



Fronals

*Friends of the Australian National Botanic Gardens
Number 85 April 2017*

ANBG Bushland Nature Walk, details p3



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 BOTANIC GARDENS**

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ALISON MILTON

Luminous Botanicus III —Enlighten

Good crowds over four evenings enjoyed the special beauty of the Gardens after dark, heightened by spectacular lighting and music (*more photos p 15*)

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COVER: Bushland Nature Walk, stone steps along the path PHOTO P ROONEY

Bush at the doorstep: the Bushland Nature Walk

Denis Warne

One of the glories of the ANBG is that it is embedded in the native bushland of Black Mountain. Now the Gardens provide even greater access to this bush environment. The recently opened Bushland Nature Walk meanders through the 40 hectare Bushland Precinct across Black Mountain Drive from the Gardens' entrance.

The Walk is accessed via a gate in the south-eastern corner of the carpark. A path leads you across Black Mountain Drive, to a gate providing access into the Bushland Precinct where the Nature Walk itself commences. From this point, the walk is 2.2 km return and is rated as 'easy to moderate difficulty with some uneven ground, a few steps and some short steep sections'. With a little dalliance along the way to enjoy the flora and fauna, and the views, the round trip takes about one hour.

Works to develop the path have included levelling of the pathway, bridges across gullies (installed with the help of a helicopter), rock walls and steps in parts, and seats enabling contemplation and enjoyment of the view. If the journey isn't enough, the destination is a lookout with a spectacular view of Lake Burley Griffin and surrounds.

Interpretative signage at the lookout includes two photos of Black Mountain showing where you are standing; the first as it was in the 1920s, when it was cleared for pastoral use and the second as it is today. An amazing restoration of native vegetation has been achieved. The path appears to extend beyond the lookout, but you soon come to the end of Gardens' property and increasingly difficult terrain. So a return back along the way you came is certainly the best way out.

The bush environment is dry sclerophyll forest typical of Black Mountain. Interpretative signage identifies four of the commonest tree species as Brittle Gum, *Eucalyptus mannifera*; Scribbly Gum, *E. rossii*; Red Stringybark, *E. macrorhyncha*; and Red Box, *E. polyanthemos*. It goes on to encourage the public to know these trees and provides images and identification hints to assist. A number of shrubs and grasses are also identified by specific signage. In spring, many of the shrubs will be in flower and, with a keen eye, ground orchids may be encountered.

In the middle of the day when I first visited the path, there was some traffic noise from Parkes Way, but not enough to drown out the bird song. The birds did not show themselves – probably enjoying the shade somewhere as it was quite hot. There was, however, an abundance of butterflies to be seen. Kangaroos nonchalantly watched me pass. If you are lucky, you may even encounter an Echidna.

I must admit that I was ignorant of the Bushland Precinct's existence before the release of the Gardens' 20 year Master Plan in 2015. I have since learned that the Gardens became responsible for the area in 1981 but subsequent funding limitations prevented planned development. Until recently it has been left in a relatively wild state complete with rare species, such as the Fan Grevillea (see Rosemary Purdie's article, pages 4-5), and woody weeds, such as the Cootamundra Wattle (being addressed through an ongoing program of the Friends of Black Mountain). Both the Fan Grevillea project and the weeding are supported by members of Friends of the ANBG.

The Master Plan rejuvenated consideration of the Bushland Precinct. The Nature Walk represents a significant first step and is expected to attract locals as well as national and international tourists, seeking an intimate exposure to a uniquely Australian ecosystem. As with any rich natural environment, it is worth visiting time and time again as the flora moves through the seasons and the years, and differing birds and other fauna deign to show themselves on each occasion. In the meantime, see the movie on YouTube by searching for 'Australian National Botanic Gardens Nature Walk'.

My thanks to Rosemary Purdie for background discussion of the species of the Bushland Precinct, and Don Beer for his comments on the historical context.



Over the bridge

LINDA BEVERIDGE



Sections of stone to protect from run-off

P. ROONEY

Getting to know the ANBG's two Fan Grevillea populations

Rosemary Purdie

The Fan Grevillea (*Grevillea ramosissima* subsp. *ramosissima*) is a small shrub with prickly leaves and tiny cream flowers. It is considered a rare species in the ACT, where it has only been recorded from Black Mountain, Bullen Range and Tidbinbilla. Two populations occur on Black Mountain, one located in the ANBG's Bush Precinct (south population) and the other just inside the ANBG eastern boundary fence and extending into the adjacent road reserve and CSIRO land (east population).

A small group of volunteers from the Friends of ANBG's Plant Science Group collected data on both Black Mountain populations in 2016 to help inform ANBG management of the species. The broad aim of the three-year project is to determine the size and health of each population and obtain information to better understand their reproduction.

In July last year all plants in both populations were measured to determine their height and whether flower buds (young inflorescences) were present. Every plant

was marked with a cable tie, yellow or orange if the plant had young buds, and white if no buds were evident. In December all the plants with yellow or orange cable ties were re-examined and the presence or absence of mature fruit recorded along with their height class.

Population size

The data we collected show that the Black Mountain populations are much larger than originally thought: the south one had 486 plants and the eastern 193. Both populations had a similar distribution in height classes (Figure 1) and size of the largest plants. If size is taken as a surrogate of age, the data suggest that both populations have a multi-age struc-

ture, with continual natural recruitment into the populations from seedlings.

The south population had a higher number and proportion of small (young) plants compared with the eastern one (Figure 1). This reflected the large number of seedlings present in the northern half of the south population that was subject to a fuel reduction burn in May 2013. However fire does not appear to be required to trigger seed germination, as plenty of seedlings were present in the long unburnt areas of both populations. Careful examination of plants in the burnt area of the south population also showed that while most mature plants had been killed by fire, some plants located in a low intensity



Plants marked with pink tape prior to being measured



Volunteers measuring the height of a plant in the south population



Fan Grevillea, *Grevillea ramosissima* subsp. *ramosissima*

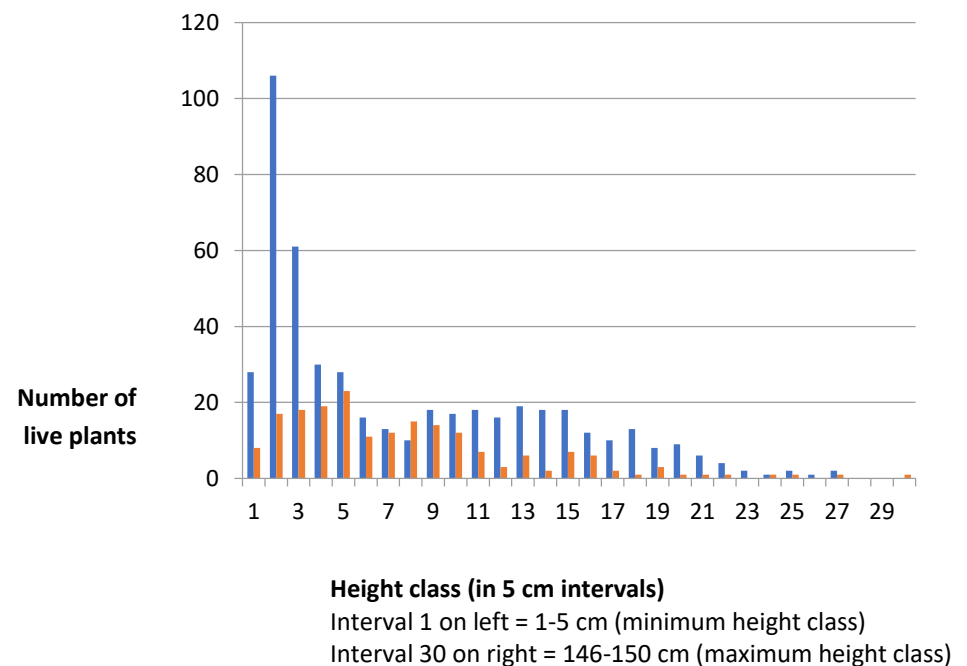


Figure 1. Population size structure: Blue= south population; Red= east population

burn area had survived and produced new vegetative regrowth towards the base of the burnt stem in the year following the fire.

Flowering and fruit set

The proportion of plants in the south and east populations that had young inflorescences on them in July 2016 was 43% and 58% (respectively). However in both the east population and long-unburnt part of the south population 94-95% of plants ≥ 30 cm tall had flower buds present, suggesting 30 cm is the height at which most plants reach sexual maturity. In the recently burnt part of the south population only 72% of plants ≥ 30 cm tall had buds; they were either individuals located in small unburnt patches or plants with post-fire vegetative regrowth. None of the seedlings in the recently burnt area had any inflorescences present, which indicates it takes more than three years for them to become sexually mature. In the south population, 93% of plants that had bud in July were developing



An orange cable tie shows the plant had young buds in July

ROSEMARY PURDIE



Two young fruits developing in an inflorescence. (the black line represents 2000 microns)

JOHN FITZ GERALD

new inflorescences in December for a second flowering. The population will be monitored to see if the buds survive the dry summer conditions.

Of the plants that had young buds present in July, 80% developed mature fruit in the south population, but only 46% in the east population. The cause of this difference is not known. Fruit-set was affected by plant size: for plants with buds in July, fruit-set in the east and south populations was 68% and 87% (respectively) for plants 0.5-1 m tall, but only 27% and 42% (respectively) for plants < 0.5 m tall. In the south population, we observed that 33% of the plants with maturing fruit had signs of their fruit being chewed by birds such as Crimson Rosellas – a feast for the birds, but fewer seeds being added to the soil seed store.

Mature seeds collected in January 2017 from a small number of plants in the east population are being germination tested by ANBG seed store staff to help determine the species' level of seed viability. This will help guide future collection of seeds for long term storage.

Management implications

The data collected so far suggest that the main management issue for ANBG is deciding how often the populations should be burnt as part of Canberra's fuel reduction program. Because the species appears to reproduce only through seed germination, it will be important that seedlings coming up after a fire reach sexual maturity and replenish the soil seed store before the next burn. The data we collect in 2017 and 2018 will give a better idea of how long it takes plants to reach sexual maturity, how much variation there is in the level of flowering and fruit set each year, and the extent to which the populations are renewing themselves through seed germination. We'll keep you updated as the story unfolds.

What's new in the ANBG Image Collections?



G. SANKOWSKY

Flowers of *Spermacoce cristulata*



G. SANKOWSKY

Brachychiton diversifolius subsp. *orientalis*

The two photos above are from the Australian Plant Image Index (APII) and were contributed by our partners at the Australian Tropical Herbarium, Cairns. They were photographed on a Bush Blitz trip to southern Cape York in Queensland. More photos taken on this trip can be seen here:

www.anbg.gov.au/cgi-bin/photo?FORMAT=TABLE&BY%23040=1&BY%23050=2&400=ATH_2

Many of the species in this batch of photographs were previously unrepresented in APII. The photos are linked to herbarium voucher specimens held at the Australian Tropical Herbarium.

To search for other photos from the APII use this link: www.anbg.gov.au/photo/

Cheryl Backhouse
Manager, Plant Image Collection
ANBG

Plant translocations: opportunities & challenges for threatened plant recovery

Leonie Monks

Science and Conservation Division, Western Australian Department of Parks and Wildlife.

The need for translocation principles and practices as a strategy to address threatened plant recovery was a key theme explored at the 11th Australasian Plant Conservation conference in November 2016. This article is based on a scientific paper presented at the Conference.

Australia has a highly diverse flora, with an estimated 23,875 plant species (Chapman 2009). Unfortunately many of these plant species are threatened with extinction, with around 5% of plant species listed as threatened on the federal *Environment Protection and Biodiversity Conservation (EPBC) Act* list in 2016.

A range of threats is affecting these species and in some cases these threats cannot be managed in situ. Increasingly, translocation is recognised as an effective means of intervention to prevent extinction for particular threatened species whose habitat is threatened. This article briefly outlines four examples of plant species that have benefitted from translocation programs in Western Australia (WA): *Acacia cochlocarpa* subsp. *cochlocarpa*, *Banksia brownii*, *Eremophila nivea* and *Hybanthus cymulosus*.

At the broadest level, translocation is the deliberate transfer of plants or regenerative plant material to a location in the wild for conservation purposes and the aim is to establish or maintain a self-sustaining population in both the short and long term. To be effective, translocation must aim to maintain the genetic diversity of the source population(s) in order to maximise the translocated populations' capacity to adapt to environmental change and to reduce the risk of inbreeding depression.

There are a number of types of translocation:

- adding individuals to an existing population (augmentation, restocking, or enhancement), or
- planting at a site where the species formerly occurred, (reintroduction or re-establishment), or
- establishing plants in areas where the species has never been known to occur, but within the known range of the species and its appropriate habitat (introduction or conservation introduction) (Vallee et al 2004).

More recently there have been discussions regarding establishing species well beyond their historic range in response to climate change (known as assisted migration, assisted colonisation or managed relocation) (Burbidge et al 2011). The translocation strategy for *A cochlocarpa* subsp. *cochlocarpa*, (Spiral-fruited Wattle), illustrates how translocation can be used to complement other recovery

actions. This WA wattle species is critically endangered and was known from one population of just 51 plants in 1998. The population occurred on road verges where it was vulnerable to accidental destruction during road maintenance and also from weed competition. There was little opportunity for the population to expand so it is likely the species will be threatened without management intervention. The WA Department of Parks and Wildlife collected seed from the wild population of this species. New safe locations were found



Spiral-fruited Wattle, *Acacia cochlocarpa* subsp. *cochlocarpa*

and seed and seedlings were planted at these sites. Two decades after the translocation work started three new populations have been established and a fourth site will be planted this year. Surveys have also located three additional small natural populations. A combination of translocation and survey means the species is now known from seven populations with just over 1000 plants and is in a much more stable position than it was two decades ago.

In the case of *Banksia brownii*, Feather-leafed Banksia, another critically endangered WA species, many of the populations were under threat from *Phytophthora cinnamomi* infestation, with ten populations already recorded as presumed extinct due to the disease. Translocation to safe, disease-free locations was considered high priority for conserving the species. A genetic study of population diversity undertaken prior to translocation found three distinct genetic groupings amongst the populations. This informed the translocation strategy, which included the decision to establish three translocation sites each containing one of the three genetic groups.



Silky eremophila, *Eremophila nivea*



Ninghan Violet, *Hybanthus cymulosus*

Propagation issues hampered translocation efforts of the critically endangered *Eremophila nivea*, Silky Eremophila. Initial attempts with seed germination were unsuccessful, as were attempts to propagate plants via cuttings. Direct seeding at the translocation site was also unsuccessful. Discussions between seed store and nursery staff resulted in a number of small changes in propagation techniques which were followed by successful propagation of seedlings. To date over 500 seedlings have been planted at the translocation site.

Whilst *Hybanthus cymulosus*, Ninghan Violet, has not been the target of a translocation program itself, this critically endangered species has benefitted from site protection actions put in place at the translocation site for *A. imitans* and *A. unguicula*. The translocation site for these two critically endangered Acacias was fenced to protect the seedlings from grazing by goats. During monitoring five years later *H. cymulosus* was found within the fenced area. Whilst the species is known from the general area it had been grazed back so much that it had never been seen at the site chosen as the translocation site. Fencing the area had the unintended benefit of allowing the species to regenerate and as a result a large seed collection was able to be made for safe storage at the Department's Threatened Flora Seed Bank.

It is important that we continue to improve translocation technologies always keeping



Feather-leaved Banksia, *Banksia brownii*

in mind that our objective is a viable population. This will ensure we optimise the value of plant translocations as an effective recovery action in preventing species extinction.

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- (photos supplied by the author)

Friendly Chatter

Photographic Group

The Committee has planned an exciting year with many new ideas initiated. Over the summer holidays members were involved in photographing events, which included the very successful Summer Sounds and the Enlighten Festival in March. Photographing these events has given the group an additional focus and assisted both the Friends and the Gardens, by providing images which can be used for promotional purposes. Photographing at night and in low light provides a challenge and an opportunity for our members.

The year began on a high note with guest speaker Lori Gould, Program Manager for the Woodlands and Wetlands Trust (Jerrabomberra Wetlands). This is a favorite haunt for many of our bird photographers.

Future events include more regular early morning walks followed by breakfast in the cafe, workshops and an overnight field trip to Jervis Bay. Our Annual Exhibition this year will be held in the Visitor Centre in October to coincide with the 2017 Australasian Botanic Gardens Volunteer Guides Conference and Floriade.

Details of the program are updated regularly on the Friends website. The Group always welcomes potential speakers and new members. Contact us at photo@friendsanbg.org.au

Brenda Runnegar



Photographic Group exhibition opening night.

Plant Science Group

The Plant Science Group finished 2016 with two more technical talks and a detailed guided tour of the National Herbarium, for which nine members joined Murray Fagg. Indeed, the talks attendance averaged about 30 people each time.

The last two monthly talks of 2016 were:

'Genomics for the Environment' by Professor Andrew Young, Director of the newly established National Research Collections that incorporates all CSIRO's collections of fauna and flora. Genomics has revolutionised medicine over the last 5-10 years and is now fundamentally changing what is possible in agriculture. The goal is now to apply genomics to questions in environmental science.

'The Australasian e-Flora – a new direction for the *Flora of Australia*' by Anthony Whalen, Australian Biological Resources Study (ABRS) and Dr Russell Barrett, ANU. The talk outlined how the *Flora of Australia* is moving from books to an interactive 'e-Flora' website where, soon, botanical authors will be able to actively contribute to the e-Flora. A live demonstration was provided

We started the new year with a flourish with 'Genetics guiding ecological offset work: the example of *Rutidosis lanata*' given by Dr Alexander Schmidt-Lebuhr from

the Centre for Australian National Biodiversity Research. Ecological offset work involves developing and managing new populations of rare or threatened plants to offset those that are affected by a new development. It requires a good understanding of the biology of the species in question, but little is known about many native species. The breeding system and genetics of *R. lanata* were studied to produce guidelines for seed sourcing to maximise the reproductive success of newly created populations.

Our Plant Science Group subcommittee (Anne Campbell, Maureen Connolly, Murray Fagg, and Lesley Harland) has been joined by Kristiane Hermann who filled the vacancy left by Diana Kirby. We are most grateful for Diana's past help. We are also delighted that Murray Fagg continues to source the speakers for the Group and have enjoyed an eclectic range of speakers and topics.

For further information email: plantscience@friendsanbg.org.au or see the Friends website under *Activities*.

Anne Campbell



Always welcomes Friends!
with a 10% discount on purchases over \$10, including the purchase of gift vouchers, on production of the customer's membership card for the person whose name is on this card.
No discount on redemption of gift vouchers.
www.botanicalbookshop.com.au

Gardens Guides

Australasian Botanic Gardens Volunteer Guides Conference October 2017

Every second year, one of the botanic gardens in Australia or New Zealand, hosts the



Australasian Botanic Gardens Volunteer Guides Conference. This year it is our turn. The ANBG will be hosting the 2017 conference, from Sunday 15 to Thursday 19 October.

More than a year ago, a small group of guides, with support from the ANBG and the Friends, started the initial planning for the conference. The theme for the conference is 'Informed Guiding; discovering the mystery & magic of our gardens'.

Planning is well under way now, with a larger number of guides and other Friends involved, developing a program of interesting speakers, guided tours of the Gardens and other activities for conference visitors, including night and early morning tours.

A full day has been set aside for guiding techniques. Following talks about communication skills, speakers from several of the national cultural institutions will highlight various guiding issues. Attendees will have the opportunity to visit some of the institutions led by their experienced volunteer guides.

The conference ends after lunch on Thursday. A one-day post-conference tour on Friday 20 October will include visits to private gardens and historical sites of the Monaro high plains.

For the conference website, which is updated regularly, go to the ANBG Friends website and follow the link at the top right of the front page.

Jane Keogh

Botanical Art Groups

Art in the Garden with Friends

9.30 am to 4.30 pm, 18 March to 17 April at the Visitor Centre

This year marks our 10th annual exhibition of work by the Botanical Art Groups at the ANBG. We have many very beautiful entries by over 40 artists. Although each artist can submit one work of their choice, all other entries must be judged by a team of botanists from the Gardens, to ensure botanical accuracy, as well as two artists who judge artistic merit. This process has resulted in a high quality of work being presented.

Watercolour, which is renowned for its transparent effects, has been a traditional medium in botanical art. Many artists have chosen to work in watercolour again this year, but some have chosen to use graphite, coloured pencil and graphite and watercolour in combination. Several exhibiting artists have had their work recognised by overseas awards, while others have work held in national collections. All work features native plants, many of which were chosen as specimens for us by the Gardens' horticulturalists. A member from one of the three Botanic Art Groups is available during the exhibition to answer questions about the work and provide information about how to join one of the groups, each of which meets once a month at the Gardens.

Bring your family and friends to the Visitor Centre during the exhibition. Entry is free and all commissions go to support the work of the Friends.

Kate Ramsey



Gumnuts
Patricia Harris



Isopogon formosus
Cornelia Buchen-Osmond

Our friend the blue-banded bee

Roger Farrow

Blue-banded bees have become one of the most familiar of our native bees because of their popularisation by the Aussie Bee Society and other groups. As well they have been given extensive coverage in articles in several different journals and in books (Dollin et al 2017). They even have their own website as well as Facebook links. These solitary bees are commonly seen in urban gardens where they can be encouraged to breed by the installation of specially designed nesting sites. They are also being promoted as important pollinators of both native plants and glasshouse crop plants through the discovery of their ability to 'buzz pollinate' cultivated plants, such as tomatoes (Bell et al 2006), and native plants, such as other Solanaceae (bush tomatoes) and Dilleniaceae (Hibbertias), among others.



MICHAEL BEDDINGFIELD

Amegilla asserta approaching an exotic Wort in a Canberra garden

Taxonomy

Blue-banded bees belong to the genus *Amegilla* but their taxonomy has been in a state of flux for many years through misidentifications and the use of unreliable characters to separate the species. The first Australian bee collected by Joseph Banks on the Cook expedition was a blue-banded and was subsequently named *Andrena cingulata* by Fabricius in 1775, where *cingulata* refers to the bands of hairs on each abdominal segment that reflect blue light. The genus *Amegilla* was created by Frieze in 1897 and the name is thought to be derived from the

Hebrew for scroll 'Megillah' mentioned in the Book of Esther. Many different species have been described in Australia over the years (over 40 by one count), although *A. cingulata* always appears to be the commonest one referred to, particularly in popular publications. The next positive step in sorting out their taxonomy involved the creation of three sub-genera by Brooks, namely: *Asaropoda* (the teddy bear bees), *Notomegilla*, mostly white-banded bees, endemic to Australia and Papua New Guinea, and *Zonamegilla*, white and blue-banded bees that have a wide distribution throughout Eurasia, Southeast Asia, and Australia. This year Michael Batley and co-workers at the Australian Museum have combined DNA studies and morphological studies of the Australian species in the latter two subgenera and have recognised two species of *Notomegilla* and twelve species of *Zonamegilla* (Leijs et al 2017). Twenty-four species names have become redundant and are re-classified as synonyms. The upshot of this is that our dominant local species is *Amegilla asserta* rather than *A. cingulata*, which is now confined to tropical and warm temperate coastal areas north of Taree. Another less common local species is *Amegilla (Notomegilla) chlorocyanea* that differs from *Zonamegilla* by the blue/green iridescent pubescence on the front and middle legs

Amegilla bees belong to the family Apidae that includes both social and solitary long-tongued bees that are characterised by baskets of bristles on the hind legs in the females, called scopa, that are used to pack and transport pollen to the nest to feed the larvae. A scopa packed with pollen is shown in this blue-banded bee that is visiting a flower of the native storksbill, *Pelargonium australe*, in the author's garden at Urila. Note the so-called nectar guides on the dorsal petals of the flower. In the older literature, *Amegilla* is placed in the family Anthophoridae that has now been incorporated into the Apidae as the sub-

family Anthophorini. The male bees are very similar in appearance to the females but lack scopa.

Behaviour

This bee is an aeronautical maestro exhibiting a characteristic hovering and darting flight around flowers and is extremely alert to any form of disturbance making them a photographer's nightmare. They are attracted to the flowers of a wide variety of native and introduced plants and have been recorded at 147 species belonging to 47 different families. There is no particular colour preference although in my garden they are particularly attracted to the intense pink of the native storksbill, *Pelargonium australe*. The female bee can sting but is not aggressive. The males form roosting aggregations at night in the vicinity of the females nesting areas and line up in rows along grass stems that they grasp with their jaws. The males of several different species of solitary bee also form similar nocturnal aggregations.



R. FARROW

Amegilla asserta collecting pollen from *Pelargonium australe* in the author's garden



ERICA SIEGEL

Roosting male bees

Life cycle

In our area, the adult bees emerge in mid-summer and are on the wing for about six weeks. After mating, the females dig tunnels in earth banks and soft sandstone, usually on vertical surfaces so that the holes are horizontal. Although each female works independently, the tunnels are often constructed in close proximity to one another giving the appearance of a colony. The same sites may be used from year to year. The female constructs a series of wax-lined cells in the tunnel that it successively fills with a paste of pollen and nectar. A single egg is laid on the lump of paste in each cell, sufficient for the bee larva to complete its development during the rest of summer. Adult bees die off in autumn and the larvae pupate in the cells and emerge the following summer. In warmer climates, there may be two generations a year.

Buzz pollination

In some plants the pollen contained in the anthers can only be released by vigorous vibration, notably in members of the families Solanaceae (tomatoes and kangaroo apples) and Dilleniaceae (Hibbertias) among others. High-speed photography has shown that blue-banded bees vibrate their thorax and head at a remarkable 350 times a second. The muscles involved are those that power the wings. Although the bees transfer much of the pollen to their hind legs, some remains attached to the hairs on the body and is transferred from flower to flower ensuring cross-pollination. It should be noted that pollination by bees and other insects is not a deliberate altruistic act but an accidental consequence of the collection of nectar and pollen from the flowers. Many insects visiting flowers are poor pollinators because pollen is not trapped on their bodies for example many smooth-bodied bees. Blue-banded bees are being promoted as pollinators for tomato crops being grown in glasshouses and are more efficient than bumblebees from the northern hemisphere (Bell et al 2006).

Nectar robbing

Like many bees, blue-banded may take short cuts to access nectar from flowers that have nectaries that are only accessible to insects with long proboscises, such as butterflies and moths, or flowers that have not opened. Alison Milton photographed an *Amegilla asserta* probing the base of an unopened tubular flower to access the nectaries of a Rock Isotome, *Isotoma axillaris*, in her garden. This behaviour is of no benefit to the plant since no cross pollination is involved.



ALISON MILTON

A nectar robber, *Amegilla asserta*

Artificial nesting-houses

Blue-banded bees dig tunnels in earth walls. Artificial nesting sites can be created by packing a mud mixture into the cavity of a concrete block or pipe and pushing some small starter holes through the wet mixture before allowing it to dry. Detailed instructions can be found on the internet. The blocks can be stacked in a sheltered spot in the garden where the bees are active. But do not be surprised if other insects take up home in these holes such as the many kinds of solitary wasp.



R. FARROW

Unoccupied blue-banded bee nest block in the author's garden

Parasitism

Some species of bee have evolved a parasitic lifestyle and instead of collecting their own pollen and nectar to provide for their offspring they simply lay their eggs in the cells of a host bee. The larva that emerges consumes the host egg and then feeds on the food provided by the host. This is known as cleptoparasitism. Close relatives of *Amegilla* in the genus *Thyreus* have adopted this lifestyle and parasitise blue-banded bees everywhere and can be seen feeding at flowers in our area. They lack scopa as they have no need to collect pollen.



R. FARROW

Cleptoparasitic bee, *Thyreus caeruleopunctatus*, at the STEP garden, Canberra Arboretum

Acknowledgements

Thanks to Mike Shihoff and friends for help with the etymology of the genus *Amegilla*, Michael Beddingfield for the main image of *A. asserta*, Erica Siegel for the males of *A. cingulata*, Alison Milton for the nectar robber and Michael Batley for advice on the complex taxonomy of *Amegilla* and for forwarding his new paper.

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An invitation to all Friends, new & old

Friends are most welcome to visit the Australian National Botanic Gardens Library and Archives. Already a popular resource for many Friends, it is also the library for staff, associates and volunteers at the Gardens and for Parks Australia.

The library is located at tree canopy level, on the first floor of the Botany Building which you enter via the building opposite the Visitor Centre. Head up the stairs towards Admin and then via the glassed-in ramp and another flight of stairs.

We have perhaps the most comprehensive collection of publications focusing on Australian native plants including books on taxonomy, botany and horticulture, and on plants from other countries. We also focus on indigenous use of plants, ecology, landscape design, botanical illustration, and plant and nature photography. Other topics include Australian fauna, national parks, discovery and exploration of Australia, and biographies of 'plant people'. Our journal and magazine collection follows similar themes, and includes the newsletters and journals of the various native plant societies and study groups.

Special collections, which are not available for general viewing, include the archive collection of published and unpublished material about the Gardens, the rare book collection, and a small collection of original botanical illustrations. Behind the scenes tours are held for the Friends from time to time, which gives you an opportunity to view these collections.

The library has benefited from grants from the Friends over many years. These funds have enabled the purchase of some very special material, such as volume 3 of the elephant folio *The Banksias* by Celia Rosser and Alex George, and a beautiful facsimile edition of James Smith and James Sowerby's *A Specimen of the Botany of New Holland*. We have also been able to purchase numerous books of general interest. Some recent titles include: *The Florilegium: Royal Botanic Gardens Sydney celebrating 200 years* / Colleen Morris and Louisa Murray; *The oldest foods on earth: a history of Australian native foods with recipes* / John Newton; *Green Nomads: Across Australia's Wild Heritage* / Bob Brown. Catalogue records and bookplates acknowledge the Friends' support. We do accept donations of books from the public, with some useful and valuable items being added to the collection over the years in this manner.

The library catalogue is accessible via the ANBG website at: <http://www.anbg.gov.au/gardens/research/library/index.html>. Using the catalogue you can find specific items by searching for titles or authors. Alternatively you may want to browse by subject to identify books on a particular topic.

Opening hours are 9.30am to 4.30pm, weekdays (excluding ACT public holidays). Friends membership allows you to borrow items from the library. Loans are generally for four weeks, subject to demand. To register as a borrower, or to visit for the first time, please make an appointment with the librarian (phone 6250 9480 or ANBG.library@environment.gov.au). We can then provide you with a brief orientation.

Look forward to meeting you.

Catherine Jordan, ANBG Librarian

The Friends are continuing their support for the ANBG library by providing a further \$2500 for book purchases. If members have suggestions as to books they would like to see in the library, they can contact Maureen Connolly on johnnmin123@bigpond.com

Book Review

BACK COUNTRY: trek through the Deua and Wadbilliga. 2nd ed. 2016

John Blay

Paperback, 271 pages, B&W photographs
Available ANBG Bookshop, \$30

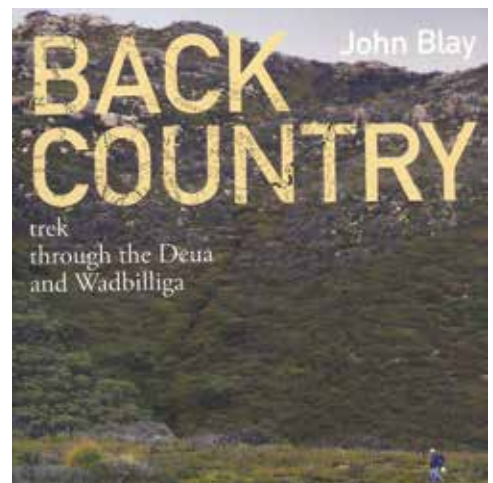
In 1981, John Blay set out from Pigeon Gully, between Araluen and Moruya, on a solo trek through the wild country of the Deua and Wadbilliga national parks, ultimately emerging at Bemboka. His book, *Back Country: trek through the Deua and Wadbilliga*, tells of the tough country, its varied characters, and Blay's own personal journey. It also tells of his companion — the often recalcitrant, four-legged character Zachary B. de Mule (Zac), the bearer of equipment and supplies. Tales of the journey abound.

This book is, in fact, a second edition. It updates scientific names and incorporates a preface, two afterwords dated 2002 and 2016, and an index. It also reflects Blay's enhanced understanding of Aboriginal connection with the region.

As I read, increasingly engrossed in the *Back Country* of the 1980s, I wondered how much would have changed by the 21st century and eagerly anticipated the afterwords. They both discuss changes to the country and some of the characters. Most significantly they reflect on Blay's own evolving personal perspective in the light of multiple short revisits over the subsequent 35 years.

Back Country is a pleasure to read. It tells a story of endeavour and natural wonders. It is well written and laced with humour, especially in regard to Zac. While I was left curious about the fates of some characters from the original trek, I'm glad that Blay did take time to follow up Zac's story.

Denis Warne



Friends Briefs

Native bees in the Gardens — a summer update

In the December edition of *Fronde*, I spoke about my interest in identifying the native bees that live and visit the Gardens. Since then, I have been visiting the Gardens regularly – observing and collecting (with a research permit) what is proving to be a wide variety of bee species that call the Gardens home. By mid-February, my collection numbered nearly 50 species across four of the five bee families that occur in Australia, namely, Colletidae, Halictidae, Apidae and Megachilidae. These four bee families also occur in other parts of the world, but the fifth family, Stenotritidae, is a small

family that occurs only in Australia, with most sightings so far being in Western Australia. Approximately 50% of native bee species in Australia are in the Colletidae family, and that seems to be true also in the Gardens, so far. These are ground nesting bees and include hairy colletine bees, as well as the small but elegant masked bees. I have yet to identify all of these bees beyond the genus level – bee taxonomy is a complex art and I am still a novice – but it might be a good winter activity.

As we move through the spring and summer seasons, the nectar sources for the native bees change, as do the native bees that visit and pollinate the plants, or so it seems. Some of the bee species I observed in the

spring have become less frequent as the summer moves on, with new bees making an appearance. Species such as the blue-banded bees (*Amegilla* spp.) and leafcutter bees (*Megachile* spp.) were not observed in the spring but are now commonly seen. Other species such as reed bees (*Exoneura* spp.) have been seen in both spring and summer. Of course, I can't cover the whole of the Gardens on each visit and I am sure my observations this year have only begun the journey to better understand the native bee population of the Gardens. It is interesting to observe the different flowering plants that are attractive to bees – some are hosts to both honey bees and particular native bees, while others attract only native bees or only honey bees. If you want

to see one of the very small masked bees (my favorite!), look closely at the Callistemon flowers.

This year I've focused on the range of native bees in the Gardens and perhaps next year I can begin to focus on their floral preferences and distribution. As I mentioned previously, if you have any useful insights into the location of native bees in the Gardens or have taken any interesting photos, please share them with me.

Peter Abbott

peterabbott@iinet.net.au

0421 227 315



Reed bees, *Exoneura* sp



Hylaeus honestus



Leioproctus sp.



Masked bee, *Hylaeinae* sp.



Reed bee, *Exoneura* sp.



Resin bee, *Megachile* sp.

MEGAN HALCROFT

ERICA SIEGEL

PETER ABBOTT

Gardens Shorts

From the Executive Director

As the Gardens continues to thrive through times of change and development, we are grateful for the ongoing support of the Friends. Figures for 2016 show the highest number of visitors since 2010.

With the opening of the *Bushland Nature Walk* we have completed the first project from stage 1 of the ANBG Master Plan. We have commenced the design development phase for the Ian Potter National Conservatory and we expect to have completed all the design documentation to enable us to go to tender for a builder mid this year. Our newly-developed *Who Did That* children's trail is another inspiring feature interpreting part of the Gardens for our younger inquisitive minds.

The Summer Sounds Concert series had another winning season. It was lovely to see people up and dancing in the cool ambience of the Eucalypt Lawn despite the hot weather. The diverse band line-up and playlist attracted similarly high numbers of visitors each night. Thank you to the Friends for your contributions — your involvement remains critical to such a positive outcome.

The Gardens is increasingly its involvement in threatened species conservation projects. Gardens staff are currently partners in over 10 projects, sharing skills and resources with the common goal of conserving threatened species both ex situ and in the wild. These projects mostly involve valuable new collections of seed and/or vegetative material, improving the genetic diversity of our collections.

We are happy to welcome Tracy Keely and her team in the new cafe, Pollen, which opens 9 April with a new menu and new decor. I would like to thank the staff at Floresco in the Gardens and Hellenic Club catering for their delivery of service in the Gardens these past few years.

Judy West

New bog and fen display

Look closely to see who's hiding in our new *Alpine Sphagnum Bogs and Associated Fens* display outside the Visitor Centre. The display features plants from these unique peat-forming wetlands, which provide important habitat for many threatened species of plants and animals, including Northern and Southern Corroboree Frogs. The frogs lay their eggs in Sphagnum moss surrounding small ponds within the alpine bogs.

Many bog and fen plants have special adaptations that allow them to survive in the cool, waterlogged, and acidic bog environment and grow nowhere else. The Gardens maintains a genetically diverse collection of bog and fen plant seeds to safeguard these nationally listed endangered communities into the future.

Our current research into the seed ecology and biology of bog and fen plants aims to better understand how long seeds last in the soil and what causes seeds to sprout.

Cafe under new management

Tracy Keely and her team will open the new cafe, Pollen, on 9 April in the Gardens with a new menu and new decor. Pollen will offer a relaxed dining experience, with lounges and comfy chairs that will invite you to sit and chat with friends, or simply sit back with a cuppa after a walk in the Gardens. A new fresh menu will delight the senses. The cafe space will be closed from 1 April until the opening day, to accommodate the changeover.

Focus on *Pomaderris*

An all-star cast, including Costa Georgiadis from Gardening Australia, Gregory Andrews, the Threatened Species Commissioner, and Gardens staff and partners, has been part of the first year of a three-year project aimed at conserving several threatened species from the genus *Pomaderris*.

The team has collected seed and cuttings to compare ex situ cultivation techniques that may be used in enhancing populations of these rare plants in the wild. Exploring non-seed propagation methods (e.g. cuttings) may give options for establishing plants in the case that seed is not available or not viable. This has already delivered dividends as several species or populations have produced little in the way of viable seed.

The next phase of the project will include investigating some of the germination requirements for these rare *Pomaderris* in the Gardens National Seed Bank.

Some of the plants are being prepared for planting in a new *Pomaderris* Garden this spring, that will give a new look at this not-so-well-known genus of Australian plants.

Summer seeds

National Seed Bank (NSB) staff are well on their way to achieving their target of collecting and storing 100% of

Pollen
Lunch

Opening Sunday **Champagne**
9 April 2017 **Craft beer**
Cider

Table reservations:
pollencafe.com.au

Music
Local wines Juices
Food & drink Smoothies
Breakfast Alfresco dining
Bird watching

Australian
National Botanic
Gardens

Pollen

the flora of the ACT, with the support of sixteen Seedy Volunteers over the 2016-17 summer collection season. There are still about 200 species left to collect by 2020. As the only long-term conservation seed bank in the ACT, the NSB is committed to achieving this goal.

So far this season they have made 31 collections of 26 species. The focus early in the season was on the lower altitude species from Canberra region grasslands. In late summer, they targeted new locations in the Bog and Fen communities with support from NSW Parks and Wildlife and ACT Parks. These additional collections will supplement existing collections and potentially increase the genetic diversity of some species, and add to the capacity to research threatened communities. By sampling many locations staff can start to answer some of the outstanding questions on how to germinate these species, why they show variation in germination



Tom North & Françoise Zaalen-Arbaut collecting at Mt Coree campground Feb 2017

responses across their range, and how this all relates to environmental cues. Understanding these processes and interactions can help us understand the generational resilience of species in the landscape.

Seedy volunteer trips occurred every Thursday, with two overnight trips this year due to the distance and accessibility of some sites.

Sabrina Sonntag

Walking with Betty

Betty the Blue Banded Bee invites children to discover surprises on a new trail in the Gardens. The *Who Did That* trail encourages children to become aware of the tracks and traces of insects, birds and animals and the amazing biodiversity of the Gardens.

Katy Penman, a casual Ranger at the Gardens, was responsible for the design and oversaw construction of the new trail.

Her beautifully drawn Betty the Blue Banded Bee invites children along the trail, and all the drawings on the panels and in the accompanying booklet (available from the Visitor Centre) are hers. Having read that children are attracted to drawings and to moving pictures rather than to photos, she decided to use drawings rather than photos. Katy says she discovered a love of drawing insects while studying entomology at ANU and many of her drawings were done from insect life she discovered in the Gardens.



Katy's two young children helped test drive different elements of the trail, and watching them and other children interact with the previous *Who Lives Here* trail gave Katy many ideas for the new one. She said children love touching or doing, and she wanted the new trail to include as many activities as possible.

The trail includes 'mix and match' panels; life size models of birds and animals; a dinosaur, a Wollemi pine and a fossil; questions to answer; flaps to lift; and all kinds of evidence of animal and insect interaction with plants.

Who Did That is located in the Banks Loop, behind the Banks Building. The trail will be re-located and extended to the area adjacent to the new tree-house in the Melaleuca Swamp when this is completed.

Barbara Podger



BARBARA PODGER



Ptilotus sp lit up in the Red Centre Garden, Luminous Botanicus



Fire twirlers, Eucalypt lawn, Luminous Botanicus

STEVE ROGERS

Obituary: Pauline Margaret Wicksteed

Pauline died suddenly at her beloved home at Bellmount Forest on Sunday, 4 December 2016, four days before her 89th birthday. Her husband Stuart had died nearly three years earlier.

I last saw her at the Growing Friends plant sale on 12 November when she came in to buy some plants. She had been a founding member of the group and, although less active in recent years, still came in from time to time and was always very charming and helpful. A former member commented: 'Pauline treasured Nature and was one of Nature's treasures herself.'

Pauline was a current volunteer at the Herbarium and attended the Thursday talks regularly. She trained as a facilitator with the Botanic Resources Centre and was instrumental in the establishment of the Friends' Public Fund. Pauline retired as a voluntary Guide several years ago.

She was a founding member of the Friends group in 1990 and served as

Vice President and President. She also served as President of the Australian Association of Friends of Botanic Gardens and convened its Annual Conference in Canberra in 2004. She was awarded Life Membership of the Friends in 2009.

Talking to neighbours at her funeral I was soon aware of how important a community member she had been. She had been involved in her church community, the local garden club and many other activities. One neighbour commented on what a wonderful transformation Pauline and Stuart had made to their block over many years. I know she has been a member of Canberra Ornithologists Group, Australian Native Plants Society and the University Women's walking group.

Pauline is survived by her son Barton, her daughter-in-law and three granddaughters, living in Chicago.

Pauline will be sadly missed by her many friends at the ANBG, as well as



Pauline propagating plants November 2015

P. ROONEY

by her local community and many others. May she rest in peace.

Kath Holtzapffel
Convener, Growing Friends



Australian Native Bees. 2016

Edited by David Brouwer

Paperback, 174 pages, Colour Photographs and Illustrations. \$35

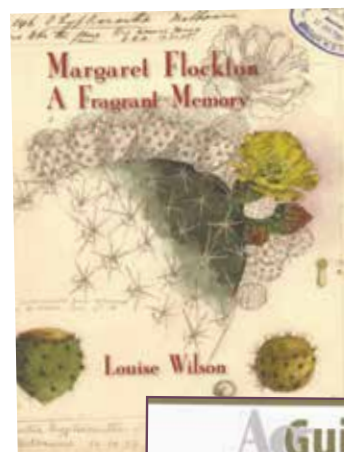
This book combines the expertise of many of Australia's leading bee experts. While the majority of recent bee publications focus on stingless bees, *Australian Native Bees* from the NSW Department of Primary Industries, has a broader focus to also cover solitary bees. The book acts as a guide for both observing and keeping a wide variety of native bee species.

Margaret Flockton - A Fragrant Memory. 2016

Louise Wilson

Hardback, 305 pages, Photographs and Illustrations. \$49.95

This beautiful biography of Margaret Flockton, Australia's first and most celebrated professional botanical artist, deftly combines the story of her life in Victorian-era Australia with examples of her stunning artwork. Following her death in 1953 Flockton was largely forgotten until the early 2000s when two botanical artists at Sydney Royal Botanic Gardens came across her work and went on to establish the Margaret Flockton Award for scientific botanical illustration to honour the artist's pioneering achievements. At a similar time, research began on this book which today, in combination with the Award, give this exceptional artist the acclaim she deserves.



Details of events are correct at the time of printing. For changes and updates please check the Friends' website at www.friendsanbg.org.au or the Gardens' site at: www.anbg.gov.au

The Friends of the ANBG thank the many speakers who volunteer their time and talents to further the knowledge of all who attend the events in the Gardens. The Friends use the 'gold' coin donations received at each activity to support Gardens' programs and development. The Friends thank all those who have donated. Please note: unless otherwise indicated, talks are in the ANBG Theatre.

Summaries or PowerPoint presentations of Thursday talks are available to Friends from the ANBG library. A donation to the Friends for the use of this material will be gratefully accepted.

Friday story-time for Preschoolers

First Friday of month from 10 to 11am \$5 per child

Have fun with stories, songs, rhymes and creative activities brought to life by the ACT Storytellers. An engaging treat for preschool children, parents and carers. Different themes each month.

Free Guided Walks

Daily at 11.00am and 2.00pm

Meet a volunteer guide at the Visitor Centre for a free one-hour tour of the Gardens.

Flora Explorer tours

Weekends & public holidays, 10.30am & 1.30pm. Purchase tickets from the bookshop. Tours cost \$6 for adults and \$3 for children and concessions. Children under 3 travel free.

45 minutes of discovery around the Gardens

School Holiday Bilby Treasure Trail - April

Follow Bilby's trail and find treasures along the way. See Gardens website

Canberra Heritage Festival — Indigenous Plant Use Ranger Guided Walk

Wednesday 3 May 10.30am - 12.30pm

Join a Ranger and learn about indigenous uses of Australian plants on the Aboriginal Plant Use trail. Fee applies. Book on Gardens website

Botanic Gardens Open Day

Sunday 28 May

A day to celebrate conservation efforts by botanic gardens. Activities for the whole family.

EXHIBITIONS

Visitor Centre Gallery Open Daily 9.30am - 4.30pm FREE

ART IN THE GARDENS WITH FRIENDS 10TH ANNUAL EXHIBITION. UNTIL 17 APRIL

The Friends' Botanic Art Groups exhibition.

A collection of works conveying the beauty of Australian native plants using a variety of media.

POINT OF DIFFERENCE. 19 APRIL - 21 MAY

An emerging artist from Bathurst, Kim Bagot-Hiller, presents her discovery of the beauty of plants and flowers through printmaking and illustrative techniques. *Point of Difference* illustrates the elements of difference behind the uniqueness of Australian native flora.

THE COLOUR OF EUCALYPTUS. 23 MAY - 25 JUNE

An exhibition by Sally Blake of 330 pieced works along with pressed leaves, drawings and coloured yarns to represent the beauty of nature derived from our most iconic and dominant trees, eucalypts. Dyes collected from 100 species of eucalypts were used to discover and record a splendid array of colours using seven different fabrics.

AUSTRALIAN ALPINE FLOWERS IN ABORIGINAL DOT ART. 28 JUNE - 30 JULY

An exhibition by Pauline Syron-Coxon featuring Aboriginal dot art in contemporary designs and colours reflecting Australian alpine flowers and landscapes, including the stunning snow gums and wildlife that live in this environment.

This exciting exhibition will showcase the Snowy Mountains region through Indigenous eyes during a time that commemorates winter and the national celebration of NAIDOC for all Australians.

Spoon Whittling Workshop

Sunday 28 May 10am – 4pm

Join a spoonsmith to learn the craft of spoon carving.

Cost: \$130 per person. Bookings essential via Gardens website

Eucalypt Dye Workshops – in association with The Colour of Eucalyptus exhibition

June dates to be confirmed 9am – 1pm

Join textile artist Sally Blake to learn the art of colour from eucalypts and dye your own piece in these popular workshops. Cost applies.

Junior Ranger Program

Last Sunday of each month from 10am – 11am

Become a Junior Ranger and explore Australia's amazing environments. Learn more about its plants and animals. Different theme each month. Suitable for ages 7 – 12.

Single sessions – \$15; 6 sessions – \$75 (save \$15 and use for any six sessions)

*Additional costs for materials| bookings essential. Book through ANBG website

April – Cryptic cryptogams part 1: Fungi fun

May – Cryptic cryptogams part 2: Mosses, liverworts and hornworts

June – Indigenous plant use

July – Nature treasure hunt

August – Build Your Own Bee Hotel*

Walk & Talk: ANBG to the Arboretum

Saturday 26 August 2017, 9.30am to 12.30 noon (or later)

Meet at the Visitor Centre, Australian National Botanic Gardens and walk along the made and unmade tracks in ANBG Bushland Precinct, the Black Mountain Nature Reserve to the National Arboretum with Guides from ANBG and Friends of Black Mountain.

If you do not wish to walk back to the ANBG, ask a friend to meet you at the Arboretum, or catch the bus back to the ANBG (Bus route 81), or arrange a ferry service with another adventurous ANBG guide.

Suitable for fit walkers. We shall be walking on made paths and unmade tracks, with steps and several steep sections.

Bookings essential: Places limited to 10. Please email your name and phone number to Linda Beveridge gkljbev1@bigpond.net.au, or phone Linda 0437 298 711 so that you can be contacted in case arrangements need to change (e.g. adverse weather). Bring: Water, snacks, sturdy shoes, shady hat, sun cream.



Walking down from Black Mountain summit

Black Mountain Woodland Walks

A project by Molonglo Catchment Group and Friends of Black Mountain to enhance the Woodland Walk on Black Mountain is being supported by the ACT Government through a Heritage Grant in 2016/17. The aim is that new educational material on signs, track markers with Aboriginal art, and e-brochures will enhance walkers' appreciation of the native flora in the area.

Guided walks of the Woodland area will be held during Canberra's Heritage Festival 2017. Both walks are generally easy with some steep sections and rough ground.

The trees of Black Mountain

22 April 9.30am to 11.30am

How do trees survive fire and drought? Join local ecologist, Michael Doherty, to walk and talk about the intriguing differences between trees, such as Scribbly Gum, Red Stringybark and Native Cherry, and other plants on Black Mountain Woodland Walk.

Botanic treasures of Black Mountain

28 April 9.30am to 11.30am

Join local botanist, Dr Rosemary Purdie, to walk and talk about this area and how it has changed over the years.

For both Walks:

Cost: Gold coin donation to Friends of Black Mountain.

Meet at the Black Mountain Reserve Car Park near Glenloch Interchange. Look for balloons marking the last turnoff and the parking area.

BYO morning tea, water, snacks. Remember to wear a hat, and sturdy shoes.

Bookings essential: Please email your name and phone number to friendsofblackmountain@gmail.com, or phone Linda 0437 298 711

Weeding Black Mountain

Removing Woody Weeds from Black Mountain and ANBG Annexes in 2017

Check Friends of Black Mountain website for meeting place for each weeding work party.

Please email your name and phone number to

friendsofblackmountain@gmail.com

or phone Linda on 0437 298 711 or Libby on 02 6296 1936 so there is enough delicious morning tea.

Saturday 1 April 8.30 – 11.30am

Saturday 6 May 9.00am– 12:00

Saturday 3 June 9.00am– 12:00

Saturday 1 July 9.00am– 12:00

Saturday 5 August 9.00am– 12:00

Saturday 2 September 9.00am– 12:00

Black Mountain Summit Walks

Black Mountain was declared a Nature Reserve by Hon Peter Nixon, Minister for the Interior on 23 July 1970, and the declaration was gazetted on 30 July 1970. The Summit Walk, a cooperative project between the ACT Government, the Australian National Botanic Gardens (ANBG) and Telstra, was officially opened on 20 July 2000.

Two walks have been arranged by the Friends of Black Mountain to celebrate these anniversaries. The Summit Walk has steep sections, so it is suitable for fit walkers only including children over the age of 12.

Walk 1: Summit Walk up and back

Sunday 23 July 2017, 9.30am (sharp) to 1.00pm (approximately),

Meet at the Visitor Centre, ANBG, and walk up the north-eastern slopes of Black Mountain to the summit with local botanist and an ANBG Guide, and return to the Visitor Centre.

Walk 2: Summit Walk down

Sunday 30 July, 9.30am (sharp) to 12.00 (approximately)

Meet at the Lookout near the Telstra Tower. Walk with local conservationist and an ANBG Guide. We shall see *Acacia* near the apex and the *Zieria* plants near the Visitor Centre, ANBG.

For both Walks:

Cost: Gold coin donation to Friends of Black Mountain

Bookings essential: Places are limited, please email your name and phone number to friendsofblackmountain@gmail.com, or phone Linda on 0437 298 711 so that you can be contacted in case arrangements need to change (e.g. adverse weather).

Bring friends, water, snacks, wear sturdy shoes, hat, and sun cream.

Thursday Talks: April to August 2017

Lunchtime talks are held at 12.30pm every Thursday from February to November in the Gardens' Theatrette. Talks last for 1 hour. Admission is by gold coin donation. There is no need to book.

Queries relating to Thursday Talks to: Sue.Serjeantson@bigpond.com

APRIL

Thursday 6 April 12.30pm

Matthew Higgins 'Adventures with Rosie'

Matthew, a professional historian, presents Rosenberg's Monitor in an ACT context, focusing on an important project on Mt Ainslie.

Thursday 13 April 12.30pm

Dr Adrienne Nicotra 'Iconic Alpine Landscapes: past, present and future'

Adrienne, a long-term collaborator with ANBG on Alpine plant research, will consider the impact of global climate change on our iconic alpine landscapes.

Thursday 20 April 12.30pm

Dr Roslyn Russell 'Partners in the *Business of Nature*: John and Elizabeth Gould'

Roslyn, an historian and museum consultant, will explore the personal and professional relationship between husband and wife that set John Gould on the path to scientific acclaim.

Thursday 27 April 12.30pm

Genevieve Jacobs 'Japanese Gardens: an exercise in beauty, restraint and imperfection'

Genevieve began presenting at ABC 666 ten years ago, on weekend gardening and arts. She delights in Japan's national aesthetic that sees beautiful gardens as works of art.

MAY

Thursday 4 May 12.30pm

Professor Geoffrey Hope 'How have our mountain peatlands withstood fire over time?'

Geoffrey Hope, Visiting Fellow in the Fenner School, ANU, will discuss the vulnerability of peatlands in the Australian Alps.

Thursday 11 May 12.30pm

John Blay 'Engaging with wilderness of the coastal ranges; strange plants, yowies and the old ways'

John, author of 'On Track' and 'Back Country' reflects on how walking changes your relationship to the countryside.

Thursday 18 May 12.30pm

Mary Lovett 'The wonders of the Pilbara'

Mary, a volunteer guide at ANBG, will talk on the significant biodiversity in the Pilbara of W.A.

Thursday 25 May 12.30pm

Dr Brian Cooke 'Galapagos: the continuing battle against invaders'

Brian, retired CSIRO scientist, recalls his time as resident scientist at the Charles Darwin Research Station on the island of Santa Cruz.

JUNE

Thursday 1 June 12.30pm

Dr Brian Hawkins 'Birds and plants in subtropical NSW'

Brian, now a scientist with Bush Blitz, describes his earlier work as an ecologist in Northern NSW.

Thursday 8 June 12.30pm

Dr Brett Howland 'Recent results of the effects of fire on grassland plants and animals'

Brett will describe his work within the ACT Conservation Research Unit.

Thursday 15 June 12.30pm

Ben Walcott 'A walk through some great gardens'

Ben will walk us through some gardens in Britain, Europe and other countries, with differing styles and plant choices.

contd. p20

Thursday 22 June 12.30pm
Dr Rolf Oberprieler and Dr Thomas Wallenius 'A necessary weevil: the pollination biology and evolution of cycads'

Rolf will talk to the broad evolutionary relationship between weevils and cycads and Thomas will place this in the Australian context.

Thursday 29 June 12.30pm
Professor Margo Neale 'Alive with the songlines! Following in the footsteps of the Seven Sisters'

Margo, Senior Indigenous Curator, National Museum of Australia, will background the next major exhibition of NMA on the Seven Sisters' rock art, opening in September.



JULY

Thursday 6 July 12.30pm
Dr Sue Serjeantson 'Charles Darwin in Galapagos and Australia'

Sue, Chair of the Thursday Talks committee, explores Darwin's diaries from the 'Voyage of the Beagle' that revealed Nature's Grand Plan.

Thursday 13 July 12.30pm
Dr Janet Gardner 'How are Australian birds affected by climate change?'

Janet, Research Fellow at ANU, has made novel use of time-series available through museum collections and bird-banding, to explore the dynamics of natural bird populations.

Thursday 20 July 12.30pm
Dr Philip Spradbery 'To breed or not to breed? How the European wasp queen suppresses her daughters' reproduction'

Philip, a research entomologist, has been asking himself this question for twenty years.

Thursday 27 July 12.30pm
Dr John Turnbull 'Australian trees and their botanists'

John, retired CSIRO scientist and volunteer guide at ANBG, will discuss the association of Australian trees with overseas botanists and relate their amazing stories encompassing adventure, mystery, sex and even murder.

AUGUST

Thursday 3 August 12.30pm
Angus Stewart 'History of Australian Plant Breeding'

Angus, an expert in Australian native plants and a media personality, will talk about the history of Australian plant breeding and share his experience in breeding iconic kangaroo paws.



Thursday 10 August 12.30pm
Dr Lydia Guja 'News from the National Seedbank: from coast to desert'

Lydia, manager of the National Seedbank at ANBG, will outline her work with Parks Australia, from Christmas and Cocos Keeling Islands in the west to Norfolk Island in the east, to Uluru-Kata Tjuta in between.

Thursday 17 August 12.30pm
Max Bourke AM 'Out of the Woods'

Max, agricultural scientist and inveterate volunteer, will be talking about the early history of tree planting in Canberra and the planters themselves: Charles Weston, Max Jacobs and Lindsay Prior.

FRIENDS BENEFITS

As a Friend you are entitled to:

- Three issues of *FronDS* a year
- Three hour free parking pass
- Botanical Bookshop: discount on most items
- Discount at Pollen
- Discount at Jindii Eco Spa

You also get:

- Advance details of lectures
- Advance bookings for some events
- Discounts on some events
- ANBG library membership – borrow books, serials, videos, DVDs plus use of computers and interactive CD ROMs
- Function facilities – special rates for functions at ANBG

And opportunities to:

- Join Botanical Art Groups
- Growing Friends
- Photographic Group
- Plant Science Group
- Assist with Gardens' research projects
- Become a Guide
- Relax in the Friends Lounge in the Ellis Rowan Building, open to members 9.30 am to 4.30 pm. Relax with tea/coffee and lots of interesting reading.

Thursday 24 August 12.30pm
Dr Liz Trusswell 'The woman who mapped the oceans'

Liz, Visiting Fellow at ANU and practising artist, will describe how geologist/cartographer Marie Tharp, working with the artist Heinrich Berann, produced maps of the global sea floor that contributed significantly to the development of plate tectonics.

Thursday 31 August 12.30pm
Geoffrey Kay 'How the marbled gecko helps science reconnect fragmented farm landscapes'

Geoff, research ecologist at the Fenner School, ANU, examines how the quality of farming landscapes influence the movements of small, ground-dwelling fauna, like reptiles.