hubs, urban sprawl, salination and today desertification. I have always tried to grow as many of the rare and endangered plants as I could, and at 'Panrock Ridge' we now have an extensive collection of these significant species.

Within Grevillea there is at least one third of the entire genus that is listed as depleted, rare, threatened or endangered. Sadly there are even several that are probably extinct, and many that are close to it!! One species, *Grevillea scapigera* would have become extinct were it not for a friend who sent me cuttings from the last known plant in the wild at Corrigin Airport. He had been refused permission to collect cuttings by CALM, but fearing for its survival decided to break the law. A week later that plant was driven over and killed!!



Native grasses are allowed to seed for finches before mowing in summer.
Photo: Neil Marriott

Fortunately the cuttings arrived in excellent condition and struck well. Material was then sent to Sydney Botanic Gardens and Mt Annan where it was put into tissue culture. From this, many thousands of plants were produced and a lot sent back to Kings Park, where the plants were grown on and finally re-established back into bushland near where it originated. Kings Park have collected seed from these and now have many growing superbly in the wild. However, without the original illegally taken cuttings this species would today, most likely be extinct!



Verticordia Garden featuring *Verticordia insignis*, *Pileanthus aurantiacus* and *Leucophyta brownii*. Photo: Neil Marriott

We are also growing many other critically endangered species, and where possible, numerous clones of those species. The West Australian wheat belt is full of rare and endangered species and it is vital that these are also kept alive in our gardens as many hang on precariously on one or two roadsides where they are ultimately doomed by road works and weed invasion. We also grow many species that are as yet, unknown in the nursery trade.



Above: *Grevillea scapigera* flowering profusely at 'Panrock Ridge'. Photo: Neil Marriott



Right: *Grevillea tenuiflora* flowering and thriving at 'Panrock Ridge', but unknown in cultivation. Photo: Neil Marriott





"Jahnsville" 1983–2015, Gawler, S.A.

What was an almond orchard, is now a garden using mainly native plants

The authors, Max & Pam Jahn, are delighted to be able to share with you some views of the garden.



The garden is designed with a driveway, pathways winding through trees, bushes and ground plants. Very early we removed most of the almond trees, replacing them with various Eucalypts to give the garden height: *Eucalyptus torquata*, *E. eremophila*, *E. leucoxydon* (pink form from seed collected from the South East coast of SA).

Acacias grow well here. We have about 15 species planted: ground covers to substantial trees.



Acacia lineata



Acacia notabilis



Acacia lachnophylla (<500 mm)



Acacia calamifolia (5 m)

Treated pine has been used to build two shelters around the driveway: "Bus Stop" and "Wattle Stop". Other areas have circles of "railway sleeper" seats: "Melaleuca Nook", "E Corner" and "Teardrop".



"Wattle Stop" & *Acacia argyrophylla*



"Melaleuca Nook"



Our "sandhill" from the "Wattle Stop": about 300 mm of pH neutral sand over perforated irrigation pipe, boarded up with split treated pine, and overlaid with white pebbles. *Acacia*, *Goodenia*, *Lotus*, *Eutaxia*, *Dodonaea*, *Pelargonium*.



Experts Ken Warnes and Keith Pitman encouraged us to grow *Eremophilas*. We have planted 64 different species over the years. I love looking into their flowers and wondering at their beauty.



Eremophila nivea: pink & white forms.





E. maculata



E. mackinleyi



E. duttoni



E. youngii



unknown



E. drummondii



Above: *Bulbine semibarbara* "Bulbine Lily"

Left: *Hardenbergia violacea* climbing on a nearly dead almond tree.



Our English visitor helping prepare *Acacia pendula* for the winter fire.

Goodenia varia



Other visitors:
Far left: *Papilio anactus*
Left: *Vanessa itea*

Right: *Alyogyne hakeifolia*
Far right: *Alyogyne huegelii*





In 2007 we opened our garden for the Australian Garden Scheme.

It is exciting when hundreds of people wander through your creation.

Sometimes, in our dry Mediterranean Climate, we forget the diversity of conditions and plants in Australia.

Our total garden is a blend of Australian and exotic plants. The front half is almost entirely planted to Australian plants. Around the house *Eremophilas*, *Westringia*, *Grevilleas*, *Melaleucas*, and *Callistemons* mix well with *Fuchias*, *Hollyhocks*, *Lavender* and *Wallflower*.



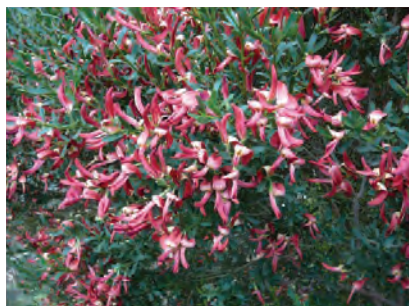
Our Staghorn fern is a sight to behold: *Platycerium superbum*.



Viola hederacea "Native Violet"



Scaevola aemula



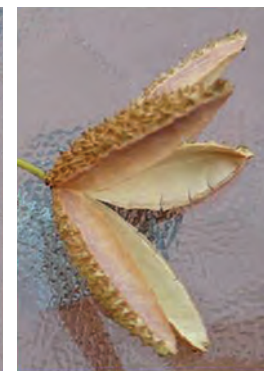
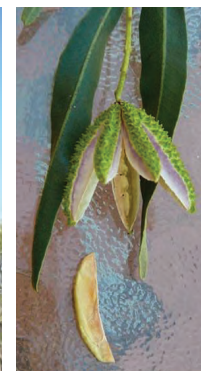
Templetonia retusa



"Cockies Tongues"

Self-propagating seedlings grow all over the garden (even in the "vegie" patch). We let them grow where it is convenient. Elsewhere we give them away as seedlings to other gardeners.

We produce most of our vegetables, and preserve fruit. We also harvest 85 kl of water and collect electricity with solar cells.



Flindersia maculosa "Leopard Wood". Fruit (above) are woody but beautiful, lime green, drying to a sandy yellow.



Our favourite plant is the *Eremophila racemosa*. Its flowers change colours as they mature.





Inverawe Native Gardens: A Garden with Attitude

Bill and Margaret Chestnut

At Inverawe Native Gardens we have a party trick when local clubs visit. We pick a great big bunch of flowers and a lucky club member gets to take them home. We can do that 365 days a year. There never is a time when we do not have lots of plants in bloom. Our aim is to encourage people to grow native plants. Visitors get to see healthy native plants growing *en situ*, not just as pots standing in a nursery. Our visitors' book has comments like "inspiring", "tranquil", "a beautiful garden" and "what a lot of work" but it just indicates what two people with a mission can achieve. People say "you must spend every waking moment in the garden!" Well, no. If you have the environment working with you, it's easier than you think.

Back in March 2001, we almost didn't buy the property. It was 22 acres of woody weeds, laced with old bits of fencing wire and an astonishing amount of rubbish, jettisoned by passing motorists. The property had been on sale for three years but most people figured it was too much work. For once, cheerful ignorance stood us in good stead. What sold us was the view down North West Bay to Bruny Island, and across to Mount Wellington, and something the real estate agent said. "The land won't break whilst it's waiting for you to fix it." That sold us. It didn't break and we have fixed it.



Xerochrysum bracteatum in the Secret Garden, Inverawe.



Correa 'Clearview Giant', Main Slope, Inverawe.

What have we achieved? We've planted over 10,000 Australian native plants, dug, graded and gravelled kilometres of paths, built stairs, handrails and hundreds of metres of pleached rock walls. We've installed interpretation signs, added poetry, sculpture and some whimsy. The garden has appeared on television and been written up in many different journals and magazines, including the *Financial Times* of London. We've had thousands of visitors from Australia and all round the world, including landscape designers, horticulturalists and botanists.

The property is not without some form for garden lovers. In the 1790s the French botanist Labillardiere was here, and a decade later Nicolas Baudin's French ships were anchored just off the next point, in clear line of sight. In the early 1800s the Scottish botanist, Robert Brown, passed this way, descending the river at the southern end of the property and then swinging north for Hobart. Both Labillardiere and Brown each described and named hundreds of Australian plant species, and a number of those species can be seen at Inverawe. The first European owner, James Vigar, acquired the property in 1839 when Tasmania was a frontier convict settlement. He lived to see Tasmania become a peaceful democratic British colony. Our interpretation signs highlight this history.





Wildlife has adopted the garden. 101 species of bird have been spotted and our fellow inhabitants now include pademelons, potoroos, bettongs, echidnas, possums and some little guys the size of mice but built like midget kangaroos. We don't know who they are. Visitors sometimes catch glimpses of this menagerie, and we manage to live at peace with them (mostly), although we wish the pademelons would stick to grass and leave our Paper Daisies alone.

What have we learnt? Heaps. We came into this pretty raw and learnt on the job. Lots of advice came from all sorts of people but no-one much was doing what we do so we are out there on the pointy end, trialling, discovering, attempting, failing, succeeding.

The property divides fairly easily into four zones. There is the inner, highly landscaped zone, a long narrow slope south of the main entrance which is extremely dry, the grass lands to the far south and a "final frontier" to the north. Our aim is to present a garden landscaped along traditional lines but using Australian native plants. It is high time we developed a unique garden style that sits easily on our often fragile land. It has to look attractive to people attuned to conventional gardens. We use traditional landscaping principles, taking advantage of the view down the bay. As you move around the garden this view darts in and out of the line. The mood changes from spot to spot - as one visitor said "there's always something surprising around the next corner".



The view down North West Bay, *Melaleuca nesophila*, pink flowers, foreground.



Hakea drupacea, (syn *saueolens*), the Long Terrace, Inverawe.

We've arranged our paths to sidle along the slope so that the path sweeps around a bend, out of sight, encouraging the visitor to see what is around the next corner. In places we have red arches to draw the eye, and little bits of business to slow people down. The views down the Bay have been arranged to enhance the sense of depth and link Inverawe to the wider world. In a landscaped garden there has to be a sense of journey, of some narrative unfolding before you.

In the grass lands to the south we've planted hundreds of trees, mostly eucalypts with some acacias and a few other species. As the trees get up over eight metres we trim the branches from the bottom two metres. This forces energy into the canopy, which shades out grass and reduces the need to mow. It also creates the effect of looking through the trees rather than at them, enhancing the sense of landscape size.

On the steep hillsides we have sorted through a wide variety of species, gradually finding plants that are attractive, rugged and low maintenance. For melaleucas for example, *M. squarrosa*, *M. squamea* and *M. gibbosa* don't work - it's too dry - but *M. spathulata*, *M. pustulata*, *M. linarifolia*, *M. nesophila*, *M. hypericifolia*, *M. armillaris* and some others are fine. With leptospermums, *L. grandiflorum*, *L. petersonii* and a couple of others are hardy enough.





The view of North West Bay, toward Howden, Top Terrace, Inverawe.

Acacia dealbata along with *Acacia melonyxylon* are the common acacias on the property but they both have the anti-social habit of copping out from root runs. If we didn't have them we wouldn't plant them. Acacias that do work include *A. mucronata*, *A. sophorae*, *A. stricta*, *A. terminalis*, *A. mearnsii* (all fairly local) as well as *A. floribunda*, *A. retinodes*, *A. pravissima* and *A. rubida*. We were very fond of *Acacia iteaphylla* (Flinders Range Wattle) but after a few years it developed a disease. We checked with some locals and they had had the same experience. In all we have around thirty species of eucalypt, maybe twenty species of acacia and twenty odd species of hakeas. Hakeas love our poor soils and dry going.

What next? As our trees get up and enhance the third dimension, height, we can better establish understory beneath them. We're getting better at knowing what plants will succeed where and now have our major infrastructure in place. In many areas we have improved the soil to enhance its moisture retention, and backed that up with ground covers and mulches. Seasonal leaf drop will also act as a natural mulch and weed suppressant. Not just birds and animals have arrived. So too have worms and insects and many plants volunteer (self-seed). It is finally starting to act as a biological community.

Inverawe Native Gardens is an extensive open to the public (entry fee applies) landscaped garden in southern Tasmania, 15 minutes south of Hobart. Bill and Margaret Chestnut commenced the garden in March 2001. *More information at www.inverawe.com.au*

Chingarrup Sanctuary: Revegetation of cleared bushland in a part of the Gondwana Link in Western Australia

Dr Eddy Wajon

Eddy is a Past President of the Wildflower Society of WA. He and his wife, Donna, live in Winthrop, a southern suburb of Perth, and own two bush blocks for conservation in the south west of WA. He has written and self-published four Colour Guides to the Spring Wildflowers of WA.

Introduction

Chingarrup Sanctuary is a 576 ha property between Jerramungup and Bremer Bay, 450 km southeast of Perth. The property was cleared in the 1960s when 1 million acres of land per year was cleared as part of the Western Australian Government's program to open up the area for agriculture. The only areas on the property not cleared were rocky areas that were too difficult to access.

The original owner only used 100 ha of the property for sheep and pig grazing. He fenced off this area and allowed the rest to regenerate. When my wife, Donna, and I bought the property in December 2002, it had not been farmed for at least three years and the cleared areas were covered with Coast Spear Grass (*Austrostipa flavescens*) and isolated mallees. The original owner also left an old shed that we have completely upgraded into comfortable living quarters.

Chingarrup Sanctuary is a participant in the Gondwana Link project whose goal is to create a corridor of native vegetation from the coast near Margaret River to the Great Western Woodlands around Kalgoorlie through the purchase of bushland and the revegetation of farmland. Chingarrup Sanctuary is in the Fitz-Stirling section. We were the first private buyers in the Gondwana Link, buying the property specifically



Caladenia bryceana



Banksia repens





for conservation. The property is protected under a Conservation Covenant and we have a partnership with Bush Heritage Australia under which they assist with environmental management.

Remnant vegetation and flora

The vegetation on Chingarrup Sanctuary is very diverse and contains eight vegetation associations, one of which is a recently declared Threatened Ecological Community, the Proteaceae Dominated Kwongan Shrubland of the South Coast. The vegetation is in excellent condition, with very few weeds. The biggest weed problem is in front of the living quarters.

The property can be spectacular in spring and I have photographed and documented more than 350 native plant species. The most significant flora is the Dwarf Spider Orchid, *Caladenia bryceana subsp bryceana*, which is listed as Threatened Flora. There are also 15 species of Acacia, five species of Banksia, nine species of Dryandra, 13 species of Eucalypts, 12 species of Hakeas, 16 species of Melaleucas, five species of Verticordia and 42 species of orchids.

Fauna

We have documented the native fauna on Chingarrup Sanctuary through pit fall trapping, bird observation and mist netting, moth light-trapping, ant collecting, bat ultrasonic detection and motion sensitive camera photography. We have recorded more than 550 fauna species including 13 mammals, 28 reptiles, 100 birds, 55 ants and 250 moths. The



Honey possum in *Eucalyptus conglobata*.

most significant or spectacular fauna are the Threatened Mallee Fowl, the Priority Western Whipbird, Honey Possum, Brush-tailed Wallaby, Pygmy Possum, Echidna, Crested Shrike-tit, Southern Heath Monitor, Military Dragon, Mitchell's Snake, Grey-bellied Dunnart, Banksia Moth, Campanotus Farmer Ant and Australian Delma (a burrowing lizard).

Revegetation program

Between 2004 and 2007, Greening Australia, Bush Heritage Australia and Shell Reconnections revegetated 70 ha of the unvegetated areas with 50 or so species consisting primarily of Acacias, Eucalypts, Hakeas and Melaleucas with seed collected from Chingarrup Sanctuary or other nearby Gondwana Link properties. The revegetation was undertaken

using a modified Chatfield seeder with a single-row seed drill which scalped the soil to push weed-infested topsoil to the side, scraped a line into which seed was deposited and then covered using a small wheel. All revegetation occurred in rows at 3.3 m spacings, though the rows were curved and kept to the contour. A seed density of 0.5–0.75 kg/ha was used.

Revegetation occurred in three tranches. The first tranche was an area of 10 ha from the west-east access track south to Chingarrup Creek in an area we call the Front Paddock undertaken in August 2004. The second tranche was an area of 40 ha on the north side of the living quarters and access track in an area we call the North Paddock undertaken in April 2005. The third tranche was in an area of 18 ha south of Chingarrup Creek in an area we call the South Paddock undertaken in August 2007/ August 2008. This occurred in two parts. The first part was conventional seeding, with 8 ha planted heavily with Sandalwood hosts. A year later, two Sandalwood (*Santalum spicatum*) kernels were placed at an average spacing of 4–10 m along the row about 5 cm deep and 30 cm from the host plant, and these germinated a year later.

In addition to broadscale revegetation, we planted tubestock in June 2014 to add a bit of colour as well as control weeds in two areas totalling 1500 m² in front of the living quarters and in the Front Paddock. Hazel Dempster, ANPSA Australian Plants Awardee in 2013, with the help of others, took cuttings of four species of Verticordia, three species of Calytrix, a Calectasia, a Petrophile, a Boronia and a Rinzia from the property in December 2013. These were propagated in the nursery of the Northern Suburbs Branch of the Wildflower Society. The area in front of the living quarters had clayey-rocky soil, while the other area had clayey-sandy soil. The ground was prepared by creating a 300 mm diameter x 300 mm deep hole with a tractor-mounted and petrol-driven auger, and mixing the soil with gypsum and a soil wetting agent. Species planted in each area were those adapted either to heavy/rocky soils or to sandy soils.

Revegetation success

We have monitored the success of the revegetation as follows:

- photographic monitoring from fixed sites almost annually
- counts of the number of stems per unit length of revegetation line
- ecological outcome monitoring
- identification of germinants not in the revegetation seed mix
- capture and banding of birds in mist nets





- analysis of feathers of re-captured birds for nitrogen and carbon isotopes
- searching for nests and identifying which bird used the nest.

The soil in the Front Paddock varied from lateritic clayey sand to clayey sand to clay. This soil variation combined with late planting (the optimum time would have been June or July) and relatively wide (3 m) row spacings resulted in a relatively low and sparse plant germination with considerable differences in germination and growth rate between different soil types. Germination and growth in the clay was particularly poor with plants reaching maximum heights of about 1.5 m. Many of the plants in this area died in the long, hot, dry summer of 2013/ 2014.



Front paddock October 2004.



Front paddock September 2012.

In the other areas of the Front Paddock, germination was also sparse, but growth has been much better than in the clay. Trees and shrubs are now 2–4 m high and the canopy has almost closed in some areas. There has been recruitment from wind-blown or soil stored seeds from species such as *Drosera*, *Conostylis*, *Gompholobium*, *Laxmania*, *Dampiera* and sedges.

In the North Paddock, the soil type also varied considerably. Seeding was followed by very heavy rain in June 2005. This, combined with narrower (2 m) row spacings, resulted in very high plant germination



North Paddock, June 2005. Photo: Lesleigh Curnow



North Paddock, September 2012.

and density, particularly in a low-lying area that used to be wet in winter, with thick stands of *Melaleuca acuminata*. Trees and shrubs are now 2–3 m high and the canopy has almost closed in some areas, but are shorter than where plants are more widely spaced. We have thought how to directly reduce the plant density, but no practical solutions have been found. The current policy is to let nature and ecological succession take its course.

Because of the good rains following seeding, weed germination in the Front Paddock and the North Paddock, especially of Cape Weed (*Arctotheca calendula*), was extremely high in the first few years. Spear Thistle (*Cirsium vulgare*), Blackberry Nightshade (*Solanum nigrans*), Tall Fleabane (*Conyza sumatrensis*) and Stinkwort (*Dittrichia graveolens*) were also present initially. We pulled out all the Spear Thistle and Blackberry Nightshade and a lot of the Tall Fleabane and Stinkwort. There was too much Cape Weed to pull out, so we left it. However, amazingly it was all gone within three years of planting as the germinating native perennials out-competed the weeds for moisture, nutrients and sunshine.



View of the North Paddock along the track in 2005.



View of the North Paddock from the Granite Ridge in 2007.

Many of the plants in clayey areas and in a circle of revegetation on the eastern side of the North Paddock, as well as areas in the remnant vegetation on rocky areas, died in the long, hot, dry summer of 2013/ 2014. Death in the revegetated areas is considered to be part of a natural cycle and a part of ecosystem succession, with some species in the seed mix not originally from clay-based areas, and thus possibly not suited to this area, dying. It is hoped that there will be some self-regeneration from seed set by the first flush of revegetation, but if this does not occur, consideration will be given to planting some tubestock of more suitable species.





Above: *Boronia scabra* cutting flowering in the clay in front of the shed.



Right: *Calytrix flavescens* planted in the sand in the Front Paddock.

In the South Paddock, germination and growth has also been very variable. In areas that consisted of shallow rocky soil, there was no germination. In areas of sandy clay, germination and growth was much better with plants reaching heights of 2–3 m.

The 8 ha Sandalwood plantation has done very well with the Sandalwood trees up to 2 m high and taller than their Acacia hosts. We have already harvested 20 kg of kernels from less than 10% of the plantation. We shell the kernels and eat the inner fatty nut whole or chopped up to make a ducca, and this is much improved upon roasting. It will take another 25–50 years before the trees can be harvested for their aromatic oil, and we will never make a fortune from the plantation (certainly not in our lifetime) but there may be a market for the nuts if we find a rapid and economical way of shelling them.

The tubestock planted in June 2014 has had mixed fortunes. Only 40% of the tubestock planted in the clayey area in front of the living quarters survived as at October 2014. On the other hand, 80% of the tubestock planted in the sandy area in the Front Paddock has survived so far.

Ecological success

About 35 bird species have been captured in the revegetated areas. Most of these appear to be utilising the revegetation as an extension of the vegetation alongside Chingarrup Creek. Birds conspicuous by their absence from the revegetated areas are robins which require older trees with more open understorey and leaf litter. The results of the carbon and nitrogen isotope analysis of feathers collected from birds captured in the revegetated areas indicate that the birds utilise the revegetation, but they do not utilise it exclusively, relying on the adjacent remnant vegetation for a large part of their nutrition. Some bird nests, primarily of White-browed Babblers and Ravens, have been found in the revegetated areas, indicating that the revegetation is providing an ecological niche.

Conclusions

Soil type and seasonal conditions were crucial to the success of native plant revegetation, just as they are for agricultural crops. Germination and survival was low in clay soils, especially following hot dry summers. Wet winters following seeding greatly increased germination. Planting or seeding before or just after the break of season is often considered the key to successful germination, but overall success appears to be related just as much to total rainfall and other seasonal conditions over several years.

The revegetated areas at Chingarrup Sanctuary look fantastic and are considerably more lush and healthy than adjacent natural vegetation and have contributed significantly to the restoration of biodiversity. Through partnerships with government, non-government and academic organisations, we are involved in a network of collaborators which has allowed us to undertake activities that we could not have done alone. This opportunity is available to many individuals and would contribute substantially to greater sustainability of our ecosystem and farming systems.

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Note: The property featured on a *Landline* program which can be accessed at www.abc.net.au/landline/content/2014/s4011431.htm



