Session 6: Identifying and Conserving Quality Grassy Vegetation

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Introduction

Friends of Grasslands (FOG) has been in existence for six years. It grew out of recognition that both the extent and quality of temperate native grasslands have been severely depleted. Grassy woodlands have experienced similar treatment and depletion. Clearing and modification of both communities continue at a rate greater than their conservation or restoration, so the issues are urgent. At the same time a great deal of progress has been made. FOG's history is part of a broader Australian experience. This includes a sharp learning curve for all stakeholders, dedication, new initiatives, and a sense of progress in slowing the rapid decline of grassy ecosystems.

In designing this workshop we decided it was time to take stock and:

- Refocus on the basic issues of grassy ecosystem conservation
- Review what progress has been made, and
- Consider where we should go from here.

There are three themes we consider ought to be addressed: the meaning of off-reserve conservation, is off-reserve conservation being achieved, and the need to keep messages about off-reserve conservation simple and non-confronting.

Some years ago, NSW National Parks and Wildlife Service (NPWS) recognised that it would be impossible to build a network of reserves for grassy ecosystems. Therefore conservation would take place outside reserves - *off-reserve*. The implication is that conservation will not be solely in the hands of government agencies but will depend on landowners and the community working in partnership with government and scientists. Grassy conservationists have been working on this assumption for some time now. The questions in our minds are: Have we kept to or strayed from the original concept? What mechanisms and tools have evolved to assist in off-reserve conservation? Have we progressed? How should we proceed from here?

In the ACT there has been tremendous progress, although not without some political sword crossing and compromise. In NSW there has been some political angst. However we have seen a number of important initiatives coming to fruition. Public land trustees and the community are recognising grassy sites on public lands and the need to preserve their conservation values. On private land there has been an encouraging response to a number of initiatives resulting in landowners committing themselves to conserve grassy ecosystems. What has happened in this region is mirrored in other regions and we welcome speakers and participants from elsewhere to share their views and experience with us.

While grassy ecosystem conservation is a complex issue, information about the identification and management of quality grassy areas needs to remain simple. There are still a lot of landowners and land managers to be won over. Our experience has been that all Australians share a love of Australia and particularly a love of its vegetation and fauna. When a non-threatening message about conservation is extended to landowners and managers, they are often very responsive. There are also positive government financial incentives, satisfaction in building more pleasant rural surroundings, and possibilities of fostering eco-tourism. The conservation of grassy ecosystems is one area in which rural and regional Australia has taken the initiative and is leading the way in achieving worthwhile national goals.

In this presentation we want to focus on:

- What are grassy ecosystems and importance of diversity
- Demise of grassy ecosystems and need for off-reserve conservation
- Assessment and management of grassy ecosystem sites
- Skills required for assessment and management
- What progress has been made, and

- Where to from here?

What are grassy ecosystems?

Grasslands and grassy woodlands welcomed earlier settlers in this area and were the most attractive areas on which to graze animals, settle and build towns. Even so, many of us cannot accept the true beauty of this region. There is still a widespread view that grasslands are unnatural in this area and that this can be rectified by planting introduced or native forest trees. Hopefully that view is changing. Many people from this area, including FOG members, can think of nothing better than the open landscapes of the Monaro. Before European settlement, the Nrarigo people lived in this area, and to the north the Ngunnawal and Wolgal peoples. From what we understand, they likewise had a preference for the open grassy landscapes and kept them that way by using fire. Unfortunately time prevents us from going into the history of Aboriginal occupation and European settlement but we commend these areas of study as being of great assistance in understanding the natural history of this region and underscoring our understanding of appropriate management practices.

When we talk of grasslands and grassy woodlands we are talking of native temperate grassy ecosystems. So we need to define our terms. By native ecosystems we are referring to remnants of native vegetation that have largely retained their structure and composition from before European settlement. By grasslands we are referring to vegetation communities which are dominated by native grasses and associated wildflowers (loosely referred to as forbs). A grassland can have up to 10 per cent tree cover. A grassy woodland has similar vegetation with a higher tree cover – between 10 and 30 per cent. Temperate grassy ecosystems in the Monaro lie between the Southern Alps and coastal escarpment. They are part of the rich mosaic which comprises the vegetation of this region and includes grasslands, woodlands, forests, heath and shrubland.

Grassy ecosystems are very diverse. In a grassy ecosystem, there are usually one or two grass species that dominate, the dominant species differing between sites according to the physical environment, management history and seed transport. In addition to these dominants there is often a wider variety of minor grasses, perhaps another 10, 20 or more species. Similarly in grassy woodlands the overstorey is dominated by one or more tree species, while the understorey is again dominated by one or more grasses. Between the grasses an even wider variety of other herbs can be found. The suite of other herbs varies widely from site to site, again according to the prevailing conditions of environment, history and seed transport. Both the number of plant species (great or small) and which species are present (native or exotic) at any site, reflect the combination of environmental and management conditions which have acted at that site and the transport of seed to that site. Likewise fauna species (birds, mammals, reptiles, frogs, insects and other invertebrates) vary greatly from place to place – this again indicates that grassy ecosystems themselves very diverse.

Let us quote some statistics. A well-known grassland species field guide, *Grassland Flora* lists:
- 21 grasses and 10 rushes and sedges
- 18 lilies and 15 orchids
- 83 other forbs
- 12 shrubs and 19 trees for a
- Total of 178 grassland species

However *Grassland Flora* does not contain a complete list and in many cases it only lists the genus (ie a listing which may include many species). Over 700 native vascular plant species have been recorded within the grasslands of south east Australia. In addition, some species have more than one subspecies or form. For example, there are at least three forms of the Common Everlasting Daisy (*Chrysocephalum apiculatum).* Given that a very good grassland site may contain from 40 to 120 native grassland species, no site will contain anything like the full range of species. These two facts indicate that there is both much diversity within sites and between sites.

Demise of grassy ecosystems

Grassy ecosystems have fared worse than other vegetation communities. For example, it has been estimated that less than half of one per cent of native temperate grasslands in existence at the time of European settlement still exist, while only about seven per cent of grassy woodlands remain. This can be seen when one travels through the region: grassy ecosystems in near original condition are few and far between. Two important qualifications should be made here. Arriving at these figures, remnant grassy patches on private land may have been underestimated. One of the authors of this paper believes that the potential for increasing these percentages is possible as we discover more about what exists on private land. Second, because of a variety of environmental and historical influences a lower proportion of the original vegetation in the Monaro region and the ACT has been disturbed.

There have been irreversible changes but perhaps there are lessons to be learnt. The first change is the demise of Aboriginal people. If we accept that Aboriginal people were active land managers, largely through the use of fire, this suggests that managing remnant vegetation requires active and not passive management. A better understanding of past Aboriginal habitation patterns and burning practices, might provide valuable insight into appropriate ecological management. Consider that there may have been 500 Nrarigo people, consisting of groups of 10 to 20 people. Where would they have been at any one time, how much did they move around, what were their fire practices, and what vegetation communities did they burn? At a different level, Aboriginal people were harvesters of some plants – how were they able to dig up great quantities of Yam Daisies when these are not plentiful today? We do not believe that we can understand either the broad parameters or subtlety of Aboriginal management, but we may be able to get some important insight. There is increasing literature on Aboriginal people in this area and it is commended for further study. Study of the impact of fire (and other post-European settlement vegetation-reduction agents – soil scraping, mowing and grazing) as a management tool will also be valuable.

Many large and small grassy fauna species have been eliminated. The Brolga, Emus, Australian Bustard and the White-footed Rabbit Rat are among many species that have become extinct in the area, and accounts by early explorers and settlers suggest that these and other species were once plentiful. Is it possible to reintroduce them? Perhaps more importantly, what function did they perform. They may have performed some simple but important functions such as scratching the soil. What has been the impact of the reduction in numbers of other fauna species? Study of native animals and their behaviour may give us some important clues to grassy ecosystem management.

Very alarming in more recent times has been the decline of woodland birds. Amongst those known in this area, and thought to be on the decline, are Crested Shrike-tit, Brown Treecreeper, Hooded Robin, Restless Flycatcher, and Diamond Firetail. There is much we need to discover about the link between vegetation, insects, and birds in grassy woodlands. Some conservationists have speculated about whether native gardeners who attempt to attract birds to their gardens by using forest shrubs may unwittingly contribute to the demise of the woodland species. Professional and amateur bird watchers are most eager to identify areas where woodland birds may be, and many community groups and individuals are playing an important part in this work.

Several grassland specialist reptiles, the Grassland Earless Dragon, Striped Legless Lizard and Pink-tailed Worm Lizard are receiving increasing research attention and several reserves have been created for their preservation. Management of these species includes avoiding structures such as fences, which may act as perches for raptors. Again community groups and individuals can play an important part in surveys for these species and in disseminating information about them.

Several grassy ecosystem insects have received attention. Two in particular have gained some conservation recognition (Golden Sun Moth and Key's Matchstick grasshopper) and work is increasingly under way to identify grassy sites containing them and to study their behaviour. FOG, on recent field trips, identified two additional sites for Keys Matchstick. The two insects

are only the tip of the iceberg as far as understanding the role of insects in grassy ecosystems is concerned.

Some grassland plant species have become extinct and many are threatened or seriously declining. There is an important focus in grassy ecosystem conservation on the distribution and favoured niches of threatened, uncommon and declining plants. Studying these plants and their habitat is not only important to their conservation but also to broader management issues. In recent years censuses of plants in grassy sites, using the 'Rapid Assessment Method' developed by Rainer Rehwinkel (NPWS) and other methods, are greatly adding to our knowledge of these plants. Data for over 800 grassy sites is now held on the NPWS Southern Directorate Grassy Ecosystems Database, which should prove to be a valuable research tool as it becomes more widely used.

Urban and rural settlement is a continuing threat to grassy ecosystems. In the ACT and region there have been many fora (including FOG workshops) and much public debate on striking an appropriate balance between conservation and other land use. While it may be possible to harmonise urban development and conservation, urban dwellers have little grassy ecosystem consciousness.

Introduced domestic livestock, rabbits, pigs, foxes, cats etc have also changed grassy ecosystems. There have been many discussions about the synergies between native pastures (and grassy ecosystems) and grazing. This was the main topic for a FOG workshop in 1999. Regarding feral foxes, dogs, cats, rabbits, pigs, etc, I think most informed Australians would like to see their elimination from the rural scene because of their destructive impact on fauna and flora.

Introduction of new plants and weeds has had major environmental impacts and the removal of noxious weeds is high on most agendas, although there is complacency at all levels from individual land managers to governments.

Identifying and assessing grassy remnants

Grassy ecosystem conservation is increasingly focused on identifying grassy remnants, evaluating them, and developing and implementing management plans. One way of assessing a site is to use the Rapid Assessment Method, referred to earlier. This identifies plant species and other information for a site. Such site data can be used to build up a regional picture of vegetation structure, composition and condition. Other methods can also be used at a regional level, including topographic maps, vegetation maps, aerial photography, threatened species maps etc. Obviously it is important to have the big (regional) picture and the micro (site) picture and to examine the links (corridors) between sites. Survival of small remnants is highly unlikely unless there is connectivity with other similar sites.

The Rapid Assessment Method involves a free transect through a site to cover each of the different micro-sites (hilltop, hill slope, aspect, soil type, watercourse, rocky outcrops) and to identify each species present. A frequency code is recorded for each plant species. Qualifications required to undertake such surveys are an acquaintance with the method and an ability to identify plants (preferably throughout the year). However survey teams comprised of people with varying plant identification skills can be used – this increases the number of eyes and provides training in the survey method. Specimens can be taken from unknown plants for later identification – care is exercised not to take material from threatened species. Some common species, which are difficult to identify to species level, are not fussed over unduly (wallaby grasses, poa and snow grasses, and bluebells for instance). Of course some species may not be seen on a single occasion but sites can be followed up over time. Data from Rainer's surveys have been placed on the Grassy Ecosystems Database referred to, earlier. The database includes sites surveyed by Nicki Taws, Alison Rowell, Isobel Crawford, John Bensen, David Eddy and Sandie Jones.

Data held on the database enable the following answers to questions to be extracted:

- At how many sites is a particular species present?
- For a particular species, what is its geographical distribution or other common site features?

- When a species is recorded, how abundant is it? Is it rare at some sites and abundant at others, or always rare?
- For any site what are the numbers and frequency of native species?
- For any site, what is the native/exotic mix? Are there particular weed problems?
- Where are the sites and are they clustered?
- Who manages the sites?
- What conservation action is applied to or recommended for a site?
- At which sites is one likely to find particular fauna or flora species? For example, the database has been used to identify sites likely to support the Golden Sun Moth and the Tarengo Leek Orchid

Work is being undertaken to come up with rating scales for uncommon species and for sites. In turn this should provide a number of tools to identify quality grassy sites, rate them on a level of significance, and establish priorities for their management.

More informal surveys and informed casual observation can often add vastly to our knowledge. It is not difficult to acquire a rudimentary knowledge of grassy sites and their inhabitants. Often the initial recognition of a good grassy site is by astute amateurs.

Management

Management across catchments or regions or for a particular site requires

- Good knowledge of grassy ecosystems - in the past we have had simplistic information and a poor knowledge base which can lead to poor outcomes;
- A clear set of objectives - it is not possible to do everything;
- A clear strategy to make processes effective and not overly time consuming;
- Commitment to implementation – someone who will take responsibility is absolutely essential;
- Evaluation – testing results and keeping an open mind;
- Research – we could say a great deal about this; and
- A formal planning and recording process – essential for self discipline and passing information to others

We need to be clear about what are we managing for, eg:

- Maintaining or rebuilding structure and integrity,
- Managing biodiversity and/or particular species,
- Removal or control of threats,
- Maintaining a particular quantum of biomass, and/or
- Other values eg production, aesthetics, crowd control, and fire management.

Developing community skill

Individuals and members of community groups, without formal ecological or related scientific training and experience, will find themselves either directly responsible for, or participating in, grassy ecosystem conservation. We are finding a variety of models emerging for managing grassy remnants. Most conservation may take place off-reserve and therefore not be under the formal control of government conservation agencies. However it is important that professional conservationists are involved in these sites. On the other hand where grassy remnants are placed in reserves, more and more conservation conscious individuals and groups are asked to participate on management boards and in on-ground work. Therefore new roles and responsibilities for professionally trained ecologists, rangers, landowners, land managers, individuals and groups are emerging.

We in FOG believe that individual and community participation in conservation is essential. Those involved should acquire a good understanding of conservation and the skills and judgement to be effective. Organisations like FOG are designed to fill this learning niche. It tries to balance learning and direct experience. It has access to the best grassy ecosystem ecologists. Its members include a wide variety of people and experience. It consists of professional ecologists, scientists, other qualified professionals, landowners and managers,

conservationists, various government agencies and private companies. It produces a highly informative newsletter every two months and has a varied program to enable people to see at first hand good grassland sites and examples of good management practice. We believe that conservation tasks are personally very rewarding because they put us in touch with nature and unlock many of nature's secrets

What has been achieved?

Legislatively, there have been great advances. In the ACT for example, Natural Temperate Grassland and Yellow Box/Red Gum Grassy Woodlands have been recognised as threatened communities and a number of threatened plant, bird, insect and reptile species, which are grassland or grassy woodland specialists, have been recognised. Action Plans have been developed for each threatened community and species, and are being actively implemented; the Government continues to announce areas that will be reserved and/or conserved to save communities and species. Mechanisms are in place to increase the listing of communities and species and there is active discussion about what should be added. There is also the possibility of adding 'threatening processes' and developing action plans for them. In NSW there has been recognition of grassy ecosystem communities and associated threatened species. The Commonwealth Government is likewise recognising grassy communities and related species as threatened.

The Commonwealth Government has established National Trust Heritage Funding under which a number of conservation projects are facilitated. Two of particular interest are the National Threatened Species Network Community Grants program and the Grassy Ecosystems Community Grants program. These are administered by WWF. Each of the three governments has an active policy unit on grassy issues, which look at both management of grassy ecosystems both inside and outside reserves. Both the ACT and NSW governments play a very active public education role in grassy ecosystems.

ACT and NSW Governments directly manage grassy ecosystem reserves. In the ACT, grassy remnant management is taken very seriously with the development of management plans based, increasingly, on sound research. In NSW public land management is developing in a similar direction.

Regarding off-reserve conservation, both governments play an active role in developing management agreements with landholders who need to manage grassy remnants on land they use for other purposes. Environment ACT has agreements with Commonwealth government agencies, private companies and non-profit organisations and is developing a database for ACT grassy sites. The NPWS Southern Directorate has undertaken an extensive survey of grassy ecosystem sites and recorded these data on its Southern Directorate Grassy Ecosystems Database. It is also working with Rural Land Protection Boards and various State and local government agencies to establish a network of good quality grassy sites throughout the south east region. This approach is being copied in other parts of the State.

ACT and NSW Governments with assistance from WWF have also conducted courses, workshops, field days, fora and production of materials including *Grassland Flora.*

University research and data accumulating are very important and much research is taking place around threatened communities and particular species. This is greatly increasing our knowledge. For its project on the Monaro Golden Daisy at Radio Hill, FOG was able to acquire some funding for research into the genetic diversity of that species, which will provide information useful to recovery actions for this species.

Grassland networks have been established and many are flourishing. These networks consist of academics, government employees, non-profit conservation organisation employees and grassy enthusiasts. One development has been the establishment of Grassecol, an on-line discussion database, which allows anyone to raise items of interest or to ask questions. If you have an e-mail connection this is an excellent source on grassy issues. There are several grassy groups and each puts out a newsletter. There are constant workshops on grassland and related issues.

Underscoring good government policy, particularly in this region, is active public education and lobbying by community groups (eg Landcare, Parkcare, farmer and conservation groups). For example, all members of the ACT Legislative Assembly are strongly aware of grassy ecosystem issues.

We in FOG would also like to mention the important initiatives that have been made by WWF. Good examples are its support of several grassland project officers; David Eddy on the Monaro, Ann Prescott and Millie Nichols in South Australia, Alison Goodland on the Darling Downs and Greg Keith in the Queensland Central Highlands. WWF has shown much foresight and have established the groundwork for much grassy ecosystem conservation.

FOG's experience

FOG's history could be broken up into a number of overlapping phases: coming to terms with the dimensions of the problem, developing a response or set of workable strategies, and implementing and refining those strategies. Today FOG is focused on:

- Maintaining a strong organisation. FOG has clearly established its objectives, has incorporated, has a strong committee (which meets monthly), and networks closely with other organisations.
- Providing services to members which include:
  - a high quality newsletter (newsy, informative and covers what members are doing),
  - a varied program that attempts to bridge the interest of each member at some point,
  - advice including visits to sites, and
  - support for members' causes.
- Making a strong commitment to ACT grasslands and grassy woodlands. This involves:
  - developing a strong understanding of the network of ACT grassy ecosystems and the legislative, political, government and community support that underlies them,
  - developing strong networks with stakeholders and other conservation groups,
  - supporting existing groups to develop a grassy focus and in some cases supporting the establishment of new grassy groups, and
  - lobbying, when necessary, to preserve threatened grassy sites.
- Making a similar commitment in the adjoining region of NSW. This involves
  - developing close links with state government agencies, local government and Rural Land Protection Boards,
  - visits to numerous grassy sites in the area - FOG has visited sites in the Adaminaby, Bombala, Cooma, Cowra, Goulburn, Queanbeyan, Snowy Mountains and Yass areas,
  - establishing a major project within the area – at Radio Hill on part of the old Cooma Common,
  - assisting in formal surveys along the Williamsdale to Cooma Rail Easement, and in surveys of Bombala and Cooma Travelling Stock Reserves, and
  - holding a previous workshop in Queanbeyan and this one in Cooma.
- Building the hands-on skills of members in identifying plants and other species, surveying and assessing sites, and managing sites. This includes practical experience in dealing with weed problems.
- Public education on grassy issues.
- Addressing national grassy issues:
  - in its newsletter, FOG attempts to keep abreast of grassy issues across Australia,
  - FOG members are active in attempts to build a national network for grassy ecosystem conservation such as participating in Grassy Ecosystem Community Grants, Grassecol and attending grassy workshops organised elsewhere, and
  - FOG is increasingly attempting to visit sites in other states and regions.

Where to from here?

Off-reserve conservation means that land managers and conservationists need to work in partnership. This has required grassy ecologists to be pragmatic and rural-oriented while at the same time respecting good science. This has got grassy ecosystem conservation off to a good start. It now appears to be finding its feet. Therefore the first direction for the future is to look at what we have achieved, what has worked, what hasn't, and refine and consolidate our efforts.

We need to explore some myths about conservation. One is the Australian preoccupation with tree planting for conservation needs. Trees are seen to cure all Australian ills, including global warming and salinity. Active management of remnants is important but, given the opportunity, many remnants have tremendous recuperative powers. Therefore we need to understand this recuperative process much better. This means allowing time for regeneration. If planting is considered necessary we should replace what was there before, using local seed stock. This is not a new message for most of you but it is for many Australians who want quick fixes. Much discussion is emerging on the role of native vegetation in addressing salinity. Native vegetation means grasslands and grassy woodlands where these are the original native vegetation – it does not mean senseless tree planting.

The biggest challenge for grassy ecologists is to address how to restore grassy ecosystems in areas where they have largely disappeared, or how to re-establish particular species (eg Monaro Golden Daisy). However, we need to be cautious. Selecting plants for reintroduction because of particular characteristics could harm the genetic diversity within those species. Re-introductions need to consider genetic diversity and compatibility; this in turn needs to be based upon good genetic research.

We consider that it is time to establish a national grassy ecosystem umbrella group to which regional groups could affiliate.

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