
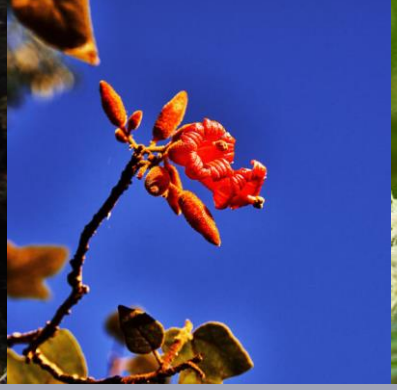


Friends of Maroochy Regional Bushland Botanic Gardens Inc.

NEWSLETTER

June 2022 Volume 26 Issue 2

From the President

Lynn Vlismas

A group of about 60 Friends and presenters from mainly Regional, but also some State Botanic Gardens along the east coast of Australia, attended the recent Association of Friends of Botanic Gardens 2022 Conference at Eurobodalla Regional Botanic Garden, near Batemans Bay south of Sydney.

We had all come to celebrate their "RESILIENCE" as they showed us many examples of how they continue to "THRIVE'.

Many of you will know how devastating the 2019/ 2020 Black Summer bushfires were for the region with up to 80% in the Eurobodalla Local Government area burnt. Yet, here we were almost 2 ½ years later at what was a fully operational Garden with the wonderfully welcoming and vibrant group of Friends of Eurobodalla BG.

Overall, the 2 day conference was packed with a wide range of presentations, and participatory workshop sessions structured to increase the range of skills all successful Friends groups require nowadays - interspersed with delicious morning teas and lunches providing many networking opportunities between Friends groups.

Professor Tim Entwistle, Director and Chief Executive of the Royal Botanic Gardens Melbourne, the keynote speaker spoke of "Surviving (and Thriving) in a Changing World", illustrating many of the adaptations the Royal Botanic Gardens has been required to make through initiatives such as the Climate Change Alliance which brings Botanic Garden organizations together to protect and adapt botanic garden landscapes in a rapidly changing climate. He then went on to describe the important role State Botanic Gardens have in partnering with Regional Gardens to showcase an increased range of plant species that would not otherwise be able to be displayed; and this message was also reinforced by Chris Russell, President of BGANZ, who used the example of the "Care for the Rare" project currently active across Botanic Gardens in Victoria.

However, Eurobodalla Regional Botanic Garden would have to be given first prize for showing examples of how resilient it has had to be in the short time it has had to successfully clean up and rebuild after the effects of the 2019 bushfires - to completely resurrect its plant nursery and propagation facilities, rebuild garden structures and bridges, replant garden beds and

Friends of MRBBG Inc.

Our Mission:
'To support the establishment and development of a unique world-class Bushland Botanic Gardens for the Sunshine Coast'.

Our Vision for the Gardens:
'To experience the harmony between people and the living environment'.

Our Vision for the Friends:
'To establish a vibrant and responsive Friends organization known for enthusiasm, participation and initiative'.

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Our Supporters

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Views expressed in the Newsletter are not necessarily those of the Friends and /or its executive.

add new themed garden areas, as well as plan, renovate and extend the existing visitor facilities that had survived the fire, then plan a conference in the ensuing 2 years.

It was difficult to reconcile the 2020 photographs that Michael Anlezark, Manager of Eurobodalla Regional Botanic Garden, showed of the uniformly ash strewn grey landscape dotted with tall, blackened forest trees, and the now lushly green landscape visitors can see in response to the generous rains of the past few years. It is even harder hard to image what it must have taken for the Friends and Council staff to start over again throughout so many aspects of the Gardens, and to also realise how fragile the balance is for future mitigation with changing environmental factors.

The MRBBG Friends attending the Conference have come away from the Conference with not only added inspiration but also a better knowledge of other approaches that may be possible in our Botanic Garden situation. Here was a group of generous, passionate and dedicated Friends of Eurobodalla achieving so many inspiring successes against all the odds. They continue to manage a large fundraising retail outlet selling botanical gifts and native plants, manage with Council a well-established Herbarium and plant nursery, know how to best apply for wide range of project grant funding, have a well organised management system between Friends and Council (the Friends are brought into the planning during the course of the project to make comment and to look for opportunities to raise additional funding where appropriate with “shovel ready” projects), and continue to have a large pool of 120 volunteers to provide the resources to help maintain the Gardens along with the 6 full-time trained Council staff.

The lasting impression gained at Eurobodalla Regional Botanic Garden is that Council places a great importance on maintaining the relevance of the Gardens, and is very much aware of the many benefits of the Gardens to both tourist groups and to their local population.

ANNUAL GENERAL MEETING

It’s that time of year again - your opportunity to run for a position on the Friends management committee.

AGM will be held on Thursday 14 July 2022

Details on how to nominate will be sent to members in early June.

The Evolution of Ferns

Wendy Johnston

It is probable that the common ancestors of ferns, and the first ferns themselves, were aquatic. Ferns probably originated in the Devonian Era, almost 400 million years ago. During the Carboniferous Era, 380 -285 million years before present, the world climate was warmer, with more rain and humidity than today. At that time ferns became very successful plants and were a major part of the earth’s vegetation. The invasion of dry land, the increase of fern size, and the wider dispersal of spores came about due to evolutionary changes.

While ferns were living submerged in water, desiccation by transpiration and evaporation was not a problem. However, to invade the land they had to develop mechanisms to deal with water loss. The epidermal cells which cover the surface of the fronds grew thicker walls. A layer of a fatty substance in these cells protected them from drying out between rain showers. Some ferns acquired a dense covering of hairs on the leaves, stipes and rachises, diminishing water loss. Stomata or pores in the frond surface allowed the exchange of oxygen and carbon dioxide between the air and deeper cells while reducing water loss from transpiration. Shrivelling or curling of the fronds also became an effective way to diminish water loss if evaporation from the leaves was greater than absorption by the roots, reducing the exposed surface area.

As ferns became larger, they developed vascular systems for conducting water and minerals to the leaves which also transferred food substances and waste products within the plant. The vascular system was able to replace water as fast as it was lost from the leaves and so prevented wilting.

Lignum also developed in fern walls. This strengthening compound supported the plants as they grew larger.

Roots evolved to anchor the fern, mechanically necessary as the plants enlarged. Another vital function of the roots was to absorb water and minerals from the soil.

Early fern ancestors were leafless, containing chlorophyll in the surface cells of the stems. As evolution proceeded small scale-like leaves appeared. To grow larger, ferns needed more chlorophyll to make more tissue, a problem solved by the development of leaves containing chlorophyll.

Ferns reproduce sexually from spores, tiny single cells which germinate in moisture. When ferns lived in water spores could be discharged directly into the water, but as they invaded the land the spores needed to develop a

durable coat to protect them against desiccation until rain made conditions favourable for germination.

In water, fern spores could be carried away by the currents but on land a different method of dispersal had to be found. The development of the annulus resulted in a very efficient mechanism of dispersal. The annulus is an elastic ring of cells to which a group of developing spores is attached. When the spores are ripe, the annulus tries to suddenly erect itself, flicking the spores into the air, away from the fern. Being very light, the spores are carried and distributed widely by wind currents.

Angiopteris evecta

Following the Carboniferous Era the supremacy of ferns gradually decreased. The earth became progressively drier and there was increasing competition from the developing flowering plants. A few very primitive ferns persisted and today remain almost unchanged e.g. *Angiopteris evecta*. Most modern ferns became much smaller and more complex.

Reference: AUSTRALIAN FERNS Growing them Successfully by Calder Chaffey, 1999

Robert Brown, Scottish Botanist (1773-1858) Part 1: *Brunonia* (and MRBBG)

Malcolm Cox *

Robert Brown described and named over 1,500 Australian native plant species, so his initials 'R.Br.' are found after their names in botanical texts. His legacy lives on in so many plant labels in so many botanic gardens, not least MRBBG, that his name should be better known.

Robert Brown, 1855 [source: Wikipedia]

As the naturalist on Matthew Flinders' circumnavigation of Australia in 1801-2, he wasn't in the right place at the right time to find/collect/describe wreath flowers. The wreath flower, (*Lechenaultia macrantha)* pictured below, is one of Western Australia's most spectacular sought-after wildflowers. You can be lucky, as we were in 2019 near Mullewa, to find hundreds of them flowering in disturbed, road-side soil. Looking more closely at the photograph, you might be forgiven for ignoring the other flower in the foreground.

***Brunonia australis* [Sm. ex R.Br.] in front of *Lechenaultia macrantha* [K. Krause], wreath flower, near Mullewa WA.** Image: M Cox

It is *Brunonia australis*, the blue pincushion or native cornflower, a member of the same family Goodeniaceae. It is less striking and more common,

occurring across most of inland Australia. However the interest here is in the name Brunonia and its authorship: Robert Brown committed a taxonomic sin, unintentionally, by naming the genus after himself.

The spelling was a compromise because *Brownea* had already been used to honour someone else, and the general rule for naming a genus is simply 'anything that hasn't been used already', so the botanist James E Smith settled on *Brunonia* when describing the genus to the Royal Society in 1810. (Surely *Robertbrownia* would have been quite acceptable?) .

Unfortunately his speech wasn't published until the next year, and not before Brown (unaware of this) had published the details in his *Prodromus florae Novae Hollandiae*.

Priority means everything, at least until other botanists undertake 'revisions' that, once universally accepted, will give them a share of the naming rights. Therefore, in the list below it shows just some of the species named by Robert Brown. His original names that still stand are followed by 'R.Br.' only, and those that have been affected by later revision/s also include the unique abbreviations of the names of the relevant botanist/s.

A selected A-G list of R.Br. plants growing at MRBBG:

- *Acacia melanoxylon* R.Br ; blackwood
- *Alpinia caerulea* (R.Br.) Benth. ; native ginger
- *Alyxia ruscifolia* R.Br. ; chain fruit
- *Banksia aemula* R.Br. ; wallum banksia
- *Calochlaena dubia* (R.Br.) M.D.Turner & R.A.White ; soft bracken
- *Callicarpa pedunculata* R.Br. ; velvet leaf
- *Carex appressa* R.Br. ; tall sedge
- *Crinum pedunculatum* R.Br. ; swamp lily
- *Cymbidium suave* R.Br. ; grassy boat-lip orchid
- *Cymbopogon refractus* (R.Br.) A.Camus ; barbed wire grass
- *Dioscorea transversa* R.Br. ; native yam
- *Doodia aspera* R.Br. now *Blechnum neohollandicum* (R.Br.) Christenh. ; prickly rasp fern
- *Eupomatia laurina* R.Br. ; bolwarra
- *Gahnia aspera* (R.Br.) Spreng. ; saw-sedge
- *Geitonoplesium cymosum* (R.Br.) A.Cunn. ex R.Br. ; scrambling lily
- *Goodenia rotundifolia* R.Br. ; star goodenia
- *Grevillea robusta* A.Cunn. ex R.Br. ; silky oak

***Eupomatia laurina* R.Br. *Callicarpa pedunculata* R.Br.**
(Images: G Miller)

This list (H-Z) will be continued in a future edition of this Newsletter, along with more about this amazing scientist.
* with thanks to Elaine Davidson for editing.

References:
https://bie.ala.org.au/species/https://id.biodiversity.org.au/node/apni/2915709 .
https://en.wikipedia.org/wiki/List_of_Australian_plant_species_described_by_Robert Brown

Swamp Wallabies

Neil Rankin

While there's not much to do outside in this weather, you might like to read this story about our swamp Wallabies.

https://www.rememberthewild.org.au/swamp-wallabies-3-big-ecological-impacts-of-a-small-marsupial/

The Demise of a Good tree

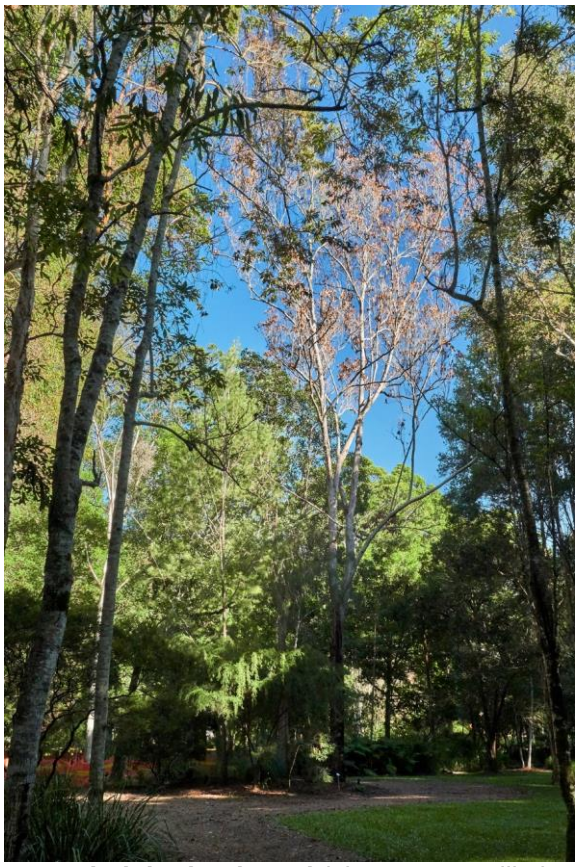
Neil Rankin

You might have noticed that there is a reasonably large Pink Bloodwood tree in the round about near the new Richmond Birdwing Arbour that has unfortunately died.

What might have caused this rather sudden demise of a well grown tree, probably aged over 50 years? The short answer is probably that root compaction has killed this tree, although there are many other possibilities including phytophthora root rot, insect infestation, and drought! It seems most likely that compaction has killed this particular tree, but how does compaction of tree roots lead to death?

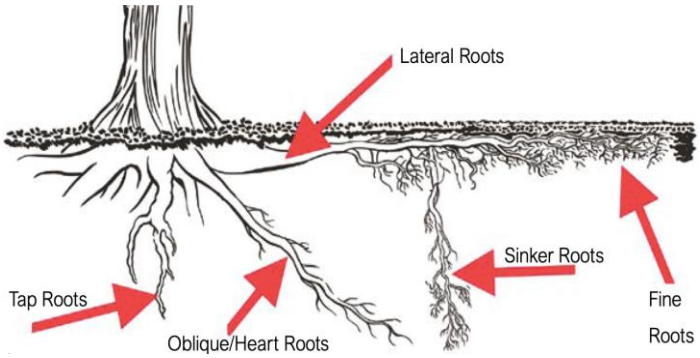
Firstly, it is important to have a clear idea of the structure of tree roots. Often we think in terms of a great big tap root going down into the soil to "seek" water and to hold the tree in place, but this is not the full story. You might have had a look at the roots of the large Tallowwood that fell in the Fern glade some years ago and will have noticed that there is a large spread of old roots, but not much evidence of a tap root (it may have broken off of course) but it is important to note the wide spread of the

lateral roots. Most of the roots of trees are in fact found in the top 20 to 30 cm of soil with some reaching down 30 to 50 cm. It is these near surface roots that are carrying out the important life functions of the plant. The other large roots are woody and serve only as support.



Dead Pink Bloodwood (photo, Greg Miller)

The diagram below shows the typical structure of tree roots. Notice the wide spread of the lateral and fine roots. These will spread out from the tree at least as far as the tree is tall and up to twice this distance! A 40 metre tall tree will therefore have roots that spread out at least 40 metres.



Tree root structure

The fine roots are living cells unlike the woody parts of the root. They therefore need oxygen to stay alive and carry out all their functions, such as absorption of minerals, production of new cells and maintaining their association with special soil fungi called mycorrhizal fungi. The cells on the very outside of the roots have long extremely thin projections called root hairs which hugely increase the surface area of the cell so it can absorb lots of water. The mycorrhizal fungi living in and on these root hairs further extend the surface area. When soil becomes compacted or waterlogged there is very little oxygen available for the living cells so they respire with reduced oxygen or even without it, i.e., anaerobically. This process results in build-up of lactic acid and or ethanol both of which will be harmful to the cells and lead to their death. A tree with dead or dying root hairs will lack water for the leaves which will also die.

In this case, the tree seems to have survived 20+ years with the road around it so why has it died now? It is possible the increased heavy traffic associated with building the RBW has had an impact, but it has also been a very wet year with the lawn adjacent to the tree becoming waterlogged during the heavy rains in February, so this may have been the final straw.

The fate of the tree now rests with the arborists who will need to assess whether the tree is large enough to be kept as a "habitat" tree, or whether the whole tree will be removed.

People might enjoy the series of 20 minute films on Eucalypts at
Eucalypt Documentary Series - Remember The Wild

'Inspired by Nature' Celebrating our Artist Friends

Malcolm Cox

Although our recent **'Inspired by Nature'** art exhibition could only be open for 8 days, we averaged 40 guests per day, displayed the creations of some 20 members and made a modest return from commissions and sales. Did we inspire guests to become artists themselves, inspired by Nature? We'll probably never know, but many were impressed by the fact that so many of our Artist Friends are also regular Volunteers. How they find the time for creative pursuits as well as editing this Newsletter, propagating, gardening, attending meetings, website work, etc. etc. is another mystery.

As a first time, one-off event, 'Inspired by Nature' was a tribute to the Friends' teamwork: Thank you Debra and Lynn for organising, Kerry for posters, Elaine for her 'Artists in the Gardens' guided walk, Lynelle and many others for unpacking, hanging, greeting guests, handling sales, cleaning up and repacking. Having artists' demonstration sessions helped to make it special, giving

insights into the processes and possibilities of clay-work, watercolours and eco-printing - to name just a few.

Inspired by Nature display

Promotion efforts ranged from local papers and TV (thanks Rosanna) to flyers and on-site posters. Once people did see the posters in the Gardens and find their way in, everyone was impressed to see a wide variety of artworks of various types, locally made and very affordable for such quality work.

Friends setting up the display

If we do decide to hold a similar exhibition in future, we know that the quality (and public interest) will be high. These examples of the positive feedback are certainly encouraging:

'One day while I was on the help roster, a group of visitors came through the Exhibition and made some purchases. What struck me was the spontaneous comments they made about the standard and variety of the artworks. They even asked how often we have these exhibitions. It goes to show that everyone has hidden talents.' Helen Wallace, volunteer.

'I believe these exhibitions are important to both the community and to the artists.' Kath Melzer, artist.

"Not only did the event bring the Friends in contact with the public, it provided a way for Friends to socialise with each other as many popped in to see the display and stayed for a chat." Kerry Boyd, volunteer

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14 Koalas! Maybe more.

Kerry Boyd

Who would have guessed that so many koalas lived in and around the Gardens? Tony Ireland, that's who! After many years of championing the cause of all things 'koala', Tony's passion has set events in motion that are likely to have a huge impact on the conservation of our local koala population.

Here's how it happened…

Last year, interested Friends' members joined Tony to form "Fauna Friends". The group met with Renee Fletcher, an Environmental Education Centre Support Officer for the Sunshine Coast Council. After hearing about the Friends' interest in continuing and expanding koala research at the Gardens, Renee somehow managed to orchestrate approval for, then diligently coordinate, a collaborative koala research project funded by Council and the Friends.

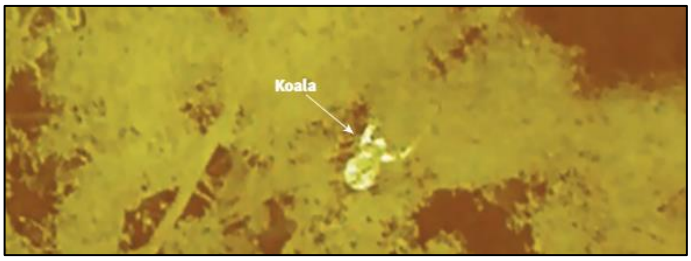
The University of the Sunshine Coast (USC) Detection Dogs for Conservation team was engaged to determine the number, genetic diversity and health of the koalas living in the Botanic Gardens, the adjacent Tall Gums reserves and some surrounding private properties of residents who gave permission.

The information gathering component of the research was carried out over three days and nights at the end of March 2022 by USC scientists, using their heat-seeking thermal drone and a scat-detection dog (willingly assisted by Friends' volunteers).

The first part of the survey involved using a thermal imaging drone to conduct the spotting survey. The drone systematically flew over a total of 176ha of council reserve and the adjoining private properties. Upon detecting a koala a GPS was then taken of its location.

Koalas are notoriously difficult to survey from the ground. They are well camouflaged and are often obscured by vegetation leading to inaccurate results. Thermal drone surveys are a much more effective and efficient survey method. The use of a thermal drone also allows a larger area and more difficult terrain to be surveyed easily. The

thermal drones are flown by trained operators and cause minimal to no disturbance to the koalas.



Thermal drone image showing a koala spotted at night.

The following morning the USC Detection Dogs team located the koalas using the GPS detected during the previous night's drone survey. Visual sightings of some koalas were made for any external signs of disease and fresh scats were collected for genetic analysis from all locations.

Kerry with scat dog Billy-Jean

Eighteen koalas were detected over the three nights through the thermal surveys which were determined to be 14 separate individuals. Fresh scats were collected from each koala surveyed. The genetic analysis of the scats is still underway. These results will enable the team to provide confirmation as to the disease status of the koalas, their sex and relatedness. The results of this study will be compared to previous results for the site and will help build on the broader koala research happening across the east coast that is informing koala conservation efforts. This research will also contribute to the implementation of Council's Koala Conservation Plan.

Perhaps the most valuable and exciting outcome of this recent collaborative project by the Friends and Council is the opportunity it has opened for the Gardens to become a location for ongoing USC koala research. This is extremely good news for us and the 14 or more koalas that live here. There is now much greater potential for the koalas' health to be monitored, unwell individuals cared for and, very importantly, koala habitat to be conserved and potentially extended through future Council land purchases. This is an outcome that the Friends can be very proud of initiating and supporting.

Caring for all flora and fauna, and especially the endangered species living in our own backyard is a responsibility and a privilege. While the Friends hope that news of 14+ koalas living in the Botanic Gardens will attract visitors, it's the potential for an increase in public awareness of environmental issues that's exciting. Awareness, education and individual action can make a difference.

You are welcome to join the Fauna Friends. You too can have fun while ensuring a voice for koalas and the other mammals, reptiles, birds and insects who are integral to the valuable ecosystem the Friends of MRBBG are helping to develop and conserve.

What's Happening on Site

Ray Dale – MRBBG Site Volunteer Co-Ordinator

Early summer problems with Covid and strong winds seem to be a distant memory as we saw them replaced with flooding rains. Given the amount of water that came through the Gardens, damage was not as bad as it could have been. There was obvious damage to the paths and bush trails and some plant repatriation in pristine areas such as the Fern Glade, which was under 4m of water. Mulching in the Fern Glade was carried out but, after another bout of flooding, replenishment has been held back pending better weather conditions.

The gardeners continue to weed and replant where possible in the never ending attempt to keep the Gardens looking the best. Focus on areas such as the Whipbird, Fern Glade and Arbour have all yielded results in what must sometime seem to be an uphill battle.

With rain comes algae so we are now seeing the value of the Council having a pressure cleaner on site which allows use at a convenient time rather than wait for hire. Maintenance tasks such as looking after the tables and chairs scattered throughout the gardens continues by bringing the items up to the shed so as to work undercover and allow better drying conditions. The volunteers responsible for this task can be proud as the Gardens have some of the best maintained infrastructure of the parks and gardens around the coast.

Lynelle pressure cleaning with Russel's help

Another area of repair was the storage bins adjacent to the A&E Centre where concrete replaced timber to stop further damage to the walls.

The crew tending to the Sculpture Garden and in particular sculpture maintenance underwent extensive training by the SCC on how to clean and preserve the various sculptures within the Gardens.

The early May rains also took out several large trees. The ground was so wet that it didn't take long for the first onset of strong winds to bring down some tall timber. The SCC invest heavily in tree management in order to maintain a safe public environment and when you see 10m trees ripped from the ground you understand why.

Areas which remain unattended due to access and size of commitment are mainly in the trails. Areas such as the Upland Track where the SCC have committed two crews of machinery to go in and repair. The volunteers can take care of some of the less accessible areas but the Upland Track requires major work after erosion.

In anticipation of there being more path upgrades the Friends have purchased a reusable formwork system designed for quick and flexible set up. Originally the system was purchased to complete the Whipbird Village path renewal but as the area has become inaccessible the project has been handed over to the Council who will use disaster funding to provide contractors. The deadline for completion will be June 2022 pending access.

A few new faces have been added to the workforce and we are currently in discussions with the council to increase numbers in the gardening and maintenance area so as to allow reprieve for the existing volunteers some of who have been doing the heavy lifting for over a decade. This will also help with the continuity of volunteers as numbers if not bolstered begin to decline. So onwards towards winter when there are predicted to be abnormal rains and once again those resilient volunteers will be there to clean up.

Friends' Events

Open Management Meetings
2nd Thu, 1pm @ Friends Shed
Jun 09
Jul 14
Aug 11

Bushcare
2nd Sat, 7am (subject to weather)
Jun 11
Jul 09
Aug 13

Fauna Watch Survey
2nd Wed, 8am
Jun 08
Jul 13
Aug 10

Welcome to our new Friends: Carol Forster, Kath Melzer, and Amanda Spooner

Information

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Membership:
A form is available on our Website, or use this link to download - Membership Application Form