

## CHAPTER 2

### *ISSUES FOR THE CONSERVATION OF TEMPERATE NATIVE GRASSLANDS*

The following issues are of relevance to the successful conservation of native grassland communities throughout lowland south-eastern Australia.

#### Recognition

The almost inevitable response to native grassland conservation is that they have an 'image problem', perhaps best summarised by the reaction of one former Victorian Conservation Minister to the issue, "... *heaven knows we've got plenty of grass!*"<sup>3</sup>

Many programs and projects have included specific actions to raise the overall awareness of native grasslands within the general public, interested groups and individuals. Indeed, the need to inform and educate is often given a high priority not merely as an adjunct to conservation but as a means of achieving it.

Despite these efforts, the requirement for continuing education within government and the community is painfully apparent. This is not merely a practical problem of recognition but can also be political issue.

The reasons for failure to acknowledge the significance of grassland areas can include:

- the extreme rarity of these communities;
- commonly held views that native grassland areas were originally treed (whether they were or not);
- that the area is burnt regularly or grazed regularly and therefore 'isn't natural';
- grazing pressure can mask the diversity and significance of a site;
- generally low aesthetic values;
- the emphasis on tree protection, tree-planting and revegetation in conservation programs;
- corporate knowledge within government agencies erased by staff turnover;
- the presence of relatively high weed cover within even some high significance grassland areas;
- lack of obvious and charismatic fauna;
- scruffy and untidy look of native grasslands;
- lack of action and involvement by major conservation organisations; and
- lack of official recognition for native grasslands in the form of conservation reserves.

That native grasslands are an 'ecosystem' is rarely, if ever, recognised and hence the seriousness of the potential extinction of entire communities is generally not appreciated.

Regrettably the issue of recognition sometimes comes down to a failure to transfer information either about a site or about appropriate management. Typically this will be manifested in damage to a site by tree planting, construction works or cultivation. Often the information has been withheld through lack of trust or has simply been 'communicated' inappropriately. While a biologist may believe that a report to government is sufficient notice of a site's values, few landholders are likely to agree!

The level of knowledge of native flora and fauna by landholders and staff of public authorities is usually low. Poor awareness of native grasslands should therefore be anticipated and planned for, rather than be the cause of frustration or surprise.

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<sup>3</sup> The Hon. Steve Crabb. *Trust News* Vol. 19 No. 7 p. 15.

## Native Grass or Native Grassland?

It appears that for the immediate future at least the confusing and generic word "grassland" will remain the dominant term for the range of natural and introduced vegetation types found across the fertile plains. Native pastures and native grasses are rarely differentiated from native grasslands in either the media or agricultural literature. As a consequence, management of native grasses such as *Themeda triandra*, *Microlaena stipoides* or *Danthonia* spp. is often regarded as analogous to conservation of native grasslands.

Some of the most important areas of native grassland remaining in south-eastern Australia have been and are used as pasture. The on-going management of these areas as low input grazing systems based on the native grassland resource will be vital to the conservation of many flora and fauna species and to the conservation of native grassland communities in the broader landscape. However, management for pasture implies that those species most favoured for production will be encouraged within the system. In time, this may result in a pasture of low species and structural diversity and, hence, relatively low conservation value.

Preliminary research suggests that landholders with higher preference for grasslands consider these landscapes to have high agricultural value but little ecological value (Cary *et al* 1998; 1999). At present decisions regarding the conservation of native grassland areas are generally made on the basis of landholders' analyses of the values of native grasses in their farming systems. There is, therefore, a risk that promoting native grassland conservation through the benefits of low-input native pasture will simplify the arguments for grassland management and conservation to the management of native pasture alone.

Differentiation of native grasslands and native pasture, grassy woodlands and grasslands, herbfields and grasslands, natural and secondary grasslands almost always involve the determination of a point on a continuum. Few authors have attempted to provide a satisfactory account of these terms and even fewer useful definitions have been generated (see Benson 1996 and Foreman 1995).

Native grasslands are simply defined as a vegetation type with few or no trees in which the dominant species are native grasses. Herbaceous plants are usually abundant and sclerophyllous shrubs are uncommon. The definition of native pasture is more problematic as 'pasture' is really a description of land use. 'Native pasture' is a term often used by conservationists to describe species-poor native grassland, where the number of herbaceous species is relatively low and (sometimes) the number of introduced species is moderately high. The difficulty with such a definition is it presupposes that more diverse remnants are in some way more "natural" when often they are simply the products of a different management regime. In addition, some extraordinarily diverse native grassland areas are very much used as pasture. Furthermore, some areas of high value for grassland conservation (as fauna habitat for example) may not be diverse at all.

The confusion is difficult to resolve. Regardless of terminology the aim for nature conservation is to ensure that landholders recognise and protect the biodiversity conservation values of their 'native pastures'.

## Restoration and Recreation

The uninformed view that native grasslands are relatively simple systems can encourage the notion that they can be easily re-created as a substitute for conservation of existing remnants. While there clearly is a role for restoration of existing remnants as part of overall management strategies, the 're-creation' of native grasslands is impossible (or at least unfeasible) with current funding, knowledge and technology. Accordingly, projects that attempt to 're-create' native grasslands are of low value in pursuing current conservation goals and objectives.

Restoration in grasslands takes many forms including planting or seeding plants of conservation significance, the use of native grass hay to control weed infestation in existing remnants, expansion of habitat for grassland fauna and so forth. All these forms of restoration can provide tangible benefits for grassland conservation. However, with the limited resources available and the limited resource to be protected it would be a folly if restoration activities were conducted at the expense of remnant protection.

The native vegetation restoration programs at the Organ Pipes National Park are well known. What is less well known is that the Friends of the Organ Pipes have played an active role in the protection of small high quality remnants in the region to secure the source of both seed and inspiration for their actions.

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## Agricultural Benefits of Conserving Native Grasslands

*Some of the benefits of native grasslands include: low use of some inputs such as fertilisers, enhanced response to summer rain, improved animal health, reduced need for supplementary feeding, production of finer wool, reduced drought risk, reduced fire risk, enhanced land and water protection, improved human health through reduced use of chemicals and reduced stress, opportunities for new farming enterprises such as seed collection and native plant harvesting and enhanced opportunities for recreation, tourism and personal satisfaction. (Crosthwaite 1997a).*

Many landholders have clearly made a decision to retain native pasture on their properties. The reasons for this have been explored in several studies including Crosthwaite (1997a) and Gilfedder and Kirkpatrick (1995) and include a range of economic, social and environmental factors.

In some regions native grassland communities are highly regarded as providing superfine wool (so long as they remain unfertilised or unimproved). Similarly there is potential for the development and marketing of agricultural products as coming from natural pastures such as 'saltbush lamb'. Native pasture can provide a complementary feed source on farms and be a useful feed source in dry conditions, provide shelter for lambing and may also have health benefits for stock.

Native grasslands, like other native vegetation communities, can also provide a range of environmental services. The use of native grasses to address issues such as salinity, and control soil acidity is currently under trial. The potential for selected species and cultivars of native grasses to be employed in non-arable hill country and where there is low soil fertility or high acidity is also being investigated. Similarly native grass species may also offer benefits such as decreased water and fertiliser use and greater persistence both in production and amenity fields.

The protection of native grassland vegetation provides habitat for native animals that can play a significant role in controlling insect pests in nearby pasture. As well as the more obvious bird and reptile species native grassland remnants in Victoria are also a refuge for native predatory mite species and therefore a potential source of controls for the Red-legged Earth Mite and Blue Oat Mite (Morgan *et al* 1993).

The hypothesis that ecological stability is increased by diversity has been recently supported by long-term research in North American grasslands (Tilman & Downing 1994). The study found that primary productivity in more diverse grassland communities is more resistant to and recovers more quickly from drought.

The world's major food plants such as wheat, rice, barley, oats and pasture plants are wild grassland plants that have been selected and cultivated by farmers and scientists. A wealth of plants for future alternatives to temperate crops and pastures may be present in indigenous grassy ecosystems. Similarly, new crops could be developed from grassland species to satisfy the market for seed from native grasses and other species, the bush food market and for oil and other products. The use of native legumes as replacements for sub-clover and introduced legumes has received some interest but further research is required (Crosthwaite 1996).

A further value of native grassland plants is their use in amenity horticulture. The use of native grasses on road batters and industrial landscapes is well established, as is the interest in indigenous gardening and revegetation.

While individual farmers acknowledge many of these benefits, most are untested through research (Crosthwaite 1997a). Furthermore many of these benefits (and disadvantages) must be considered in the context of current farming systems and the farm as a whole. In addition there is a 'lifestyle' benefit for farmers that is difficult to quantify: low-input native pastures require less working hours, there is satisfaction in protecting conservation values and maintenance of native pasture systems is less prone to fluctuations in inputs and outputs.

The major benefit of conserving native grassland communities that should be communicated to landholders is in relation to landscape stability and land degradation. Protection of the plant and animal community that has evolved naturally on the fertile plains is a sensible precaution in all regions.

## Reserve Systems

In developing our current conservation reserve system two factors have been paramount. Firstly, perceptions of conservation value have been influenced by the beauty and wildness of areas and, secondly, reserves have generally been selected from unallocated crown land (ie. land that was too steep, infertile or remote to be put to economic use). This approach to conservation has not served agricultural landscapes well in terms of formal public reservation and as a consequence, the ecosystems of the fertile plains are poorly represented within the reserve system.

The corollary of this is that development pressures have been (and continue to be) greatest on fertile land that is suitable for high intensity agriculture, leaving relatively few remnants of conservation value. This has meant that natural ecological communities on the fertile plains of south-eastern Australia are not only poorly represented within the reserve system, but also are generally very rare and opportunities for including such communities in conservation reserves extremely limited.

The overriding urgency in developing conservation reserve systems is the degree of threat posed to native vegetation on both public and private land throughout the fertile plains.

The Commonwealth, Territories and States of Australia have agreed to establish a comprehensive, adequate and representative National Reserve System (NRS) to conserve Australia's native biodiversity.

The goal of the NRS program is *to assist with the establishment of a comprehensive, adequate and representative system of protected areas to conserve Australia's native biodiversity* (Commonwealth of Australia 1999).

Within this framework, the NRS aims to include samples of all ecosystems identified at the regional scale. It will also consider:

- the ecological requirements of rare or threatened species and rare or threatened ecological communities and ecosystems;
- special groups of organisms, eg. species with complex habitat requirements or mobile or migratory species or species vulnerable to disturbance which may depend on reservation for their conservation.

For highly fragmented vegetation communities, a range of protection mechanisms should be adopted including land purchase and acquisition and private land agreements and that incentives should be developed to encourage voluntary partnerships to protect biodiversity on land off-reserves. In some regions, private land agreements and incentives may be the only option available for protecting biodiversity.

By inference, the end result will not be a conventional public reserve system as might occur in well-vegetated regions, but a whole range of different areas occupying a range of different land tenure and protected for specific purposes.

A conservation reserve system that incorporates private management is likely to be more easily achieved and politically acceptable than an approach based on public acquisition alone (Howard & Young 1995). Whether a site is protected as public or private land will depend on a range of factors including current land status, land values, threats, desired management, availability of incentives, willingness of landowners to negotiate and so forth.

Issues of acquisition aside, in fragmented and widely dispersed communities, such as grassland and grassy woodland, the costs associated with management for a public agency are likely to be higher than for larger reserves. Conservation agencies have evolved with the development of large, contiguous reserves: management of many isolated sites will require a substantial change in approach. This new approach would encourage an integrated view of management and promote diversity of management regimes across the range of remnants.

Mechanisms for formally recognising off-reserve conservation are beginning to evolve. The *Interim Scientific Guidelines for the National Reserve System* (ANZECC 1997) defines a protected area as:

*An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.*

Management agreements that are maintained in-perpetuity would meet this definition. This is recognised in the interim guidelines which note that implementation of the National Reserve System will include *inter alia*:

*... identification of opportunities for public lands managed by local government and other statutory authorities to be included in the NRS; and, identification of opportunities for including in the NRS private and leasehold land covered by a voluntary binding conservation agreement which secures biodiversity conservation as the primary objective. Noting that the core reserve system needs at least to be comprehensive.*

## Management

Throughout south-eastern Australia there is considerable confusion about the most effective management of native grasslands for conservation. So extreme is this confusion that on occasions sites have not received any management out of fear of doing harm.

It would appear that much of this is due to unfamiliarity rather than fact. It is true that the management of native grasslands for conservation is a relatively recent phenomenon. However, the grasslands we are hoping to conserve have, in the main, been successfully managed for many decades, albeit for other ends. It could be argued that we actually know more about the responses of grassland systems to different disturbances than we do for most other plant communities. There appears to be a large body of agricultural research that is highly relevant to grassland conservation that has yet to be interpreted for this purpose. Similarly there are insights to be gained from conservation management of temperate grasslands in other countries (see Taylor 1998).

Individuals, community groups, local government and public authorities currently manage many grassland remnants on public land. Although this management is generally not specifically directed at conservation objectives, maintenance of existing practices (which may include burning, grazing exclusion and the absence of soil disturbance) are likely to be beneficial for conservation. However, maintaining sympathetic management in these areas will be a major challenge in the face of institutional and social changes in rural areas.

The type, frequency and consistency of management intervention, or lack of it, has a profound influence on the composition of grassland flora and fauna (Lunt & Morgan 1998a). Research on grassland management in Australia (see Robertson 1998; Davies 1997; Lunt 1991) suggests that:

- Light grazing is better than intensive grazing;
- Ploughing, fertilising and heavy grazing are detrimental to native grasslands and grassy woodlands;
- Intermittent grazing is better than continuous grazing;
- Dramatic changes to existing management regimes in high quality sites should be avoided; and
- Change in management from burning to grazing or to frequent burning of grazed sites can be detrimental.

Management considerations must also include the effect on fauna habitat.

Grassland systems are tremendously responsive and management objectives regarding structure and composition can in theory be achieved in a matter of years rather than decades. However, as the secessional periods for native grasslands are relatively short, the speed required for management decisions can be a significant problem for public land managers.

The most important aspect of grassland management is that it should focus on outcomes. Issues of naturalness are largely irrelevant in most grassland communities. Rather, managers should aim to achieve specified objectives of diversity, structure and habitat by the best means available.

At a landscape scale intermittent, rotational and seasonal grazing at suitable intervals and intensity will often be the most effective tool for maintaining and, sometimes, enhancing biodiversity in currently grazed landscapes. Obviously such management must be adjusted to suit the particular vegetation community. The periods of

exclusion may vary from months to several years with total grazing exclusion required for some open woodland communities including those dominated by *Callitris* and *Casuarina* species.

In regions with lower rainfall, set stocking can lead to a decline in biomass with adverse effects on both conservation and agricultural values. As one landowner commented, 'I want more vegetation – my sheep eat vegetation'.

As many remnants of grassland communities are small and isolated, the issue of long-term viability is often raised. This question is best approached in relation to management objectives for a site. If these objectives are to preserve populations of threatened plant and animal species, the determinants of viability will relate to the existing population size, the presence of important associated species and the presence of suitable or potential habitat. These issues are relevant regardless of size. While size may be important in relation to these factors, the over-riding determinant of viability will be the intention and ability of management to provide appropriate active management and to mitigate threats. In many cases, small sites may be more easily and successfully managed due to the scale of action required. Indeed, provided management is careful and consistent, small remnants have proven to be extraordinarily stable, in spite of their alien surrounds. The major issue for all sites is the maintenance of suitably large or dense populations of target species. Again, intact small sites will often support larger populations (both in relative and absolute terms) than much larger but more degraded sites.

The above comments notwithstanding, larger sites (in general) are likely to provide more variation in habitat, have greater carrying capacity for fauna and flora, be more resilient in the presence of threats including one-off events and provide greater opportunity for ecosystem scale processes to continue to function. The robustness of all sites (large and small) can be significantly enhanced through their active management as part of a Protected Area Network.

In practice, a 'choice' between small and large sites rarely arises. Conservation values that are relatively common on small sites may be absent on large sites and vice versa. Protection of a range of sites and management of these sites in a variety of ways is necessary to preserve the full range of biodiversity of the grassy plains.



**Burning for pasture rejuvenation, Tasmanian Midlands.**

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## Grassland Conservation in Productive Landscapes

Throughout the fertile plains of south-eastern Australia there is a dramatic shift in agriculture from low-intensity grazing to more intensive use of land. With the support and encouragement of governments and industry groups, hundreds of thousands of hectares of new crops are being sown in regions that contain the last remnants of native grasslands.

Although, regulations are in place to limit or control clearing of native vegetation, land development continues to reduce options for biodiversity conservation in agricultural regions of Australia. Further if the prospect of land clearing or development exist it allows speculative pressures to inflate the land purchase market and hence reduces opportunities for conservation purchases.

In some regions, most notably the Riverina, issues relating to sustainable landuse are unavoidable for nature conservation. Intensification of landuse intensifies other management requirements and increases the conservation pressures on remnants. Land development may also threaten remnants through a range of off-site impacts including increased pest plant and animal numbers, changes to ground water levels, nutrient and water run-off and increased threats of salinity. These impacts are rarely considered in development decisions. Regrettably improvements in agricultural practice do not always favour nature conservation. For example, more efficient water use can facilitate increased clearing and cropping in dryland regions.

How native grasslands on farms are managed into the future will depend in part on how the conflict between agricultural and conservation policy goals is resolved. It appears certain that the existing threats to native grassland communities will continue and are likely to intensify. Even where there is currently little clearing in natural grassland landscapes there is a constant and continuing threat of new technology, new crops, new weeds, changed market conditions and economic circumstances. Most farmers face an on-going struggle to make a living. In the absence of public policy initiatives that anticipate possible changes to farm management, remnant native vegetation will be under threat on most farms tomorrow, if not today.

Low stocking rates to protect high quality native grasslands have high opportunity costs (Crosthwaite 1997a), but these costs are not so high where moderate stocking rates are consistent with maintaining grassland values. High returns can be gained by cropping areas of native grassland and under-sowing to pasture in the third year of cropping. However, the risk of crop failure and reduced prices can reduce returns to below that of native grassland. Where rainfall is low and variable, this risk can be removed by making large capital investments in irrigation. The long-term sustainability of groundwater resources, and irrigation impacts on salinity levels, must be viewed with concern.

In the face of such uncertainty we must use legislative and planning mechanisms to consolidate conservation areas and conservation management now. Acceptable levels of agricultural development should be set in each region with requirements for nature conservation and sustainable land use underpinning those decisions. It may be desirable in such schemes to specify zones where dryland farming and conservation are the only permissible land use. Inevitably some landholders will be aggrieved in this process and a range of voluntary and regulatory mechanisms and incentives will be required.

Despite the apparent conflict between agricultural development and native grassland conservation, the area of high-quality native grassland remaining that should be protected is a very small percentage of the total agricultural area. Consequently there would be negligible impact on existing or future economic conditions in these regions by virtue of retaining high quality native grasslands.

This raises the prospect of conservation interests developing strategic alliances with key industry sectors. WWF, in association with the NSW Farmers Association and national and state environment groups, has developed a position paper on the requirements for conservation of native grasslands in NSW. WWF and NSW Farmers Association sent this paper to the State Premier in October 1996. The paper included costings for conservation assessments, incentive programs, extension services and acquisition in five regions.

*An interested and committed landowner is just as capable of conserving the values of his/her own site as a large bureaucracy dealing with many types of land. (Barlow 1997).*

If farmers are to seriously consider addressing nature conservation issues, they must know what actions to take, what management is required, and the areas concerned. They must also be properly informed of the effects of these actions on agricultural production (Lambeck 1999). In this context there is much to be gained from the partial budget approach employed by Crosthwaite and Macleod (*in press*) as a tool for analysing the choices available to farmers with native grassland resources. Such analyses will be of particular importance where maintenance of native grasslands actually confers a benefit for the farmer.

Binning and Young (1997) draw a distinction between the **Duty of Care** for sustainable land management faced by a landholder and the provision of a **Public Conservation Service** that goes beyond that duty by landholders managing vegetation to meet conservation objectives.

*Determining where “duty of care” stops and “public conservation service” begins is a difficult issue. It is suggested that the dividing line should be drawn between those management practices required to achieve landuse objectives at a landscape or regional scale and any additional practices required to sustain sites of unique conservation value. Hence, a public conservation service is provided when the community’s interest lies in securing active and ongoing management of a particular site.*

Where the boundary falls between this general Duty of Care and some extra Public Conservation Service will be crucial to programs for native grassland conservation. It would be strange to suggest that there was no duty to protect native vegetation in grassland regions. However, for those sites of the highest conservation value, the need for certainty and for specific management practices will usually require a partnership to be developed between landholders and the government or other parties based on long-term management agreements.

Most landholders see themselves and other farmers as the best or most suitable managers of native grassland areas (see Gilfedder & Kirkpatrick 1995). Influencing how that management is practiced or securing it in the long term is a major challenge for conservation.

It is important that those pursuing nature conservation goals recognise that the priorities of landholders will often be at odds with maintaining natural values. On the other hand, landholders that have retained native grasslands on their properties have usually done so for one or more reasons and these are usually related to a perceived benefit (Crosthwaite 1997a). While these landholders may also acknowledge the need for conservation of these communities not all will be prepared to enter into management agreements or covenants or sell land for conservation (Gilfedder & Kirkpatrick 1995). In such cases conservation interests will be best served by providing information on grassland conservation and management to allow them to manage conservatively and independently while offering appropriate incentives to leverage management agreements on significant areas. Regrettably there will also be the farmers who do not wish to conserve native grasslands or do not recognise their values. Community education to raise the profile of grassland conservation may lead to a change in attitude amongst these landholders.

It is apparent that many landholders still do not recognise the link between sustainable agricultural production and retention of threatened remnant vegetation. As a result even where there are positive attitudes to remnant vegetation, those attitudes often do not translate into action (Elix & Lambert 1997).

It is vital therefore that extension programs continue to promote broadacre, sustainable vegetation management. Within that framework, native grasslands are a stable productive system that can be sustainable in the long-term, especially in areas of low and erratic rainfall. The vegetation and landscape of most grassland regions has undergone extraordinary change in the past century. However, there is still some chance of maintaining or recovering much of the diversity and structure in regions where extensive areas have escaped cropping. In this context, an understanding of landuse history is a vital management and extension tool.

Although awareness of the need for conservation of native vegetation in rural areas has increased dramatically over the past decade, many private land managers are still unaware of, or are unwilling to, recognise the value of conserving native grassy ecosystems. Indeed, there is antipathy towards grassland conservation in some areas due largely to the coincidental emergence of native grasslands as a conservation issue and the institution of controls on native vegetation clearing. This may continue where there is conflict between development aspirations and native grassland conservation. In addition there is a belief in some sectors of the community that

there should be no new conservation reserves especially in agricultural districts. This belief may be founded on philosophical grounds or on the perceived inability of governments to manage land effectively.

While the owners make the ultimate decisions about farm and business management, farm advisers might have an important influence. Advisers include farm management consultants, bank managers, accountants, stock and station agents, pasture or crop specialists, and livestock advisers amongst others. Landholders are also more likely to take an interest in their native grasslands if local community and Landcare groups are actively pursuing conservation and land management issues. A pro-active approach that trained multi-disciplinary farm advisers skilled in farm management and with training and support in grassland management issues would ensure that grassland issues were considered in a whole farm context.