



March–April 2017

FOG activities and workparties in March (For April & early May see page 2)

March 21, Tuesday, 5.30 for 6 pm FOG Annual General Meeting

All financial members of FOG are warmly invited to attend the 2017 Annual General Meeting of Friends of Grasslands Inc., at the Conservation Council offices, 26 Barry Drive (Lena Karmel Lodge), Acton ACT. The agenda is included with this newsletter.

Come at 5.30 pm so you can chat with other members beforehand. Parking (free at 5.30) is available directly across Barry Drive. Afterwards all or some of the group are likely to go to dinner at a nearby restaurant.

Election of the new committee: This year we particularly are looking for new faces on the committee, to future-proof FOG. Any financial member of FOG may nominate office bearers and committee members, either before the AGM in writing with the nominee's written acceptance, or at the meeting itself. It may be helpful to know that FOG committee meets at 5.30 pm on the 4th Tuesdays of March and every second month thereafter.

Please contact the Secretary soon, john.fitzgerald@fog.org.au, with nominations and with RSVPs (for catering).

Welcome to new member
Megan Dixon of Carwoola, NSW.

Saturday 4 March, 8.30 – 10.30 am Workparty, Hall Cemetery woodland

Our work will be satisfyingly active though prickly and scratchy – deseeding & bagging, weeding. We will definitely need sturdy gloves and secateurs – please bring your own, and be clad suitably for both work and weather. As always, FOG provides a morning tea. To make sure there is enough, please tell john.fitzgerald@fog.org.au by Thursday 2 March if you plan to come.

Saturday 18 March, 2.30 – 4.30 pm FOG visit, to 'Ballyhooly' property near Bungendore NSW

'Ballyhooly' is the 1000 acre property of FOG members the Mossops. They have kindly invited FOG to visit on **Saturday 18 March, from 2.30 pm.**

We expect to go on a short ramble, starting from the house. The main vegetation on the property is Yellow Box–Red Gum Grassy Woodland with a diverse grassy understorey, and there are many birds and other fauna. Walking off track at this property is said to be not difficult for any moderately fit and agile person. To cater for the risk of snakes, everyone in our party will need to wear walking boots and long pants. Please bring your own waterbottle, and dress for the weather.

If you'd like to join this visit, email margaret.ning@fog.org.au who will give you directions. A flora and fauna list is available.

Seed industry survey

The Australian native seed industry survey has re-opened (see p.5). If you are interested in completing the survey please email ANPC Project Manager Martin Driver for the survey link: projects@anpc.asn.au
Closing date is COB 28 April 2017

Photo at right:

STOP PRESS: Dangerous Bulbine Lily captured and behind bars at last ... ??

Actually, no. It's a miniature seed-orchard.
See page 6. Photo: Sue McIntyre.



FOG activities and workparties continued: April and early May

For workparties and outdoor activities, please always wear suitably protective clothing, footwear and hat, and bring water. Workparties are cancelled if: the forecast is for 35C or more; it is a total fire ban day; there is lightning; or there is heavy rain.

Tuesday 11 April, 4 pm

FOG visit to grassland restoration trials

We are being given the chance to visit the ACT Government's grassland restoration-trial plots at Kama Nature Reserve, south of Belconnen, ACT.

There are three projects in progress there: (i) the Forb Enhancement Project being undertaken by the Molonglo Implementation Team under Dr Richard Milner; (ii) the translocation of the Striped Legless Lizard to the site, being run by Dr Brett Howland and funded by NRM programs; (iii) the use of fire as a tool to promote restoration, which Brett, Richard and Maree Gilbert from the Parks and Conservation Service are running as part of funding from NRM programs. A key component in all these projects is monitoring.

The team plans to show us around and explain the restoration works underway, and how they are using monitoring to provide feedback on these actions.

To join in this FOG visit, please email margaret.ning@fog.org.au who will tell us where to meet.

FOG supporting ACT Tree week 2017

On **Saturday afternoon, 6 May**, FOG will hold a public walk at **Hall horse paddocks, ACT**. We aim to discuss the woodland tree species there and their relation to the grassy groundcover. More details nearer the time.

Stirling Park Woodland workparties

Saturday 1 April & Sunday 30 April
9 am

Here are the next two chances for healthy outdoor activity and fitness in a FOG/Yarralumla Residents workparty at Stirling Park, Yarralumla ACT. To join this happy group and share in the always excellent morning tea, be sure to email the organisers, so they can not only cater for everyone but also direct all comers to that day's action.

For 1 April, jamie.pittock@fog.org.au

For 30 April, jamie.pittock@fog.org.au or
pmcghie@optusnet.com.au

Hall Cemetery woodland workparty

2 hours, Saturday 8 April, 8.30 or 9 am

Please tell john.fitzgerald@fog.org.au that you intend to join this follow up to the workparty on 4 March (page 1). We meet at the gate on Wallaroo Road near the Barton Highway, suitably clad for weeding, whippersnipping and spraying, and bringing our own water. John provides the start time, and tools and a very welcome FOG morning tea, for **those who register with him**. Thanks John!

Controlled burn for Stirling Park

Jamie Pittock

The National Capital Authority plans a controlled burn (with the Rural Fire Service) at Stirling Park in late autumn this year, similar to burns of other patches of the Park in previous years. The intention this year will be to reduce fuel available to wildfires, and to assist the ecology of a strip of woodland along Alexandrina Drive, along the north and east sides of the park.

One of the walking tracks around the area will be temporarily used for light fire-fighting vehicles to control the edge of the planned burn. This is important, to break up a large patch of woodland into two smaller patches that can be more safely burnt (in different years).

A relatively small number of *Eucalyptus* saplings will be removed to enable vehicle access. This will change the appearance of the track to a modest extent in the short term. From an ecological perspective, FOG considers that there is a high density of young eucalypts and that removing a small number will help understorey plants to thrive, such as the endangered Button Wrinklewort. FOG will assist the NCA to identify ecologically sensitive areas for conservation during the burn operation.

Please contact me if you wish to discuss any of the above matters. jamie.pittock@fog.org.au

FOG advocacy

Naarilla Hirsch

December: FOG made a submission to the ACT Treasurer as part of the 2017–18 ACT budget consultation process. Points included the need for adequate, strategic and long-term guaranteed funding for the conservation of our grassy ecosystems into the future, the need for an increase in the weed budget across the ACT to increase the effectiveness of current weed control, and the need for an increase in funding to control pests such as rabbits, foxes and cats.

January: The Advocacy Group met in January to discuss its priorities for 2017 and operational issues. A full report of this meeting will be included in the advocacy report to the AGM.

The full text of FOG submissions appears on our website.

Saturday 25 March. FOG helpers wanted

FOG plans to join other environment groups to talk with visitors at 'Charny Carny' (a community day) about land-care and biodiversity in ACT. We shall focus especially on Ginninderra Creek catchment (comprising most or all of Gungahlin and Belconnen) which includes a number of patches of Natural Temperate Grassland and Box–Gum Woodland.

If you would like to help, sometime during 11 am – 5 pm, on Lhotsky Street, Charnwood, please contact ann.milligan@fog.org.au

Visit to M2G offset site, spring 2016

Naarilla Hirsch

The advocacy group has been involved in the community consultation process for the Murrumbidgee-to-Googong (M2G) pipeline since the beginnings of this project. While good rainfall in recent years has meant that operation of the pipeline has been limited to the minimum to keep it in working order, Icon Water have continued to work on rehabilitation along the pipeline corridor and improvement of the offset block, in accordance with EPBC approval conditions. The consultation reference group associated with the project is also ongoing, at a lower level. The latest (October 2016) meeting of this group was on the offset block (at Williamsdale), giving FOG advocacy group members an opportunity to view the current condition of parts of this block.

The block is slowly improving in condition (top photo). We saw a number of common grassland species in flower, including *Stackhousia monogyna* Creamy Candles, *Bulbine bulbosa* Bulbine Lily, *Ranunculus lappaceus* Common Buttercup, *Microseris lanceolata* Yam Daisy, *Swainsona sericea*, *Eleocharis acuta* Common Spike Rush and *Acaena ovina* Sheep's Burr.

Grasses were not particularly high, due to grazing by kangaroos and goats. Icon Water has a feral animals program for the block. A number of goats are removed each year, but unfortunately more move in from neighbouring areas afterwards. Pigs are also targeted and removed, although in 2016 there was little evidence of their presence.

Weeds are a continuing target for Icon Water. Serrated Tussock was sprayed in 2015 and was being targeted again in 2016. On advice from the ACT Government, St John's Wort was not sprayed in 2015 because of the release of biological controls for this weed. We saw a few of the beetles attacking St John's Wort plants (middle photo), but there were plenty of new plants emerging and it isn't clear how long it will take for the biological control approach to work.

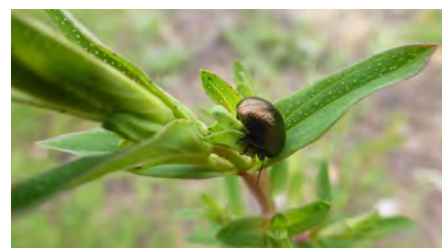
Woody weeds have been removed for several years, and will continue to be sprayed when they re-emerge. To replace the cover provided by these weeds for smaller birds, Icon Water has employed Greening Australia to plant local shrub species such as *Bursaria*, *Cassinia*, *Kunzea* and *Acacia*. Some of this replanting has been done along gullies as part of the erosion control program.

We also visited one of the sites where the endangered *Swainsona recta* (Small Purple Pea) was planted by the Australian National Botanic Gardens. While it appeared that a number of plants didn't survive, we saw several in flower (photo at right). The area had been subject to a cool burn a year before, and the surrounding area was more diverse than I remember it from a view years ago. Particular highlights were the number of *Arthropodium minus* Small Vanilla Lily and *Eryngium ovinum* Blue Devil.

Overall, the condition of the block is slowly improving, with Icon Water to continue as the managers.



Above: Billy Buttons *Craspedia variabilis*, native shrub planting and gully erosion control.

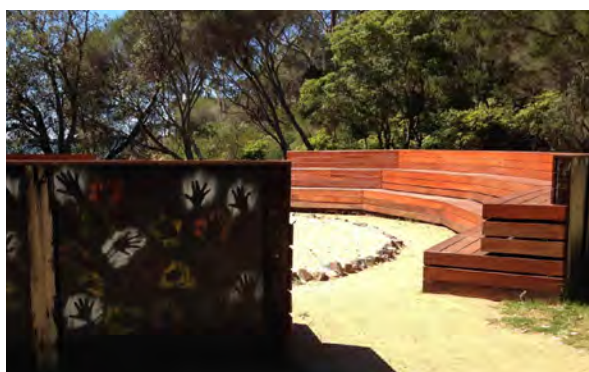


Photos: Naarilla Hirsch

Images from the Eden end of the Bundian Way by Naarilla Hirsch

I missed the FOG visit to Delegate and the Bundian Way last November, but was in Eden the following month and walked a little way along the coastal end of the Way. Here are some images.

The habitat is woodland rather than grassland, but there were a few plants in flower, including Hyacinth Orchid *Dipodium roseum*, Grey Everlasting *Ozothamnus obcordatus*, Blunt-leaved Wattle *Acacia obtusifolia*, Hop Goodenia *Goodenia ovata*, and Toothed Daisy-bush *Olearia tomentosa* (photo below).



Germinating plans for a grassy groundcover seed and restoration industry? The 11th Australian National Plant Conservation (ANPC) conference

Cathy Robertson

The Royal Botanic Gardens Victoria Melbourne was the venue for the eleventh **Australian Plant Conservation Conference (APCC11)**. ANPC has been promoting and working for plant conservation in Australia for 25 years. The theme of the Conference was 'New approaches to plant conservation challenges in the modern world'. I was thrilled to be there to share the learning and experience of so many inspiring conservation scientists and practitioners. Other FOG members attending were Geoff Robertson, Margaret Ning, and Janet and Andrew Russell. I would like to sincerely thank FOG for awarding me the cost of my conference registration.

APCC11 showcased the challenges and opportunities facing Australia's plant conservation and restoration community, with six themes, 41 presentations, a choice of three field-trip options, and a national keynote speaker. The organisers succeeded handsomely in creating an inspiring and unforgettable experience. Linda Broadhurst, the President of ANPC, opened the conference and welcomed delegates. She said that developing the logistical and technological capacity to ensure we have sufficiently high quality seed for species restoration, and understanding how to best use mutualistic organisms, were both essential for improving Australia's capacity to recover and conserve plant species. (Pollination is a classic example of mutualism.)

Gregory Andrews, Australia's Threatened Species Commissioner,^[1] presented the keynote address titled 'The Australian Government's Threatened Species Strategy and the thirty plants we will save from extinction'. He gave an entertaining account of his experiences with introducing his mission to local communities and gaining commitment for plant conservation.

Theme 6, 'New challenges, emerging ideas' included a report on 'Green roofs as an opportunity for rare plant conservation and dispersal', by Williams, Farrell, Lundholm & Delpratt. Plantings were installed on four large roofs of the Pixel Building, an international award winning eco building in Melbourne CBD. The 29 species, from the critically endangered Victorian volcanic plain, were monitored over three years for their survival and recruitment, and this study reported some success. A *New Scientist* article^[2] associated with the conference gives an overview of the results and a photo of one plot.



The 'Field Trip 2' group at the Grassy Woodland Restoration area at Yanakie Isthmus National Park, Wilsons Promontory, with John Morgan who is leaning on the enclosure. *Photo: Geoff Robertson.*

Friends of Grasslands' contribution to grassland restoration featured twice. Under Theme 2, 'Conservation for people and nature: How we maximise the benefits for both', Geoff Robertson gave a talk, subsequently published in *Greening Australia's Grassy Groundcover Gazette* December 2016. Also, Andy Russell provided information and answered questions on behalf of Southern Tablelands Ecosystems Park (a FOG member), at his pop-up exhibit space in the conference reception area.

The WOW factor presentations were by Dr John Morgan (a landscape ecologist at La Trobe University) entitled 'Targeting the timing of fire to restore ecosystem structure and function'; and Dr Paul Gibson-Roy, Greening Australia's lead scientist, entitled 'An Australian's first hand observations of the US seed production and restoration sectors'.

In partnership with Parks Victoria, John Morgan is managing a major project to restore coastal grassy woodlands that have declined dramatically in extent and condition over the last five decades. His team is testing the importance of timing of fire on structural recovery of coastal grasslands at Yanakie Isthmus, Wilson's Promontory National Park (see photo below).

John told us late summer fires in this location have reinforced the dominance of Coastal Tea Tree. Originally, Yanakie Isthmus was a cultural grassland landscape. Following the removal of the original custodians, and use of fire management and pastoral management, the land became dominated by tea tree. Results of the current experiments with hot fire management show that early summer fire, occurring at a time when there is minimal seed load, destabilises the dominance of Coastal Tea Tree. However, fire alone has not restored the structure or the function of the grassy understorey. Post-fire overgrazing by macropods and wombats left a low shrubby storey which prevents full grassland recovery. Hence, the grassland canopy, and the fine fuels necessary to implement low intensity management fires and inhibit further establishment of Coastal Tea Tree, are unlikely to fully recover. Options permitting control of overgrazing and protection for the grassy groundcover species are under consideration. The enclosure in the photo (left) shows what could happen if grazing animals were excluded. With more moderate grazing, grasses would be more dominant and the grassland could be managed by a mix of grazing and cool burning; without grass, cool burns may not be possible.

Paul Gibson-Roy made a compelling case that now is the time for urgency and for Australians to fundamentally accept that achieving a large-scale increase in the extent and range of Australian groundcover communities is possible. His presentation included a shortened version of his Churchill Fellowship study investigating American techniques for producing species-rich native seed crops for biodiversity restoration. The full report of his study^[3] includes policy recommendations.

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Visit to Australian National Botanic Gardens nursery on 21 February 2017

We have just enjoyed the first FOG activity for 2017, on a gloriously cloudless mild February day. Ten of us visited the nursery at the Australian National Botanic Gardens, hosted by Julie Percival, one of the Gardens' Horticulturalists. Julie gave us an engaging overview of whole process, from collecting material in the wild, through the nursery's various stages and out into the Gardens. (Not everything can be planted out, but that is the general intention.)

Our tour began at the sterilised nursery-created potting mixes, and Julie took us through the various stages of propagation: of seeds, of cuttings and of grafts, in dry or humid or misty glasshouses, and out to the airy shadehouses. Hygiene is crucial, to restrict transfer of pathogens between the Gardens proper and the nursery. They use integrated pest management, including *Drosera* sp. in the glasshouses and sticky traps in the shadehouses.

Julie outlined two major projects: (i) solving the challenges of propagating *Swainson recta*, Small Purple Pea, to make seed available for use in restoration; and (ii) the 3-year project rescuing 12 *Pomaderris* species from around NSW. This second project, funded by the NSW Environment Trust uses a special maternal genotype collecting protocol for the whole process, from annual field collection of cuttings and seed, right through the nursery. Some of the vigorous *Pomaderris* on benches in the shadehouses will eventually form a new bed in the Gardens. Read more at <http://www.seedpartnership.org.au/node/313/>.

It was a visit that reinforced our respect for the professionalism of the Gardens staff. Every detail of collected material is entered into databases to add to knowledge of species' ecology and propagation. In the field, collectors note soil type, microenvironment, population size, details of parent plants, evidence of attack by pest or pathogen, and more. Then every step and nuance of the journey at the seed bank and/or through the nursery is added to the database for that particular voucher specimen once it reaches the Gardens.



We saw and heard so many interesting facets of the work of the nursery, and there is not enough space to describe them adequately. Thank you very much, Julie, for your willingness to show us around, tell us so much, and answer our group's non-stop questions.

Ann Milligan

Continuing from p.4: APCC11 conference – Seed Industry Workshop and Survey

Geoff, Margaret and I attended the Australian Native Seed Industry Review workshop: 'The Purpose, The People, The Practice and The Proposals for Action', on the last day of the conference. This 'Call to Action' workshop drew on both Dr Paul Gibson-Roy's review of the American native seed industry and the pre-conference industry-wide on-line survey, along with our workshop participation, to identify the key issues, gaps and opportunities in the Australian native seed industry at this time. The workshop was sponsored by the Rural Industries Research & Development Corporation.

Both the workshop and survey targeted input and participation from the Australian Seed Bank Partnership, regional seed banks, commercial seed collectors, seed companies, contractors/revegetators, restoration organisations, regional NRM bodies, State/Federal agencies, research institutions and casual collectors and enthusiasts.

The workshop identified some of the key issues and gaps in the Australian national and regional seed supply chains and how we fare against learnings from the American scene. This has helped to list and prioritise some critical elements that need to be addressed; and note opportunities, actions and key players to assist in creating a true native seed supply industry. A detailed outcomes report on the workshop will be available in early 2017^[4].

The Australian native seed industry survey, undertaken prior to the APCC11 seed industry workshop, **has now re-opened**. The organisers are keen to ensure we distribute it amongst our networks. *If you are interested in completing the survey please email the ANPC Project Manager, Martin Driver* <projects@anpc.asn.au> and he will send you the survey link. **Closing date is COB 28 April 2017.**

References

- [1] <https://www.environment.gov.au/biodiversity/threatened/commissioner/about>
- [2] 'Islands in the sky used as Noah's ark for threatened plants.' *New Scientist* 9 November 2016. <https://www.newscientist.com/article/2111566-islands-in-the-sky-used-as-noahs-ark-for-threatened-plants/>
- [3] *Investigating techniques for producing species-rich native seed crops for biodiversity restoration.* <https://www.churchilltrust.com.au/fellows/detail/4019/Paul+Gibson%20Roy>
- [4] Report on APCC11 seed industry workshop. <http://www.anpc.asn.au> (expected autumn 2017).

NOTE: Cathy Robertson received the grant offered by FOG to attend this conference.

Restore, Regenerate, Revegetate conference (5–9 February 2017)

David Johnson and Kat Ng

FOG members Kat Ng, Sue McIntyre and David Johnson from the Canberra region, as well as Wal Whalley (Armidale) and perhaps others, attended and gave presentations at the recent Restore, Regenerate, Revegetate (RRR) conference at the University of New England in Armidale NSW. The overall theme, 'Restoring ecological processes, ecosystems and landscapes in a changing world', attracted over 350 delegates from all over Australia and a few from overseas for the three days of presentations and one day of field trips.

The conference coincided with unusually high temperatures in NSW, and only two of the four conference rooms were air-conditioned, sometimes swaying our choice of sessions. Nevertheless, the conference was well organised and catered, with plenty of opportunities to socialise. Delegates included students, environmental academics, restoration ecologists and other practitioners based at universities, CSIRO, Greening Australia, catchment and landcare groups, state and local government, consultants, and representatives of the farming and mining industries. We can report only a few aspects here.

The themes ('symposia') ran concurrently and included: Seed genetics and management; Grazing management for biodiversity conservation; Broadacre revegetation strategies and techniques; Cost-effective revegetation and restoration; Revegetation for ecosystem service provision; Restoration on farms; Fauna and restoration; and others.

In the **Grazing management** symposium, we heard from researchers who work actively with the farming community to find ways for livestock production and biodiversity to co-exist. They propose that productivity and biodiversity conservation do not have to be 'either/or' land-use choices a land-owner must make. One example: grassland ecologist Dr Wal Whalley (who was also one of conference organisers) illustrated using cattle to manipulate species composition and convert pasture dominated by *Aristida ramosa*, which is undesirable for grazing, to pasture rich in *Rytidosperma bipartitum* – one of several native grass species valued for livestock production.



How cattle work on grassland management. Wal Whalley's slide on Twitter at #RRRUNE2017, where the numerous tweets and photos give a nice insight into the sessions and field trips.

Speaking on the topic of managing overgrazing by macropods, Dr Sue McIntyre stressed that if forb populations are large and dense enough, they provide resilience to grazing stresses. Among other approaches, she proposed in situ 'seed-orchards' (strategically placed wire-mesh fencing in bushland, *as shown in her photo on page 1*) to protect grazing-sensitive species, to try to maintain variation in the groundstorey sward structure.

During **plenary presentations**, we heard about research on relationships between plant and pollinator species (by Caroline Gross), emphasising the need to consider the entire insect life-cycle when restoring plants and habitat resources. Resources used at the egg-laying or larval stages would be very different from those needed at the adult stages of pollinator species.

Plenary speaker Dr Paul Gibson-Roy gave an upbeat presentation about the successful large-scale and financially viable seed production and restoration sector in the US, which has strong agronomic underpinnings: you can purchase a variety of bee-mixes, diversity-mixes, bird-mixes, erosion-mixes, roadside-mixes, all based on native grassy communities there. Could we do the same in Australia, instead of the default exotic-grass mix in land restoration here? Lack of belief, seed resources, markets, infrastructure and equipment are some reasons that might be setting us back.

Another plenary presenter (Tom Jones from USA) talked about the role of plant soil feedbacks (PSFs) in community succession, linking annual species with negative PSFs and perennial species with positive PSFs, and suggesting these are important mechanisms in bringing about the change from communities dominated by short-lived pioneer species to stable communities of long-lived perennial species.

In the **Revegetation for ecosystem service provision** symposium there was strong emphasis on the importance of native grassland species in providing habitat for 'beneficial' species that carry out pest control and pollinate plants. There are still gaps in deciding which species to use for revegetation that would benefit pollinators and other beneficial insects. A phone app is being built to support such decisions.

David Johnson presented his results in this symposium, from a survey at Kama Nature Reserve in Belconnen ACT. Native annuals were more sensitive to litter depth than exotic annuals. Native perennials benefited less from increasing moisture and were more sensitive to soil fertility (P) than exotic perennials, but were more tolerant of increasing clay in the soil. There was considerable variation in individual species' responses to litter, soil texture and fertility, even among species with the same origin and longevity. David intends to publish further details in the coming months.

Kat's paper, while related to this symposium, was presented in the **Fauna and restoration** symposium. She outlined patterns of distribution and movement of ground-dwelling beetles between farm paddocks, revegetated corridors and adjacent bush remnants.

The 'Seeds, seedlings, and community effort' field trip was inspiring, visiting (i) a small native nursery that has grown into the region's biggest seed collection and revegetation business, having

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Restore, Regenerate, Revegetate Conference (5–9 February 2017) continued

developed their own machines and methods for collecting, cleaning and storing seed, (ii) the Armidale Tree Group, which emerged 33 years ago as a community response to dieback in the region and is now a successful business, and (iii) the garden of Maria Hitchcock, an active member of the Australian Plants Society and originator of the Correa Group.

Later, the **Seed genetics and management** symposium included work on soil and vegetation management at the vineyard floor (by Melanie Weckert) exploring the possibility of using summer-dormant native grasses, e.g. *Rytidosperma geniculata* and *R. caespitosa*, as cover crops to improve soil structure and soil microbial diversity. Research suggests that root-fungi and soil-fungi, which would be beneficial to the growth of grapevines and the germination and growth of wallaby grasses, are being reduced by the presence of ryegrass and fescue.

Emerging challenges and further information

Here are some of challenges for restoration ecology which emerged from so many interesting topics during the five days: adapting to climate change (should we revisit the definition of natives vs non-natives?); a need to think at a broader landscape scale when planning projects; reduced land availability; lack of markets and innovation or technologies to increase the scale of restoration efforts (in Australia especially); a need to protect existing habitats (land clearing is still an issue); considering diverse needs of various stakeholders; the needs both to demonstrate effectiveness so as to encourage behavioural change, and to acknowledge amazing people and skills that are already succeeding.

The conference abstracts are online at <http://conferencecompany.com.au/wp-content/uploads/2016/05/RRR-Abstracts-31-Jan.pdf>.



Field trip to a revegetation site at 'Eastlake', south-east of Uralla NSW. Photo: Kat Ng.

Snippets

Fire & Restoration Network <http://fireandrestoration.org.au>

This is a web-based discussion network and resource hub, set up by NSW Nature Conservation Council's Bushfire Program. Practitioners and researchers can exchange knowledge and experiences, and post any queries or challenges they have encountered in relation to fire and restoration. There are discussions on weeds, fauna, cultural burning, restoration principles, fire thresholds and related topics. To participate in the discussion you need to register to be part of the network.

Project to harvest and mill Kangaroo Grass aims to encourage farmers to adopt native Australian crops <http://www.abc.net.au/news/2017-01-09/potential-for-farmers-to-grow-native-plants/8161212>

Bruce Pascoe, in his book *Dark Emu* (see Libby Keen's review in *News of FOG* January–February 2017) proposed that Aboriginal people cultivated native plants prior to white settlement. With volunteers from Victoria and the NSW south coast, and funding by Pozible, he has bought a specialised harvester to cut Kangaroo Grass. They intend to mill the grass to make flour, to show how the native grain can be used to make bread.

A photo guide to common cicadas of the greater Sydney region, by Nathan Emery. <https://www.inaturalist.org/posts/7766-photo-guide-to-common-cicadas-of-the-greater-sydney-region/>. 'A comprehensive, yet easy to follow field guide for 22 of the most common cicada species in the Greater Sydney Region.' Photos, habitats, song structures, species maps.

Other groups' upcoming events

16 March, Saturday, 9.30–4.00: **'Being an effective voice for the environment'** symposium. Conservation Council of the ACT Region. <http://conservationcouncil.org.au/>

26 March, Sunday, 2–4 pm: **John Blay speaking on early interactions between settlers and indigenous peoples and the Bundian Way**, in 'Listening Space: Sharing Stories'. Friends (Quaker) Meeting House, corner of Condamine St & Bent St, Turner ACT. RSVP by 24 March, to ph. 6247 4824, gfortey@gmail.com, or ph. 6259 5078, david.christine@iinet.net.au

3 May, Wednesday, 9.00–4.00: **'Protecting the environment on Commonwealth land'**, includes two talks about FOG's activities. EIANZ forum, University House, ANU, ACT, with entry fee. <https://www.eianz.org/events/event/protecting-the-environment-on-commonwealth-land>

30–31 May & 1 June, Tues–Thurs: **'Fire, Fauna and Ferals: from backyards to bush'**, Nature Conservation Council's 2017 Bushfire Conference, Sydney. Early bird discount 'til 31 March. <https://www.nature.org.au/healthy-ecosystems/bushfire-program/conferences/>

3 June, Saturday, 7 pm: **World Environment Day Dinner**. <http://conservationcouncil.org.au/>

21–22 July, Fri–Sat: **'Bushfire Management: Balancing the risks'** community symposium. <http://www.npaact.org.au/event.php?id=1533>

Close-up

Prasophyllum petilum Tarengo Leek Orchid

John Fitz Gerald

Hall Cemetery in spring and summer is a place of many wildflowers, not just the *Drosera* featured in the last *News of Friends of Grasslands*, but also attractive plants such as Milkmaids, Scaly Buttons, Buttercups, Blue Grass and Fringed Lilies. The *Themeda*-rich grassland is also a hiding place for a small endangered orchid, *Prasophyllum petilum*, the Tarengo Leek Orchid.

The orchid is named after the travelling stock reserve near Boorowa NSW where tens of thousands of these plants grow. However, all of its other occurrences have, at maximum, only tens of plants: hence its endangered conservation status in NSW and ACT.

In ACT, the population has been monitored annually by ACT Conservation Research since 1991, as detailed by Wilson, Seddon and Baines (2016). Their report finds that numbers are stable at present, but fluctuations in the number of flowering plants appear related to number of very frosty nights in the preceding year. Research and monitoring are ongoing for this poorly understood species.

One of these ongoing studies is a collaboration between ACT Government and the Australian National Botanic Gardens (ANBG). In summer 2016, seeds were collected for investigation into germination of the species.

The close-up images show stems in bud and flower (top composite, with an intruder*), and after flowering (middle composite). One of the fine-mesh bags ANBG used to collect seed is still attached to the stem of the orchid inflorescence in the middle composite. The bag is about 200 mm long. Many stems of *Themeda* and *Briza* grasses surround this bag.

The final image shows a few of the tiny seeds; some of the smallest ones are probably infertile. The white bar at the bottom right of the image indicates a line 0.1 mm long, roughly the width of the full seeds.

Tom North, Curator of the National Seed Bank at the ANBG, is thanked for releasing the seeds and for allowing use of the microscope for seed-imaging at the seed bank. This image of seeds is ©ANBG.

Reference

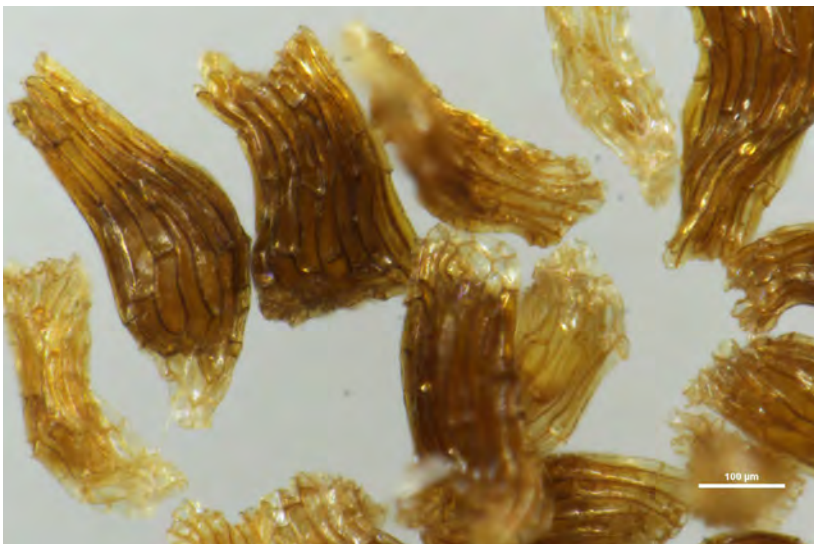
Wilson N., Seddon J. and Baines G. (2016). Factors influencing the flowering of the Tarengo Leek Orchid (*Prasophyllum petilum*). Technical Report 36, Conservation Research, Environment Division, Environment, Planning and Sustainable Development Directorate, ACT Government.



*Note the brown-flecked bud of a Scaly Button plant, ... here ^



The seed-collecting bag ^ about 200 mm long



Biosecurity Alert: Ox-eye Daisy *Leucanthemum vulgare*

Sarah Sharp

Most of this information has been taken from the Biosecurity Alert put out by Parks and Conservation Service (http://www.environment.act.gov.au/_data/assets/pdf_file/0008/901943/Ox-eye-daisy.pdf).

Parks and Conservation Service are becoming increasingly concerned about the risk posed by a number of ‘new’ weeds that we are seeing more of. One of these is Ox-eye Daisy. There had been a few incursion sites earlier, including in Southern ACT, on the roadside near Mt Clear campground and Mt Franklin Road, and on Sutton Road to the north. It has now been seen in many more areas.

Please keep a lookout for this plant, and pass on information about this through your networks!

The Ox-eye Daisy is a widespread flowering plant native to Europe and the temperate regions of Asia, and an introduced plant to North America, Australia (NSW, Victoria, Tasmania, South Australia and Western Australia) and New Zealand. In some habitats it is an invasive species forming dense colonies displacing native plants and modifying existing communities. It is difficult to control or eradicate since a new plant can regenerate from rhizome fragments, and is a problem in pastures where beef and dairy cattle graze, as usually they will not eat it, thus enabling it to spread (Wikipedia).

Distinguishing features

Ox-eye Daisy is an upright and long-lived herbaceous plant, usually 30–60 cm tall, with leaves arranged alternately along the stems but forming a basal rosette during the early stages of growth. The rosette leaves are stalked and have slightly toothed to lobed margins, while the upper stem leaves are smaller, narrower and usually stalkless with irregularly toothed or lobed margins. Flower-heads (2–6 cm across) are like a typical ‘daisy’ with numerous white ‘petals’ and a yellow centre. On the back of the flower are overlapping rows of green bracts with brownish margins. The flower-heads give rise to numerous small ribbed ‘seeds’ about 2.5 mm long.

This daisy may be confused with:

- Shasta Daisy (*Leucanthemum X superbum*) which generally has unbranched stems, flowers in heads 5–8 cm wide, and regularly toothed leaves. Ox-eye Daisy has irregularly toothed or lobed leaves.
- Large-headed Daisy (*Brachyscome diversifolia*) has similar flowers and leaves but the leaves have a tapering base where they attach to the stem.

What to do if you see it

Take a close-up photograph of the plant and a grid reference or GPS point (note datum) or draw a map, recording the nearest access point, trail, walking track or creek. Report sightings to <http://canberra.naturemapr.org/> or phone 13 22 81.

Other daisy weeds

Many daisies from overseas have invaded pasture, gardens and bushland. We are all familiar with the ubiquitous Flatweed *Hypochaeris radicata*, Dandelion *Taraxacum officinale* and Prickly Lettuce *Lactuca serriola*. These are weeds but aren’t declared pest plants in ACT, partly because they are beyond control, and partly because, although ubiquitous, they do not form monocultures.

To see all the work being done to control weeds in the ACT, look at the ACT Government website; for example:
http://www.environment.act.gov.au/_data/assets/pdf_file/0008/1026647/Six-Month-Report-on-Environmental-Weeds-Program.pdf



Ox-eye Daisy, usually 30–60 cm tall.

Photo: Don Wood, from Canberra Nature Map

Other daisies that are declared pest plants under ACT legislation (not all of which occur in the ACT, but may be prohibited from sale or distribution and/or notifiable if found) are:

- *Centaurea maculosa* Spotted Knapweed
- *Hieracium aurantiacum* Orange Hawkweed
- *Hieracium pilosella* Mouse-ear Hawkweed
- *Senecio madagascariensis* Fireweed
- *Carduus nutans* Nodding Thistle
- *Carduus pycnocephalus* Slender Thistle
- *Carduus tenuiflorus* Slender Thistle
- *Carthamus lanatus* Saffron Thistle
- *Onopordum acanthium* Scotch Thistle X
- *Onopordum illyricum* Illyrian Thistle
- *Chrysanthemoides monilifera* Bitou Bush.

Hardenbergia violacea: aka *Hardenbergia monophylla*

Jennifer Liney

Some time ago, the then Horticulture Apprentice at Eurobodalla Regional Botanic Gardens, Ryan Harris, spent two weeks at the Royal Botanic Gardens Sydney. He was shown most aspects of the Gardens, including a number of old botanic publications. After demonstrating a keen interest, he was given some of these to take home. Among them were a series of booklets on *The Flowering Plants and Ferns of New South Wales, with especial reference to their economic value*. This account is based on one of them.

J.H. Maiden, who in 1896 was appointed Director of the Royal Sydney Botanic Gardens and New South Wales Government Botanist, wrote these booklets (as well as numerous other books on botanical subjects). The booklets on *The Flowering Plants and Ferns of New South Wales* were published in 1895, and priced at 3s 6d. They included beautiful hand drawn and painted illustrations of the various species.

No. 20 in the series is titled 'FALSE SARSAPARILLA *Hardenbergia monophylla*', and the cover attributes it to 'J.H. Maiden, F.L.S. (Fellow of the Linnean Society) assisted by W.S. Campbell, F.L.S.'

Maiden wrote that False Sarsaparilla

is correctly known as *Hardenbergia monophylla*; monophylla from two Greek words signifying single leaves which are always solitary. It is commonly called False Sarsaparilla, or *Kennedya monophylla* [the generic name we now give to the Dusky Coral Pea *Kennedia rubicunda*].

Hardenbergia is in honour of Frances, Countess of Hardenberg, sister of Baron Huegel, an Austrian traveller and botanist who visited our shores and contributed not a little to Australian botany.

Following are some extracts from Maiden's booklet on this species.

Leaves. – Sometimes mistaken for those of our 'Native Sarsaparilla', which they distantly resemble, and hence collected by ignorant persons. Their medicinal properties are, however, imaginary.

Roots. – These are stated to have been used as a substitute for Sarsaparilla. It may be mentioned that in the case of ordinary Sarsaparilla (*Smilax officinalis*), the root is the part employed, while the sweet leaves are used in the case of the ordinary native or Colonial Sarsaparilla (*Smilax glycyphylla*).

Distribution. – Found in all the colonies except Western Australia, chiefly in the coastal and coast-mountain districts, and varying somewhat in habit, shape of leaves etc.

The powdered root of *Smilax officinalis* (Sarsaparilla) is traditionally used for the relief of dry flaky skin, as a diuretic, and is supposed to help cleanse the blood. Incidentally, the specific name *officinalis* means that the species is used as a medicine.

Hardenbergia violacea is a well-known very hardy climbing or scrambling plant, most commonly seen in profusion on roadside embankments, where it seems to thrive in impossibly dry clay, often facing directly into the western



This illustration in the booklet was probably painted by J.H. Maiden.



Hardenbergia violacea buds, flowers and leaves.

Photo courtesy of Eurobodalla Regional Botanic Gardens.

summer sun. It is not long-lived, particularly in cultivation, but its masses of purple, white or pale mauve pea flowers in late winter and spring make a wonderful display.

Botanists describe the leaves as 1-foliate, or 3- or 5-foliate. This means that at one time each leaf was one of several leaflets (somewhat like *Kennedia rubicunda*), but as the plant evolved over millions of years the side leaflets ceased to grow. However, it is clear that they were there once, because each 'discarded' leaflet left a little bump, or place, on the remaining leaf stalk. It seems a strange thing to do, but then evolution often seems a totally incomprehensible process with no perceivable logic.

Jenny Liney, long-time FOG member, adapted J.H. Maiden's booklet for an article in the newsletter of the Eurobodalla Regional Botanic Gardens, of which she is Curator. This is an edited version of that article.

The joys of Rock Lilies and rewards of weed control

Elena Guarracino

After reading the article about Rock Lilies by Klaus Huenneke in FOG's January–February 2017 newsletter, describing the wonder of seeing a mass display of Rock Lilies for the first time along the Yass River in October last year, I thought I would share my experience of these wonderful forbs.

There is a very healthy population of Rock Lilies growing on our 360 ha property 'Wildcroft' which is on the Snowy River, near Dalgety, a couple of hours south of Canberra. The ancient granite soil is euphemistically described as 'light' country, but I would call it marginal farmland or arid. *Eucalyptus bridgesiana* Apple Box, the dominant tree, covers about 50% of the property which has been 'flogged' through sheep grazing over many years.

Like Klaus, I too was delighted by my first sighting of masses of tall yellow Rock Lilies *Bulbine glauca*, growing on a rocky hillside on the property, facing the Snowy River, in spring. I had never seen this plant before, so looked it up in *Grassland Flora: a field guide for the Southern Tablelands (NSW & ACT)* (1998).

We (my partner Richard and I) bought the property in 2006, and over the years the Rock Lilies have exploded in numbers, forming quite a monoculture on two rocky hillsides, much to our joyful amazement!

I'd like to think it is due to my weed control efforts in these rocky places, scrambling up the tumble of rocks with a knapsack spray unit weighing ~20 kg on my back, targeting Vipers Bugloss *Echium* spp. and Great Mullein/Aaron's Rod *Verbascum thapus* L., as well as Serrated Tussock! While destocking may have played a part, I don't think sheep would venture up these steep rocky slopes somehow. It is such a wonderful reward to be searching for weeds in these areas and not find them anymore, with Rock Lilies filling the available spaces between the rocks.

For those who are not familiar with the Rock Lily, loosely quoting from *Woodland Flora: a field guide for the Southern Tablelands (NSW & ACT)* (2015),

It is a perennial forb with erect or arching unbranched flower stems up to 1 metre tall. The leaves are onion-like, bluish green and persist after flowering. The flowers are bright yellow with six petals each 17 x 5 mm on elongated spikes on stems to 70 cm long. They appear in spring and summer and are long flowering. Found in woodland and dry forest, rarely grassland, in relatively undisturbed rocky sites. The Rock Lily is uncommon, though widespread in the eastern and southern parts of the Southern Tablelands.

The Bulbine Lily *Bulbine bulbosa* also grows at Wildcroft, but so far I have only found it on two small undisturbed native grassland sites that have never been grazed.

References

- Eddy D., Mallinson D., Rehwinkel R., Sharp S. (1998) *Grassland Flora: a field guide for the Southern Tablelands (NSW & ACT)*.
Sharp S., Rehwinkel R., Mallinson D., Eddy D. (2015) *Woodland Flora: a field guide for the Southern Tablelands (NSW & ACT)*.



Above: Dense stands of Rock Lilies. The Snowy River and revegetation are just visible on the left-hand side. Below: Elena with Rory among more lilies.



Photos: Elena Guarracino & Richard Valler

Cultivation corner

Life in the city

Janet Russell

Cultivation Corner articles are Janet's observations on grassland species in ACT, now from an apartment instead of a suburban block.

We are not short of new visitors arriving on our balconies. The Hover Flies were the first to arrive and they returned day after day to the flowers during spring and early summer. We were surprised to see black ants appear one afternoon on the south balcony. They spread out seemingly searching for some soil to disappear into. They left as quickly as they arrived and we did not see where they went. They may be in a pot somewhere but if so we have not found them yet.

Most of the other insects either come in on the wind or are attracted by the light, and those that arrive are often as temporary as the ants. We have had a few insects such as the Bogong Moths, Christmas Beetles and locusts, some of which may appear in greater numbers in other parts of Canberra. The Christmas Beetles seem to come in from the Blue Gums that have been planted around the district. A variety of spiders, flies and other insects come in from time to time and it makes me mildly curious about the path they take to get here.

The plants are more static, although Climbing Saltbush *Einadia nutans* and Small Crumbweed *Dysphania pumilio* germinated in the same pot and they are obviously from seeds that we brought with us. Similarly, we have found a few Potato Vine seedlings that our neighbour used to grow over our shared fence in Aranda. An attractive fungus appeared that we had not seen before.

At ground level much of Constitution Avenue has been landscaped mainly with grassland species. I will watch with interest to see if the landscaping will mean an increase in biodiversity. The Common Grass-blue butterfly *Zizina otis* seems to be one of few insects at home on the rank grasses and weeds that infested the waste ground round here when we first arrived. Tussock Grass *Poa* sp. and a Rush *Juncus* sp. were planted as monocultures some years ago at the eastern end of Reid but they have not seemed to attract much wildlife. There are also other areas near us that still need to be landscaped and have been mulched with hay. They are supporting healthy populations of exotic grasses and other weeds. This is in addition to the weedy species that are popping up between the plantings, although there have been weeders who have come through and worked on them.



Above: A visiting Green-tailed Christmas Beetle, about 20 mm long. Photo: Janet Russell



Above: A Yellow-winged Locust (~30 mm long) called in.
Left: This March Fly was another visitor. Photos: Janet Russell



I have found remnant grassland species in the area, such as Austral Bindweed *Convolvulus angustissimus*, Scrambled eggs *Goodenia pinnatifida* and Yellowish Bluebell *Wahlenbergia luteola*. They will last until the areas are mowed or otherwise tidied up.

City life is full of surprises. We saw Yellow-rumped Thornbills in Glebe Park, and walking past the Casino met a Praying Mantis whose latest prey was a ladybird that was on the footpath. The Canberra Ornithologists Group discussion line reported that several of what seem to be the same species have been seen around apartments in the city. I have seen the Yellow-rumped Thornbills in one of the oak trees in Constitution Avenue and I am hoping they will make their way east.

I could not see the random appearance of these insects on our balconies having much meaning, but now I see them as all part of our greater ecosystem.

The Orange Spider Wasp – a colourful, nectar-feeding hunter

Michael Bedingfield

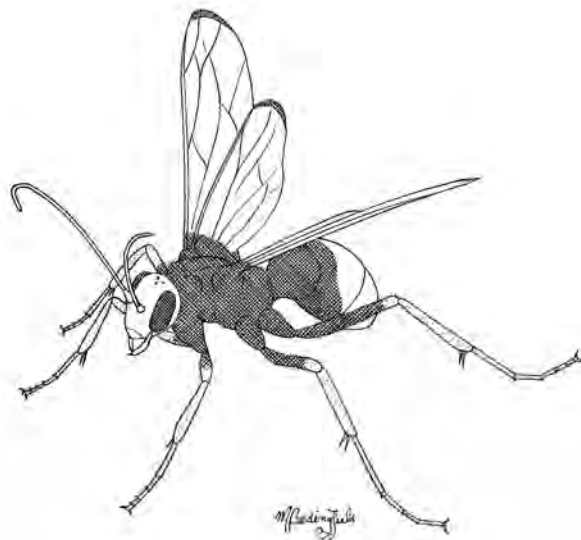
The Orange Spider Wasp goes by the name *Cryptocheilus bicolor*. It is a large insect, with striking colours in bright orange and black or dark brown. The females can have a body length of up to 35 mm, though the males are smaller. The bright colours that get your attention are usually a warning sign, but in this case the warning is perhaps meant for its predators. The wasps give a painful sting but are not aggressive toward people. If you see one of these wasps working furiously to dig a hole in the soil, it will be a female, creating a chamber as a nursery for its offspring. They work busily with their long legs, sending dirt and dust flying behind them. Being quite strong, they can move pebbles weighing much more than they do. They are restless and move in a jumping motion, flicking their wings repeatedly and moving their antennae, very attentive to their surroundings. If you get too close they will move away to a safe distance, but will resume their digging when the threat is gone. They dig a tunnel with chambers along it, using tough spines on their front legs. Into each chamber they place a paralysed spider, on which they lay an egg on the spider's abdomen.

The female wasp usually attacks Huntsman spiders (family Sparassidae) but also wolf spiders (family Lycosidae). She hunts in a tree or along the ground, stings the prey spider and thus paralyses it. She then drags the inert but live animal to the nursery tunnel, sometimes over a distance of tens of metres. A Huntsman spider is much larger and heavier than the wasp so that is quite an achievement. After laying an egg she seals the chamber. When the nursery is full she conceals the entrance. When each egg hatches the larva eats the spider, growing as it eats, and when it has finished it pupates in a cocoon of silk there under the soil, later emerging as an adult.

Males do not hunt in the same way as females. In a description of *Cryptocheilus australis*, the Golden Spider Wasp, I read about male behaviour for that closely related Australian species. The males emerge from the nursery 3–8 days before the females. Then they gather around the nurseries waiting for the females to emerge. They mate with the females when they come out, while they are still quite docile. After about two days the females will begin hunting, sometimes re-using old nests.

Spider wasps belong to the family Pompilidae, and there are many species worldwide. They vary in size and have different species of spiders as prey. They are solitary, not communal. Although the females are capable hunters the adults feed on flower nectar. They all have generally similar behaviour, though in some species the female lays the egg on the spider at the location where she paralysed it, and the grub feeds and grows without the protection of a burrow. Some are able to carry their prey by flight. A smaller number lay their eggs on the prey they have stolen from other spider wasps. In general, eggs laid on larger spiders tend to produce a female infant and smaller ones a male.

I have provided a line drawing of the Orange Spider Wasp with the dark brown or black areas being shaded. The rest of the insect is orange or orange-brown. The curled antennae and long legs are typical. Notice the large eyes for good vision as well as three smaller eyes on the top of the head. I have also included a photo of a Zebra Spider Wasp, *Turneromyia* sp., which I found dragging a limp looking Huntsman spider to its burrow over rocky terrain. This wasp was also reasonably large, 20–25 mm in body length. Like the Orange Spider Wasp it was very alert and aware of my presence. It occasionally flew away from the spider to the nest



Zebra Spider Wasp, *Turneromyia* sp., dragging a Huntsman spider to its burrow. Photo © Michael Bedingfield 2017

hole where it did some digging in the burrow before returning to the spider.

Orange Spider Wasps are widely distributed throughout Australia in a range of habitats. I have found the few species of spider wasps that I have encountered to be quite fascinating. They are energetic and busy but wary and elusive, a challenge to study closely, an intriguing element in nature's inexhaustible variety.

References

- <http://australianmuseum.net.au/spider-wasps>
- http://www.brisbaneinsects.com/brisbane_vespoidwasps/OrangeSpiderWasp2.htm
- https://en.wikipedia.org/wiki/Spider_wasp
- <http://www.inaturalist.org/taxa/198790-Cryptocheilus-bicolor>
- https://en.wikipedia.org/wiki/Cryptocheilus_australis

Contacts for Friends of Grasslands Inc. groups and projects

Refer to the website www.fog.org.au for more information

Friends of Grasslands Inc.

General inquiries: info@fog.org.au

or Ann Milligan (mob: 0419 243 773)

Advocacy: advocacy@fog.org.au

Committee & correspondence: PO Box 440, Jamison Centre
ACT 2614, or committee2@fog.org.au

Financial matters, excluding membership:
treasurer@fog.org.au

Small grant applications: grants@fog.org.au

Membership: membership@fog.org.au

Newsletters & e-bulletins: sent out in alternate months
through the year. Contributions are welcome, to
newsletter@fog.org.au or ebulletin@fog.org.au

Website, www.fog.org.au: webmanager@fog.org.au

Promoting wider knowledge of grassy landscapes

Publications: *Woodland Flora*, *Grassland Flora*, other books &
sales (order forms at the website), booksales@fog.org.au

Monitoring: at Scottsdale, near Bredbo, NSW
linda.spinaze@fog.org.au

On-ground work:

Hall Cemetery, ACT john.fitzgerald@fog.org.au

Yarramundi Reach & Stirling Park jamie.pittock@fog.org.au

Old Cooma Common, NSW margaret.ning@fog.org.au

Education: Southern Tablelands Ecosystems Park (STEP) at
National Arboretum Canberra: secretary@step.asn.au

Activities: activities@fog.org.au

Media contact: Kim Pullen (mob: 0400 447 958)

FOG Calendar for March, April, early May

4 March Saturday 8.30 am. Hall Cemetery woodland ACT **workparty**.

Email: john.fitzgerald@fog.org.au

18 March Saturday 2.30 pm. **Visit to 'Ballyhooly' NSW, grassy woodland.**

Email: margaret.ning@fog.org.au

21 March Tuesday 5.30 for 6 pm. **FOG AGM** at the Conservation Council
office, Lena Karmel Lodge, Barry Drive, Civic, ACT.

25 March Saturday 11–5 pm. **Help?** Email: ann.milligan@fog.org.au

1 April Saturday 8.30 or 9 am. Stirling Park ACT, **workparty**.

Email: jamie.pittock@fog.org.au

8 April Saturday 8.30 or 9 am. Hall Cemetery woodland ACT **workparty**.

Email: john.fitzgerald@fog.org.au

11 April Tuesday 4 pm. **Visit Kama NR grassland restoration plots.**

Email: margaret.ning@fog.org.au

30 April Sunday 8.30 or 9 am. Stirling Park ACT, **workparty**.

Email: jamie.pittock@fog.org.au or pmcghie@optusnet.com.au

6 May Saturday early pm. ACT TREE WEEK walk at Hall Horse Paddocks.

In this issue

Agenda for FOG 2017 AGM (insert)

FOG activities and workparties, March–early May
FOG advocacy

Controlled burn for Stirling Park

M2G offset site, spring 2016

Images from the Eden end of the Bundian Way

A seed and restoration industry? (APCC11 conference)

Report on the first FOG activity for 2017

Restore, Regenerate, Revegetate conference

Snippets

Other groups' upcoming events

Close-up: *Prasophyllum petilum* Tarengo Leek Orchid

Biosecurity Alert: Ox-eye Daisy

Hardenbergia violaceae

The joys of Rock Lilies and rewards of weed control

Cultivation Corner: Life in the city

Orange Spider Wasp, a colourful nectar-feeding hunter

FOG contacts

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PO Box 440

Jamison Centre ACT 2614