fostering research into the biology and cultivation of the Australian flora

Research Matters

Newsletter of the Australian Flora Foundation

January 2015

Inside

Dear Australian Flora Foundation supporter - welcome to this edition of our newsletter, which is the first with a name.

Yes, research does matter! Research is a journey of discovery. A long journey. With us, its ultimate destination is a much greater knowledge of our flora. Along the way we can learn a lot that will help with our flora's conservation. This conservation will contribute to the enhancement of the lives of those that are here and those who follow us.

Ours is a unique organization. And now our newsletter has a unique name!

One of the good things about being Editor is that I'm able to ask knowledgeable people for articles. And, because we have predominantly an electronic newsletter, I can accommodate their generous responses without space restrictions. We do have some inspiring articles in this issue I'm sure you'll agree. Thank you to each of our contributors!

If you are one of the few people who receive this newsletter in printed form, you could benefit by having better quality pictures if you switched to the electronic version. You would save our administrative time and postage too. Just send me an email (itcox@bigpond.com) and I'll add you to the email list.

Don't forget, our Research Fund has been specially set up under taxation laws to accept your donations, which are spent 100% on research projects. Before approval, each project is rigorously scrutinised by our Scientific Committee to ensure it meets the highest standards and chances of success.

It's simple to add your tax-deductible donation to your remittance when renewing your membership.

Thank you for your continuing support!
Ian Cox, Editor

Student Awards

Winners of the Australian Flora Foundation-sponsored prizes at the 2014 Ecological Society of Australia's annual conference have been announced.

The AFF prize for best spoken presentation on the biology or cultivation of native plants was won by **Sonya Geange** from ANU. Her talk title was: *Plasticity in water use traits within Australian alpine plants*.

The AFF prize for best poster presentation on the biology or cultivation of native plants was won by **Mitchell Star-Jones** from the University of Adelaide. His poster was: *A comparison of the parasitic and epiparasitic strategies in mistletoe*.

When advising us of these awards, Professor Angela Moles, who is Vice President of Student Affairs at the Ecological Society of Australia, wrote:

"I can report that both the talk and the poster were absolutely outstanding. Thank you so much for your ongoing support for these prizes – they really make a huge difference to our students (a line like this on their CV is gold in these days of scarce employment

opportunities), and I love being able to recognise excellent plant biology."

John Wrigley AM 1934–2014

We sadly record the passing of John Wrigley in July 2014. John was actively involved when the Australian Flora Foundation was formed in 1981 and was a Councillor from 1981 to 1993.

John Wrigley is well-known to lovers of native plants for his iconic and much-referenced work *Australian Native Plants*, which he wrote in collaboration with the photographer and illustrator Murray Fagg. This book has sold 250,000 copies. All told, John was author of 19 books on Australian flora.

In 1957 he was a foundation member of the Society for Growing Australian Plants (now the Australian Plants Society) in NSW and was involved in their activities in NSW and the ACT. He was National President in 1971.

In 1967 John was appointed curator of the Canberra Botanic Gardens (now the Australian National Botanic Gardens), his major task then being to have the gardens ready to be opened by the Prime Minister in 1970. Also in 1970 he landscaped the Australian Pavilion at Expo 70, Osaka, Japan. He remained curator of the ANBG until he retired to Coffs Harbour in 1981.

Summary of a recent Final Report

Each year the Australian Flora Foundation funds a number of grants for research into the biology and cultivation of the Australian flora. While the grants are not usually large, they are often vital in enabling such projects to be undertaken. Many of the researchers are honours or postgraduate students, and their success with an AFF grant hopefully stimulates their interest in researching Australia's unique and diverse plants throughout their careers.

This work is only made possible by the generous support of donors and benefactors.

Presented here is a brief summary of a recently-completed project. Full reports of this and other projects can be viewed on the Foundation's website http://www.aff.org.au/

Techniques for improving *Phytophthora* resistance in potential new floricultural crop *Newcastelia interrupta*

Melinda Perkins

Newcastelia interrupta is an herbaceous perennial plant endemic to southern Queensland which produces attractive flowering stems over a long flowering season. Combined with a compact growth habit and soft grey-green foliage, *N. interrupta* is aesthetically well-suited to landscape plantings. The species also has potential as a cut-flower crop. Market research has found *N. interrupta* stems were well-received by florists in Japan (the largest importer of Australian native cut flowers/foliage), and anecdotal evidence suggests that the stems ship well and exhibit a long vase life.

Initial attempts to cultivate *N. interrupta* have revealed that it is susceptible to the fungal root pathogen *Phytophthora cinnamomi*.

Several *N. interrupta* genotypes were collected from a natural population in southern Queensland and subjected to trials aimed at improving resistance to *P. cinnamomi* infection. One approach was to graft *N. interrupta* onto rootstock of coastal rosemary (*Westringia fruticosa*), a related species known to be *Phytophthora* resistant. It was demonstrated that grafted plants could be produced, however the grafting success rate was extremely low.

A second approach was to determine whether *N. interrupta* is capable of forming mycorrhizal associations (mutually beneficial relationships with certain species of soil fungi) and, if so, whether these associations could be used to protect the plant against *P. cinnamomi* infection. *N. interrupta* root samples from the natural population exhibited two types of mycorrhizal associations. A subsequent pot trial found that a commercial inoculant containing

both types produced plants with a higher shoot biomass than non-mycorrhizal plants. However, mycorrhizal plants showed no difference in growth or survival compared with non-mycorrhizal plants when challenged by inoculation with *P. cinnamomi*.

Genotype was shown to have an effect on the survival of plants inoculated with *P. cinnamomi*, with one genotype exhibiting a survival rate of 95% compared with <62% for all other genotypes.

Conclusions

Improving *Phytophthora* resistance in *N. interrupta* may best be achieved through selection of genotypes that exhibit natural resistance towards the fungal pathogen and by pot culture in pathogen-free medium. Whilst induced mycorrhizal associations displayed no protective effect against *P. cinnamomi* infection, they were shown to be useful in promoting plant growth. Grafting onto *Phytophthora* resistant rootstock had limited success and is inherently labour-intensive and costly. In its current form, grafting is not a viable option for overcoming *Phytophthora* susceptibility in *N. interrupta*.

Flowering stems of *Newcastelia interrupta* being incorporated into a bridal bouquet by a florist in Japan

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Design with Nature

Lawrie Smith[1]

It would not have been possible to create the diverse range of parks and gardens, each with its own unique Australian regional character, without the close association I have enjoyed as a member of the Australian Plants Society (SGAP in Queensland). Being integrally involved with this organisation at all levels for more than 40 years, has allowed me the opportunity to access some of Australia's foremost botanists and horticulturalists. This has ensured that every project for which I have been responsible celebrates the unique Australian flora of the relative bioregion by interpreting and

demonstrating to the community the potential that the local flora has for use in amenity horticulture.

The Importance of Gardens

Throughout my career I have been fortunate to be able to convey this 'Design with Nature' philosophy through all of the projects and specifically the public parks and botanic gardens for which I have been responsible. Public gardens generally and Botanic Gardens particularly are places where the community can be encouraged to reconnect with nature. Contemporary urban communities are becoming increasingly divorced from the 'natural' landscape origins from which we all evolved, with consequent expanding physical and psychological problems. A garden is a special space that can restore our natural association with nature and importantly improve our health and wellbeing.

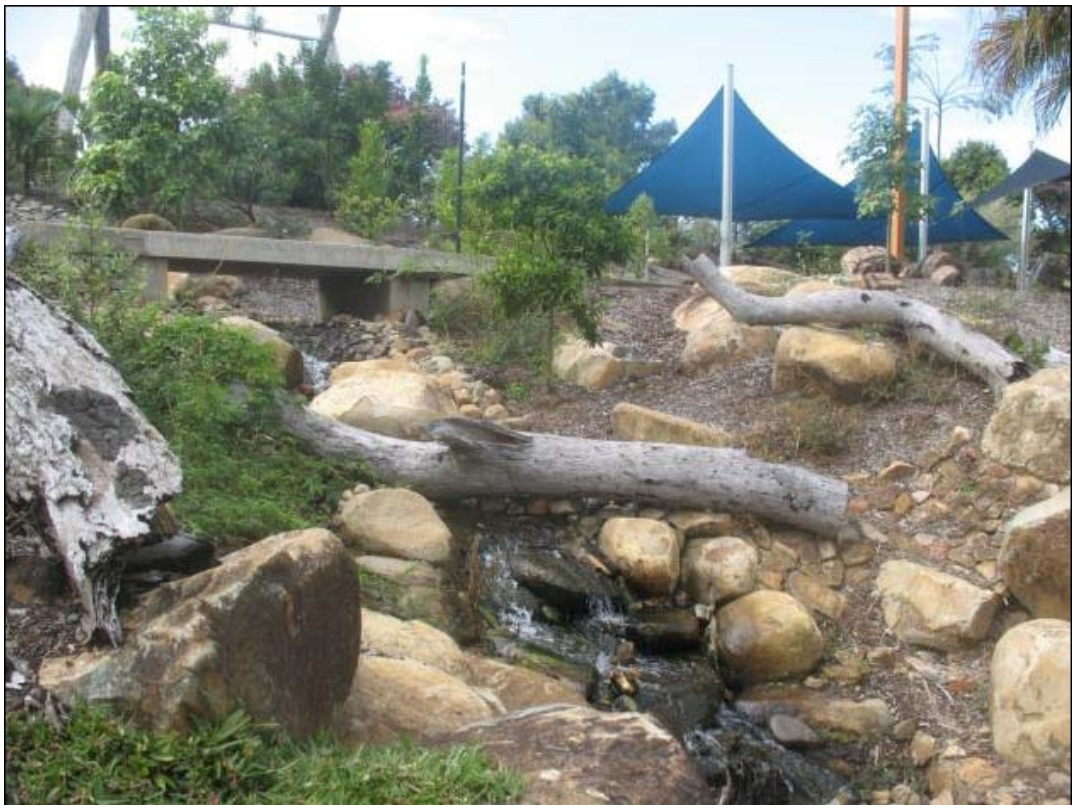
Finch Hatton Waterway, Mackay Regional Botanic Gardens

These are some of the tangible and intangible elements that a garden offers to those who experience them: stroll along the avenues; meander the pathways; explore progressively, enticed by glimpses, views and vistas; appreciate the innovative natural or built focal points; stop and smell the roses (or preferably the Wattle); appreciate the seasonal diversity; experience the sun and shade patterns; and importantly understand the preferences of plants suited to differing environments and soils;

Inspiration for landscape and planting design

In commencing a project I do not consciously set out to 'design' a landscape. My initial approach is practical rather than artistic. The inspiration is primarily derived from a detailed understanding of the

physical site, the visual attributes and the imposed functional components of a project. This is complimented by identification and evaluation of the range of related issues that may be used to influence the planning and detail design – for instance related natural or cultural heritage stories can inspire layers of interest. To be successful the final outcome must have a strong sense of place and ready acceptance by those who use it – without the combination of these two aspects any park or garden can never reach its intended potential.



Geology Garden, Mackay Regional Botanic Gardens

The primary element of a landscape of any scale is the plant material. This dictates that the designer has a thorough knowledge of plant species for the region, their form, suitability, amenity horticultural potential and particularly availability. Species selection and massing that considers growth habits, specific forms, seasonal effects and colours is the fundamental palette used to inspire the overall design.

Similarly, understanding the materials chosen for the built landscape elements will inspire and enhance the design, specifically when using innovative approaches to their use in construction. A park or garden can be distinguished as special or unique if the built elements are inspired by the forms found in the regional landscape or in the detail shapes and textures of rocks, plants or water. The ability to innovatively synthesise, interpret or conventionalise nature provides a range of planning and design opportunities that will firmly place any project in a logical relationship with its surrounding environment whether this is urban or rural.

Linking with natural and cultural heritage

Design of any garden, public or private, is fundamentally a creative endeavour as you are constructing a contrived place that, in its planning and design must react appropriately and sometimes innovatively to imposed site constraints and opportunities. Generally these functional impositions (drainage issues etc) can be designed to be positive elements of the garden – this is the creative challenge that can lift a design above the ordinary.

Critically analysing the forms and forces of nature provides strong prompts that suggest how to creatively combine the various hard and soft landscape elements. Whether the creative result is subtle or blatant, the opportunity exists for these artistic elements to enhance the observers understanding of the processes of nature. This is fundamentally important in a botanic garden where it is vital to define the environment or habitat for specific plants or plant communities so that the scientific value of the plant collection is enhanced and understood.

First impressions are the most lasting – so it is important to set the scene at the arrival locations by creating a strong visual and physical experience that attracts the observer and temps deeper exploration into the park or garden. It is important to incorporate or interpret local physical and heritage elements appropriately into the planning and design process to achieve local character and relationships. This requires detail research into the history and heritage of the site or locality.

Cremorne Visitor Centre, Mackay Regional Botanic Gardens

It is important not to imitate nature but aim to plan gardens and create associated elements that have a physical or aesthetic connection with nature. Be inspired by nature and natural processes in the planning and design process. These built or sculptural elements might be stylistically embellished to enhance the

experience, sometimes using subtle messages or even frivolity to enliven and make a walk through a garden more memorable.

Application to Mackay Regional Botanic Gardens

In the Mackay Regional Botanic Gardens a number of local characteristics have inspired the planning, design and the collection.

- The anabranch of the Pioneer River forms Eulamere and Kaliguil Lagoons as the central feature of the Botanic Gardens. The steep to undulating slopes down to the water provide a strong basis for a variety of views, vistas and ecological niche environments. These are celebrated and enshrined in the overall site planning and design.
- The intrusive volcanic hills typical of the coastal lowlands landscape is reflected in the site landform and winding pathway down through the Sarina Proserpine Garden to suggest the plant associations and altitude at which the related species naturally occur.
- The century old barnacle encrusted rainforest logs saved from the demolished finger wharf at Mackay Harbour, initially logged from Fraser Island, were used in numerous ways throughout the Gardens: as the structure of the Tropical Shade Garden Fernery; clusters of tall stately pillars clothed in ferns and epiphytes; a large arbour of triangular frames extending geometrically along a walkway to support robust rainforest lianas;
- Traversing the Coal Garden is ‘a walk back through time’ progressively suggesting the plant species of the various evolutionary eras’ planned to underline their economic importance and interpret the botanic derivation of the coal extracted from the nearby Bowen Basin.

Lawrie Smith (right) making fossil concrete for the Coal Garden

- In the Heritage Garden photographs of several of the significant local homestead gardens, now long gone, were used to create small cameo glimpse gardens to commemorate their contribution of imported botanic additions to the local tropical landscape. One was established by Baron Ferdinand von Mueller.
- The Torres Strait Islanders and South Sea Islanders each have their own specific precincts inspired by their local homelands and plant communities to similarly celebrate their significant, if enforced, role in the fledgling sugar industry.
- The Maltese Garden celebrates the important role of this immmigrant community in developing the sugar industry and links the Mediterranean to the tropics through a native olive hedge beside the Bocce court as well as beds of Australian succulents.
- The Screens and Hedges Garden comprises a collection of dense low growing local species planted in a stylised arrangement of maze like beds to research and demonstrate their value in this aspect of amenity horticulture. None of these species have ever been used in this way before.

Screen and Hedges Garden

Whatever the future holds for the planning and design of parks and gardens, I believe it is fundamentally important that Australian Native Plants are widely acknowledged as a principal component of built landscapes in order to appropriately practise and celebrate Design with Nature.

1. A warm welcome to Lawrie Smith AM as a guest contributor to our newsletter! Lawrie is one of our country's leading landscape architects. Some of the more significant projects for which he has been responsible are World Expo 88; the Australian Gardens at Liverpool International Garden Festival 1984; the International Garden and Greenery Exposition Osaka 1990; Regional Botanic Gardens in Gladstone, Bundaberg, Darwin, Mt. Isa, Longreach, Gold Coast, Barcaldine, Townsville, Maroochy, Tweed, Dubbo, Cairns, Mackay and Whitsunday. He has held many honorary positions, including President of the Australian Institute of Landscape Architects Queensland and President of the Society for Growing Australian Plants Queensland. He is currently National President of the Australian Native Plants Society. Lawrie was an Australian Flora Foundation Councillor from 1991 to 2000.

Adding Nitrogen to soil naturally

Dr Tina Bell[1]

By world standards, Australian forests, woodlands and heathlands are nutrient-poor compared to their counterparts overseas. Most of Australia has been geologically stable for millions of years and large areas of the continent have undergone prolonged weathering and leaching under high rainfall conditions. As a consequence, Australian plants have developed a range of mechanisms to cope with variability and scarcity of nutrients such as nitrogen and phosphorus.

In soils where the supply of nutrients may limit plant growth, special adaptations such as densely clustered proteoid roots or formation of mycorrhizal associations between fungi and plant roots can be found. In another common plant-microbe association, atmospheric nitrogen can be provided to plants by symbiotic or mutualistic association with nitrogen-fixing bacteria. The most well known relationship of this type occurs between plants in the family Leguminosae (legumes, Figure 1) and soil bacteria in the genera *Rhizobium*. In nitrogen-fixing plant-microbe partnerships, bacteria induce the plant to develop root nodules to provide a suitable growing environment and a means of obtaining energy as carbohydrates from the host plant. In return, the host plant has access to a supply of nitrogen, delivered as amino acids, from the bacteria. With 78% of our atmosphere composed of nitrogen gas for some plants there is a seemingly limitless supply of this important nutrient.

Figure 1. Members of the genus *Acacia* are typical nitrogen-fixing plants.

Biological nitrogen fixation is the process by which certain microbes can use the energy stored as products of photosynthesis to reduce atmospheric nitrogen (N_2) to ammonium (NH_4^+). These microbes use a nitrogen-fixing enzyme called nitrogenase to reduce atmospheric nitrogen to a form that can be readily transported and used by plants.

Based on morphology, development and physiology, nodules have been classified into two main types: indeterminate and determinate (Walsh 1995). Indeterminate nodules originate from the inner cortex of the plant root and have an elongated shape due to a persistent apical meristem that continues to function for the full lifespan of the nodule. These nodules are associated with the majority of tropical and temperate legumes. In contrast, the meristem of determinate nodules ceases activity at maturity giving rise to round nodules. Determinate nodules occur on several crop and tropical species of legumes. The type of nodule that develops depends on the host plant, not on the strain of *Rhizobia* involved.

Regardless of type, legume nodules are generally characterized by a central region infected by nitrogen-fixing bacteria surrounded by a cortex of uninfected cells and a dichotomously branching vascular system within the cortex (Figure 2). A range of environmental factors influence the formation of nodules (the 'nodulation process') and include changes in the soil surrounding the nodules (the 'rhizosphere') due to water stress, salinity, excess soil nitrate, phosphorus deficiency, temperature, heavy metals and biocides. The restricted root development of host plants may limit water and nutrient uptake, especially when environmental stresses are common.

Free-living (non-symbiotic) soil bacteria, blue green algae and lichens (cyanobacteria associated with fungi) can also fix atmospheric nitrogen. The rate of nitrogen (N) fixed by free-living bacteria is less than 5 kg N ha^{-1} yr^{-1}, blue green algae may fix 50–80 kg N ha^{-1} yr^{-1} and lichens can fix up to 80 kg N ha^{-1} yr^{-1}. In comparison, rates of nitrogen fixation by bacteria associated symbiotically with legumes can be from 100–200 kg N ha^{-1} yr^{-1} with rates up to 600 kg N ha^{-1} yr^{-1} having been measured (Attiwill and Leeper 1987). Nitrogen fixation in natural ecosystems is estimated to be 195 Tg N yr^{-1} but this value may range widely from 100–290 Tg N yr^{-1} (Cleveland *et al*. 1999).

Legumes that form symbiotic partnerships with nitrogen-fixing bacteria are common in Australia including *Acacia*, *Daviesia*, *Hardenbergia* and *Viminaria*. Symbiotic nitrogen fixation has also been found for non-legume Australian species including *Casuarina*, *Allocasuarina*, *Gymnostoma* and *Cycas*.

When nitrogen-fixing plants die, the nitrogen stored in their tissues is released during decomposition making it available to other plants. In traditional and organic farming, fields are rotated through various types of crops including nitrogen-fixing plants such as clover, lupin and alfalfa. This practice is often referred to as 'green manure'. Native Australian perennial herbaceous legumes with potential to be used as pasture plants include *Cullen*, *Swainsona*, *Glycine*, *Kennedia* and *Lotus* (Ryan *et al*. 2008). In non-agricultural areas in temperate regions, legumes are abundant in the early stages after disturbance such as fire. Nitrogen fixation by native herbaceous and woody legumes is important in nitrogen cycling of burnt ecosystems by replenishing the nitrogen lost due to fire.

Nitrogen-fixing microbes and their symbiotic plant partners clearly have a vital role in nitrogen cycling in both natural and managed systems.

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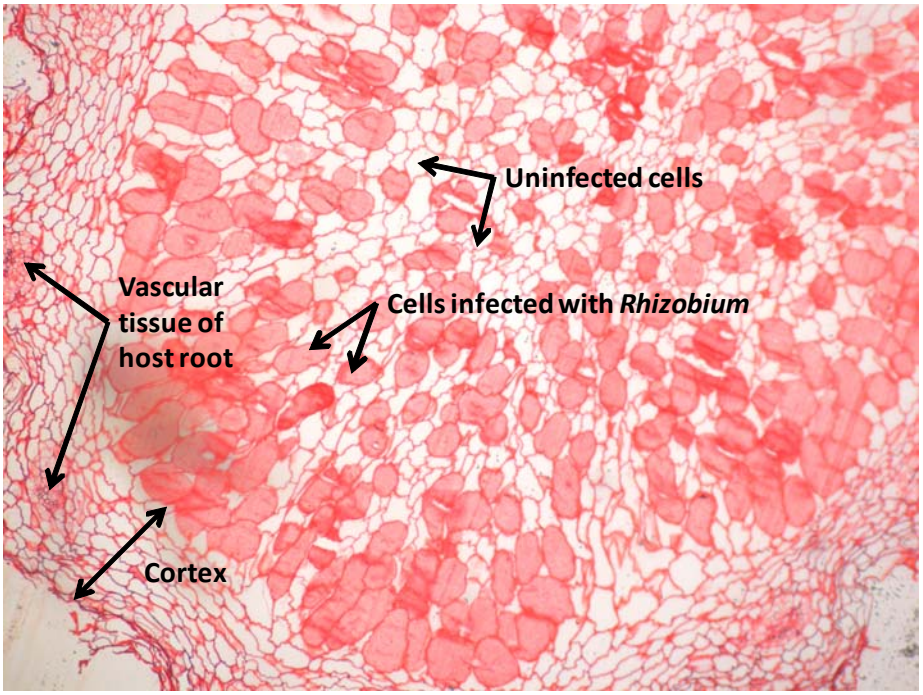

Figure 2. Anatomy of a typical root nodule showing uninfected cortex with vascular tissue and the central region infected by nitrogen-fixing bacteria.

1. Dr Tina Bell is a Councillor of the Australian Flora Foundation. She is Senior Lecturer in Fire Ecology at the University of Sydney, and is currently a Project Leader in the Bushfire CRC and has been a member of this national research centre since its inception in 2002.

Our Eco-house and Garden

Gordon and Marie Rowland[1]

In 2002, we sold our Sydney house of nineteen years, and bought 10 hectares (25 acres) of partly cleared wet-sclerophyll forest adjoining Wallingat National Park at Pacific Palms on the mid-north coast of New South Wales. It was one giant step towards the vision we shared: an eco-friendly house and garden in harmony with nature.

We hired a local earthmover to excavate a lagoon/wetlands from the swamp/slow moving creek crossing the property, and extend the treed knoll to create an island retreat for birds, about 600 mm above water level to escape flooding. We specified varying water depths, from 200 mm for wading birds, to 6 metres for diving birds and as a retreat for aquatic life during periods of high temperatures

and low water levels. Since then we've installed native freshwater mussels, glass-shrimps, yabbies, Australian Bass and Pacific Blue-eyes.

After speaking with several architects, we hired Sydney architect Kevin Snell, whose designs and eco credentials stood out above the others. We discussed with him the house we had in mind:

- modern, unpretentious, low-profile, functional, energy-efficient
- independent of fashion, fads and the architecture of bygone eras and other cultures
- bushfire safety features integral to the design
- earthen/mud brick and weatherboard construction, with a zincalume roof to reflect heat, and plantation or recycled timber windows and doors
- in visual harmony with the surrounding landscape
- centrally located open-plan kitchen/dining/living area, opening to a wide veranda with overhang to screen summer sun and admit winter sun
- orientation between 30° east and 15° west of true north (depending on land contours), for maximum solar gain
- passive solar design and through-flow ventilation, to control temperature and reduce the need for active heating and cooling
- slow combustion heater, underground rainwater tank and reed-bed wastewater system.

After completion of the lagoon and driveway in December 2003, the foundations were laid in July 2004 and the house completed in March 2005.

We have since revegetated with around two thousand local native trees and shrubs, mainly scattered along previously cleared sections of the north and south boundaries. These provide wildlife corridors into Wallingat National Park and screening from neighbouring properties.

In 2006, we turned our attention to the gardens, starting with the south-facing front entrance garden. After deep ripping the clay base, compacted during construction, we mixed the stockpiled clay-loam topsoil with grit, horse and chicken manure and worm castings, and then re-laid it. To screen the visitors' car parking area and provide a sense of enclosure, we then installed a timber fence and lined it with a natural, fire resistant cladding product, Natureed®.

During the laying of the house foundations, a buried pipe and electric wiring were installed, running from the lagoon to beneath the house, the pipe emerging in the front entrance garden. From here we dug a dry creek bed that winds through the garden to the far end and around the house to the lagoon. It always looks attractive and serves as an effective means of aboveground drainage during periods of high rainfall.

With the lagoon end of the pipe attached to a waterside pump, the flick of a kitchen switch brings water splashing into the creek from a hidden ‘spring’. The water flows through the creek before returning to the lagoon. It’s a favourite feature with visitors, our grandchildren in particular. It also cools the air, brings colourful dragonflies and frogs – including tiny green tree frogs – and other wildlife, and it’s an easy way to water nearby plants during establishment and prolonged dry periods.

After we’d spread a coarse mulch layer and lined the creek with crushed rock and pebbles, we installed our first garden plant *Cyathea cooperi* (Scaly Tree Fern) next to the creek. Since then, we’ve installed many more plants, with more to come, whenever.

To impart a relaxed ambience and *sense of unity,* and for ecological integrity, we plant mainly local and bioregional species. These thrive without chemical fungicides or insecticides, and they attract many native songbirds including birds that feed on insects. With such an abundance of insectivorous birds and frogs, mosquitoes seldom bother us.

We’re both passionate about uniting aesthetics with biodiversity and conservation, and we seize every opportunity to promote a wider, deeper appreciation of local and regional natural heritage. Our aim is to leave a legacy of timeless beauty for our children, our children’s children and future generations of Australians.

The real voyage of discovery consists not in seeking new landscapes but in seeing with new eyes - Marcel Proust.

1. Gordon Rowland is managing director of Indigenous Landscape Design Australia, and Marie Rowland is its researcher. Gordon is a supporter of the AFF.

Public parks will save our wildflowers

Angus Stewart

Reproduced from http://gardendrum.com/

Australian landscape architects and designers are gradually evolving a distinctively Australian style to their public parks, and I recently came across a great example of this in a municipal park in Dunsborough WA - Seymour Park.

The plantings in the park are a fascinating mixture of cultivars derived from species local to the region such as *Pimelea ferruginea* 'Magenta Mist" and *Anigozanthos* 'Bush Pearl'. These cultivars provide spectacular feature areas that are complemented by plantings of the indigenous species of the region such as sword grass *Lepidosperma* and tall kangaroo paw *Anigozanthos flavidus* and silver bush *Leucophyta brownii*.

One of the dilemmas of ecotourism to the Western Australian wildflower areas is that there may be nothing for people to look at in a bad year. The other problem with wild areas is that taking tourists into them causes irreparable damage in many cases. Sometimes this is overt through people trampling the very plants they have come to marvel at. In other cases the damage is more insidious such as the introduction of dieback disease caused by the cinnamon fungus *Phytophthora cinnamomi*.

The creation of regional parks around Australia that can showcase local wildflowers in structured gardens provides the obvious benefit of a predictable display. It can also be done in an environment that can avoid the damage that inevitably occurs when large numbers of people go to wild areas. A further benefit is that infrastructure for tourists such as roads, toilets and accommodation can also be provided with less damage to the local environment.

The overall result achieved by my particular example of Seymour Park in Dunsborough, WA is to showcase the amazing Western Australian flora in a beautifully balanced way. It highlights both the less spectacular wild species as well as the 'wow factor' cultivars that are emerging from breeding and selection work within the nursery industry.

President's Report 2014

Delivered by Dr Peter Goodwin at the AGM on 24th November 2014

Research supported by the Foundation

Four new grants were awarded this year:

- to Rebecca Jordan for the project *Understanding climate adaptation and its implications for revegetation in* Eucalyptus microcarpa;
- to Michelle Leishman for the project *Phylogenetic analysis of smoke-promoted germination in eastern Australian flora*;
- to Noushka Reiter for the project *Establishment of an ex-situ collection and seed orchard for the endangered Grampians Globe-pea*;
- and to Paul Rymer for the project *Moreton Bay Fig: distribution of native genetic variation and threats from cultivation*.

Further details can be found on the Foundation's website at http://www.aff.org.au/AFF3'_Grants.htm

One final report was received this year:

From Melinda Perkins, School of Agriculture and Food Sciences, University of Queensland, Gatton: *Techniques for improving Phytophthora resistance in potential new floricultural crop* Newcastelia interrupta.
It can be found on the Foundation's website at http://www.aff.org.au/AFF3_Res_repts.htm

Communication with members

Two new Newsletters were sent out by Ian Cox, one in January and one in July. Newsletters were added to the website six months after they were provided to members.
The Foundation website has been updated so that each page is responsive, i.e. can be viewed successfully on devices ranging from smart phones, to tablets to laptops or desktops with screens up to two-and-a-half A4 pages wide (50 cm or 2000px). A social networking blog site has been set up, and our funded researchers have been encouraged to use their site to make their research more immediate to you. To see the current blogs go to the AFF home page http://www.aff.org.au and click on Blogs. You are asked to leave a comment on the blogs that you like, to encourage our researchers.

Succession planning

The Council is attempting to develop plans to ensure an orderly hand over of activities when any of the members of the present executive, Jenny Jobling (Treasurer), Ian Cox (Secretary) or Peter Goodwin (President), wish to resign. Each of these members has served on the executive for eight years.

Finally I should like to thank all of you for your contributions over the year, most particularly members of the executive, members of the Finance Subcommittee, of the Scientific Committee, and members of Council. A special thank you to all donors and benefactors of the Foundation: without you the Australian Flora Foundation could not function. Particularly noteworthy are donations of $5,000 from APS NSW, $5,000 from SGAP Queensland Region and $1,000 from APS Newcastle.

Meet our new Councillor - Dr Rhonda Daniels

Rhonda joined the Australian Flora Foundation Council at the AGM in November 2014. She is an active member of the Australian Plants Society NSW since joining in the early 1990s. She has been a Director of APS NSW since October 2012, focusing on growth and promotion. Other APS NSW roles include Study Group Liaison Officer (2010-2014), Conservation Officer (1997-1999), and

member of the Bequest Committee. She has held various positions with APS Sutherland Group over 20 years including President, Vice-President, Secretary and Newsletter Editor.

Rhonda has a PhD in transport management, Master of Policy Studies and Bachelor of Science (Honours) in economic geography. She has a Certificate 4 in Horticulture and Certificate 2 in Bush Regeneration, and is an active Bushcare volunteer with Sutherland Shire Council. Rhonda has worked in transport planning, policy and economics in state government, and researched and taught transport and urban planning in universities. She currently works in her own business *Right with Rhonda* providing research, review and editing services.

Financial Statements

These statements have been extracted from the Foundation's audited accounts for the year ended 30th June 2014:-

Income	**$**
Donations	19,005
Membership fees	2,190
Interest, investment income and change in value of investments	63,905
Imputation credit refunds	3,303
Total Income	**88,403**
Expenses	
Grants	42,739
Accounting and audit fees	3,003
Postage, printing, general expenses	1,128
Total Expenses	**46,870**
Surplus for year	**41,533**

Assets	**$**
Investments and bank accounts	893,702
Debtors	15,261
Total Assets	**908,963**
Liabilities	
Grant commitments	18,244
Net Assets	**890,719**
Accumulated funds	
Balance 1st July 2013	**849,184**
Surplus for year	41,533
Balance 30th June 2014	**890,717**

The Australian Flora Foundation is an Australian non-profit non-government organization dedicated to fostering scientific research into Australia's flora. It is totally independent. All members of the Council and the Scientific Committee give their time freely as volunteers.

The Council (*governing body*)

- Dr Peter Goodwin, President
- Professor Richard Williams, Vice President
- Associate Professor E. Charles Morris, Vice President and Treasurer
- Mr Ian Cox, Secretary
- Dr Tina Bell
- Dr Rhonda Daniels
- Dr Jenny Jobling
- Professor Michelle Leishman
- Dr Paddy Lightfoot
- Dr David Murray
- Mr Ross Smyth-Kirk

The Scientific Committee

- Professor Richard Williams, University of Queensland - Chair
- Professor Kingsley Dixon, Kings Park & Botanic Gardens, WA
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