



# News of Friends of Grasslands

*Supporting native grassy ecosystems*

September-October 2004

## Program

**Friday 17 September - Sydney grassy woodlands** An unusual opportunity to visit some of Sydney's best grassy woodlands, *Cumberland Woodland* and *Shale Sandstone Transition Forest* both listed as endangered ecological communities. We visit Holesworthy Training Area (9:45am to noon) and Orchid Hills Penrith (2.30 to 4:30pm), both Defence Department establishments, with Marina Peterson, Regional Environment Officer. We also visit (lunchtime) the Cumberland Plain Seeds, Castlereagh, owned by Tim Berryman who is trialing different methods of grass seed collection and production for use in restoration work around Sydney. More information page 2.

**Sat-Sun 18-19 September - Please note that the Eden Heath Weekend is cancelled.** Sorry for any inconvenience.

**Saturday 9 Oct, 2pm - Plant ID at Sutton.** FOG will visit Sarah and Adrian Fether's 25 acre property to assist in plant identification. For information on directions see page 2.

**Saturday 23 October - Braidwood orchids.** With Dave Mallinson we shall visit a site near Braidwood that has 56 orchid species. We hope to see a goodly number of those including some uncommon species. We will meet near the petrol station on the main road out of Bungendore at 10:00am. Bring lunch and thermos.

**Saturday 30 October 2004 (9am to 3pm) - Field day visiting Bungendore biodiversity hotspots and becoming a FOG buddy.** FOG is supporting the *Sustainable Bungendore* project, organised by the Southern Tablelands Grassy Ecosystems CMN. Rainer Rehwinkel is requesting experienced FOG members to act as mentors and/or buddies and to team up with local residents and/or not-so-experienced FOG members, to impart to their "buddies" a better understanding of the biodiversity and other values of grassy ecosystems by visiting two or three sites around Bungendore. More information page 2.

**Saturday 13 November. FOG's Tenth Birthday.** Come and celebrate our birthday where it began some ten years ago in a grassland walk, followed by dinner at Gib Street Café in Bungendore. We shall park and meet at Bungendore Park (off Gibraltar St) at 3:30pm before going to the Turullo Grassland Reserve for a short walk and reminiscing. At 6:15pm we shall adjourn to the café, 2/15 Gibraltar Street, Bungendore. To show our appreciation the two course dinner will only cost you \$10 after FOG's subsidy, but you need to bring your own liquid refreshment. We have the café to ourselves and there will be a special but short slide show, celebrating our ten years. As a lucky door prize, Michael Bedingfield is generously donating one of his drawings, and to add to this pot, there will be two FOG T-shirts. Inquiries Sandy or Margaret, and to ensure your booking send \$10 and your details to the FOG postbox (see last page).

## In this issue

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- A weekend in bogs
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- FOG's on-a-role
- Small St John's wort, an innocent native with an infamous cousin



Mauve burr-daisy (*Calotis glandulosa*). Southern Tablelands daisies, birds, reptiles, mammals and ecosystems were all on the menu for FOG-STEP workshop planned for 28 August. Report in next issue.

## News Roundup

### FOG slide afternoon

Margaret Ning

It was a cold bleak Saturday afternoon on 23 July when over thirty people came to FOG's winter slide afternoon, our best ever attendance for this event. We had two good draw cards. Mark Imber presented the results of his research on burning danthonia grasslands, while David Tongway took us on a tour of Middle-east desert ecosystems. Both speakers invited many questions and audience comments, and provided many insights into the functioning of ecosystems and their management and recovery.

### Desert ecosystems

FOG exists to support natural grassy ecosystems, but to understand such ecosystems it is useful to contrast them with other ecosystems. David Tongway's presentation on deserts in the Middle East, at the FOG slide afternoon on 24 July, provided such a contrast, and with his unique way of looking at things, his talk and slides provided many insights into the functioning of ecosystems.

David has been undertaking consultation work in the Middle East in three different countries, Kuwait, Amman (Jordan) and Saudi Arabia. Most his time has been spent in Kuwait, where David is part of a team to diagnose and monitor recovery following the devastating oil

fires at the end of the first Iraq war.

Little work has been done on the ecology of Kuwait. David pointed out that it has six vegetation communities and held up a slim book which provided a list and description of the plants of Kuwait, native and introduced.

Three billion barrels of oil were lost as a result of the fires. A twenty-four-hour, starless-midnight descended on Kuwait for six months. To put out the fires, 798 oil wells were detonated. Nevertheless, some 28m barrels of oil were retrieved by scooping it up from the desert. David is truly impressed by the skills of those who put out the fires.

The result of the fire and its extinguishment was a tarcrete crust that covered the fire-affected areas. The tarcrete did not seem to have any residual effects on the soil and was breaking up. David's slides illustrated both the devastation and the recovery.

There were some good news stories about recovery and some of David's slides showed a fascinating lizard that appeared to be relatively abundant, and some areas of shrubs. One fascinating slide showed Kuwait's only native tree. It was somewhat amazing that it had survived the war, but unfortunately this shrubby three-meter-high, 150-year-old tree was the only one of its kind left in

the country.

Most of what was shown was areas devoid of vegetation. This was the result of overgrazing by domestic animals. The desert people who kept large flocks of animals were wealthy enough to purchase hand feed most of the year around. This meant that any vegetation that appears after rain is eaten as soon as it appears.

One good news story was that a huge national park had been created and fenced off. This will be off-limits to domestic grazing. While areas on both side of the fence currently look the same, maybe over time vegetation may reappear in the park. An obstacle here is a cultural attitude that finds flat landscapes particularly appealing. This might undermine any attempts to create artificial niches that might collect water a little better and be the genesis of new areas of vegetation.

The situation, cultural attitudes, and issues in Amman and Saudi Arabia were somewhat different and David described the people in Amman as somewhat more conservation-minded and eager to re-establish a population of oryx, a large native deer.

David posed a fascinating question: - these areas had been once covered with more vegetation - is it possible to bring it back?

With David's knowledge of ecosystems, he pointed out many things that others would miss. He was fascinated with the relationship between the beloved camel and the different species of dung beetles that attended them. He found lichen growing under rocks - yes there was more moisture there, but how did photosynthesis take place in the dark?

Many questions were posed to David who was able to open people's minds to new niches in ecology. At the same time David showed a love and respect for the people who lived in these lands.

### Burning danthonia grassland

Using burning as a management tool for native temperate grassland is somewhat controversial - some grassland ecologists being keen supporters of the concept and some very much against. Mark Imber's presentation at the FOG slide afternoon on 23 July may assist to take some heat out of the debate.

**More program information continued from cover page.**

**Fri 17 September - Sydney grassy woodlands** Bring own lunch and thermos. We meet at the Security Gate, Range Control, Artillery Road, Moorebank (Directions - take the Moorebank exit on M5, keep right and head south. Artillery road is the extension of Moorebank Avenue). Marina needs to know who will be coming so contact Geoff Robertson, details back page, to register and discuss possible car-pooling. You need to bring your driver's licence.

**Sat 9 Oct, 2pm - Plant ID at Sutton** Directions from Canberra - travel north along Federal Highway and cross the NSW border. Take the first exit left to Eaglehawk. At the top of the exit turn right onto the Federal Highway overpass towards the United petrol station. Take the first left before you go past the petrol station on to a service road heading north again parallel with the Federal Highway. At the bottom of the hill take Bidges Rd to the right. There's a sign for the White Ibis Tourist Park. Travel to the end of Bidges Rd. The Fether's gate numbers are 241 and 243 and the gates are pale blue. Go 1k to the end of the bitumen driveway. Watch out for potholes.

**Saturday 30 October 2004 (9am to 3pm) - Field day Bungendore.** The sites will include Turallo Nature Reserve (grassland) and Six-Mile TSR (grassland and woodland), and time permitting, one of the following: Sweenys Reserve (woodland), Brooks Hill Reserve (grassland and woodland) or Lake Road, Lake George (grassland, woodland and wetland). We will meet at Bungendore Park (Gibraltar St at 9:00am). Bring lunch or buy picnic lunch at Bungendore (great cafes and bakery); wear comfortable shoes, sunscreen and hat.

In the last issue of the FOG newsletter, by way of advertising his talk, Mark asked "to burn or not to burn – is that the question?" In other words, he is suggesting that burning is one, but not an essential, management tool for managing grassy ecosystems, at least in danthonia (wallaby grass) grasslands.

Mark has been the manager of the danthonia grassland at the Majura Field Firing Range, as well as other Defence Department grassland sites in the ACT, for many years. His curiosity about fire management of grasslands led him to choose the following topic for his honours thesis - *the influence of time since fire, in a Danthonia sp. dominated natu-*

*ral temperate grassland in the Australian Capital Territory.*

Mark tested several hypothesis: species richness varies significantly with time since fire; fires in November, January, or April will increase species richness; and the present of bare ground increases species richness. His analysis was confined to danthonia grasslands. He pointed out that most work to date had been done analysing the impact of fire on themeda (kangaroo grass) grassland. He provided a comprehensive description of the previous and current extent of natural temperate grassland, the situation at the Majura Field Firing Range, and his study design.

His findings were that his plots recorded 51 species (35 indigenous and 16 introduced, comprising 15 grasses and clovers and 36 other herbs). Forty-seven species turned were common to the burnt and unburnt plots, with another four turning up in the burnt plots and a different four turning up in the unburnt plots. Surprisingly, he found that fire was not necessary for species richness. Burns in November and April produced more species richness, January burns did not. Open space assisted diversity.

He pointed out that his research had several limitations. First, his research could not be compared with other research on danthonia grassland as comparable grassland fire research had focussed on themeda grassland. Second, his research period was not long enough. Third, his research had been carried out in a drought period. Finally, his research was restricted to small plots - larger plot size may have produced different results. His conclusion that fire is not necessary for

Goorooyaroo is a huge area largely dominated by yellow-box and red gum and the understorey is still dominated by native grasses and forbs. Given the combination of time of year, the fairly heavy grazing under previous management, and the drought, it was hard to determine the composition of much of the very short understorey.

Alan assured the mob that the understorey further into the reserve was much

better and Nicky Webb, who also came along on the trip, agreed, mentioning some spectacular flowering of lilies last spring.

Some of the trees in the reserve are superb, although there was some concern about several older trees that had apparently recently died. Interest was shown in the



FOG's visit to Goorooyaroo on 26 June on a sunny but icy afternoon.

species richness in areas where there is kangaroo grazing is an interesting one.

Mark thought that further research was required to examine the seed bank in soils, the size of gaps between plants, seed dispersal distance, different shapes of fire (eg elliptical rather than square), and the impact of kangaroo grazing.

In my view, Mark has made an excellent contribution, confirmed evidence that often fire does not seem to have an impact, and has shown us that the real world is subtle and complex with different paths achieving the same effect. Fire can be, but isn't the only, or even an essential (in the presence of other biomass reduction pathways), management tool.

#### Ford's fifth foray

A goodly number of people (over 20) turned up on a sunny but icy afternoon on 26 June to explore the new Goorooyaroo grassy woodland reserve. This was Alan Ford's fifth winter tour of Canberra grasslands - this time a grassy woodland.

recent fencing, part of plans to manage the reserve for conservation.

#### Burning grassy ecosystems Grasscover

28 JUNE I drove from Canberra to 'Gooandra', Mike Cattermole's property to attend a field day organised by the Monaro Grassland CMN on managing native grassland with fire. Gooandra is about 9km from Adaminaby on the Snowy Mountains Highway towards Kiandra.

While I had planned to get there with time to spare, I was delayed and so I did not have time to stop on the way to take pictures of some of the beautiful grassy-ecosystem landscapes between Cooma and Adaminaby. These landscapes are fast disappearing as areas around Cooma move rapidly to a mix of hobby farms, more intensive, and some irrigated, farming, and occasional pine forest - not a pretty sight. I thought I would like to stop and take a photo of the beautiful *Eucalyptus lacrimans* - another time maybe.

Despite being thirty minutes late, people were still straggling in when I arrived,

and so I had not missed the main show, starring Mike and David Eddy.

Essentially what we saw were several areas of grassland that had been subject to different fire management regimes.

Mike's property is 100 acres and is essentially the setting for four up-market cabins. The property is around 1200m altitude and on average receives around 29 inches of rain. Some areas had been 'supered' but there had been no pasture improvement.

A large area around the cabins is mown - this looks like an extensive quality lawn, although the large areas of rusty red colour cannot be mistaken for anything other than kangaroo grass. While most of the fifteen participants were not interested in mowing, I wanted to know more about this management regime and pestered Mike for answers accordingly.

Over the course of the ninety minutes we were shown several areas, all lush with native grasses and forbs, and almost weedless.

The first area was a lush half-metre-high kangaroo grass grassland which had been burnt about eighteen months ago. It looked no different to the second patch that was burnt about seven years ago. There seemed to be ample evidence of forbs and sufficient inter-tussock space for plant recruitment.

The next area had not been burnt but looked similar to the previous patches. It did however have a few plants of St. John's wort. Mike said "The wort is more prevalent, by a substantial amount, in the next door neighbour's which has not been grazed or burnt for a number of years. The few wort plants in my block only seem to appear on areas that have not been burnt for at least three years. I tend to think burning helps manage the wort but I have yet to prove this theory!!".

Mike allows agistment on his land and sheep grazed all areas that we saw. However, this was obviously relatively light and the presence of the rare Australian anchor plant supports this view.

Mike did little weeding, and we only saw small amounts of briar, St John's wort in one area, and a patch of thistle from where silt dug out of the dam had been piled up outside the dam.

Next we saw two recently burnt areas, one burnt two weeks before the event and the other two days. Both fires were cold burns that Mike preferred. In cold

burns dead material is burnt off but the vegetation structure remains in place and there was again plenty of evidence of forbs. Mike was hoping to light a fire for the visitors but it was too windy on the day.

We moved onto the mown area. Apart from its appearance, it was probably as diverse as the other areas we saw.

Mike enjoyed playing with fire but was cautious and areas were burnt infrequently. His mix of management methods certainly resulted in healthy looking vegetation.

It was a little after 4pm when I got away, and I did have time to stop and photo those *E. lacrimans*.

#### **Gearing up for ACT election** *Grasscover*

The ACT election will take place on 16 October. In all likelihood the new assembly will be dominated by the two major parties with minor parties and maybe independents having the balance of power. Unfortunately, in recent times both major parties have worked together to destroy some of Canberra's best grassy ecosystem remnants to develop the Gungahlin Drive Extension and up-market housing at O'Malley. There seems to be a tacit agreement to down play biodiversity and other conservation issues in the election.

The Conservation Council is responding by challenging all candidates to address important conservation issues. Key issues cover transport, greenhouse, water, waste, biodiversity, planning and governance.

In the Council's view, all candidates should understand that conservation outcomes benefit all the community, and they should commit to good conservation outcomes. It is equally important that candidates understand and support the role of conservation groups as the "environmental conscience". Without such groups, there would be no opportunity for the community to work through the complex array of conservation issues to come up with considered views on what is the best way forward to meet the social, economic and environmental needs of our community.

The Council is seeking cash and in-kind support from conservation-minded people in its election campaign.

#### **\$480k for grassland recovery**

FOG has learnt that the Commonwealth Government has funded the next three years of the Natural Temperate Grassland Recovery Plan - some \$480k. An important component of this will fund a project officer. Jane O'Neill is temporarily in this position until it is filled on a more permanent basis. Geoff Robertson is FOG's representative on the recovery team.

#### **Veg restoration guidelines**

Environment ACT has released *Draft ACT Vegetation Restoration Guidelines, June 2004*, prepared by Geoff Butler and Associates. These guidelines were conceived as a result of a revegetation workshop conducted by Environment ACT in November 2003. Many members of FOG were involved in the workshop.

The draft guidelines provide a framework for restoration/revegetation, call it what you will, in a variety of complex situations. The document is certainly a useful reference for anyone anticipating this type of work, but does not venture into details such as what particular species to plant and not plant. Community groups have been asked for comments.

#### **Replying to Wal** *Rainer Rehwinkel*

In response to Wal Whalley's e-mail regarding the conventions for presenting species names in publications, can I say that there is no "correct way of doing things", as you quoted David Eddy as saying. We in the NSW Department of Environment and Conservation (DEC) have adopted a different convention, as I believe many who currently write about biodiversity do. Just by the way, I have consulted a commonly-used style guide - it says that you shouldn't use capitals (unless there is a proper noun in the name), just like Wal says. However, I don't agree with that convention. Below are some reasons why I don't agree with that convention, and why we should continue with that that adopted by NSW DEC, and others.

I believe the best reason for presenting species' common names in which the first letter of each name capitalised, is that a common name of a plant and animal is a proper noun, just like the name of a city, town or country is (cities, towns, countries and region are always spelt with a capital), or for that matter, as are the names of people - geoff rob-

robertson would probably be upset if his name was spelt like that!

Another reason why a common name should be presented with a capital is to allay confusion. For example, when stringing a set of adjectives in front of a common name in text, it is not easy to see where the adjectives end and the common name begins without the capitals present. For example, you could have a phrase that says "... the beautiful threatened superb parrot ...". This phrase is not really clear - I believe the main purpose of writing should be to convey clarity.

Another very good reason to present common names as capitals is to provide a distinction between a specific taxon, as when you refer to the Superb Parrot, as opposed to a general reference to a parrot, when lower case is appropriate. This applies equally to plants, say for example, references to general or non-specific eucalypts or gums will be in lower case, while the Scribbly Gum or Manna Gum is presented with upper case initial letters.

Part of this convention is that in hyphenated names, the second part of the name after the hyphen is in lower case, as in Glossy Black-cockatoo or Mauve Burr-daisy.

I would encourage FOG to continue to use capitals in the presentation of common names, because it makes for clarity, and this will align FOG with most others who write about biodiversity.

*Response: Well now we have two well-argued cases for and against using lower case in the common names of plants. So we tossed a coin and in our endless wisdom decided, sorry rainer, that we would use lower case for common plant and animal names, at least as an experiment, and invite members to respond. As all admit, there is "no correct way of doing things" and on occasion either approach has its shortcomings. - editor.*

### Leveraging research for woodlands

In our last issue, mention was made of the ACT Government allocating half a million dollars for post-graduate scholarships in threatened species research. Members of FOG have been briefed on tentative plans to leverage this funding (using it to attract more) to focus on re-

once more is known about appropriate management.

### Bush incentive program

19 AUGUST Southern Catchment Authority announced its bush incentive program that will be piloted on the southern highlands around Braidwood and Tarago, and in the Illawarra. The program provides an incentive to farmers and landowners to tender for conservation of native vegetation. \$500,000 will be provided for on-ground work under this NHT-NSW Government partnership. Applications will be assessed and additional weight will be given for connectivity, improvement to riparian areas, quality of ground cover, and the presence of threatened communities and species. Monies may be spent on fencing, planting and weeding. This is a step by the NSW Government to protect threatened and rare ecological communities. Contact Donna Hazell, 4842 2594 for details.

This is the second major project by the Catchment Management Authority. A similar project, the Monaro

Grassland project, which is similar in size, provides funding for grassland conservation. Tim Fletcher 6452 1455 is the contact for that project.

### Picaree Hill

Readers might recall Alan Ford's article on FOG's flora survey at Picaree Hill on 19 October last (*November-December 2003 FOG Newsletter*). The results of that and the other survey work has now been put together in the *Picaree Hill, integrated conservation management plan, Murrumbateman Landcare Group 2004*, prepared by Lori Gould, Greening Australia.

This is an excellent piece of work demonstrating how, with a lot of effort, a huge number of institutions, community groups and individuals can be brought together to work on a one-off project for biodiversity. The plan itself is put together in a simple but comprehensive



Some of the trees in Goorooyaroo are suburb. Photo taken on FOG's visit to reserve on 26 June.

search into better woodland management.

Environment ACT is working with David Lindenmayer and Adrian Manning (Centre for Resource and Environmental Studies at the ANU) on a major proposal for woodland research focussed on Goorooyaroo and Mulligan's Flat reserves. These reserves represent one of the largest woodland areas in Australia.

Best management practice and species recovery for threatened and rare bird and reptile species is the goal. Specific research will investigate the impact of presence/absence of fallen timber, and different fire and fencing/grazing regimes on habitat. Consideration would be given to the reintroduction of species



manner. It will be invaluable in managing Picaree Hill but it also provides a very good benchmark for assessing other sites. Congratulations to all involved, and in particular to Lori.

### **Grazing to sustain biodiversity**

*Rebecca Lines-Kelly*

A new review of grazing management and biodiversity conservation has called on agronomists and ecologists to work together to develop sustainable and bio-diverse grazing systems.

The review also calls for the re-training of extension staff to ensure they are aware of both biodiversity conservation and sustainable grazing management strategies.

The review published in the *Australian Journal of Agricultural Research* says there is little information available on maintaining long-term productivity and biodiversity conservation. The information available suggests that native grasslands are affected by set stocking rates.

Grazing, fertilisers, and pasture replacement have impacts. Intermittent grazing is more likely to benefit biodiversity and production, especially if it involves a wide range of grass species. But we need to know more about the effect of different grazing strategies, such

as rotational grazing or a season of rest, on remnant grassy vegetation.

We also need to know more about our grasslands and grassy woodlands. We know a little about some plants, threatened vertebrate species and pest invertebrates but have a poor understanding of other species and how all the elements of grassland ecosystems interact.

We know that increasing the cover and abundance of perennial grasses in grasslands is an important factor in achieving sustainability. However, management of these perennials for livestock production may conflict with the needs of native flora and fauna. We need to know more about grazing these grassland ecosystems in ways that benefit both livestock and native systems.

The review says considerable research and extension is required before we can achieve a sustainable and biodiverse grazing system in our temperate grassy ecosystems. It says 'We still have only a very basic understanding of the effects of different grazing strategies and pasture management on biodiversity and this is a major impediment to the development of appropriate and compatible best management practices.'

'There is an urgent need for improved communication and collaboration between agronomic and ecological researchers and research agencies to ensure that future programs consider sustainability in terms of biodiversity as well as pasture and livestock productivity and soil and water health.'

You can read the review, 'Livestock grazing management and biodiversity conservation in Australian temperate grassy landscapes' by Dorrough et al, in Vol 55 (2004) of the *Australian Journal of Agricultural Research*.

*Re-published from Agriculture Today, page 7, The Land, 24 June 2004. Rebecca Lines-Kelly is the NSW Agriculture Extension Coordinator, Wollongbar.*

### **Repairing soils with natives**

Commenting on a nine-year pasture trial at Blayney in *Agriculture Today* (April 2004) Department of Primary Industry Agronomists, Bruce Clements (Bathurst) and Mike Keys (Queanbeyan) say fertiliser applied annually - for the first three years at 300 kilograms a hectare to correct very low phosphorus levels and then at more normal rates - both increases profitability and preserves native species. (The Land 22 July, page 34).

## ***New Findings on Grassland Earless Dragon***

*Margaret Ning*

At the ACT Herpetological Association June monthly meeting, in front of a respectably-sized winter-time audience, Lyn Nelson talked to us about the grassland earless dragon (GED). Lyn started work with the ACT Parks and Conservation Service in 1995 (in Will Osborne's old job) and she is now with the NSW National Parks and Wildlife Service and has almost finished her PhD on aspects of the thermal ecology and life history of this small reptile. The GED is a threatened species in our region which has recently been promoted to species level following DNA work in 1999 that suggested there were two sub species on the Southern Tablelands, ie Cooma populations are different from Queanbeyan-Canberra populations.

Lyn told us how the GED's former local distribution was in the expansive grassland areas around Canberra and the even larger areas around Cooma. Specifically, Havelock House and the ABC building were known local sites. It was previously thought to be extinct locally until Will Osborne rediscovered it in 1991 near Queanbeyan. Its previous Australian distribution included Melbourne, Bathurst and Toowoomba, although there may be some doubt as to whether the Toowoomba earless dragon is the same species. The 1990s saw vast surveying for the GED, and although Toowoomba became another possible rediscovery site, it was concluded that it must be extinct in Victoria.

The main reason for the GEDs' reduced numbers is extensive habitat destruction. In Canberra this includes urban development, and in NSW it is changing agricultural practices, including ploughing (which reduces its rocky habitat), and increased fertiliser use. Ploughing also destroys the structure of the soil, as well as the spider holes that are the lizard's main shelter. These spider holes were probably wood cricket holes initially.

One of Lyn's take home messages was that the GED is not found only in high quality grassland. High quality grasslands were the first places surveyed and the dragons were not always found there. And then when more resources were found, it enabled the researchers to go further afield to less classic dragon habitat and they were even found in areas containing introduced grass species.

Lyn's study sites were:

- Kuma Nature Reserve just outside Cooma, which was established specifically to protect three reptile species (GED, striped legless-lizard and little whip-snake).
- Quartz Hill, a property south of Cooma where, even in drought, the GED could still be found.
- Majura Valley including Majura Field Firing Range, where they were found after a bad fire (including anecdotal evidence of fire-fleeing lizards, including GEDs), and the grassland east of Campbell Park.

- Both the east and western sides of Jerrabomberra Valley on the "Woden" property.

### Body temperature and its role in lizard biology

Given that reptiles need warm body temperature to eat, mate, move around etc, Lyn's study of the GED included temperature control experiments. She wanted to discover their heat preferences in laboratory-controlled conditions during summer, autumn and spring. The dragons were put in 30 degree temperature for around 30 minutes, and a video was then turned on to record their movement to see if they subsequently moved to the cooler or warmer end of the laboratory temperature gradient. Later, during a holiday period, Lyn waded through her videotapes and categorised the time the animals spent in the different temperature zones. The temperature categories were under 20 degrees Celsius, 20-24°C, 25-20°, 30-34°, and 35 °C or greater.

The conclusion was that the lizards preferred more than 35 degree temperatures, in autumn and spring, regardless of their sex, size or origin. In summer they selected equally between less than 30 and more than 35 degrees, again regardless of sex, body size or site. The experiment was not complicated by the presence of food or water. This means that they are like other agamid lizards in their temperature preference.

Next, Lyn used temperature-sensitive radio transmitters to monitor 20 GEDs' body temperatures in autumn, summer and spring in the Canberra and Cooma areas. She found that if it was too hot in summer they may become active in the middle of the day, and, in the colder temperatures of Cooma, their activity was more restricted. Cooma and Canberra lizards were not active until 16° and maximum activity was at 45°.

Overall they were normally active at sub-optimal temperatures of less than 35° and Lyn concluded that Cooma and Canberra don't have the optimal thermal environment for them. The spider hole environment provided the least variable temperatures, not rising above 30°, or below freezing. Incidentally she concluded that the GED never sheltered in tussocks for long periods of time when they were inactive.

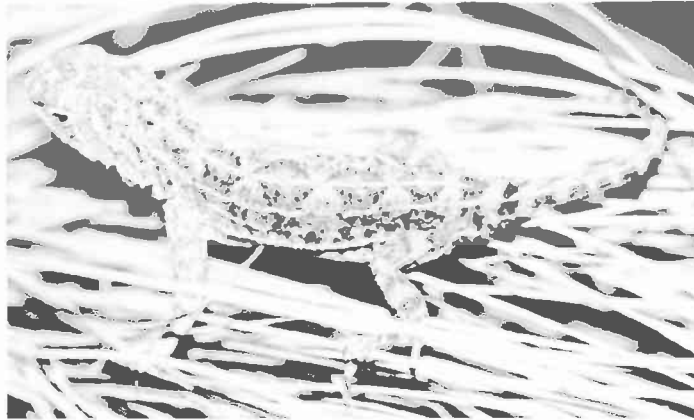
### GED biology

Lyn found that the Cooma GEDs hatched about a month later than the Canberra lizards, and grew faster and were chunkier. They grew faster in the hot, dry weather of an El Nino period and vice versa. Males were in the best condition in autumn and they grew faster than the females. Despite growing more slowly, the females end up larger. Lyn theorised this was to possibly accommodate the egg mass, as the females only reproduced once and needed a big body to accommodate the 5-6 large eggs they produced. Gravid females don't fit into the spider hole traps. Males are possibly shorter lived than the females though Lyn knows of one that was definitely three years old.

The males had bright yellow colouring under the throat and orange coloured flanks in autumn and spring. Lyn concluded that some males possibly mate with females born in the previous season that did not reach maturity before winter, and that they probably mate in autumn and spring.

### Management

There is a lack of conservation management knowledge due to limited research of the species. Early pitfall traps were not very effective as the lizards were wary of them and were only ever trapped once, although metal rooves placed above them increased the captures as they gave protection from predators. However a new innovation of two PVC cylinders, one inside the other with an internal sandy lining and ends, is used by Monaro GEDs despite their adequate supply of rocks.



Lyn advises that management change is generally not advisable. Grazing keeps the open structure the GEDs prefer for basking. Lots of grassland ecologists want to burn, which Lyn thinks is probably not a good thing for reptiles and invertebrates, and suggested that Kuma Nature Reserve should be managed for reptiles, not floristics where this may conflict

with the lizards' needs (the striped legless-lizard (*Delma impar*) also occurs there). Another no-no in grassland management is the creation of perches, including the fences that come with urban and rural-residential development.

Habitat gets fragmented and recent local examples include the Canberra Airport's extensions and widenings and the proposed Defence Headquarters. Lyn doesn't believe that there is any 'compatible land use' that really has no detrimental impact on the GED, though she did add that light grazing might be acceptable. Lyn stressed that the views she was expressing were her own.

### Conservation

The artificial spider holes may help with GED conservation, although some lizards laid their eggs in them during a drought at two Canberra sites and did not survive. Maybe this was a moisture thing as the PVC cannot breathe. Lyn concluded that the Cooma population is living on the edge, and a couple of bad years could have a detrimental effect on the populations. Logically, the recent warm dry years should have been good for the species in this region, although a big hole in this theory includes the food/diet aspects associated with the present dry conditions.

Lyn painted a picture of a species that is very, very vulnerable, at the extremes of its thermal range, under stress, and with its environment under pressure. Nevertheless, despite the gloomy prognosis, it was an excellent evening with Lyn's enthusiasm and passion shining through. Her presentation was punctuated by Will Osborne's thoughtful questions and we saw some excellent photos most of which were hitherto unseen by the audience.

## A Weekend in Bogs

Eric Whiting

FOG exchanges newsletters with the Murrumbidgee Field Naturalists. In their July issue they published the following report on FOG's Wadbilliga weekend, and even though this was written up in our last newsletter, we thought that it was interesting to have another perspective.

Having spent the previous week in the Canberra area, Rowena and I took the opportunity to join the Friends of Grasslands group on their ANZAC weekend excursion looking at bogs. Upland sphagnum bogs that is, in the Wadbilliga National Park and further south in the Tantara-wangalo section of the South East Forests National Park.

On the Saturday we headed south from Canberra to Cooma then eastwards to Countegany and finally south again to meet the group at the junction of Wadbilliga Road. The access into the Park is initially through private property but we were soon into the Park travelling on typical forest tracks. Our first stop was at a grassy opening in the forest, which to our delight had masses of gentians. Unfortunately the cold weather of that weekend meant that they were not fully open. This bog was fairly dry and did not have much sphagnum in it.

Another opening in the forest a bit further on was wetter and had plenty of large patches of sphagnum. If we had not had such a drought we would have been really squelching around in gumboots. As it was walking boots sufficed and all we got was very bouncy foot-falls. In more raised parts of this bog were thick carpets of the hanging fern.

After this bog we crossed the Tuross River, here just a deep creek with a bouldery bottom but still needing four-wheel drive to cross. The track soon became steeper and rockier. Several linear bogs could be seen to one side but we kept going until we met and followed for some way the Park boundary. NPWS have added a separate electrified fence alongside the usual barbed-wire fence here to keep out the wild dogs (mostly not dingoes!) from the neighbouring sheep runs.

Lunchtime was spent alongside a long narrow bog and was accompanied by a bit of drizzly rain. I don't know whether it was the latter that caused the distraction but the whole party walked straight across the bog to a prominent outcrop of Permian conglomerate covered by a marvellous display of mosses and lichens.

It was now time to return along our track. By special request we stopped at an open hillside covered in dwarf casuarina, *Casuarina nana*, that was only knee to thigh high. As we found out, it was wind that kept the vegetation to this height.

Nevertheless we were all drawn as if by a magnet to climb up to the top of the hill. It was good to get an overview of the area we were in.

Our final stop on this day was at another bog (of course), this one distinguished by clumps of banksias in and around it. Most had flower heads.

The plan was for those attending both days to camp out the night in the Tantara-wangalo Forest. Conditions were such that

all elected to stay in or around Geoff Robertson's and Margaret Ning's house near Nimmitabel. So we had a very convivial evening in very comfortable surroundings.

Sunday dawned with sunshine but with still a chilly wind. We were all glad we had decided not to camp at the higher altitude of the Southern Tablelands forest. We were soon on the road travelling south east from Nimmitabel, turning off just before Brown Mountain.

First stop was at Packers Swamp. We had Jackie Miles with us on this day. Last year she discovered the rare eyebright, *Euphrasia scabra*, at this swamp, only the second location known for this plant in the state. To our delight we soon found some in full flower where she found them before. Under her direction we began to count the number of plants in a systematic manner. We found several more areas down one side of the swamp. At one point Jackie changed from a total count to defining the area covered as the count had gone over three hundred - compared to only seventeen the year before.

Most of the morning was spent searching nearly the whole of Packers Swamp. *Euphrasia* was not the only plant we looked at. The swamp has a diverse range of sedges and grasses and we also saw some orchids in their fruiting stage and a rare fern.

Our second stop was at Nunnock Swamp for lunch at the camping/picnic ground NPWS are developing. This was followed by a walk through part of Nunnock Swamp. This is a large swamp with a wide range of bog habitats and interspersed islands of shrub and/or forested islands. Trees in the latter included the colourfully barked swamp gum. It was good to have a guide as it is easy to get lost.

The first part of the swamp was in normal times a lagoon. A tide mark 30cm up the stems of tall spikerush, *Eleocharis spachelata*, showed the normal water level. Due to the drought the lagoon was totally dry. On the way back we saw smaller lagoons, also dry, that had isolated granite boulders within their bounds. The usual water level was marked by a fringing bare rock base below a dense lichen covered top.



Eric (top), Alan Scrymgeour (right), and Pierre Cochard (back of head) examine lichens and plants.



It was 3.30pm by the time we got back to the cars. There was one more optional stop on the program, that we elected to have despite the intention to drive home that night. This tempting stop was for coffee and cake at the Nimmitabel Coffee Shop. So we enjoyed another hour of conviviality before starting off on the long haul home.

It had been a marvellous weekend in totally different country to what we are used to, and with great company. Thank you FOG.

## Australian Grasshoppers

Book Review by Kim Pullen

*A Guide to Australian Grasshoppers and Locusts* by D.C.F. Rentz, R.C. Lewis, Y.N. Su & M.S. Upton. 2003. Natural History Publications (Borneo), Kota Kinabalu, Malaysia. 419 pp.

In summer, a walk through any Australian grassland—indeed, any landscape with grass as a component of the vegetation—is likely to disturb grasshoppers. As they leap out of your way, perhaps flashing coloured wings and making a crackling sound (crepitating) as they fly before diving back to earth, they are often the most conspicuous of the multitude of invertebrates in the habitat.

Until now the only aid to identifying these insects has been Baker (1984), which dealt only with the immature stages of the NSW fauna. Rentz (1996), while covering the whole of the continent, treated not only grasshoppers but also crickets, katydids, cockroaches, mantids and stick insects, necessitating a limited selection of species.

Now David Rentz and his 'grasshopper team' of Bob Lewis, Yu Ning Su and Murray Upton have pooled their accumulated knowledge (also drawing on work of the late Ken Key) and skills to produce an identification guide to the Australian members of two families of grasshoppers: the dominant *Acrididae* with 750 known Australian species, and the *Pyrgomorphidae* with just 24 but including some of the most striking. Two other families are not covered. The pygmy grasshoppers (*Tetrigidae*) are small, dull-coloured insects mostly living on damp soil, and the *Eumastacidae*, although diverse in Australia, are inconspicuous and mostly confined to arid and tropical parts of the country.

And where do locusts fit in? A locust is simply any species of grasshopper that periodically forms dense migratory swarms. Only five species qualify in Australia, but four of these can cause great damage.

*A Guide to Australian Grasshoppers and Locusts* is crowded with lavish coloured photographs outstanding for their quality. For each species treatment, a (usually) live adult insect is pictured, together with diagnostic structural details: the head, pronotum (part of the thorax forming a kind of shell behind the head), male genitalia, hind (jumping) leg, and a particular knob under the thorax invaluable for distinguishing species. Paragraphs on 'identification', 'related or similar species' and 'habitat and behaviour' accompany the photos, as well as a distribution map and table of monthly occurrence of nymphs (baby grasshoppers) and adults. Just under half the known Australian species are treated individually; an appendix lists the full fauna.

Readers will notice many species identified only by such names as '*Sumbilvia* sp. 8' or even 'Genus novum 28, sp. 1', designations indicating that the respective taxon is yet to receive a formal scientific name. The huge task of 'describing' these taxa awaits future taxonomists. But this will only happen if the taxonomy is adequately funded, a point the authors make clear. At least all the species treated now have 'common'

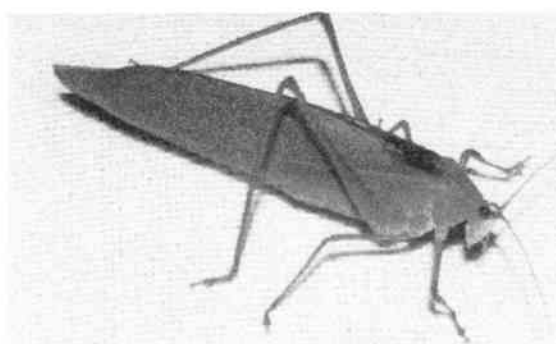
names, in many cases entertaining ones. How about 'Salt & Pepper Clepsydria', 'Reluctant Stonehopper', 'Giant Valanga', 'Striped Ungee-Gungee' (derivation, anyone?), 'Mount Isa Chintillga' or 'The Parazelum'? A tribute to years of painstaking work by Lewis is the 26 pages of photos of nymphs, which often look very different to adults.

Introductory chapters cover grasshopper structure, life history, classification, habitats and their relations

with man, who both destroys their habitats and suffers the depredations of locust plagues. There is a chapter on how to collect and preserve specimens and how to rear immature grasshoppers. At the back of the book is a bibliography, guide to other sources of information, glossary of scientific terms, an explanation of the photographic and imaging methods used, and indexes to common and scientific names as well as the aforementioned full species list.

As a first step in putting a name to the grasshopper specimen in your hand, there is an illustrated key to the major taxonomic groups within the two families treated. Unfortunately this is the only identification shortcut provided—if your specimen turns out to belong to the dominant subfamily *Catantopinae*, of which there are over 600 species in this country, you have 256 pages to leaf through! To ease the task, a key (or informal guide) to the genera would have been useful, and perhaps a geographical breakdown of the fauna, since many species occupy restricted areas. And arranging the genera and species alphabetically under tribes or subfamilies would have made it easier to find and compare the 'related and similar species'. The book's adherence to a strict taxonomic sequence obliges the reader to refer constantly to the index and serves no useful purpose.

For those studying or needing to identify Australian grasshoppers this book will be essential. For those with a broader interest in insects, or even in nature generally, it will provide a fascinating insight into a very special fauna, replete with stone-, twig- and leaf-mimics as well as creatures with red, yellow, green and even blue stripes and spots. And unless you live sur-



Gumleaf grasshopper, photo at Nimmitabel. belongs to the *Acrididae* family.

rounded by brick and concrete, or deep inside a rainforest, you are bound to find a grasshopper you know.

#### *References*

Baker, G. (1984). *Field Guide to Nymphs of Grasshoppers and Locusts in New South Wales*. Advisory Bulletin 2, Department of Agriculture, NSW. 28 pp.

Rentz, D.C.F. (1996). *Grasshopper Country: The Abundant Orthopteroid Insects of Australia*. University of NSW Press, Sydney. 284 pp.

## *FOG's on-a-role*

To celebrate our ten years, FOG is preparing an honour role of people, and some institutions, who have made a significant contribution to FOG through sharing ideas, providing presentations, or contributions to the newsletter; assisting with advocacy, education, research, on-ground work; organising or hosting activities; doing the hard yakka work; and/or helping in some intangible way.

Most names on the list are current or past FOG members, but some are not. A few predate FOG. We would also like to hear about names that may have been missed.

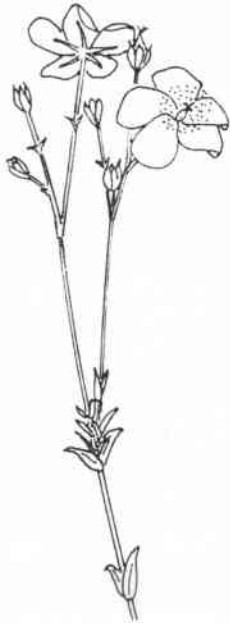
Rob ADAM, Harold ADAMS, Ian ANDERSON, Jenny ANDERSON, Michael ASKEY-DORAN, Peter AUSTEN, Joe BAKER, TOM BAKER, Tim BARLOW, Edwina BARTON, Matthew BARTON, Geoff BARTRUM, Brendan BAXTER, Michael BEDINGFIELD, Peter BEER, John BENSON, Tim BERRYMAN, John BETTS, Carl BINNING, Rosemary BLEMINGS, Richard BOMFORD, Maryke BOOTH, Alison BOWMAN, Sunni BOULTON, Jenny BOUNDS, Andrew BRIGGS, John BRIGGS, Nicky BRUCE, Geoff BUTLER, Andrew CAMPBELL, Karin CALLEY, CANBERRA TIMES, Tony CAREY, Rachelle CARRITT, Di CHAMBERS, Geoff and Gwyn CLARKE, Jo CLARKE, Andrew CLARIDGE, Darryl CLUFF, Rebecca COLE, CONSERVATION AND HERITAGE, CONSERVATION COUNCIL OF SOUTH EAST REGION AND CANBERRA, COOMA MONARO COUNCIL, COOMA-MONARO EXPRESS, Simon CORBELL, Ros CORNISH, Megan COUSINS, Jule and Norman CRAIG, Alex COSTIN, Mason CRANE, Isobel CRAWFORD, Jim CROSTHWAITE, Murray DADDS, Matthew CROZIER, Iain DAWSON, James DAWSON, Ros and Garth DIXON, Josh DORROUGH, Peter DOWLING, Michael DUNN, Kylie DURANT, David EDDY, Ted and Muriel EDWARDS, Graeme EDWARDS, David ELDRIDGE, Alison ELVIN, ENVIRONMENT ACT, ENVIRONMENT AND CONSERVATION, Indra ESGUERRA, FAMILY AND COMMUNITY SERVICES, Roger FARROW, Masie FAWCETT, Pamela FINGER, Helen FITZGERALD, Sue FLETCHER, Alan FORD, Henry FOSTER, Ian FRASER, David FREUDENBERGER, Denys GARDEN, Ian GARRARD, Jean GEUE, Louise GILFEDDER, Peter GILLARD, Phillipe GONTIER, Roger GOOD, Mary GOODACRE, Alison GOODLAND, Joan GOODRUM, Arvid GOETESSON, Jan GOUGH-WATSON, Lauren GRAY, GREENING AUSTRALIA, Maurice GRIFFIN-WARRICKE, Wendy HAIN, Fiona HALL, Georgina and Nigel HALL, Sandra HAND, Janette HANNAN, Ann HERBERT, Petrus HEYLIGERS, Robert HILL, Naarilla and Gerry HIRSCH, Michael HISSINK, Colin HOCKING, Ken HODGKINSON, Linda HODGKINSON, Paul HODGKINSON, David HOGG, Theo HOOY, Angela HORE, Jenny HORSFIELD, Leon HORSNELL, Geoff HOPE, Margaret HOWITT, Phil HURLE,

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## Small St John's Wort

*innocent native with an infamous cousin*

Michael Bedingfield



Many readers will be familiar with St John's wort, which is an exotic and very invasive weed, has been declared noxious in NSW, and grows up to one metre high. Small St John's wort has none of these qualities.

It is a petite native plant, having a five-petaled flower which is yellow to orange, growing only 10 to 30 cm tall. The flowers are grouped in "cymes" at the tops of the stems. They vary in size, and are usually smaller, from about 5 to 17 mm across, are sometimes cup shaped and have many stamens. A cyme is an inflorescence in which each flower is on the tip of a shoot, with new branches forming from just below each flower, creating a compound multi-branch structure. The bluish green leaves are in opposite pairs along the stems, and they often fold in close to the stems. They are 5 to 15 mm long and are marked underneath with dot sized glands. The plant is perennial and new growth occurs from dormant rootstock after the cooler months, with flowering occurring in spring to summer. As summer advances, flowers wither and fruits form on the erect stems, remaining there for some time, even into winter, as the foliage turns brown with age. In the accompanying drawings the plant is shown at half normal size with some flowers shown separately at full size.

The small St John's wort favours grasslands, woodlands and open forest and is common throughout the local region. It also occurs down the coast, at

higher elevations, and on the slopes and plains of NSW, and all Australian states.

The scientific name for small St John's wort is *Hypericum gramineum*, and for St John's wort is *H. perforatum*. Another related native species that occurs locally is the matted St John's wort (*H. japonicum*), which is low growing, with prostrate stems, and occurs only in damper areas, usually in grassy flats of mountain gullies. There are also a number of introduced *Hypericum* species that are used in gardens, such as some shrubs which are used for their displays of bright yellow flowers.

The derivation of the scientific names is of some interest. The genus name *Hypericum* comes from the Greek, 'hyper' meaning 'above' and 'eikon' meaning 'picture'. In medieval times in Europe the flowers of *Hypericum* species were put above religious images to keep away evil spirits on mid-summer's night on 24 June. This date later became the feast of St John, and this is how the common names arose. The species name '*gramineum*' simply means 'grass like'. And '*perforatum*' relates to the leaves of the St John's wort which, if you hold them to the light, seem to have lots of tiny holes. These are small translucent glands, and are found with a number of the species of this genus, though most clearly for *H. perforatum*.

Another saving grace for the noxious St John's wort is that it is used by naturopaths for its medicinal properties. Once when I was overweight it helped me lose three stone, and it has frequently assisted me with insomnia.

Whether the small St John's wort has the same mystical or medical properties as its relations I do not know. However, it is a non-nuisance native with an interesting family tree.



*Hypericum gramineum*  
Small St. John's Wort

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## *Friends of Grasslands Newsletter*

Do you want to subscribe to the newsletter? It comes out six times a year, and you can obtain it by joining FOG. You do not need to be an active member - some who join often have many commitments and only wish to receive the newsletter.

However, if you own or lease a property, are a member of a landcare or parkcare group, or actively interested in grassland and woodland conservation or revegetation, we hope we have something to offer you. We may assist by visiting sites and identifying native species and harmful weeds. We can suggest conservation and revegetation goals as well as management options, help document the site, and sometimes support applications for assistance, etc.

Of course you may wish to increase your own understanding of grasslands and woodlands, plant identification skills, etc. and so take a more active interest in our activities. Most activities are free and we also try to arrange transport (or car pool) to activities.

If you are already a member, why not encourage friends to join, or make a gift of membership to someone else? We will also send a complimentary newsletter to anyone who wants to know more about us.

## *How to join Friends of Grasslands*

Send us details of your name, address, telephone, fax, and e-mail, etc. You might also indicate your interests in grassland issues. Membership is \$20 for an individual or family; \$5 for students, unemployed or pensioners; and \$50 for corporations or organisations - the latter can request two newsletters be sent. Please make cheques payable to Friends of Grasslands Inc.

If you would like any further information about membership please contact Margaret Ning, or if you would like to discuss FOG issues contact Di Chambers and Roger Farrow. Contact details are given in the box above. We look forward to hearing from you.

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