News of Friends of Grasslands

Supporting native grassy ecosystems

September-October 2001

FOG'S 2001 PROGRAM

Important notes on coming events:

Please put firm dates in your calendar.

For all outdoor activities, don't forget your hat, sturdy walking shoes, sunblock and drinking water.

For insurance purposes, sign in/out at activities.

For any information about activities (including times, venues and carpooling details), please contact Margaret Ning on 6241 4065 (home) or 6252 7374 (work).

To make program suggestions, contact Margaret.

Saturday 1 September, 10am - Radio Hill fence removal All hands on deck for a trip to Radio Hill to remove the old fencing that criss-crosses the site. Please let Margaret know if you can spare some time for this, as it needs to be removed before the opening of the Reserve the following week.

Friday 7 September (Threatened Species Day): Opening of Old Cooma Common Grassland Reserve, celebrating the end of the beginning for FOG's Radio Hill Project. At 10 am Cooma Council and FOG will declare the grassland reserve open, launch the colour brochure, unveil the signs, crack open the bubbly, serve light refreshments, and take attendees on tour. We want many members to come and celebrate our achievement, especially if you put some hours into this. Contact Margaret for details.

8/9 September – Riverina grasslands This is a FOG activity to introduce us to native grassland species in the Hay/Deniliquin area. It's not too late for you to join us for this activity, so contact Margaret asap for details. (h) 6241 4065

Friday, Saturday, Sunday and Monday 28-30 September to 1 October – NPWS/NPA biodiversity survey at Dananbilla in the Young area NPWS & NPA are looking for volunteers to help with this targeted flora and fauna survey in the Dananbilla Nature Reserve and adjacent public and private land. Come and help out for some or all of the days, accommodation will be mainly camping. It should be a wonderful learning experience. Phone Margaret asap if you are interested. Applications close 31 August.

Saturday 6 October, 10am to 1:30pm Green Living Day - Grassland style. FOG will hold a grassland day at the Environment Centre to show itself off to the community, other conservation groups, FOG members who haven't had the chance to meet other members, and to the general public. This will be a great day and will include a number of presentations on grassy issues, birds and woodlands, threatened species, using grassland species in your garden, etc. Posters and other media will be on display, and experts and amateurs will be on hand to chat. Come along and say hello, drag a friend or family member with you and introduce them to the marvels of grassy ecosystems and their importance.

Saturday 6 October, 2pm - Orchids at Gungahlin Hill A compact grassy woodland remnant which contains a surprising number of spring orchids. If you travel north along the Barton Highway, Gungahlin Hill is on the right of the highway approximately half way between the 2CY/2CN transmitting stations and Gundaroo Drive. You will see a wooded area with a track off the southbound lane of the highway.

17 Oct to 28 Nov - Recovering our grasslands, a series of field days organised by NPWS, Environment ACT and FOG. This is an opportunity to find out about the Recovery Plan, the grassy-ecosystem Conservation Management Network, how to get involved (if you wish) and a great way to see many fantastic sites in spring. Contact Geoff Robertson (details back page) to get further information. Program visits:

- Tumut - 17 Oct
- Yass-Gunning - 23 Oct
- Gundaroo-Sutton - 24 Oct
- Goulburn-Crookwell - 30 Oct
- Bungendore-Tarago - 31 Oct
- Braidwood-Captain's Flat - 6 Nov
- Queanbeyan-Stoney Creek 7 Nov
- Canberra - 13 and 15 Nov
- Cooma - 20 Nov
- Nimmitabel - 21 Nov
- Adaminaby - Beloka - 26 Nov
- Bombala - 4 Dec
- Jindabyne - 5 Dec

Saturday 20 October, 2pm - Kowen Forest We'll visit a place called the Pound which is a former TSR. Travel out of Queanbeyan on the coast road: the Pound is 9.7 kms along the King's Highway from the turnoff to Captain's Flat. The Pound is on the right side of the King's Highway, and there's a sign saying "Kowen Travelling Stock Reserve, Remnant vegetation conservation area".

Saturday 17 November, 2pm - Theodore grassland We'll visit a grassland site in Theodore.

Saturday 1 December, - In pursuit of the Golden Sun Moth We'll visit Belconnen Naval Station.

8/9 December – more Monaro grassland gems

OTHER EVENTS

STIPA Conference 27-28 Sept. Full details were given on page 3 of last newsletter. Registration form and more details found at http://www.stipa.com.au/announce.html or contact Mike Byron at conference@stipa.com.au

ASGAP 2001 Canberra, Biennial Conference and Seminar - 29 Sept to 5 Oct. While this will run the full week and contain three days of seminars on the topic 'Australian Plants in a Changing World', and field excursions. You can pick and choose what to attend. For those interested in conservation, there will be an excellent range of speakers on Friday 5 Oct, including many FOG favourites, Ian Fraser, Rainer Rehwinkel, Frank Ingwersen, Sarah Sharp, Jeanette Mill and Geoff Butler. There is a free public lecture by David Jones on orchid conservation on Monday night. Monday sessions include landscaping, commercial growing of native plants, and botanic garden perspectives. Speakers include Judy West, Henry Nix, Dianne Firth, John Nightingale, Peter Ollerenshaw, Lotte von Richter, Robin Nielsen John Knight, and Iain Dawson. Wednesday focuses on what ASGAP study groups are achieving. Seminar days cost $40 each and day excursions $50. Enquiries: Hilary Merritt 6236 9317 and JMerritt@bigpond.com.

NEWS ROUNDUP

In this issue:

- Dragons pushed aside in airport development.
- The great salinity debate, Part III: Soil organic matter, past lessons for future learning - *Christine Jones*
- Grassy ecosystem conservation on the Darling Downs in Queensland - *Alison Goodland*
- Rugged cattle station enthrones the green new kings of grass castles - *James Woodford*
- Neglected necropolis reveals a natural treasure - *James Woodford*
- Naarilla's updates - *Naarilla Hirsch*
- Extract from Canberra: a Nation's Capital - held over until next issue.

Airport disaster

The big news story is the Commonwealth Government's decision to approve the extension of Canberra airport's runway and the lightning speed of its implementation. The outcome is the destruction of a significant part of Australia's Grassland Earless Dragon community and its grassland habitat, possibly other detrimental environmental consequences, and lack of consultation and transparency. The Commonwealth and ACT governments and the airport all deserve some criticism and it is now up to those agencies to provide partial redress. A special article is included on page 5.

Prison decision nearer

The decision on an ACT prison moves nearer, or does it? The government's latest proposal includes a 500 bed prison at Symonston. The prison would be publicly owned and privately operated. Because of its increased size (originally a 300 bed prison was contemplated), there are concerns that the prison may encroach on 11ha of high conservation value Yellow Box/Red Gum Grassy Woodland. The Conservation Council has said this is unacceptable. In the original proposal, some encroachment of the woodland was flagged. On the other hand, the original and latest proposals should provide a secured future for the grassland, its population of Grassland Earless Dragons and other conservation areas at the site, very highly desirable objectives. The ALP Opposition opposes the siting of the prison at Symonston.

Latest dragon findings

On Saturday 28 July FOG had the pleasure of a presentation by Lyn Nelson, who is undertaking a PhD on the endangered Grassland Earless Dragon (*Tympanocryptis pinguicolla*), examining impacts of environmental temperature on the life history of NSW and ACT populations. This dragon was initially described as a sub species of *T lineata* by Mitchell in 1948 and has recently been elevated to species level. Two sub-species have been recognised by Scott and Keogh in 2001. A population was recently discovered in Queensland. The debate about the taxonomy of the dragon continues and there is some evidence, based on more recent work by Scott and Keogh that the animals in Queensland may be a different species.

The dragon had a broad distribution in native grasslands from Victoria through NSW, ACT and Queensland. It has suffered extensive habitiat destruction and is now listed as endangered, all populations remain threatened. In the ACT, former sites include Havelock House and the ABC. While ploughing, fertilising and pasture improvement affect the presence of the dragon, it can tolerate grazing but we do not know precisely what their habitat requirements are, or the optimal grazing management regime.

One of Lyn's sub topics is body temperature and its role in lizard biology. Like all reptiles, the animal is an ectotherm, the thermal environment affecting body temperature, and her investigations include temperature regulation, metabolism, activity and growth rates. Lyn is also examining the relationship between temperature and life history to see whether life history traits co-vary with elevation, and thus temperature. An understanding of the effects of the thermal environment on individuals should assist in explaining geographic difference in life histories and other properties of populations.

The extant populations in the ACT are at 570-600 metres and those in NSW are at 880-1000 metres. Bureau of Meteorology data for Cooma and Canberra show that the mean monthly minimum temperatures are lower at Cooma but that the mean monthly maximum temperatures are similar. Lyn explained the difficulties involved in trapping methodologies and her preferred use of artificial spider hole tubes. It is interesting that the animals have different back patterns that assist in identifying recaptures so growth can be monitored.

Based on two years of data, Cooma animals of the same body length as the ACT animals, are almost one fifth greater in mass than those in the ACT. In terms of temperature preference in the laboratory, Lyn found that most animals preferred 30 degrees or higher. She found that while there were no differences in selection in terms of the temperature gradient, NSW animals were more active.

Lyn found that there were no significant differences in field metabolic rates between NSW and ACT animals but temperatures in Cooma were higher during this part of the study than in the ACT sites. But other data suggests that NSW animals grow more slowly and live longer. The Dragon is severely endangered throughout its range and it is important to conserve its habitat which is still being destroyed at places like the Canberra Airport and elsewhere. We also need to be careful in the use of grassland management tools such as fire. It is an indictment on our society that this little creature is in danger, especially when you consider the sums being spent to restore degraded landscapes elsewhere.

Grant monies available

Applications for the WWF/NHT Grassy Ecosystems Community Grants Program for 2001-2002 opened on 4 August 2001 and close 28 September 2001. Additional information can be obtained on the WWF website at http://www.wwf.org.au and following the links, or you may phone 1800 251 573.

New website and logo for FOG

FOG has finally made some progress with its website and has a new address http://www.geocities.com/friendsofgrasslands. We are working to add some additional pages, including adding a page to advertise groups with similar emphasis. Send us any information or comments you consider would assist. FOG has adopted a new logo, see page 1. Thanks to Michael Bedingfield for his artwork.

On-goings of WGWG

Woodlands and Grasslands Working Group (WGWG) has been concentrating on road developments in the north east of the ACT as these affect remnant native vegetation, which is largely small areas of grassy woodland. First, there is the re-

development of Sutton Rd, and next Fairbairn Avenue. The Fairbairn Avenue redevelopment would result in the loss of a number of trees and impact on the Mt Ainslie section of Canberra Nature Park. There is little spare space in parts of the Fairbairn Ave corridor and much of that has been mown regularly, resulting in the loss of whatever remained of the native understorey.

The Conservation Council has also been examining issues for the forthcoming local ACT election. It has been busy drawing up policies on Biodiversity, Planning and Transport. It will be appreciated that these are an integrated package and need consideration if we are to protect what remains of our fragile environmental legacy.

Grassy ecosystem recovery seminar

This seminar held on 20 June at NPWS offices in Queanbeyan heard Kevin Wale talk on the recovery work on the Cumberland Plains Woodland and the successes, failures and lessons. After providing some background, Kevin discussed the issues that the work had covered such as mapping issues, determining significance of areas, involving stakeholders and stakeholder politics, the aims that had emerged, legislative issues, mechanisms for moving ahead and the groping towards best practice management. While the area was different, the experiences had a familiar sound.

Environmental law

The Environmental Defenders Office (EDO, ACT) recently released a series of fact sheets on environmental law, designed to give plain English background knowledge to planning and environmental decision making in the ACT. The next few newsletters will contain snippets from these fact sheets. If you want the complete set, contact the EDO on 02 6247 9420, website www.edo.org.au. It also has a set of fact sheets on NSW environmental and planning laws.

Heating with wood

Should Canberrans Heat with Wood was the title of a recent forum on 26 June organised by U3A (ACT). Kerry Tucker, Greens MLA, spoke about her legislative efforts. She sees firewood as a huge environmental issue as grassy woodlands are threatened in our area. Initial efforts in this area led to a voluntary code of practice, which she used as a basis for her legislative framework. This received industry support, which sees it as protection against fly-by-nighters. The legislation ensures that information is now available, eg the type of wood and whether it's seasoned (dried). Other speakers included Max Kitchell, Head, National Heritage Division, Environment Australia, who spoke on wood use and loss of biodiversity, and David Power, Assistant Manager, Air and Hazardous Materials Unit, Environment ACT.

Lawson Development

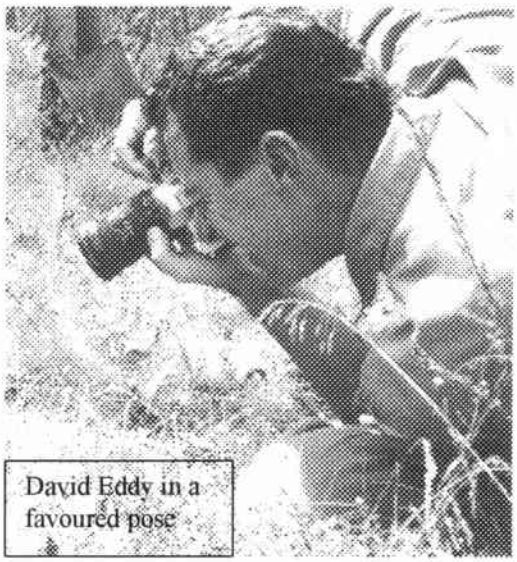
The first 400 dwelling development will take place in Lawson in May 2002. This follows recent development tenders being sought. Once the naval transmission station is decommissioned in 2002-03, Lawson will have 306ha available for residential development, open space and grassland conservation.

Send in those news stories

Many people have contributed to this News roundup by sending in short articles, press clippings, things from the net, snippets of information, etc. Thank yo all and keep those items coming in.

Special FOG recognition

The FOG Committee recently presented David Eddy with the three volume set of Don and Betty Wood's *Plants of South Eastern NSW* for his contribution to FOG in the Radio Hill (Old Cooma Common Reserve) Project, his work in organising FOG workshops, his leadership on FOG tours and many other contributions. FOG wishes to thank those whose generous contribution made this presentation possible.



David Eddy in a favoured pose

Roger McGrath appointed

The Riverina Grassland project should now grow quickly following the appointment of Roger as project officer. The project is funded under the WWF/NHT grassy ecosystem grants and managed by the Western Riverina Regional Vegetation Management Committee. The project model for the Riverina follows that used successfully by WWF in the Monaro and SA, involving locating good sites on private land and arranging some assistance with conservation. Roger has been a resident of Hay for many years and has worked extensively as a contract musterer in the Booligal area before completing his PhD in environmental science. He was quoted in the Rural News as saying 'Grasslands are an integral part of the western Riverina landscape and provide habitat for a wide range of native animals, including the endangered Plains-wanderer. They are also productive and drought resistant in an area of considerable climate variability, being the mainstay of the Riverina's sheep and wool industry". Roger will be leading FOG's trip in the Riverina in early September (see details on page one).

Twenty-six Regent Honeyeaters

The Rural News 22 June, reported that many endangered woodland birds were found 'in profusion' in a recent NPWS survey in the Wollondilly River Valley, north of Goulburn. Ninety two bird species were identified, including 26 Regent Honeyeaters (a bird whose numbers may be fewer than 1000), diamond firetails, hooded robins, brown tree creepers, weebills, jacky winters and turquoise parrots.

Saving daisies

A Greening Australia Wagga project, sponsored by the Australian Geographic Society, has discovered the largest recorded area of the threatened Yass Daisy. The project surveyed 96 travelling stock routes around Gundagai and found two hectares of Yass Daisy blooming in the Indian Creek Travelling Stock Route, one of 123 stock reserves and routes in the region. Other threatened species unearthed in the extensive survey include the Tumut Grevillea and Superb Parrot.

Bushland or Buildings
Alan Ford

I attended the two-day *Bushland or Buildings*, Nature Conservation Council of NSW Conference in June. It was concerned with State environmental legislation and planning and development issues as they affect nature conservation, with particular reference to urban areas. The main thrust of the first session, covering legislation, was the failure of the various pieces of legislation to protect adequately urban remnant native vegetation. The second session was concerned with planning and development is-

sues, concentrating on the ecological implications of current development policy (in NSW) and alternative scenarios for planning around biodiversity. The third session covered economic issues as instruments for urban remnant native vegetation and biodiversity conservation, and the final session covered integrated planning solutions to ensure biodiversity conservation.

A number of presentations were very useful, although many on the NSW *Threatened Species Act* and the eight part test, and the role of Local Government, largely took a Sydney perspective. Steve Douglas, in his paper, noted that nature conservation was not a focus of great attention outside the metropolitan area (This may simply reflect the view from the 'Harbour').

Martin Fallding spoke on the project he coordinated, the *Biodiversity Planning Guide for NSW Local Government*, which provides examples of planning approaches, plan provisions and sample planning instruments that can improve current practice.

Stuart Little (Department of Urban Affairs and Planning) presented a number of new approaches aimed at delivering improved biodiversity outcomes through the various stages of planning and development. He indicated that biodiversity and conservation outcomes can be improved through: the collation and use of natural resource information at the regional and local government area level; allocation of appropriate land-use planning controls; improved subdivision design; the consideration of available private land conservation mechanisms; and ensuring that consultation is conducted as early as possible in the planning process. He suggested that there was a need to focus on the causes of biodiversity decline, such as Key Threatening Processes, and on better biodiversity outcomes. I regard his presentation as one of the more significant at the conference. Interestingly it echoed comments by his Minister, Andrew Refshauge, who opened the conference.

Carl Binning (CSIRO) presented a paper on conserving urban bushland. He argued that the raft of recent NSW legislation, which have all placed increased responsibility on local governments and State agencies to ensure that urban bushland is protected, has not succeeded as the outcomes from the process have been disappointing. He indicated the importance of developing institutional structures that balance the need for scientific assessment, leadership and centralised planning from the 'top down' with strategies for engaging landholders and local communities from the 'bottom up'. He argued for a model toolkit of practical policies and programs for engaging communities and landholders. The conference concluded with a presentation from Ian Lowe on ensuring biodiversity conservation by needing to confront problems as diverse as population policy and metabolic flows.

Canberra Grassland Sites
Alan Ford

On 16 June, eight members set out on a sunny excursion to examine a few of the Grassland sites in Action Plan 1. The sites were all in Yarralumla and Barton and are worth a spring visit. The lookout for the Governor-General's residence on Lady Denman Drive was the meeting place for Site 29, a series of scattered remnants along the road side and adjacent areas. It still has some *Themeda* and forbs amongst the ruins. We wandered around the corner to look at a magnificent stand of *Poa* along a creek line. There may be other things there, but the time of year is against us. There was also a lively discussion about Chilean Needle Grass (a truly dangerous weed) and how to identify it.

Sarah, Margaret and Michael getting down to it on 16 June excursion. Photos by Jean Geue.

On Dudley St sits the small but brilliant Site 30, a stunning little remnant with the remains of Blue Devils (*Eryngium ovinum*) still prominent among the stands of *Themeda*. In spite of its size it is probably the second most significant site visited, after St Marks, as it has a diversity that sets it apart. Chris Harwood then took us to a grassland site within the Forestry complex, where he was looking for ideas on ways to preserve it by careful management. Discussion included removing some of the small trees around the boundary and appropriate fencing and signage.

Sites 31 and 32 are on Novar St and Black St respectively. I had never been certain of my identification of the former but now know that I can access both sites (they are within walking distance of each other) quite easily. Site 32 is a magnificent *Themeda* grassland with accompanying forbs and would be worth a spring visit to find out what is there in peak season.

The St Marks site, Site 33, is important as a refuge for Button Wrinklewort (*Rutidosis leptorhyncoides)*, and also has considerable diversity. It has been the subject of two controlled burns recently and it will be interesting to see what happens as the year progresses. It is a lovely *Themeda* grassland for most of the time but there are other gems, such as a greenhood orchid, beginning to reveal their existence. Our thanks to Sarah Sharp for sharing her knowledge with us during the excursion. Action Plan 1 can be found on the web at http://www.act.gov.au/environ/actionplans/GRASSLAND.html.)

Red Centre

Environment Tours was recently commissioned by the Canberra Ornithologist Group to take a party to the Red Centre. Plants, as well as birds, were a feature of the tour as they birded along their way. FOG member, Alan Ford reported that prominent among the grasses was Sand Spear Grass (*Aristida contorta*), which proved its common name time and again. Every now and then an isolated pocket of *Themeda* would appear along the roadside, an indication of the situation before farm animals ate it out. In some of the reserve areas it is coming back slowly. He said the *Themeda* situation is interesting as there is another species in the Centre, *T. avenacea*, as well as the *T. triandra* familiar to us. To be frank, he said, it was only towards the end of the tour that he had some idea of the differences between the two species. Alan reported that a huge problem exists in the Centre with Buffle Grass (*Cenchrus ciliaris*), an exotic which is taking over large areas.

DRAGONS PUSHED ASIDE IN AIRPORT DEVELOPMENT

What happened?

The Commonwealth Department of Transport is providing $9m to Canberra International Airport to widen the runway and taxiway junctions and provide a turning node at the northern end of the runway. With the subsequent support of the Commonwealth Department of Environment, this has resulted in the destruction of native grassland and the removal of eight animals from the threatened population of Grassland Earless Dragons. All, supposedly, so an estimated dozen or so Government visitors could land in wide bodied aircraft per year. The airport has consistently denied that they intend to encourage an increase in commercial use of the airport by wide bodied aircraft.

Most Canberra citizens probably welcome the development of the airport and associated Canberra-based industry. However, coincident with that the development, the airport is obliged to address three major environmental management issues - the management of a threatened vegetation community (temperate grassland), the management of threatened species (Grassland Earless Dragon, Golden Sun Moth and Canberra Raspy Cricket) and keeping noise down to acceptable minimums in surrounding suburbs. FOG questions how well the airport has done on the first two issues. We also question whether Commonwealth and ACT Governments have been effective in their obligation to ensure the protection of these environmental values.

Is this Commonwealth environmental protection in action? Why does that protection result in the destruction of habitat, and the reduction of an already small population of a threatened species?

In the past, FOG has been anxious about similar airport development proposals because of the threatened community and species there, and this has been covered in earlier newsletters. The Commonwealth and ACT Governments, and the airport, assured us that any development proposal would be subject to a proper environmental assessment. We do not suggest that either the airport or Governments have broken the law. But we do question whether the stated environmental objectives of these organisations have been met.

Within the airport boundary there are 120ha of natural temperate grassland of varying quality. Some of this is habitat for the threatened species but much of it is unsuitable habitat unless rehabilitated. The runway development is destroying 9ha of good quality grassland and in part of that area eight dragons have been found. We do not accurately know the area of land occupied by the dragons nor their numbers. The probable small size of the population and difficulty in surveying make accurate estimation impossible. However, given what we know of the number of captures from the small number of sites that exist (and extensive surveys have now been done by Environment ACT of potential ACT sites), the number of animals in the ACT and Queanbeyan is likely to be in the order of a thousand or fewer. Therefore the removal of 9ha of habitat is significant at the local scale. At the airport, where the population might be measured in the order of less than a hundred, the removal of animals could be devastating, especially in the context of other pressures such as predation and mowing regimes.

As the Commonwealth Government is prepared to fund the destruction of threatened communities and species, it should look for ways to make amends. Can it boost research funding and acquire and/or fund rehabilitation of nearby sites that may lead to a more secure future for the dragons and the Sun Moth?

We also believe that the whole process has been very rushed lessening any opportunity of saving as much as possible from a bad situation. FOG, as a member of the *Tymanocryptis* Recovery Team, was only consulted by the airport at a very late stage in the development process. There was no consultation over the original variation approved by the Department of Transport. Assessment by the Department of Environment only occurred following lobbying by FOG and the Recovery Team. Now the development is proceeding, the Recovery Team has been asked to consult on how impact can be minimised. FOG would like to salvage something positive from the situation and lists some suggestions below.

Key events

11 May 2001 John Anderson, Deputy Prime Minister and Minister for Transport, approved the removal of an area from the Airport's environmental significant area to allow for the extension, etc. to the runway. Subsequently, following considerable lobbying pressure, the airport agreed to make a submission to the Minister of the Environment indicating that the development was proposed and requesting an assessment. (The ACT Government could have triggered a Commonwealth assessment but declined to do so.) The airport argued that the work would not effect dragon habitat, but this was clearly untrue as the removal of eight dragons from the development site has subsequently shown. It also talked of the need for consultation with the Recovery Team and FOG. Such consultations never occurred directly with FOG.

When it became aware of the assessment, FOG made a submission to the Minister of the Environment commenting on the airport proposal. FOG's submission, prepared by Art Langston (a dragon expert and member of the Recovery Team) gave ample evidence that the airport was selective in the presentation of data. As a result its assessment of the environmental impact was misleading and incorrect. Submissions from the Recovery Team supported these arguments.

27 June, Senator Hill, Minister for the Environment, signed-off on the development stating that the runway work is not a 'controlled action' under the legislation. Nevertheless, he required that the construction be performed in accordance with an Environmental Management Protocol to be finalised with Environment ACT (ACT Government). Any taking and 'relocation' of dragons were to be undertaken by a qualified biologist.

10 July 2001, Environment Australia issued a permit allowing the destruction of 9ha, taking or destroying the dragons, mentioning that dragons will be handed over to the Conservator of Fauna and Flora, and mentioning the appointment of two qualified biologists. There was no explanation of the basis of the Minister's decision to support the development.

Is this Commonwealth environmental protection in action? Why does that protection result in the destruction of habitat, and the reduction of an already small population of a threatened species?

What the protocol says

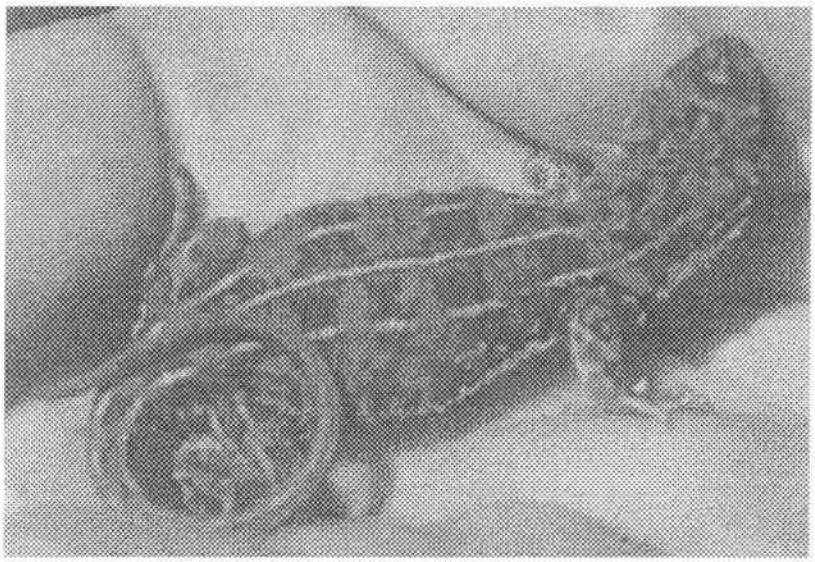
The protocol says a lot about the capturing and removal of the dragons, makes some useful statements about using materials (soils and plants) from the destroyed area elsewhere in the airport, discusses doing some seeding of areas using seeds from the Majura Field Firing Range, and mentions some other steps to improve poorer areas. It also talks about reseeding with non-intrusive exotic grasses in other areas. However, as readers will appreciate, we in grassland conservation have not made much progress in grassland restoration, and the haste with which this document has been put together demonstrates that it is makeshift at best.

The protocol mentions that in April 2001, the airport agreed to develop and implement a conservation management plan, which has yet to be done. FOG believes that government agencies and community groups should be active partners in this. Why, more than one year after the airport agreed, has the Commonwealth Government taken no action to ensure this plan was created and implemented?

It is interesting that the protocol mentions the area to be destroyed is only potential dragon habitat. This sounds like the Commonwealth Government following the lead of the developer. The airport had argued that no dragons were likely to exist. Eight have been found following a search by the biologists, and some experts have expressed concerns that others may have been missed.

FOG concerns

Frankly, FOG has been very disappointed by the airport's attitude and behaviour toward endangered species and communities. These recent events suggest that the airport has not met its own objective to conserve grassland and the dragon lizards. Other evidence supports this. We believe it cuts the grass too low for the habitat requirements of the dragon. It barely mentions the threatened community and species in its promotional material thus suppressing the education of the community about its presence. Community awareness is further suppressed by not allowing anyone on the site, unless directed to, citing safety reasons. We know of at least one individual who approached the airport to run environmental tours and was not allowed to do so. Our personal dealings with the airport convince us that it readily plays the – "whenever we want to do something at the airport those greenies say a species is threatened" card to avoid its responsibilities.



A Grassland Earless Dragon - its life is in our hands.

FOG is also very concerned about government behaviour. It seems inappropriate for the Minister for Transport to make environmental determinations, although this decision we believe was undertaken under the Airports ACT 1996. What advice did the Minister receive and from whom? If the airport was the source, it can hardly be considered unbiased and objective. Why did the Environment Minister concur despite informed submissions about significant impact on threatened species? Why were no explanations given about the conservation basis of the decision? Why were the views of experts, the recovery team, and community groups not sought, and when given, apparently ignored? Why was the ACT Government left out of the process for so long? Indeed, why did the ACT Government officially choose to stay out of the process for so long? Why did the Commonwealth-appointed Airport Environment Officer not raise the environmental concerns that were subsequently expressed by FOG, the Recovery Team and the ACT Government?

What can be salvaged?

- Community groups should be given the opportunity to comment on the airport conservation management plan, which should be a joint responsibility of Commonwealth and ACT governments and the airport. We would like to see the airport make a categorical commitment to no further development on the natural grasslands (given it now has what is has publicly stated it wants).
- The airport should commit itself (enthusiastically) to revegetating and caring for the natural grassland areas (especially to improve habitat), and fund grassland community and species monitoring and research. FOG has repeatedly asked the airport to promote the threatened community and species in appropriate airport displays and promotional material.
- There ought to be an effective ongoing body (with suitable community representation) to oversight ecological management of the natural grassland at the airport. The airport should also provide occasional tours to community groups such as FOG to illustrate its management.
- There is a responsibility for Environment Australia and Environment ACT to exercise more clout and to be more publicly accountable.
- As the Commonwealth Government is prepared to fund the destruction of threatened communities and species, it should look for ways to make amends. Can it boost research funding and acquire and/or fund rehabilitation of nearby sites that may lead to a more secure future for the dragons and the Sun Moth
- The Commonwealth Government needs to take threatened communities and species and transparency more seriously, and the ACT Government should be less willing to accommodate backroom deals.

What happens to the eight dragons?

FOG is seriously concerned that 'relocation' of the eight dragons is simply a loss to what was already a small population. Experts have believed for many sound reasons that these animals should not be taken from the wild. What will happen to them? Given the lack of consultation, haste of the process, and short lives (dragons live one year in the wild, and maybe a little longer in captivity), it appears that there are no actual plans to make the most of this opportunity for captive breeding or research purposes. We understand that the Recovery Team is preparing a research proposal to put to the airport, but it is unlikely that a captive breeding program is possible at this stage.

THE GREAT SALINITY DEBATE, PART III: SOIL ORGANIC MATTER, PAST LESSONS FOR FUTURE LEARNING

Christine Jones

Getting the basics right

In Parts I and II of this series, the issues of groundcover and its management were examined in a historical context. For Part III, the role of soil organic matter and the types of disturbance regimes required to enhance it, will also be placed in a historical perspective. It is important to understand where we've been in order to find a way forward.

The productivity and health of agricultural land depends on i) inherent landscape capability ii) long and short term seasonal effects iii) soil condition and iv) land management practices. The first two factors are beyond our control, the latter two are of fundamental significance for the future of rural Australia.

Have you noticed that we spend an inordinate amount of time and energy mapping landscapes and trying to predict the weather, all the while just "hoping" that soil health and land management skills will somehow find their own way? Land of even the highest productive potential can deteriorate rapidly under inappropriate management. Conversely, the health of degraded landscapes can improve markedly under regenerative management.

Processes such as dryland salinity, soil structural decline, nutrient decline, erosion, sedimentation and the eutrophication of waterways, all derive from inappropriate disturbance regimes which reduce the quality of perennial groundcover and, as a consequence, the levels of organic matter in and on the soil.

Intermittent disturbance regimes

In ecological terms, a "disturbance" is something which affects the growth or reproduction, or rearranges the order, of the components of an ecosystem. For example, mowing your lawn, spraying herbicide, using fertiliser or pulling out weeds are disturbances. Australian native grasslands cannot tolerate unremitting disturbance regimes, such as continuous grazing, or broadacre cultivation. Nor do they thrive when there is no disturbance at all. For maximum health and productivity, an intermittent disturbance regime is essential. Intermediate levels of disturbance also foster high levels of biodiversity, which give plant and animal communities the necessary resilience to cope with natural disturbances such as drought and fire.

Following the extinction of our megafauna thousands of years ago, the functioning of Australian landscapes became dependent on the interactions between the environment, aboriginal people and small native animals. The dietary requirements of native fauna such as dunnarts, planigales, potoroos, bandicoots, echidnas and bettongs included (depending on the species), grasshoppers, beetles, cockroaches, spiders, termites, ants, larvae, worms, small invertebrates, tubers, seeds, berries, herbs, roots, resin and fungi. The activities of these insectivorous/carnivorous/omnivorous animals were essential to maintaining the health of grassy woodland ecosystems, particularly soils (see Greg Martin's article, next issue).

Of particular importance to an understanding of soil health, is to recognise that at the time of European settlement, there were many thousands, indeed millions, of mouse-sized to rabbit-sized, nocturnal, ground foraging mammals, which turned the soil over while searching for a wide variety of foods including insects and fungi. These animals were not grazers. Aboriginal people also dug the soil in small patches to obtain Yam Daisy (*Microseris lanceolata*) and other tubers. Although the patch disturbances created by native animals and aboriginal people accounted for only a small percentage of the landscape in any one year, over longer time scales virtually all of the soil would have been turned over, providing an uneven surface and incorporating organic matter. Our environment was skilfully "managed" for sustainable production in keeping with the overriding influences of long and short term seasonal effects.

The loss of protective grassland habitat which accompanied the introduction of broadscale, unremitting grazing regimes, resulted in the rapid demise of ground foraging mammals. Their removal from the ecosystem, coupled with eradication programs for dingos (an essential predator) and grazers such as wallabies and wombats (considered to compete with livestock), created a void into which the rabbit population exploded. This voracious, rapidly breeding herbivore completely devastated what remained of native groundcover and the associated organic matter in many areas of southern Australia.

Over time, other grazers such as kangaroos (previously present in much lower numbers) and introduced predators such as cats and foxes (which occupied the niche of the displaced dingo), added further pressure to an ecosystem on its knees. In the absence of rejuvenating disturbance regimes, Australian soils, already reduced to a relatively inert, compacted state, suffered their final humiliation - broadacre cultivation. The organic matter content of most soils is now so low, and the previous levels so long forgotten, that the fundamental importance of organic matter to ecosystem function, including water balance, is rarely considered.

Soil organic matter - the missing link

When areas were first explored, or newly settled by Europeans, soils were variously described as mulched, peaty, soft, loose, friable and high in humus, even in relatively low rainfall areas. The spongy nature of the soil was frequently lamented. Horses stumbled in the soft conditions and sometimes broke their legs, drays were difficult to pull overland, and much of the rainfall sank straight into the soil to replenish waterways as basal flow, rather than immediately running off to refill the waterholes and creeks being over-utilised by stock.

However, these conditions changed rapidly. There were highly significant increases in sedimentation rates in lakes and lagoons at the time each area was first settled. During these periods of extremely rapid erosion, huge quantities of friable topsoil were lost. These events coincided with the removal of protective groundcover under the inappropriate grazing regimes used for domestic livestock. Prior to settlement, the groundcover was not heavily grazed over wide areas.

Somehow the details of these catastrophic events have become blurred by time. Perhaps the writings from the early settlement period should be compulsory reading? For example, in 1818, John Oxley described the grasslands of the treeless Liverpool Plains as being "of the richest description". In 1842, Leichhardt recorded the constituents of the soils as chiefly "clay and humus" and noted the obvious indications of many small native animals. Now the plains could best be described as "a mosaic of annual monocultures and

bare fallows on poorly structured soils, high in clay, low in organic matter and devoid of most living things". The richness of the vegetation, the diversity of the animal life and the high humus content of the soil are factors long since forgotten.

Many of the wells sunk in the Liverpool Plains in the mid 1800s contained brackish water. The saline watertables in those areas today have not come from somewhere else, they have simply risen through inappropriate groundcover management. They will continue to rise unless the basic principles of land management are addressed.

Although the Liverpool Plains are about to detach themselves from the rest of Australia and float away on their own saline sea, their problems are by no means unique. The only factors which differentiate them from other salinity-affected parts of the continent are soil type and the seasonality of rainfall, neither of which we can do anything about. However, we can change land management to increase the organic matter content, and hence the water holding capacity, of our soils. Humic materials have a far greater affinity for water than do clay colloids, which in turn have a greater affinity for water than coarse textured materials such as sand. There is no need to despair if you only have sand. You just need more humus!!

Today, most of our agricultural soils are compacted, hard-setting and lifeless. Many contain two percent or less organic carbon, much of which is the non-labile remnant of thousands of years of aboriginal burning, and as such is of no significance as a soil ameliorant. Yet time and again we hear that the organic matter content of soil is not as important as its "nutrient status" (which can apparently be corrected with the addition of fertiliser) and that soil water holding capacity is not as important as "high water use" (which can apparently be obtained by planting trees and introduced grasses). Our ecosystem is a little more complex than that. Were tonnes of fertiliser being applied prior to settlement? Was the landscape vegetated by high water use plants? No and No. So how can those factors restore the balance now?

Have we fallen into the trap of window-dressing a deteriorating landscape because we don't know what else to do? The addition of either fertilisers or high water use plants will do little to bring about the fundamental changes required. Nor will such simplistic solutions revitalise rural communities. **Our current problem is that rain does not properly infiltrate where it falls, nor is it properly held in soil.** On sloping land, the water moves across the soil surface, taking nutrients and fine soil particles with it, and becomes a watertable and sediment problem somewhere else. In flatter parts of the landscape, low levels of organic matter in soils result in far more water being lost to evaporation and deep drainage than is put to productive use.

In comparison to an equivalent area of trees, a healthy perennial grassland will have a greater distribution of roots at depth, higher levels of soil organic matter, higher levels of microbial biomass and greater soil water holding capacity. The reason for these facts not being widely known can only be that their importance has not been appreciated. Because humic materials are continually being generated by the decomposition of grass roots, grasslands regenerate soils far more quickly than do forests, especially if the grasses are pulse grazed (see Part I).

The emphasis to date in salinity research has been on de-watering soils rather than on controlling the movement of water in the landscape. Water is an extremely precious commodity and one which we need to use effectively to improve the productivity of our natural resource base. We lose production **and** we create a problem when water is not held where it falls.

Putting it all together

The Australian landscape is more resilient than we imagine, and finding a way forward may not be as hard as it seems. The two essential ingredients for healthy, porous, high water holding capacity soils are:

- as close as possible to **permanent soil cover** (plants plus associated litter) to provide protected habitat for soil biota, invertebrates and small vertebrates
- an intermittent disturbance regime to both **stimulate** biological activity and provide periods of **rest and recovery**.

Provided these criteria are met, the enterprise choices and the plant species used are secondary considerations, although as outlined in Parts I and II, there are many good reasons for choosing native over introduced, or a combination of the two.

With creative thinking, innovative landholders are finding ways to implement the basic principles of high levels of soil cover and intermittent disturbance regimes into their day to day activities. Some of these are summarised and compared to more conventional approaches in Table 1. There could be limitless combinations and variations on these themes. For example, pulse grazed native groundcover can form a productive base for a variety of cropping, horticultural and silvicultural enterprises. The adoption of these practices does not necessarily require all landholders to be graziers. In the United States, there are full-time businesses based on "renting" livestock for these purposes. Too hard? Take a tour through some salt affected land and think again!

Simplistic solutions

In Part I of this series the tendency for high water use plants to exacerbate dryland salinity by drawing up fresh water and bringing salt-laden water closer to the soil surface was noted. In addition to bringing salt closer to the surface, high water use plants can also over-dry soils. Rain simply runs off dry, poorly mulched soils, or enters deep cracks and passes through to the groundwater without properly re-wetting the topsoil. It is therefore important to recognise that we don't have to increase transpiration rates in order to reduce deep drainage. A better result can be achieved by increasing the water holding capacity of the soil. De-watering soils and restoring water balance are entirely different concepts, but appear to have become confused. Even more worrying is the notion that the apparently "incurable" nature of dryland salinity is justification to live with salt as best we can. However, if we simply try to live with the **symptoms** of an ecosystem out of balance, we will be de-watering saltier and saltier soils until even those options become untenable.

Conclusion

It is widely acknowledged that our vegetation, soils and water are seriously degraded and that this has happened extraordinarily quickly on a geological time scale. Our ecosystems are at the crossroads and the lights are red. Without the participation of rural communities, the regeneration of Australia's natural resource base will be impossible. But even participation is not enough. Simply planting and/or retaining native perennial plants will not reverse salinisation or any other land degradation process. Much more is required. New attitudes, new ways of looking at the land. New ways of looking at ourselves, and how we interact with the land. We need a deeper understanding of how Australian landscapes functioned prior to European settlement. What were the component parts? How did they fit together? How can we stimulate soil forming processes today?

We don't need any more strategic plans. For most of the landscape,

we can make fundamental change without drastically altering traditional enterprises. In some areas, more diversification would be of benefit, and in others more trees and shrubs would have enormous ecological advantages. But there will only be one "solution" to our water balance problems. That will be to support, encourage and reward the landholders who are devising flexible management options incorporating intermittent disturbance regimes to achieve healthy, diverse groundcover, and to increase the organic matter content in and on their soils.

Acknowledgments

I am deeply indebted to Greg Martin of Earth Sanctuaries Limited, for information on the soil building activities of ground foraging native fauna, and his exceptional insight into the role these animals, and their disturbance regimes, play in ecosystem function (see next issue); to Allan Savory, founder of the Center for Holistic Management, for his teachings on the crucial role of decision making processes in regenerative land management and his visionary approaches to the interactions between grazing animals, vegetation and soils; and to farmers Darryl Cluff, Colin Seis and Bruce Maynard, for their unconventional, courageous and highly successful ventures into the brave new world of integrating, in space and time, permanent groundcover, annual crops and livestock.

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Table 1. The extent to which land use addresses the fundamental requirements for a healthy balanced ecosystem.

OM = organic matter; WHC = water holding capacity; C3 grass = winter active e.g. common wheat grass [native], ryegrass [introduced]; C4 grass = summer active e.g. kangaroo grass [native], paspalum [introduced]. **Key**: - rarely; ☆ sometimes; ★ usually

Land Use	Protective soil cover	Intermittent disturbance	Increases soil OM	Increases soil WHC	Reduces run-off	Increases biodiversity	Chemical free	Summer water use	Winter water use
Conventional agricultural practices									
• Annual winter crop (cultivation)	-	-	-	-	-	-	-	-	★
• Annual summer crop (cultivation)	-	-	-	-	-	-	-	★	-
• Annual winter crop (zero till)	☆	-	☆	☆	☆	-	-	-	★
• Annual summer crop (zero till)	☆	-	☆	☆	☆	-	-	★	-
• Set stocked annual pasture	☆	-	☆	☆	☆	-	-	-	★
• Set stocked introduced C3 pasture	☆	-	☆	☆	☆	-	-	-	★
• Set stocked introduced C4 pasture	☆	-	☆	☆	☆	-	-	★	-
• Set stocked native C3/C4 pasture	☆	-	☆	☆	☆	☆	★	★	★
"Living with salt" options									
• Engineering works	-	-	-	-	-	-	★	-	-
• Saline aquaculture	-	-	-	-	-	-	☆	-	-
• Harvest salt	-	-	-	-	-	-	★	-	-
• Salt tolerant plants	☆	☆	☆	☆	☆	☆	☆	★	☆
Simplistic salinity "solutions"									
• Lucerne	-	★	-	-	-	-	-	★	☆
• Vine/shrub/tree monocultures without managed groundcover	-	-	-	-	-	-	-	★	★
Transitional agricultural practices									
• Vine/shrub/tree monocultures in set - stocked introduced C3 pasture base	☆	-	☆	☆	☆	☆	-	★	★
Regenerative agricultural practices									
• Pulse grazed native C3/C4 pasture	★	★	★	★	★	★	★	★	★
• Pulse grazed introd. C3/C4 pasture	★	★	★	★	★	★	☆	★	★
• Direct-drilled annual crops in pulse grazed native C4 pasture base	★	★	★	★	★	★	☆	★	★
• Woody polycultures in pulse grazed C3/C4 perennial pasture base	★	★	★	★	★	★	☆	★	★

GRASSY ECOSYSTEM CONSERVATION ON THE DARLING DOWNS IN QUEENSLAND

Alison Goodland

Darling Downs Biodiversity

The Darling Downs of southern Queensland contain a number of grassy ecosystems - all diminished greatly in extent due to 150 years of extensive fragmentation. Of greatest importance are the treeless open grasslands on alluvial plains, now reduced to approximately 1.25 percent (5000 hectares) of their former extent. Broad scale cultivation of these highly fertile soils has restricted this Queensland Bluegrass (*Dichanthium sericeum*) dominant vegetation community to remnants on a small number of private properties and number of stock routes across the Downs. It is now listed as an endangered regional ecosystem in Queensland.

These grassland remnants support plant species from both temperate and tropical environments, including a number of rare and threatened plant species such as the Australian Cornflower (*Stemmacantha australis*) and *Digitaria porrecta*, making it a unique and diverse ecosystem. The grasslands were habitat for a number of small mammals, birds and reptiles such as the Common Dunnart (*Sminthopsis murina*), Scrub Turkey (*Aspidites ramsayi*) and upon recent discovery, the thought to be extinct Grassland Earless Dragon (*Tympanocryptis pinguicolla*). With many species, the extensive fragmentation has made their presence questionable today.

The major threat to the Darling Downs grassland remnants is the change in their management. This change includes:

- lack of fire;
- vegetation destruction by road and utility construction and maintenance, resulting in habitat loss and weed invasion; and
- adjacent landholder impacts such as overgrazing and frequent slashing, resulting in loss of species diversity.

These threats have come about through a lack of understanding of the importance of grasslands which the World Wide Fund for Nature (WWF) aims to rectify. The aim is to increase consciousness of the importance of grasslands and the threats to the diversity of the region.

WWF Darling Downs Grassy Ecosystem Projects

Funded through the Natural Heritage Trust's Bushcare program, WWF has received two grants to further grassland conservation in the Darling Downs. The first project focussed on roadside remnant grassland communities and stockroutes, while the second was extended to include public land such as cemeteries and camping and water reserves, as well as private leasehold land. The second was also expanded to include all endangered grassy ecosystems on the Darling Downs, as well as to survey for sites of rare and threatened flora and fauna.

The first project, the *Conservation of Endangered Darling Downs Remnant Native Grasslands*, ended in November 2000. WWF worked with stakeholders such as the Department of Main Roads, Queensland Parks and Wildlife Service, Department of Natural Resources, Queensland Rail, local councils, utilities and the general communities to address the lack of awareness in the community of the importance of grasslands. This was achieved by increasing the knowledge, training and coordination of associated agencies, roadside workers and the general community through consultation, extension and involvement in grassland conservation.

The project involved data collection and mapping of known roadside remnant grassland locations and sites of rare and threatened species. Significant sites were proposed for signposting and a Memorandum of Understanding (MOU) was developed between the Department of Main Roads, Environmental Protection Agency and the Queensland Parks and Wildlife Service for the long term conservation of four significant grassland stock routes. The MOU covers 1200 hectares of remnant grasslands and open poplar box woodlands, protecting almost a quarter of remnant grasslands in the region.

A report, *Grassy Ecosystem Significant Sites of the Darling Downs, Queensland: locations and management recommendations*, was produced and is currently used by the Department of Main Roads in its strategic planning as well as the basis for the MOU. The Environment Protection Agency is using the report to assist local government environmental planning as well as maintaining the GIS database.

A grassland management on roadsides training package was developed for the Department of Main Roads and was delivered to Department of Main Roads and local council staff.

The second project's, *Conservation of Endangered Darling Downs Native Grassy Ecosystem,* ultimate objective is to protect significant grassy ecosystem sites through covenant agreements such as Nature Refuge Agreements. Other initiatives, including Land for Wildlife and the Greening Australia's devolved grants program, will be used and promoted allowing a range of options for landholders. Land managers will be assisted in the development and implementation of management plans and on-ground activities. Information kits, field days and workshops on species identification and ecosystem monitoring will contribute to community knowledge and long-term awareness.

Alison is the Darling Downs Project Officer, World Wide Fund for Nature Australia: P.O. Box 1306, TOOWOOMBA, QLD 4350, Phone (07) 4637 9468, Fax: (07) 4638 2891, wwfnature@hypermax.net.au).

A Grassland Pea

The Sydney Morning Herald

Rugged cattle station enthrones the green new kings of grass castles

James Woodford
Environment Writer

At Carnarvon station in central Queensland, ringers are to be replaced by rangers and cattle all but exiled by conservation.

The trees and wildlife of the 60,000-hectare property in the middle of the State's land-clearing belt, south of Emerald, will be protected from the bulldozers after the Australian Bush Heritage Fund announced its 13th and most dramatic acquisition.

The buy adds weight to the fund's mission for becoming a force in Australian conservation.

For the first time, the fund has employed rangers, which will increase its management costs, up to $150,000 a year for Carnarvon alone. The plan is to host visitors on the property.

Conservationists see private land as crucial for the protection of biodiversity and these days several individuals and organisations are tackling the problem.

Earth Sanctuaries is removing feral animals and building fences to protect endangered species, while Wild Australia has bought the 300,000-hectare Mornington cattle station on the Fitzroy River in the Kimberley.

The chief executive officer of the Australian Bush Heritage Fund, Mr Doug Humann, who declined to reveal the sale price, said the combined area of land managed by the group before the latest buy was 2,600 hectares.

"It's a huge increase in scale for us," he said. "People are supporting us because of the opportunity to preserve areas and because they are frustrated with what they see in the management of the publicly owned national park estate. We are fully focused on conservation."

'It's a huge increase in scale for us. People are supporting us because of the opportunity to preserve areas and because they are frustrated with what they see in the management of the publicly owned national park estate. We are fully focused on conservation.'

DOUG HUMANN
Australian Bush Heritage Fund

The fund is considering another big acquisition in inland Australia. The western division of NSW and Queensland are priorities because of the scale of land clearing in both States.

Mr Humann said the Federal Government donated $2 for every dollar spent by the Australian Bush Heritage Fund on its Carnarvon purchase. He said every $30 donation enabled his organisation to buy another hectare of threatened woodland.

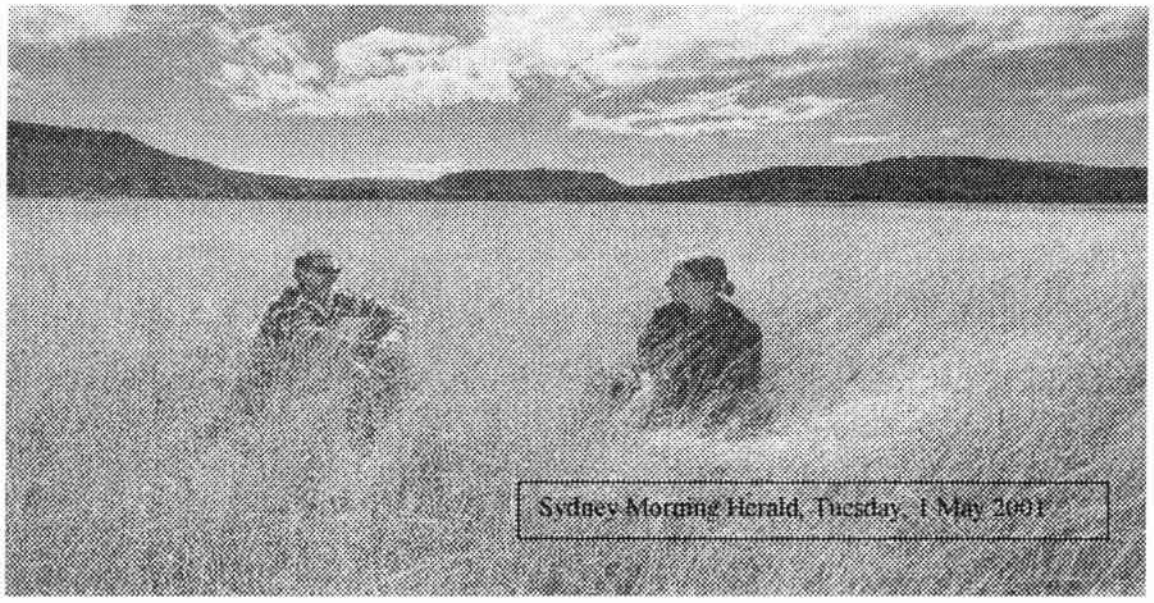
The station, which runs about 5,000 head of cattle, will be known as Carnarvon Reserve and will be managed for conservation instead of beef production. A small number of cattle will, however, remain because of fears that removing stock too suddenly could lead to problems with vegetation diversity.

While much of the region has been transformed by agriculture, the station has remained remarkably unspoilt – up to 90 per cent of its ecosystems are regarded as reasonably intact.

The property, next to Carnarvon National Park, includes huge areas of grassy woodlands, eucalypt forests and vine scrubs. The landscape is dominated by deep river valleys and sandstone escarpments.

The Australian Conservation Foundation's campaigns director, Mr John Connor, said he welcomed "this new stream of conservation".

"It's part of a new wave of looking after the land," he said.



Sydney Morning Herald 4 April 2001

Neglected necropolis reveals a natural treasure

James Woodford
Environment Writer

Danie Ondinea loves benign neglect and procrastination by Christians – it has saved the last known patch of the grasslands which once sprawled between Sydney and Parramatta.

At the back of Camperdown cemetery is an area, 60 metres by 30 metres, of the original vegetation that Watkin Tench in 1791 called the "Kangaroo Ground". This furthest point from St Stephen's Church – a genuine lost world where all signs of the city are blocked out by a sandstone wall and dense vegetation – is also officially, a "no-mow zone".

According to Ms Ondinea, author, naturalist and member of the Marrickville Heritage Society, native grasses are sensitive to mowing as their "growing point" is much further off the ground than introduced turfs.

"It's a matter of the community being able to accept this look, which is a wilder country cemetery look," she said.

The significance of the patch was only realised in the mid-1990s and since then botanists have been pushing for the site to be protected.

Trustee with the Camperdown Cemetery Trust, Mr John Scott, said he was committed to seeing the grassland preserved and, if possible, its condition improved.

Interestingly, the presence of the grasses may actually be playing an important part in keeping the gravestones stable, Ms Ondinea said.

More than a dozen species of grasses, ferns, lilies and twiners survive around some of Sydney's most ancient headstones.

"In a way, benign neglect has been the absolute saviour of this patch," Ms Ondinea said. The most dominant of the grasses in the remnant is kangaroo grass. Surviving with the grasses are a suite of original invertebrates and reptiles – the caterpillars of at least six species of native butterflies may use the kangaroo grass as habitat.

But until now the site has never been managed for conservation, and in fact there was nearly a disaster a few months ago when a well-meaning employee of the trust decided it needed mowing.

Ms Ondinea is hoping to establish a local group to help regenerate the grassland and to encourage nearby residents to grow native grasses in their own backyards.

"Once people see this grass they fall in love with it," she said.

Benign neglect at Camperdown Cemetery proved to be a godsend to naturalists anxious to preserve the wealth of rare native grasses hidden behind a sandstone wall. Photo: Rick Stevens

NAARILLA'S UPDATES

Naarilla Hirsch

Newsletters received

Grass Notes (Native Grass Resources Group) has an article on the effects of fire on some native plants and communities, based on two members' experience with experimental burns over ten years.

The *FloraBank Newsletter* describes the next (and last) stage of the FloraBank project as maintaining the FloraBank presence until October 2001, turning the guidelines into training modules that can be used more widely by trainers who can help people make the connection to field activities, packaging of the web site, and the FloraBank final report.

Life Lines (Community Biodiversity Network) mentions the launch of phase I of a new search engine specific to Australian weeds. It's located on the National Weeds Strategy (Weeds Australia) web site http://www.weeds.org,au\. The Australian Agriculture and Resources website, www.library.usyd.edu.au/subjects/agriculture/agres.html, provides links to a wide range of relevant to government decision making for natural resources, the environment and agriculture. The National Land and Water Resources Audit has recently published the *Australian Water Resources Assessment 2000*, an audit of Australia's water resources that considers all water uses, including the environment, and the *Australian Dryland Salinity Assessment 2000*, an audit which defines the distribution and impacts of dryland salinity across Australia. Both these reports are available free from the National Land and Water Resources Audit on 02 6257 9516.

Stipa Newsletter reports on a pilot project to harvest native grasses in Victoria, with most of the seed being used by Parks Victoria for revegetation. The article also reports on a project using direct seeding with various species of native grasses to work out the best methods of establishing native grass, and on an idea on how Serrated Tussock might be replaced with Kangaroo Grass.

Don't forget that you can contact Margaret if you want to have a look at any of the newsletters discussed in this column.

Environmental law

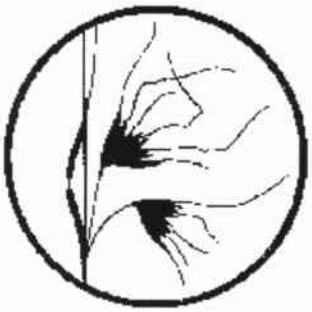
The first fact sheet is *Environmental and Planning Law in the ACT*. It gives a brief overview of our legal system. The ACT's main environmental and planning laws are:

- Australian Capital Territory (Planning and Land Management) Act 1988 (Commonwealth)
- Land (Planning and Environment) Act 1991 (ACT)
- Environment Protection Act 1997 (ACT)
- Nature Conservation Act 1980 (ACT)
- Water Resources Act 1998

Where there is a conflict between Commonwealth and State/Territory laws, the Commonwealth law prevails. Environment ACT has produced a series of fact sheets on the Environment Protection and Nature Conservation Acts, available from the Environment Information Centre on 02 6207 9777, website www.act.gov.a-u/environ. The PALM Shopfront has a series of pamphlets on the Land (Planning and Environment) Act - phone 02-6207 1923, website www.palm.act.gov.au. Websites for legislation and cases are www.austlii.edu.au and www.act.gov.au.

FloraBank

FloraBank guidelines 5 and 6 are *Seed collection from woody plants for local revegetation* and *Native seed collection methods*. The first describes "provenance" as a term used for seed collected from a natural population. Provenance can be used to describe patterns of genetic variation in a species over its geographic range, patterns



that are often closely associated with the ecological conditions in which the species has evolved. When a number of provenances of a species are planted out at the same site, you usually find differences in survival, growth and possibly other characteristics between provenances. A "local provenance" boundary can be set by moving further away and observing the plant and planting site characteristics. At the point you no longer feel comfortable that the characteristics of the plants you are collecting from, or the area in which they are located, sufficiently match those of the planting location or its local vegetation, a local provenance boundary can be set for seed collection.

Local collection for revegetation projects has many benefits. Local plants are naturally adapted to local conditions. Using local plants promotes genetic and ecological sustainability of local vegetation and thus enhances biodiversity. The use of local plant material is vital to the rehabilitation of important conservation areas or where there is likely to be interaction with local wildlife.

When collecting seed, look for local plants that are in healthy and viable natural populations and are large enough to provide sufficient seed by sustainable and responsible collection methods. Correct species identification is vital, so be aware of the natural variability in appearance of the target species. As closely spaced neighbouring plants are likely to be closely related, collect seed only from plants separated from one another by a distance of at least twice the plant height. Isolated plants are less likely to breed with other unrelated plants, so avoid collecting from reproductively isolated plants, even if they carry heavy seed crops. It is also important in revegetation work to match the environment conditions at the collection site to those of the planting site. When collecting seed, collect no more than twenty percent of the seed crop or fruit on any individual plant. Don't forget to obtain permission from landowners and local authorities, and according to State legislation, get permits for collecting on public land.

Guideline 6 also describes useful equipment for different methods of collecting seed. Seed production areas and seed orchards are an organisations of good seed for planting programs. Further information is available from guideline 7 *Seed production areas for woody native plants*. For a copy of this guideline, contact the FloraBank coordinator on 02 6281 8585 or email greenaus@ozemail.com.au

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Supporting native grassy ecosystems
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FRIENDS OF GRASSLANDS NEWSLETTER

You have read this far, so we must have kept your interest. If you are not a member of Friends of Grasslands why not subscribe to the newsletter? It comes out six times a year and contains a lot of information on native grassland issues.

You can get the newsletter by joining Friends of Grasslands. 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 group, or actively interested in grassland 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, plant identification, 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 Geoff Robertson. Contact details are given in the box above.

We look forward to hearing from you.

Friends of Grasslands Inc
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