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Contents

Herbaceous Plants	Masumi Robertson	3
ANPSA Biennial Conference, Wrest Point, Hobart	Anne Campbell	7
ANPS Support for Canberra Nature Map	Geoff Butler	10
Winners of 2017 Australian Native Plants Awards		11
What's going on in the ACT weeds world?	Sarah Sharp & Geoff Butler	14
Hobart Environs Tour	Lesley Page	18
Celebrating National Pollinator Week	Julie Armstrong	20
ANPSA National Conference, Hobart	Neville Page	25
My Canberra Garden in Transition	Fran Middleton	28
Boabs or Baobabs — That is the Question	Roger Farrow	35
Study Group Notes	Brigitta Wimmer	41
ANPS Canberra contacts and membership details		inside back cover

Cover: *Rulingia magniflora*; Photo: Glenn Pure

Journal articles

The Journal is a forum for the exchange of members' and others' views and experiences of gardening with, propagating and conserving Australian plants.

All contributions, however short, are welcome and may be accompanied by photographs or drawings. The editor reserves the right without exception to edit all articles and include or omit images as appropriate.

Submit photographs as either electronic files, such as JPEGs, or prints. Set your digital camera to take high resolution photos. Please send JPEGs separately and not embedded in a document. If photos are too large to email, copy onto a CD or USB drive and send it by post. Please enclose a stamped, self-addressed envelope if you would like your prints returned. If you have any queries please contact the editor.

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The deadline dates for submissions are 1 February (for March edition), 1 May (June), 1 August (September) and 1 November (December).

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Text and photos by Masumi Robertson

With the arrival of cooler weather, I am looking forward to planting out smaller plants both to fill in gaps in the garden and to replace plants that died due to the extremes of our Canberra climate.

One group of plants suitable for this are herbaceous plants: non-woody plants that can be used like small shrubs, small accent plants or ground covers. Other herbaceous plants such as grasses and clumping plants (many monocotyledonous plants) will be dealt with in the June edition of this Journal.

Herbaceous plants add colour to any garden. Many are long flowering over the warmer months by continuously producing flowers. They also have the ability to regrow and flower well in autumn to early winter when the spring growth and flowers are removed. They are particularly useful in smaller gardens or new gardens as they are relatively quick to grow.

Those described here are perennial forbs which respond well to a late winter clip and feed every year. Other than *Brachyscome multifida*, they are all locally occurring species, adapted to our difficult environment.

Brachyscome multifida



One of the *Brachyscome* daisy species with mauve, pink, blue and white flowers that contrast well against their dark green leaves.

Following a late winter tidy up they mainly flower in spring, but they continue to flower when watered well over the hot summer months and can cover a fairly large area.

This is one of the most rewarding and reliable daisy plant species with a number of cultivars.

There are also many other *Brachyscome* species, some occurring locally, and they are worth a try when available. They include *B. decipiens*, *B. graminea*, *B. rigidula* and *B. spatulata*.

Chrysocephalum semipapposum



A local golden daisy, this plant grows more like a small shrub to about 0.5 m high. It is an everlasting, or paper, daisy that used to be in the genus *Helichrysum*. Paper daisy flowers last for a long time, keeping their colour. Clusters of flowers at the end of the stem contrast well against the soft green leaves. The main flowering time is spring into summer, but with summer pruning and watering, can flower well in autumn. It is a handy plant where you want a bit of height.

Coronidium scorpioides



Another cheerful local paper daisy with bright golden-yellow flowers that contrast well against the green leaves.

The flowering stems grow to about 30 cm long but they tend to flop down, creating yellow dots against the green. Under good conditions with water, sun and feed, this plant can sucker, covering a relatively large area.

Coronidium species were split from the genus *Helichrysum*; they contain paper daisy species with “sun” like flowerheads having shorter ray flowers. The main flowering time is spring and summer but it continues to flower into autumn.

I find it easier to maintain over summer by cutting it down to remove spent flowers and even flower buds and letting the plant regrow in late summer. With this treatment, the plant flowers well in autumn and into early winter. As with other daisies, it needs a late winter prune to remove old growth.

Eryngium ovinum



The iridescent blue of our Blue Devil shines in the summer sun. It is a perennial plant seen around Canberra, growing to around 0.6 m high, or taller in a garden. The blue flowers can last into autumn. They can be dried and used as dried flowers along with paper daisies. It is best to remove the died down old leaves and flowering stems in

late autumn. By then, new leaves have formed following the autumn rain, and fresh flower stems emerge in spring from a spiky rosette, thus repeating the cycle. They flower best in full sun, and winter leaves are not affected by frosts or cold in any way. They are best planted out in autumn.

Goodenia pinnatifida



plant dies down after flowering to an underground tuber, resprouting with the arrival of autumn rain. The tuber is edible and has been an important food source for the aboriginal people. Having this type of root also means that the plant can survive hot summers protected underground.

Pelargonium australe



Large, bright yellow flowers are continuously formed from spring through summer and held about 20 cm high over a rosette of leaves. This perennial plant can spread by suckering, popping up in an area it finds best suited to grow among other plants and also into open space in the garden.

Despite its scrambling growth habit with thin wiry flower stems, this plant can tolerate our hot dry conditions quite well. It flowers best in full sun and appreciates water when very dry.

Microseris lanceolata

The yam daisy has one of the largest daisy flowers in bright yellow, held high at 30 to 40 cm, swaying in the wind. Flowering stems emerge from slender basal leaves, one flower per stem. The

This is a very tough native ‘geranium’. The plant forms a rosette of leaves and multiple flowering stems with many pink-mauve flowers for a long time from spring into summer. I cut our plants in early summer, removing dying flowers and older leaves. The plant will look tidy with a fresh regrowth and more flowers in late summer into autumn. This plant

also forms an underground thick tap root, thus it is more likely to survive hot summers and dry periods. The plant responds to summer rain and watering and flowers best in full sun.

Stylidium graminifolium



This is the pink trigger plant. When well established, multiple flowering stems emerge from the centre of a rosette in late spring and summer. Twenty to 30 pink flowers open from the bottom to the top of the stem, 20 to 40 cm in height.

The grass-like leaves remain green all year but it is best to remove the spent flower stems. It grows best in a well-drained soil in full sun. The trigger in the centre of each flower is sprung by small insects pollinating the flowers. The trigger resets after a while.

Wahlenbergia stricta

One of the most hardy *Wahlenbergia* species for your garden. Another species, *W. communis*, is very similar and also grows well in gardens. We have seen these plants growing in road verges, baking hot, but surviving continuous mowing and very tough conditions. We have cheerful blue flowers, 2 to 3 cm in diameter, from spring to autumn, even in early winter. There is also a white flowering form. The flowers close every day and during



rain, opening with sun and heat. Our plant has spread by suckering, coming up among other shrubs. The plant dies down completely in winter, so it is best to remove the dead stems before spring.

Xerochrysum viscosum



This is a hardy perennial everlasting daisy that grows like a small shrub to 0.7 m high. Yet another species that used to be in *Helichrysum*, then in *Bracteantha* and now in *Xerochrysum*.

Whatever its name, a clump produces many flowering stems, each with a bright yellow flower, in spring and summer. It can grow in most conditions but it flowers best in full sun with supplemental watering when very dry. A similar species, *X. bracteatum* (not an ACT local), tends to be an annual or a shorter lived perennial. Old stems are best removed in early spring for both species.

ANPSA Biennial Conference Wrest Point, Hobart

By Anne Campbell

The Australian Native Plants Society Australia (ANPSA) Conference was held between 15–19 January this year at Wrest Point, Hobart, which proved to be a good venue with great views across the water. Many of us also stayed there.

The Conference was very well organised and the calibre of the speakers was good. We particularly appreciated having a printed conference handbook which provided a brief description about the speaker and a short abstract of their topic, as well as general information. The Conference organisers had also appointed an independent small company to manage the bookings and finances.

The theme of the Conference was Grass Roots to Mountain Tops and each day focussed on a different aspect. The overarching format was similar to that of the one held in Canberra in 2016, namely talks each morning until lunch time followed by afternoon excursions to a range of destinations.

These included salt marsh wetlands at Lauderdale and a well-established private native suburban garden (Green's), Mt Wellington, Royal Tasmanian Botanical Gardens and an inner-city garden in Battery Point (Champion's garden), Inverawe Native Gardens and Kingston Stormwater Wetlands.

As well there was the Tasmanian Bushland Garden (beside the Tasman Highway west of Buckland), designated a Regional Botanic Garden and being one of the very few public gardens in Tasmania devoted entirely to Tasmanian native plants. On the last day, this format was reversed with a morning excursion until lunch time and then the afternoon session.

Some highlights were the Welcome to Country with a wonderful singing rendition of same, a virtual tour of the Tasmanian coastal saltmarsh wetlands, an introduction to the bryophyte world, a number of presentations on landscape restoration and Tasmania's Gondwanan heritage.

There were also reports from some of the study groups, whose posters could also be found in the foyer where there was an excellent book stall and an opportunity to test one's knowledge in several quizzes. As in the past, there was a raffle with a range of prizes from which to choose.

The Governor of Tasmania, patron of the Tasmanian Society, opened the conference and then later received us at Government House where there was also an opportunity to tour the native garden there.

There was a good range of pre- and post-conference tours which a number

of the Canberra delegates enjoyed namely: multiple day trips covering Alpine to Rainforest, King Island, Hobart Environs (Tasman, Hartz Mountain and Mt Field National Parks and Wellington Park), and day trips to Bruny Island and the Warra Supersite.

A list of the talks follows:

Day 1: Grass roots to Mountain Tops

- Alpine vegetation of Tasmania — Professor Jamie Kirkpatrick
- 200 years of Botanical History — The Royal Tasmania Botanical Gardens Bicentenary — Mark Fountain
- The Subantarctic flora and vegetation of Macquarie Island — Nick Fitzgerald

Day 2: Coastal/Grasslands and Flowers

- A virtual tour of the Tasmanian coastal saltmarsh wetlands — Vishnu Prahalad
- Gondwanan flora: a global collection within a local natural ecosystem (Inala Jurassic Garden) — Tonia Cochran
- Lowland native grasslands — Louise Gilfedder
- Managing a native orchid hot spot: learning about the plants and their needs — Phil Collier

A.J. Swaby Address: Going to seed and proud of it: The Tasmanian Seedbank story — James Wood.

Day 3: Dry Bushland

- Tasmanian Island Ark: Ecological and cultural restoration in the Tasmanian Midlands — Sebastian Burgess
- Revegetation of the Midlands — Tanya Bailey
- Study Groups
 - Introduction — Jane Fountain, ANPSA Study Group Coordinator
 - Banksia — Kevin Collins
 - Plants in containers — Lynner Mockridge
 - Isopogon and Petrophile — Catriona Bate and Phil Trickett
 - Waratah and Flannel Flower — Maria Hitchcock
 - Garden Design — Ben Walcott
- Living in the Goldilocks zone: a look inside one of the world's tallest and most productive natural forest ecosystems — Tim Wardlaw

Day 4: Rainforests and climbing up

- Tasmanian ferns and fern allies: diversity, habitats and conservation management
- Tasmania's rainforest and its Gondwanan heritage — Fred Duncan
- Mosses, liverworts and hornworts, their contribution to the plant world — Patrick Dalton
- Grass Roots Projects

- Tasmanian Bushland Garden — Keith Corbett
- Heritage Forest Native Garden Launceston — Jill Clark presented for Daphne Longman
- Blue Water Crescent — how to surreptitiously introduce locals to native gardens — Ritta Boeink

Day 5: To the top

- In my own backyard, Mt Wellington — Sib Corbett
- **Next conference — Albany, Western Australia (28th September to 4th October 2019)**
- Panel on the future — address issues that had been posted on a notice board by delegates during the week.



Current and past members of ANPS (Canberra Region) at the Conference

We were delighted to be able to include Gwyn and Geoff Clarke (North Coast, NSW) and Pamela Finger (Mackay) in our Group, along with Catriona Bates and Phil Trickett, the latter two still Canberra Region members even though now ensconced on the South Coast.

ANPS Support for Canberra Nature Map

By Geoff Butler, Conservation Officer

Most (if not all ANPS members) would be aware of Canberra Nature Map (CNM). For those who do not know of its existence, CNM can be found at <http://canberra.naturemapr.org/>. CNM was established by Aaron Clauson, after an epiphany with a rare orchid while out mountain bike riding. CNM has since progressed to a very successful partnership between the ACT Government and the community.

The main objective of CNM is to record observations, locations and abundance of flora and fauna in the ACT and local region with the hope of improving public awareness of the diversity and importance of the diversity of life that surrounds us. It is also providing accessible and current locational data that can already be used by scientists and government when making decisions about development(s) and how they may impact on biodiversity.

Observations can be recorded by scientists or interested citizen scientists. There are currently some 1,200 members of CNM who have contributed 1,152,576 sightings of 4,700 species. Observations are easily recorded and are presented on screen in a user-friendly way.

CNM has a number of moderators who check any observations to either confirm the sightings or provide a name to any unidentified observations to ensure

data is as accurate as possible. The CNM website has public education in mind and provides a venue for contributors to communicate and share their knowledge with other like-minded people.

ANPS has two primary conservation objectives — *to promote the conservation of Australian plants and their habitats* and *to observe and support laws for the preservation of Australian native plants*.

As ANPS members will know, weeds are one of (if not the greatest) threat to biodiversity anywhere in the world. This year ANPS Council decided to provide a \$2,000 donation to CNM to assist with software modifications related to weed reporting processes.

Our donation to CNM will assist in furthering our conservation objectives and facilitate regional knowledge on the occurrence of serious weeds, especially any new incursions or new locations for existing weed species. Allied with this is a CNM reporting process which will enable a rapid management response, especially with new weed incursions or new populations of existing weed species.

In my personal opinion, ANPS support of CNM contributes in a significant way to our conservation objectives, and I would encourage the Society to consider regular support for what is an innovative and effective conservation tool.

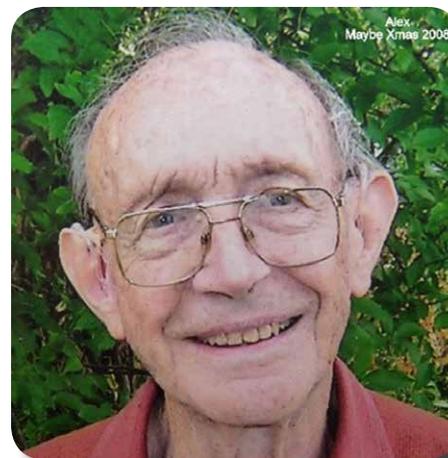


Winners of 2017 Australian Native Plants Awards

Alexander Floyd and Diana Snape have been announced as the 2017 winners of the prestigious Australian Native Plants Award.

These coveted awards are presented every two years by the Australian Native Plant Society (Australia) (ANPSA) to people who have made an outstanding contribution to the knowledge of Australian plants. Winners are chosen in two categories: professional and amateur.

The Professional Award



Alexander Floyd, OAM

The professional award this year goes to rainforest expert and author Alexander Floyd, who spent much of the 1970s and '80s assessing the conservation status of the NSW rainforest communities, discovering many new species in the process.

He was 70 when he joined the Australian Plants Society of NSW in 1996 — the same year that he became Honorary Curator of the forestry herbarium of the North Coast Regional Botanic Garden in Coffs Harbour. It's a position he still holds, aged 91, and its collection has grown from 16,000 to nearly 29,000 specimens in that time.

'I'm very surprised and very flattered to receive this award', Alex says. 'It's some time ago now that I was working on the evaluation of the NSW rainforests. We often used a helicopter for reconnaissance to identify the most interesting areas and then it was a matter of getting in there; many areas were very remote.'

Originally from Hampton, Vic, Alex served in the navy during WWII then studied botany at Melbourne University

before moving to the Australian Forest School in Canberra and then joining the NSW Forestry Commission. It is here that he set about finding, identifying and classifying the rainforest trees of NSW, now published as *Rainforest Trees of Mainland South-Eastern Australia*.

His service to botany was recognised with a Medal of the Order of Australia in 2008 and his discoveries have been honoured with two genera of plants and several species being named after him.

Yet when asked what he considers his career highlight, Alex lists a student excursion to Black Range, west of the Grampians, led by the legendary Dr Jim Willis, who was then Assistant Government Botanist at the National Herbarium of Victoria.

'He was so keen on everything he saw — big or small — he was a great mentor and inspiration for me.'

The Amateur Award

The winner of the amateur category goes to author and artist Diana Snape, who believes that using Australian plants is critical to creating an Australian garden.

She describes her reaction to receiving the award as 'Utter amazement, really', although she has been a member of the Australian Plants Society — first in NSW and then Victoria — for more than 50 years.

'When we started gardening in 1960, we could find only two gardening books with information to help us and little information about Australian plants,' she remembers. 'Now there would be hundreds, or possibly thousands. I think this explosion of knowledge has resulted from the work over the years



Diana Snape

of SGAP/APS and its Study Groups and individual members. They really led the way and then some tertiary institutions gradually followed.'

After studying a Master of Science at Sydney University, Diana taught science at secondary and tertiary level, writing *Meet the First 30 Elements* in 1989.

However, she says she was always a keen gardener and interested in art and design: 'In 1974, I asked at Burnley [Horticultural College] about doing a landscaping course but at that stage they had no part of the course that mentioned Australian plants and, when I discovered that, I lost all interest,' Diana says.

Instead she 'read a lot' and later served as a member of the Open Garden Scheme selection committee in Victoria. Diana and her husband Brian created a beautifully landscaped Australian plants garden in Hawthorn East that was

opened to the public and featured in a number of publications.

'Our last open weekend it was glorious weather and we had almost 1000 people through in total, so we thought we'd finish on a high,' she says. Now they have downsized but have Balwyn's Maranoa Gardens on their doorstep.

Diana founded the ANPSA Garden Design Study Group in April 1993 and edited its newsletter for 10 years, as well as writing for *The Age* and special-interest journals. She is author of two books on garden design: *Australian Native Gardens: Putting Visions into Practice* (Lothian, 1992) and *The Australian Garden: Designing with Australian Plants* (Blooming Books, reprinted 2008), the latter with co-authors and all royalties donated to the Garden Design Study Group. Many of the photos and illustrations are also by Diana.

In 2002 Trust for Nature named a 754-hectare property near Dimboola

Snape Reserve, honouring her husband Brian, who was chairman of Trust for Nature for 10 years, and Diana.

The national Plant Awards are made in conjunction with ANPSA's Biennial Conference and Seminar, held this year in Hobart.

The ANPSA (formerly known as the Association of Societies for Growing Australian Plants) has been growing and promoting Australian Plants since 1957. It caters for people interested in Australia's native flora whether that interest is simple appreciation of the beauty and diversity of the flora or whether it extends to propagation, cultivation and conservation.

The Society's activities are wide ranging and include special interest Study Groups <http://anpsa.org.au/study.html> and support of research through the Australian Flora Foundation <http://aff.org.au/>. For more information please visit www.anpsa.org.au.



Senecio pinnatifolius var alpinus, Porcupine Walk, Kosciuszko National Park; Photo: Gail Ritchie Knight

What's going on in the ACT weeds world?

By Sarah Sharp and Geoff Butler

This article is the first of what the authors hope will be an irregular regular feature in the Friends of Grasslands and Australian Native Plant Society Newsletters. Over time, the authors (with lots of help from various weedy friends) will attempt to provide information on actions that are occurring, as well as issues or links to information.

Despite the volumes of information now available through various internet sources on weeds, including pages directly relevant to the ACT, our key reason for doing this is to ensure that the ACT community continues to work in cooperation with Government to manage weeds in our landscape.

We hope that these articles will also be reproduced for use in other media, such as other community group newsletters and sent out more widely across the region. We encourage you to utilise these articles and copy and distribute them.

However, while we acknowledge the assistance of others in preparation of these articles, please ensure you respect that they reflect the opinions of the authors alone, that they are written for information and that the ACT Government is not to be held responsible for implementing all actions identified within timeframes identified.

The Weeds Advisory Group

The authors are community representatives on the ACT Weeds Advisory Group (WAG). Sarah's work in natural grasslands and grassy woodlands in the ACT has had a great deal (unfortunately) to do with weeds, given they comprise the greatest threat (alongside development) to these ecosystems.

In her role as a scientist in the ACT Government for some 17 years she was also on the Weeds Working Group and has retained a strong interest and concern with weedy matters since leaving the public service.

Geoff, who is a founding member of the Australian Network for Plant Conservation, and member of ANPS, Conservation Council and the Friends of Grasslands, has been for many years an active advocate for effective weed management and has been the weeds officer for the Conservation Council for many years.

Both of us are committed to ensuring the community is well-informed and actively supporting weed management in the ACT, whether it be for biodiversity, economic or amenity reasons (yes, including our own gardens!)

WAG operates as a non-statutory advisory group and was identified in

the ACT Weeds Strategy 2009–2019 (Environment ACT 2009). WAG is a 'technical reference group set up to oversee implementation of the ACT Weeds Strategy, be a source of expert advice on weeds matters, and serve as a conduit for providing reports to the ... ACT Government' (Environment ACT 2009, p.5).

Other members of WAG include academics, ecologists, ACT Government managers and technical staff, including Steve Taylor and Jenny Connolly, Invasive Plants Officers with Parks and Conservation Services (PCS) and Transport Canberra and City Services (TCCS) respectively. WAG is supported by a secretariat, Dr Alison McInnes (Senior Policy Officer, Biosecurity and Rural Services, ACT PCS).

WAG meets approximately twice annually and goes through a pretty broad agenda each time. Five meetings as well as several out of session meetings have now been held since early 2015. More information can be found about the Strategy and the priorities, membership and function of WAG in the weeds strategy (http://www.environment.act.gov.au/__data/assets/pdf_file/0007/575071/ACT-Weeds-Strategy-2009-2019.pdf).

In addition to WAG, ACT Government staff also are part of a regional biosecurity group, which links land managers across the region (including the National Capital Authority and Commonwealth Department of Defence, as well as NSW local government Councils).

WAG met on Monday 4 December 2017, and we have included several items on

the agenda that give a taste of what the group addresses:

- Progress on high risk weeds alerts to, and passive surveillance reporting from, key stakeholders including community groups. We will elaborate further on this in a future article, but the attached alert about Coolatai Grass (*Hyparrhenia hirta*) utilises the agreed process for reporting sightings. This species has recently invaded the Southern Tablelands, in locations very close to the ACT. Canberra Nature Map (CNM) has an automatic alert placed on this species, as well as some other species of concern, so that a reporting placed on CNM goes automatically through to the newly established High Risk Invasive Plants Team who can then respond to that report immediately (see the article below by Steve Taylor). There have been a number of recent new incursion and high risk occurrence sightings lodged on CNM that have been attended to very rapidly by the Invasive Plants Team.
- Steve Taylor gave a report on weed control and management undertaken in the past three months by Government and contractors, including budget expenditure and included reports on Chilean Needle Grass control monitoring and mapping. Annual weed plans, progress on their implementation, reviews and information on particular weeds are available at <http://www.environment.act.gov.au/parks-conservation/plants-and-animals/Biosecurity/invasive-plants>.

- WAG discussed community education and involvement in the context that several programs run over many years have come to an end (eg Floriade and (potentially) Weed Swap). WAG identified the need to develop and implement a program that best utilises current resources, particularly the effective use of electronic reporting and mapping by staff, consultants, contractors and community. More on this at a later date.
- WAG discussed the sale of illegal online trade in invasive plants through Facebook, eBay, Gumtree and similar sites. This is a matter affecting every country in the world, with many species advertised for sale in overseas countries, as published in several papers presented to WAG. The ACT Government is working closely with other states to determine how best to deal with this. Several heavy fines have been applied interstate to online traders who had received previous warnings about sales of legislated pest plants, but even so, had continued to advertise these plants for sale. Our attention was drawn to a sale item currently on eBay for the highly invasive Mexican Feather Grass.
- A review of achievements against the priorities of the ACT Weeds Strategy 2009 to 2019 was discussed. Some examples include a review of the urban tree planting guidelines, to which developers are required to comply. This is an action that has been sorely needed for many years.

This review, with significant input by WAG, has just been completed and will be released very shortly. This list has removed many invasive species, and restrictions have been placed on where some species may be planted, such as not allowing them to be planted adjacent or near reserves.

Another priority item identified in the Strategy was to hold a Weed Forum every three years to facilitate information and knowledge exchange. Two have been held to date, and a third is to be held hopefully in 2018, possibly to workshop community future programs.

The High Risk Invasive Plants Team

Steve Taylor, Senior Invasive Plants Officer, ACT Parks and Conservation Services

The ACT Weeds Advisory Group recently decided there was a need for a rapid response team to deal with the increasing reports of high risk new and emerging invasive plants.

It was decided to create a multi-agency team of technical experts to prioritise and implement responses — called the High Risk Invasive Plants Team.

Members of the team include: Dr Michael Mulvaney, the Senior Environmental Planner with Environment Planning and Sustainable Development Directorate (EPSDD); Jenny Connolly, the Invasive Species Officer with Transport Canberra and City Services (TCCS); the Senior Invasive Plants Officer with ACT Parks and Conservation Services (PCS), and Mal Copelin who is a pests and weeds expert with TCCS.

Two recent examples are given below of how the team responds to a report.

Turkey Rhubarb report at Mt Majura

Waltraud from Friends of Mount Majura discovered a suspicious vine on Mt Majura. She posted it on Canberra Nature Map (CNM) <http://canberra.naturemapr.org/>. It was identified as the invasive vine — *Acetosa sagittata* (Turkey Rhubarb), native to South Africa.

An auto-alert email from CNM was sent to the High Risk Invasive Plants Team. The location was mapped on the Collector app weeds—not treated map. As this was a new incursion in the ACT, a specimen was taken to the National Herbarium the next day, for confirmation and their collection.

A wider search for more plants was also undertaken and other plants were located and treated. Control commenced a day later and the area was mapped on Collector app—treated weeds.



Turkey Rhubarb (also known as Rambling Dock)

Spanish Heath report at Mt Taylor

Sequence of events: Kathy Eyles from Friends of Mt Taylor reported an infestation of a suspicious plant at Mt Taylor to CNM. Identified as *Erica lusitanica* (Spanish heath).

An auto alert email was sent from CNM to the High Risk Invasive Plants Team. The infestation was mapped on the Collector app—weeds not treated map.

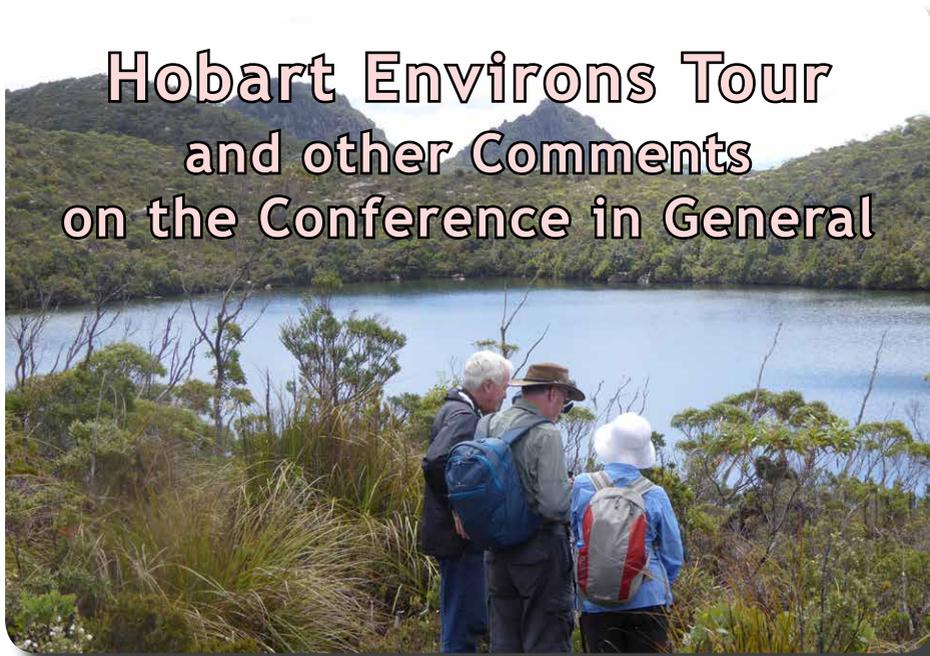
The job was too big for the team, so Ranger Ellyse Sheridan and specialist weeds contractor J & J French undertook the control work and it was mapped on Collector app—treated weeds.

Well done to all involved — these examples show the value of Citizen Science.



Spanish Heath (*Erica lusitanica*)

Hobart Environs Tour and other Comments on the Conference in General



Lake Esperance, Hartz National Park

Words and photos by Lesley Page

Nev and I arrived a week early for the conference. We had booked the Hobart Environs tour, which proved to be a very good choice. The first day we visited the Tasman National Park on the coast, south of Hobart. Second day was Hartz National Park, inland high country. The third day was Mount Wellington on a clear day and the fourth day was Mount Field National Park where the Tasmanians go skiing and we saw the fabulous Pandanii (Richea) grove. The epacrids were like enormous ants out of Lord of the Rings.

My favourite park was Hartz National Park. It was so pristine, no apparent weeds, great diversity and such interesting plants. I would even say it competes with my love of Kosciuszko National Park. Here we found at Lake

Esperance the smallest eucalypt in Australia, *Eucalyptus vernicosa*, the varnish gum because of its shiny leaves. Richeas abound, the largest epacrid, *Richea pandanifolia* subsp. *pandanifolia* was seen in the distance. The richeas were in flower, spectacular.

We also saw dotted in amongst the landscape *Bellendena montana*, Proteacea family, in flower, white pink poms poms clustered small shrub. There was also *Banksia marginata*, widespread. Only two banksias are on the island, the other being *B. integrifolia* found in the north-east of the island. *Lomatia polymorpha* was also in flower, unusual for me because I have not seen lomatia in flower on the mainland. *Telopea truncata*, the local waratah, had just finished flowering.



Richea, Pandanii Grove, Mount Field National Park



Richea pandanii flowers, Mount Field National Park

Another delightful plant, which had pink berries was *Leptecophylla parvifolia*, another epacrid. Tasmania has a large Epacridaceae family. The eucalypts were majestic. It competed with Victoria for the largest flowering tree in the world, *Eucalyptus regnans*. There was *E. coccifera*, Tasmania's answer to our snow gum, *E. pauciflora* although I think they do have it. *Eucryphia lucida* was in flower, beautiful white buttercup shaped flowers, famous for its leatherwood honey.

A smooth transfer of duties from Canberra to Tasmania was made on Sunday at Wrest Point where most of us were staying.

The Conference began on Monday and followed through to Friday, speakers in the morning and visits to gardens and places of interest in the afternoon.

The topic Grass Roots to Mountain Tops was well organised with exceptional speakers. Nev and I got so much out of it, as it was about Australia, its incredible beauty and problems, in particular climate change. The topic also related to what we are trying to do at Wamboin, maintain and improve a Box Woodlands environment mixed with grassland.



Bellendena montana, Hartz National Park



Lomatia polymorpha, Hartz National Park

Celebrating National Pollinator Week

with Wild Pollinator Count at the ANBG

Words and photos by Julie Armstrong
ACT for Bees

Last November, to celebrate National Pollinator Week ⁽¹⁾, The Australian National Botanic Gardens joined in the seventh annual Wild Pollinator Count in collaboration with ACT for Bees <http://actforbees.org/>. Ten volunteers turned up on the Tuesday morning of National Pollinator Week and were each given a particular location in the Gardens where they were to carefully count and record the number of native bees, wasps, flies and butterflies for ten minutes at a time. They noted all the insects including European bees.

The pathway from the Bookshop turned out to be one of the most fruitful places to do the 10-minute observation with

35 wild pollinators recorded. Near the waterfall, Bulbine lilies, Brachysomes and Rhodanthe species attracted several native bee species and a few butterflies. The Banksias were buzzing with bees and the tall Xanthorrhoea flower spike was forage for bees, wasps, butterflies, moths and wattle birds. Numerous Leptospermum species were flowering at the time which attracted a wide range of native bees and wasps, particularly outside the main gates and in the Sydney region gully area.

The Grasslands area's diverse species of daisies attracted many types of native bees and butterflies. The cascading bushes of *Kunzea ambigua* to the left of the Rock Garden were a surprise; as even between deluges of rain, small moths, flies and beetles emerged to



Bulbine glauca with native bee



Brachyscome multifida with native bee



Leptospermum rotundifolium with Bembix sand wasp



Xerochrysum bracteatum and native bee

feed from the flowers. Of course, the Callistemon had honeybees, flies, wasps and a range of birds enjoying the nectar.

The insect identification charts in the Resources section of the Wild Pollinator Count website were good guides for the basic differences between bees, wasps and flies, and easy for all to use. Most

of the observations in the Gardens for the week were honeybees, wasps and native bees. It's already known that the Gardens are home to more than 50 species of native bees, as recorded by Peter Abbott, a native bee enthusiast during the Spring and Summer of 2016–17.



Ammobium alatum with bee *Lasioglossum callomelittinum*

We were very fortunate that Peter Abbott conducted two guided observation walks during the Wild Pollinator Count week and greatly helped with bee and wasp identification. There is a wide variety of native bee species in the Gardens in Spring, the most common being *Lasioglossum* sp, *Exoneura* sp, *Leioproctus* sp and *Hylaeus* sp.

For the Thursday walk, a good turnout of home-schooling families brought with them an enviable range of magnifiers to closely observe the insects. Unfortunately, the Saturday was a washout with torrential rain throughout the day and minimal sightings of pollinators.

Nationwide, The Wild Pollinator Count received 458 observations from 126 locations with participants counting more than 4800 insects. The folks at the Wild Pollinator Count headquarters tell us that European honey bees were not



Leptospermum thompsonii, Budawang area, Sydney gully — prolific with insect life

the most-counted flower visitor. They say, 'Flies (1256 total counts) won the numbers this time! The results highlight how many non-bee insects are visiting and often pollinating our favourite flowers.'⁽²⁾ This Australian project is helping to provide much needed data about our wild pollinators as there is little long-term data to show the state of health of wild pollinators, particularly in farming regions.

The University of Adelaide is mapping the activity of bees and native pollinators in areas of native vegetation and re-vegetation around different crops to identify a list of plants with the most useful sources of pollen and nectar. This will be used to create a unique map for strategic vegetation plantings around farms to improve biodiversity and productivity.

The Australian National University and the University of New England are also involved in the pollinator corridors on

farms project which will help to secure pollination of almonds, pears, lucerne, canola, apples and cherries.⁽³⁾

In Germany a citizen science project similar to the Wild Pollinator Count has been operating in 64 nature-protected areas for the last 27 years and has yielded concerning results: a 75% decline in flying insect biomass.⁽⁴⁾ These results, overseen by university scientists, are of especial concern because the project is conducted within nature reserves, and the situation is likely far worse elsewhere.

In November 2017 Michael Gove, the UK Environment Secretary announced tougher restrictions on neonicotinoid pesticides: 'The weight of evidence now shows the risks neonicotinoids pose to our environment, particularly the bees and other pollinators which play such a key part in our £100b food industry, is greater than previously understood... We cannot afford to put our pollinator populations at risk.'⁽⁵⁾

Studies suggest that this class of pesticides affect bees' navigation and immune systems. There is also concern that other beneficial insects, songbirds, small mammals and aquatic invertebrates are also negatively affected by these systemic pesticides.⁽⁶⁾ A 2017 UK study showed more than 70% of plants labelled 'bee friendly' contained neonicotinoid pesticides which can remain in the plant for many years.⁽⁷⁾

Neonicotinoids are widely used in Australia in agriculture and the nursery and garden industry. Many have welcomed Bunnings' recent decision to remove Yates Confidor, one of the most commonly used

neonicotinoid pesticides, from Australian and UK stores by the end of 2018.⁽⁸⁾ The common product names of Imidacloprid, Acetamiprid, Clothianidin, Thiamethoxam are listed in the Bee Friendly Gardening section of actforbees.org website.

ACT for Bees formed as a voice for the bees in response to an apparent drop in honeybee numbers in the summer of 2013–14 and an apparent lack of pollination in backyard gardens around the ACT and NSW. According to many beekeepers, it was the worst year for honey on record.⁽⁹⁾

ACT for Bees have collaborated with Cool Australia to create a free, online Years 5–6 Australian curriculum-aligned unit called 'Love Food? Love Bees!'⁽¹⁰⁾ In March 2018, Cool Australia will launch a 'Food Security' unit aligned with the new Years 9–10 geography curriculum. ACT for Bees is working with several local agencies and the Ginninderry development in West Belconnen to make a bee friendly Canberra with pollinator corridors of year-round flowering plants.

All of us can provide pollinator-friendly habitats by planting forage to encourage beneficial predatory insects including ladybirds, hoverflies, native predatory wasps and small insectivorous birds to keep a natural balance. Where possible, please plant natives and heritage varieties for more pollen and nectar, and plant flowers in clumps of up to one metre to reduce foraging distances for insects.

Native plants are an excellent way to support local wildlife and it's important to check what they have been sprayed

with prior to sale. In the ACT, plants and seeds treated with pesticides harmful to bees are not labelled. Keep a shallow bowl of water with stones topped up with clean water for the local wildlife.

The next Wild Pollinator Count will be held 8–15 April 2018, so please join in by visiting The Wild Pollinator Count website and help contribute to much-needed Australian data.

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The views and opinions expressed in this article are those of the author and are not necessarily the views and opinions of the Society.

ANPSA National Conference Hobart

By Neville Page

The 2018 Australian Native Plants Society Australia (ANPSA) National Conference was held in Hobart, Tasmania at the Wrest Point Hotel, in January.

The Conference proper commenced on Monday, 15 January 2018 with the official opening carried out by Her Excellency Professor the Honourable Kate Warner, AC, Governor of Tasmania. The Governor is Patron of the Australian Plants Society, Tasmania, and as indicated in her opening address, is a keen bushwalker.

Format of the Conference followed that established in Canberra in 2015, with technical sessions in the mornings, followed by excursions in the afternoons. There were five excursions: Inverawe Native Gardens and Kingston Wetlands, Royal Tasmanian Botanical Gardens and the Champion garden, Tasmanian Bushland Garden, Salt-marsh wetlands Lauderdale and the Green garden, and Mount Wellington.

The keynote speaker was Professor Jamie Kirkpatrick, Distinguished Professor of Geography and Environmental Studies at the University of Tasmania. Jamie's topic was *Alpine Vegetation of Tasmania*, and in his presentation he explained that alpine flora is highly Tasmanian endemic in the

west and more like that of the mainland in the east. Much of Tasmania's alpine vegetation is fire-sensitive.

The next speaker was Mark Fountain, Deputy Director of the Royal Tasmanian Botanical Gardens. His presentation was titled *The Royal Tasmanian Botanical Gardens Bicentenary*. Then Nick Fitzgerald talked about *The Subantarctic flora and vegetation of Macquarie Island*. Nick is a geographer, plant ecologist and field botanist with a special interest in Macquarie Island.

Following lunch, various groups departed by bus on the first day's excursions.

The next day started with a very interesting talk by Vishnu Prahalad on *A virtual tour of the Tasmanian coastal saltmarsh wetlands*. This talk linked in with the excursion to salt-marsh wetlands. Tonia Cochran spoke on *Gondwana flora: a global collection within a local natural ecosystem*. Tonia's business is Inala Tours which operates an extensive world-wide natural history museum and Jurassic Garden on Bruny Island.

Ecologist and conservationist, Louise Gilfedder then spoke on *Lowland native grasses*. The last technical session of the day was by computer scientist, Phil Collier whose topic was *Managing a native orchid hot-spot: learning about the*

plants and their needs. Phil's property is home to about one quarter of the Tasmanian native orchid flora.

On Tuesday evening we had the presentation of the 2018 Plants Awards. The Award in the professional category was presented to Alexander Floyd, rainforest expert and author. Alexander Floyd spent much of the 1970s and '80s assessing the conservation status of the NSW rainforest communities, discovering many new species in the process.

He was 70 when he joined the Australian Plants Society of NSW in 1996 — the same year that he became Honorary Curator of the forestry herbarium of the North Coast Regional Botanic Garden in Coffs Harbour. It is a position he still holds, aged 91, and its collection has grown from 16,000 to nearly 29,000 specimens in that time.

The Award in the amateur category was presented to Diana Snape. Diana founded the ANPSA Garden Design Study Group in April 1993 and edited its newsletter for 10 years, as well as writing for *The Age* and special-interest journals.

She is author of two books on garden design: *Australian Native Gardens: Putting Visions into Practice* (Lothian, 1992) and *The Australian Garden: Designing with Australian Plants* (Blooming Books, reprinted 2008), the latter with co-authors and all royalties donated to the Garden Design Study Group. Many of the photos and illustrations are also by Diana.

The A J Swaby Address was given by James Wood, titled *Going to seed and proud of it: the Tasmanian Seedbank Story*. James is manager of the

Tasmanian seedbank program based at the Tasmanian Seed Conservation Centre of the Royal Tasmanian Botanical Gardens. Prior to his move to Tasmania, James worked for Kew Gardens Millennium Seed Bank project. Among other things, James spoke about the challenges of getting collected native seed to germinate.

Sebastian Burgess, Greening Australia's Tasmanian Director of Conservation, presented his topic: *Tasmanian Island Ark: Ecological and Cultural Restoration in the Tasmanian Midlands*. In his talk, Sebastian described the problems experienced in the Tasmanian midlands by inappropriate farming practices, and measures taken to restore the environment.

The next speaker was Tanya Bailey who spoke about *Revegetation of the Midlands*. Jane Fountain, ANPSA Study Group Coordinator, then chaired a session on Study groups, with presentations from five Study Group leaders. Forest researcher Tim Wardlaw finished Wednesday's technical sessions with a talk on *Living in the Goldilocks zone: a look inside one of the world's tallest and most productive natural forest ecosystems*.

The next day started with Mark Wapstra talking about *Tasmanian Ferns and fern allies: diversity, habitats and conservation management*. Patrick Dalton spoke about *Mosses liverworts and hornworts, their contribution to the plant world*. The final technical presentation was from Fred Duncan who spoke about *Tasmania's rainforest and its Gondwana heritage*. A description of grass roots projects was presented by Keith Corbett, Daphne Longman and Riitta Boevink.

The Conference Dinner was held on Thursday night in the historic Derwent Room where we had a very informative and amusing presentation from John Groom about the history of the Wreast Point property. The Wreast Point Casino was established in 1973, but the site has a long history pre-dating that. A luxury hotel, the Wreast Point Riviera was built on the site in the 1930s. Many of the original art deco features of the old hotel are still intact.

On the final day of the Conference, Friday, 19 January 2018, Sib Corbett gave a presentation titled *In my own backyard — Mt Wellington*. Then the President of the Wildflower Society of Western Australia outlined details of the next National Conference, to be held in Albany WA. The Conference concluded with a panel discussion on the future of ANPSA.

Tours included Hobart Environs (Hartz Mountains National Park, Mount Wellington, Mount Field National Park, and the Tasman National Park), four days in King Island, a five-day Alpine to Rainforest tour, a one-day tour to Bruny Island, and a visit to the Warra Supersite.

As always, the Conference was a great opportunity to catch up with old friends and meet new acquaintances. It was good to chat with Geoff and Gwyn Clarke, Phil Trickett and Catriona Bate. Pamela Finger was also there from Queensland. The Canberra contingent comprised Ben and Ros Walcott, John Carter and Wendy Smedley, Jan Simpson, Warwick and Shirley Daniels, Els Wynen and David Vanzetti, Janelle Chalker, Anne Campbell, Mike and Robyn Shihoff, Lesley Page and yours truly Neville Page.

Correction

On page 33 of the December 2017 issue of the *Journal* (Vol 19 No 4), the photo at the bottom on the left was incorrectly named. It should read: *Olearia lirata*.

And on page 34 of the same issue, the photo at the bottom was also incorrectly named. It should read: *Leucochrysum alpinum*

Text was correct when submitted by the author.



Olearia lirata



Leucochrysum alpinum



My Canberra Garden in Transition

Former semi-circle of lawn beside driveway now a small garden surrounded by a path. *Callistemon* 'Kings Park Special' (left) will provide height eventually. Four-year-old *Xanthorrhoea glauca* doing well so I've recently planted two more a few metres away.

Words and Photos by Fran Middleton

One of my New Year's resolutions has been to more regularly photograph what's happening in my 28-year-old Canberra suburban garden.

Back in 1990 I had that sometimes-prized opportunity, a blank canvas on which to create a garden. Sadly, my enthusiasm for native plants was well into the future. Being from a completely different climate zone (Brisbane), upon arrival in Canberra in 1982, I became enthusiastic about all the 'new' wonders of the plant world which the Canberra climate allows. Over many years spent a small fortune on bulbs, perennials, Camellias and the like. That was my garden.

More recently, I have decided to tip the balance in favour of native plants and thought I might make some contributions to the Garden Design Study Group Newsletter about my challenges, strategies, successes and failures as I'm probably not the only member who would be embarking on such a project, whether the existing 'canvas' on which they are designing is of their own making or not.

So, here's instalment number one. Tipping the balance, rather than starting all over again, is key to my decision as I do intend to keep many of the mature deciduous trees for their amenity in ameliorating the climate extremes of

this city. Some of my exotic plants have sentimental value and a few I just really like but native plants are really my passion.

My garden has a gentle slope roughly east to west and the private back garden is on the north side, a delight in winter. The irregular shape of my house means that there are nooks and corners facing in all directions, microclimates for which I am very grateful in this part of the country. I do have one area that suffers total cold shade in winter and then baking afternoon sun in summer and I am still thinking about what plants might do best there. I've always found that gardeners and gardens have to be very resilient here.

Canberra has a 'no front fence' policy which theoretically means that gardens flow out to the footpath, enhancing the streetscape. A corner block on the main through-street has its challenges in that there is just so much garden 'on display', whether I like this or not and whether the weeds have gone feral or I'm managing to get on top of it all. I must ensure that my plantings don't reduce visibility for traffic turning out of my street.

Being so visible does seem to lend itself to chats with passers-by who occasionally stop when I'm gardening and ask what I'm up to and some even notice the greater number of native plants now. More importantly, the birds and insects have noticed and numbers and species have increased. At last count there were three Blue Tongue Lizards in residence.



The gradual transformation of gardens beside the public footpath — *Acacia* 'Little Nugget' (is only little if I prune it), *Melaleuca incana* (dwarf, I think/hope), plumes of *Dichelachne crinita*.



Textures and colours of *Brachyscome multifida*, *Chrysocephalum apiculatum* and *Kunzea* 'Badja Carpet' wrapping around a rock.



Life imitating Art, will the real Blue Tongue Lizard please stand up?

Challenges included a very large amount of lawn which I've gradually reduced to a small area in the back garden. Being a compulsive plant collector, it's not hard to fill up such spaces so I need to try to apply good design principles to make sure that these new gardens are worthy of the hard work of getting rid of so much lawn.

Early failures with Grevilleas in some former lawn areas made me wonder if there might have been some residue of phosphorus from lawn fertilisers. I persevered with them and other Proteaceae and over time assume that the phosphorus has been leaching out.

My suburb used to be a hillside pine plantation on clay soil. Years of autumn leaf fall in my garden has overlaid this soil with a humus layer in many areas. I have earthworms in abundance but I also have mature tree roots.

Whenever I have any serious tree pruning done I acquire a big pile of chips for mulch. It doesn't have the even size or colour of commercial mulch but it's free. I have an automatic irrigation system but I have found after some losses that new plantings need hand watering over their first summer.

The only straight lines in my garden are those created by the public footpaths on two sides and my approach has been to create meandering paths that follow the curved edges of the former lawn areas. This mostly works well for moving in a coherent way around the garden. I must remember to stand back more often and gaze and think and imagine.

I've admired Leatherwoods, *Eucryphia moorei* on ANPS Wednesday Walks in

the mountains between Canberra and the coast and *E. lucida* when walking in Tasmania, so when a mature and diseased double white ornamental peach in a prominent place at the front of the house had to go, I was delighted to find *E. lucida* at a recent ANPS plant sale to replace it. Hotter, drier climate here, but a bit of extra water in summer and fingers crossed.



Eucryphia lucida, first flowers January 2018



Brachyscome multifida soften the edges where three hard surfaces meet. Note to self, propagate more Brachyscomes!

So, it's clear that I'm not immune to the disease of impulse purchases, many bought with wishful thinking during my travels, but I don't have too many other vices...



Replacing roses and a hedge, some 'pretties' I propagated, *Isotoma axillaris* and *Scaevola humilis* 'Sitting Pretty'. *Pandorea jasminoides*, *Billardiera* sp. (obscured) and *Boronia* 'Purple Jared' complete the picture

Sometimes I try my hand at propagating from cuttings — a good insurance against loss as well as providing plenty of opportunities for repeat planting which will help to unify the look of the garden as they mature.

I am challenged by all those exotic bulbs which have multiplied and self-seeded prolifically and to my eye don't always look quite right alongside native plantings, although the sheer hard work of removing absolutely all of them is probably unrealistic now so selective culling and 'deadheading' before seeding has been my strategy so far. I have been casting a critical eye over mature exotic shrubs that are past their best and many have had the chop!

Even painting their cut stumps with herbicide hasn't stopped some of them reshooting but overall I'm winning that particular battle. And the scourge of carpets of Vinca (both major and minor) has now been overcome by a very labour-intensive exercise with gloves, herbicide and a paintbrush. In general I would prefer not to use herbicide for all the usual reasons, but I'm using it responsibly and sparingly and for the greater good.

There is always something in flower, even if only briefly and tiny, and to my surprise and delight the January 2018 tally of flowering plants is about 90 and counting. Many of my plants are still tiny so I find myself celebrating a

solitary flower. However, I don't want to rely solely on flowers so I also seek out interesting foliage.



Hemiandra pungens showing promise as a ground cover



Regelia ciliata has lovely, neat foliage



Melaleuca hypericifolia 'Ulladulla Beacon'

I do like to clothe the walls and vertical structures with greenery and I hate to admit it but there had even been Ivy in this garden at some stage! I'm finding that *Billardiera* make good light climbers as long as they have support. So far I've been trying six species for suitability in Canberra, all of which seem easy to propagate, so far so good and I can replace those that may not survive their initial locations.



Billardiera sp.



Billardiera cymosa



Billardiera granulata seed pods

It seems to be taking forever for the Colorbond fence in the back garden to 'disappear' behind this four-year-old hedge of *Callistemon* 'Great Balls of Fire'. When this summer heat is over, a light prune should encourage some more of its colourful new growth.



Callistemon 'Great Balls of Fire'

I know there are different approaches to gardening with natives and I am definitely a pruner. Much as I admire them, it has not been my intention that this garden will ever look like a naturalistic bush garden but I hope it will eventually be an example of how to effectively combine native and exotic plants. I'm a little impatient to see how some of my planting combinations work out.

Many of my plants are grown in pots, some just to see how they survive the frosts as they wait out the winter under varying amounts of shelter, some because I'm almost certain they won't be happy in Canberra clay soil. There are often 'spares' coming along from my propagation efforts, just in case. *Crocea* 'Ryan's Star' was successful last year so I'm now trying four in the ground.



Crocea 'Ryan's Star'



Ceratopetalum gummiferum 'Johanna's Christmas'



Darwinia diosmoides

There are some weedy areas of my garden that I haven't yet incorporated into my plan — just not enough hours in the day.

There have been losses due to absence, weather and poor choices. However, I'm definitely past the point of no return with this project and loving it.

Some more January flowers



Correa glabra 'Coliban River'



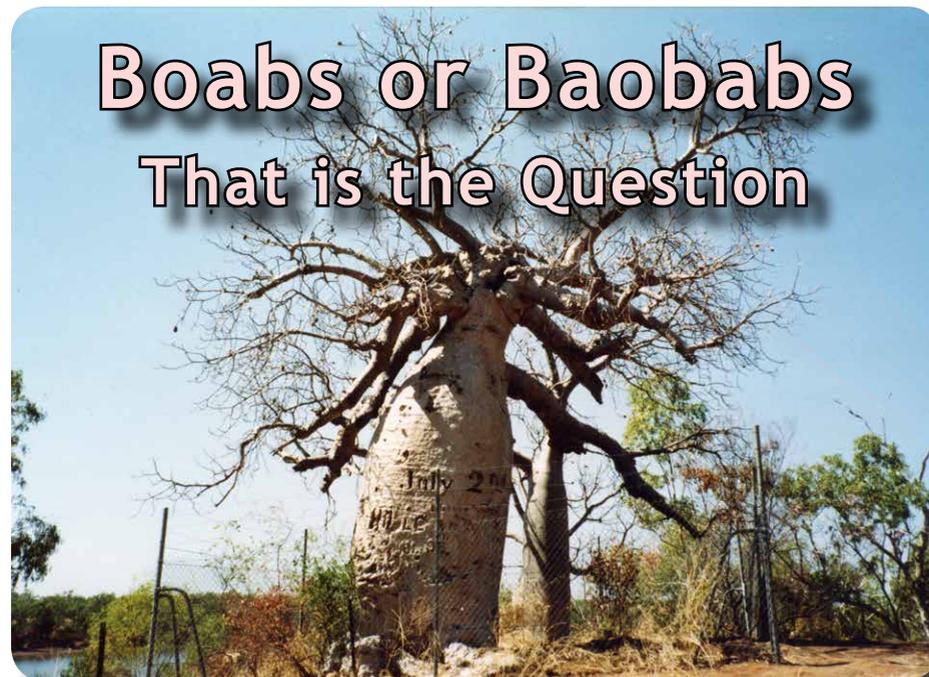
Dianella 'Uralla', a delightful miniature plant



Pelargonium rodneyanum

This article was first published in the Garden Design Study Group Newsletter 101, February 2018, pp 16–19

Boabs or Baobabs That is the Question



A boab, *Adansonia gregorii*, Kimberley

By Roger Farrow

One of the objectives of my visit to Madagascar in October 2011 was to see their endemic baobabs (*Adansonia* spp) and I then asked myself what is their connection with our own endemic boab and here is what I found.

The Australian boab, *Adansonia gregorii*, is an iconic tree of the Kimberly region of north-western Australia. It is a **pachycaul**, that is, it possesses a swollen trunk that is used for water storage, an adaptation to survive long periods of drought typical of tropical savannas. It is also deciduous, being leafless for much of the tropical dry season that also enables it to conserve water.

The nearest relations of our boab are the baobabs of Africa and Madagascar and its common name is almost certainly a corruption of baobab. The vernacular name 'baobab' is derived from Arabic (būhibāb), which means 'father of many seeds', and refers to the African species that is also found on the Arabian Peninsula, although I would not regard it as a particularly prolific producer of fruit and seeds.

Carl Linnaeus honoured Michel Adanson, 1727–1806, the discover of the African baobab with the generic name *Adansonia*. Adanson was a French naturalist of Scottish descent who explored Senegal from 1748–53 and



African Baobab, *Adansonia digitata*, Chobe National Park, Botswana

collected and described the African baobab, *A. digitata* (Linnaeus). This is very common in that country and its specific name, *digitata*, refers to the digits on the hand and the five leaflets that make up the compound leaf. The baobab is often referred to as the upside-down tree from its appearance when leafless.

Adansonia belongs to the family Bombacaceae that also includes the kapok tree, *Ceiba petandra* (common all over Africa mainland and Madagascar and introduced in Australia) and *Bombax ceiba*, the red kapok tree, common in Asia and northern Australia that has attractive red flowers. Recent studies have moved the Bombaceae to a sub-family in the Mallow family, Malvaceae.

Until recently there was only one species of *Adansonia* described from mainland Africa, *A. digitata* that has been widely spread across Africa, Madagascar and Asia by human agency over the past 70,000 years. It is a tetraploid, that is, it has four sets of chromosomes instead of the normal two sets and it would have been derived from a diploid ancestor in recent times.

A second species, *A. kilima*, was described in 2016 and was reported to be a diploid and commoner at higher elevations. This has not been supported by subsequent genetic and taxonomic studies, which have confirmed that *A. kilima* is a synonym of *A. digitata*. This species is morphologically highly variable over its extensive range.

Tetraploid plants are also thought to be more vigorous than their diploid ancestors. This species attains a massive girth of up to 24m that is approximately the same as the height attained. All species are very long-lived and some specimens of *A. digitata* have been estimated from their faint annual growth rings to be over 1000 years old.

Six species of *Adansonia*, all diploids, are native to the lowland dry forests of west Madagascar plus the tetraploid African species, alleged to be a human introduction about 1000 years ago. Madagascar contains many endemic plant species and genera due to its long period of isolation but it is not clear why *Adansonia* has diversified over a relatively small area of dry forests in the western part of the country. Several species co-exist.



The avenue of *Adansonia grandidieri*, Morondava



Adansonia rubrastipa in the spiny forest



A venerable specimen, undergone regular 'pruning'



Adansonia grandidieri in leaf near Morondava



Adansonia za. The Bottle Baobab with etchings

Not pictured are *A. madagascariensis*, *A. perrieri* and *A. suarezensis* from the north-west of the island, an area I did not visit.

The eight species of *Adansonia* can be grouped by flower colour, which is associated with their respective



Adansonia digitata, the introduced African Baobab

pollination strategies. Two flower colour combinations occur: white or red/yellow. The individual flowers of both types open for one night only and are strongly scented.

The white-flowered species, *digitata*, *grandidieri*, *gregorii* and *suarezensis*, are predominantly pollinated by night-active flying foxes and primates, although hawk moths sometimes visit the flower



A. digitata



A. grandidieri



A. gregorii



A. suarezensis

The red/yellow-flowered species: *madagascariensis*, *perrieri*, *rubrastipa*, and *za* are pollinated at night by hawk moths and other moths



A. rubrastipa



A. za

The flowers of *madagascariensis* and *perrieri* are similar

Human connections

The baobab is an important food source across Africa and in Madagascar. The fruit yields a tasty sherbet-like pulp and the young leaves are used to produce a mucilaginous sauce eaten with rice and other grains. In Madagascar, the baobabs are often pruned to improve the yield of fruit and leaves. The trunks are sometimes cut into to supply water for domestic animals.

Genetic studies of the Indian populations have shown that multiple introductions of the African baobab across Africa and to the Middle East and Asia have occurred since prehistoric times and are associated with the movements of African people through trading, labour recruitment and possibly slavery.

In Australia, a similar translocation of the Boab by the indigenous people has also occurred over a long time-period. It has been suggested that the diversification of *Adansonia* in Madagascar may be due to the absence of humans until recent times and that this restricted gene flow and encouraged speciation.



Grandidier's Baobab pods for sale



Baobab pod split open

Origins of the Boab

Molecular studies show that the Australian Boab is most closely related to the African species, *A. digitata*, rather than to any Madagascar species. Both are probably descended from a common ancestor in Africa. There are three theories for the origin of the Australian Boab.

1. It is a Gondwana relic, which would put its date of appearance back 100 mya but this is not supported by molecular studies.
2. It arrived in the last five million years, probably during the Miocene era, by transoceanic dispersal of the seed (hydrochory) although this hypothesis is not supported by prevailing ocean currents.
The fruit of the African baobab is reported to survive immersion in seawater for six months although the shell of the seedpod of our modern Boab is relatively thin and would not survive such prolonged immersion.
3. It was brought to Australia by human migrations from about 70 tya. This appears to be too recent to account for the morphological differences between *gregorii* and *digitata*, although a higher mutation rate could be responsible for this discrepancy.
Transoceanic dispersal from East Africa still appears to be the most plausible source for the Boab. The ancestors of many modern endemic plants and animals in Madagascar are thought to have arrived this way.

Acknowledgements & References

Thanks to the internet for the flower pictures and Wikipedia for information on the botanist Adanson.

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Study Group Notes

By Brigitta Wimmer, Study Group Liaison Officer, ANPS Canberra Region

Acacia Study Group

Newsletter 139, December 2017

- From the Leader
- Welcome
- From Members and Readers
- *Acacia cretacea*
- *Acacia pruinosa*
- *Acacia rhotinocarpa*
- Acacias and Galls
- Archibald James Campbell
- *Xylella fastidiosa*
- Wattle Family Plumbing
- Use of *Acacia dealbata* in dyeing
- Seed Bank
- Study Group Membership
- Financial Report
- Seed Bank Listing

Eremophila Study Group

Newsletter No. 118, November 2017

- Letter from the Editor
- What's New in the Study Group
- Keying Eremophila
- Feature species — *E. calorhabdos*
- A Note about Drought-hardiness
- *E. hygrophana* seedlings
- A Trip in Western Australia
- A new hybrid
- Group Field Trip Report
- Events
- From Your letters

- Future Newsletter Themes
- Financial Report 2016–17
- Errata
- About the Study Group

Eremophila Study Group

Newsletter 119, February 2018

- Letter from the Editor
- What's New in the Study Group
- The Great Grafting Survey
- More on Chimeras
- An Introduction to Hybrids
- Of Hairs and Microscopes
- Feature species — *Eremophila forrestii*
- A new find in Victoria
- *E. Meringur* Crimson vs *E. Passionate* Lady
- Sub-group meetings
- Biennial Report to ANPSA
- *E. maculata* field photos
- Eremophilas in Cloudy Hill Garden
- Field Trip Financial Report
- From Your letters
- Future Newsletter Themes
- Corrigenda
- About the Study Group

Garden Design Study Group

Newsletter 101, February 2018

- Leader's Comments
- Correspondence
- GDSG Meeting, Hobart
- The Marriott Garden

- Book review: Native-Art and Design with Australian Plants
- Comments on the book
- Australian Plants Award: Diana Snape
- Canberra Garden in Transition
- GDSG Queensland: notice of meeting
- Treasurer's Report
- Index

Hakea Study Group

Newsletter 66, February 2018

- Message from the Leader
- Propagating
- Letters from the Members
- Financial Report
- Frost
- *Hakea collina*
- ANPSA Conference, Hobart, January 2018
- *Hakea epiglottis*
- Hakea Crawl 2018
- *Hakea linearis*
- *Hakea ambigua* and *falcata*
- *Hakea lasiantha*
- Photos
- Vic, Melton and Bacchus Marsh plant sale (including Hakeas), 12 May 2018

Waratah and Flannel Flower Study Group

Newsletter 14, November 2017

- Maria writes
- From the members
- *Actinotus forsythii* for sale
- *Telopea truncata*
- Gallery
- *T. mongaensis*

- Waratahs from cuttings
- Wild about Waratahs Festival
- Floristry with Waratahs
- Checklist of *Telopea* species and varieties
- Checklist of *Actinotus* species and varieties

The ANPSA Study Group Coordinator, Jane Fountain, reported in her Newsletter No 5 (25.11.2017) the following:

Revived Study Group I would like to welcome Lynne Mockridge who has revived the Australian Plants for Containers Study Group.

In Recess Australian Plants for Bonsai Leader Roger Hnatiuk has put the Study Group into recess for up to two years in order to pursue pressing interests but plans to return.

Jane suggests that any study group leaders feeling challenged by writing the newsletter themselves might appeal to the members for contributions.

She also appeals again to those Study Group Leaders who have not produced a Newsletter during the last year, to send out a page or two so members know that a particular plant still has much interest. Maybe they even have information to share.

Australian Native Plants Society, Canberra Region Inc.

The aims of the Society are to foster the recognition, conservation and cultivation of Australian native plants.

Meetings are held at 8 pm on the second Thursday of each month, February to December, in Canberra. Visitors are always welcome.

Day and weekend field trips to locations of outstanding botanical interest are organised on a regular basis.

The Society publishes a Bulletin in all months except January, and this quarterly Journal in March, June, September and December.

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Membership Fees

Single or family memberships are the same price.

Basic membership including Bulletin and Journal — \$35 (\$18*)

Full membership including Bulletin, Journal and Australian Plants — \$50 (\$33*)

Life member subscribing to Australian Plants — \$15

* Concession rates apply to pensioners (Centrelink), full-time students and unemployed.

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Back cover: *Eucalyptus pauciflora*, Porcupine Walk, Kosciuszko National Park; Photo: Gail Ritchie Knight

