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## CHAPTER 1

### *INTRODUCTION*

#### Background

*... a cataclysm has reduced landscapes of colourful, unique species-rich grasslands to a few small, scattered refugia, making these grasslands the most endangered natural ecosystems in Australia. (McDougall & Kirkpatrick 1994).*

The importance of biodiversity conservation is well recognised within the community and by governments (Commonwealth of Australia 1996). This recognition is manifested in conservation programs that aim to prevent the extinction of species at all spatial levels. In general such programs concentrate on *in situ* measures, typically through the reservation of large, relatively natural areas to provide habitat for plant and animal species in an environment that is robust and self-sustaining.

For many terrestrial ecosystems (such as temperate forests and mallee shrublands) a considerable area, in both absolute and relative terms, remains under public control. The strategies that are relevant to broadscale conservation on public land are however, inappropriate for the conservation of highly fragmented ecosystems that are largely under private or local community control in fertile agricultural districts. Consequently conservation of temperate native grasslands has proved difficult and, in many regions, little progress has been made in the past decade in securing permanent protection for remnants or even halting the decline of these communities.

The response to this has varied from anger and frustration to disbelief and disappointment. However, the 'problem' of grassy ecosystem conservation has also prompted the development of new thinking and new approaches that are of importance for nature conservation throughout agricultural landscapes in temperate Australia.

#### Project Objectives

This project aims to ensure that the most successful methods developed for grassland conservation are documented and applied to current and new on-ground projects and that the benefits of grassland conservation to landholders and the broader community are maximised. The project aims to develop a practical vision of the nature of landscape-scale temperate grassland conservation and the means for its realisation.

The substantial occurrence of native grasslands on private land suggests a necessary link between conservation of native grasslands and sustainable production.

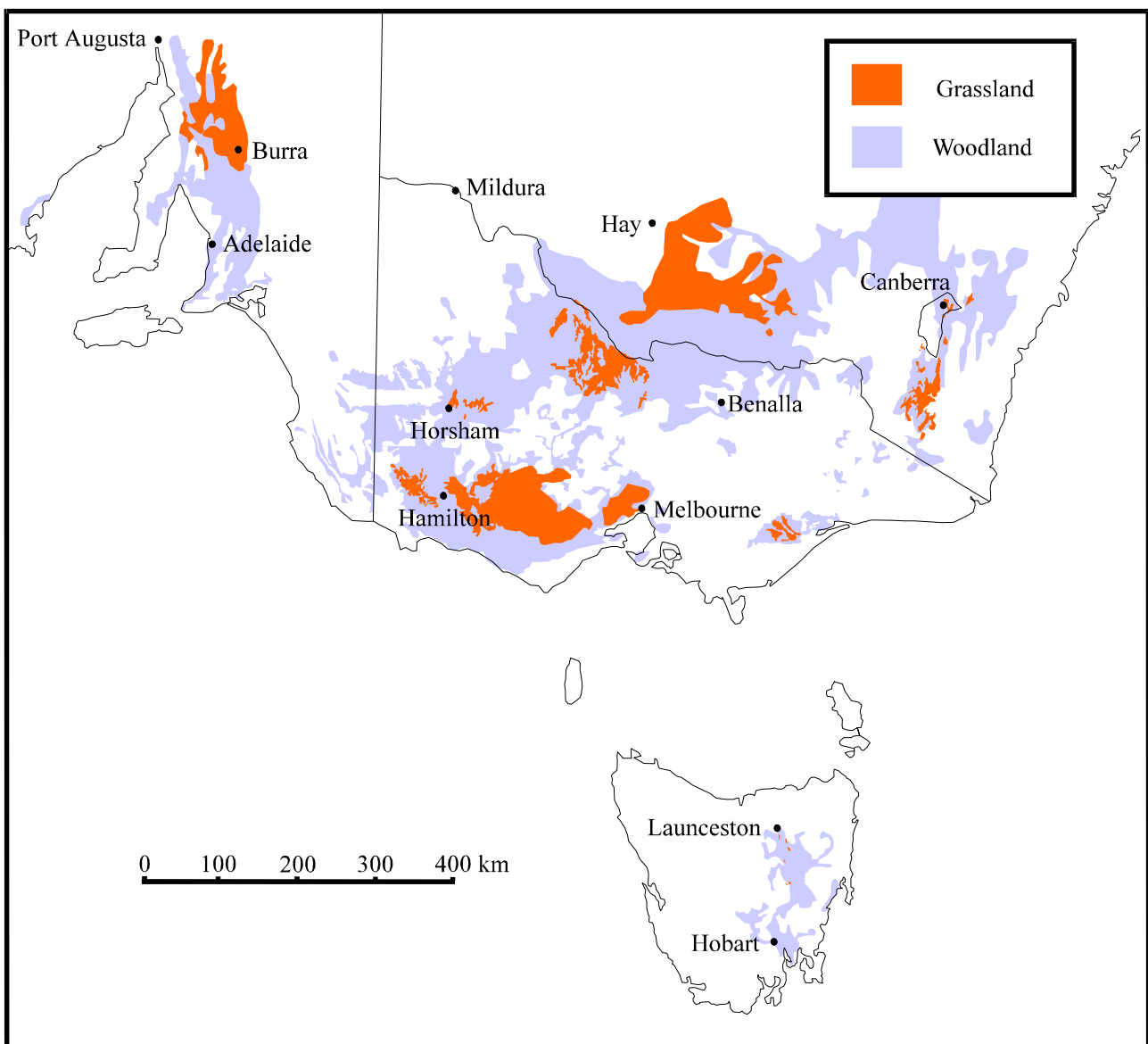
In particular the objectives of the project are to:

- Document successful programs, projects and approaches to grassland conservation throughout south-eastern Australia.
- Identify key conservation measures for grasslands and quantify the resources required to achieve these outcomes.
- Document best cases of integrating grassland conservation with sustainable production.
- Develop a guide to best practice grassland conservation for distribution.

## Current Status of Temperate Native Grassland Conservation

Modified remnants of the original vegetation of the grassy plains extend from Peterborough at the northern end of the Mt Lofty Ranges in South Australia, across the subcoastal and inland slopes and plains of the Great Dividing Range through Victoria, New South Wales and the ACT and the Tasmanian Midlands. The region can be further divided into biogeographic regions: the Lofty and Yorke Blocks, and the Narracoorte Coastal Plain (South Australia); the Victorian Volcanic Plain, Wimmera, Riverina and Gippsland Plains (Victoria); Riverina Plains, the South-west Slopes and Southern Tablelands (NSW); and the Tasmanian Midlands (see Lunt *et al* 1998). Grassy ecosystems are also found on the Liverpool Plains, New England Tablelands, Moree and Walgett regions in New South Wales, East Gippsland and Murray Mallee in Victoria, and the Darling Downs and Central Highlands regions of Queensland.

**Figure 1: Pre 1770 Distribution of Temperate Lowland Grasslands and Grassy Woodlands in south-eastern Australia. (Lunt *et al*/1998)**



Early settlers' accounts of the indigenous peoples of grassland regions suggest that they were a healthy and well-nourished people surviving on the harvest of the plains (Bride 1898). Clearly these areas, like the other great grassland regions of the world, must have supported spectacularly rich communities of plants and animals.

Surveys across south-eastern Australia of open grassland communities have identified over seven hundred indigenous vascular plant species from seventy seven families (McDougall & Kirkpatrick 1994)<sup>1</sup>. More than half of these species come from just six families - daisies, grasses, peas, sedges, salt bushes and lilies. While grasses dominate the ground flora of open grassland communities in terms of numbers of individuals, they constitute only 15% of all species found. While the total number of species found in grassy ecosystems is relatively modest, the diversity of these communities at a small scale can be quite astounding. For example the Red Gum Grassy Woodlands in the Grampians region of Victoria support up to forty-five different species in a square meter - a figure that is amongst the highest for any terrestrial community in the world (Lunt 1990).

Native grassy ecosystems occur in fertile agricultural regions and are consequently subject to a range of disturbances that affect their composition and diversity. As a result there can be notable differences between remnants of grassland communities based on previous management histories (see Lunt 1995). Similarly, grassland remnants may include relatively high numbers of introduced species often at a stable level within a consistent management system.

The term 'native grassland' can embrace a wide variety of vegetation types from highly diverse herb-rich sites to species-poor areas composed predominantly of native and introduced grasses (see below *Native Grass or Native Grassland*). In general, grassland conservation programs (and this report) are concerned with those remnants that still retain a relatively high degree of structural and/or species diversity. There are some notable exceptions to this, especially where the conservation of some grassland fauna species is concerned.

In all the temperate lowland regions of south-eastern Australia the natural grassy ecosystems have either been eliminated or reduced to small scattered remnants that together are just a tiny fraction of their original area. The fate of remnants is themselves uncertain: the fragments of our natural sweeping plains continue to be degraded and destroyed. Grasslands today shelter in a variety of unlikely locations: cemeteries, roadsides, stock routes, rail reserves, pastoral properties and industrial sub-divisions to name a few. The greatest area of native grassland is found on private land although the highest quality remnants generally occur on small public land sites.

Unlike treed bushland, native grassland communities are not readily identified and as a result mapping, studies and conservation programs have only occurred to any great degree since 1990. Temperate native grassland communities are now regarded as requiring urgent conservation action in all states in which they occur.

Only seven of the twenty-four nationally rare or threatened grassland flora species are adequately protected (Kirkpatrick *et al* 1995). Furthermore around half of the rare or threatened grassland plant species are found on private land with many of these found only on private land. A number of grassland fauna species including the Plains-wanderer (*Pedionomus torquatus*), Grassland Earless Dragon (*Tympanocryptis lineata pinguicola*), Striped Legless Lizard (*Delma impar*) and Golden Sun Moth (*Synemon plana*) are listed on state and national threatened species schedules.

The main threats and impediments to conservation of the remaining native grasslands include:

- Conversion to crops and introduced pasture;
- Overgrazing by introduced stock;
- Poor management of remnants;
- Urban expansion; and
- Invasion by exotic plants.

Threatening processes operate on both public and private land and are exacerbated by the common failure of landowners and government agencies to recognise native grasslands as native vegetation of conservation value.

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<sup>1</sup> These figures do not include grassy woodland communities that would significantly increase the numbers of species and families.

<i>Region</i>	<i>Original Area (est.)</i>	<i>Current Area (est.)</i>	<i>%Extant</i>	<i>Conservation Reserves</i>
South Australia	1,000,000 ha	5,000 ha	0.5%	460 ha (3 sites)
Victorian Volcanic Plain	1,500,000 ha	5,000 ha	0.3%	c.500 ha (5 sites)
Wimmera	100,000 ha	100 ha	0.1%	none
Riverina (Victoria)	1,000,000 ha	10,000 ha	1.0%	c.800 ha (2 sites)
Riverina (NSW)	2,500,000 ha	25,000 ha	1.0%	none
Monaro / ACT	270,000 ha	3,500 ha	1.3%	c.365 ha (6 sites)
Gippsland Plains*	60,000 ha	0 ha	0%	none
Tasmanian Midlands	12,500 ha	1,000 ha	6.0%	16 ha (1 site)
<i>Total</i>	6,400,425 ha	49,600 ha	0.77%	2,141 ha

\*excluding South Gippsland (Frood 1994).

**Table 1: Estimates of original and current extent of lowland temperate native grasslands in parts of South-eastern Australia.<sup>2</sup> Based on Barlow (1999a) updated to include new reserves**

<i>State</i>	<i>General Description</i>	<i>Status</i>	<i>Reference</i>
ACT	Natural temperate grassland	Threatened (L)	ACT Government 1997a.
NSW	Riverina	Unreserved	Benson <i>et al</i> 1996.
	Monaro	Poorly conserved	Benson 1994; McDougall & Kirkpatrick 1994.
South Australia	Lomandra tussock grassland	Very rare & endangered	Neagle 1995; Hyde 1995; Robertson 1998.
	Danthonia/Themeda tussock grassland	Very rare & endangered	Neagle 1995; Robertson 1998.
	Stipa/Danthonia grassland	Uncertain	Neagle 1995; Hyde 1995; Robertson 1998.
Tasmania	Lowland grassland	Inadequately reserved	McDougall & Kirkpatrick 1994.
Victoria	Riverina Plain	Threatened (L)	Foreman 1997a; McDougall <i>et al</i> 1994
	Victorian Volcanic Plain	Threatened (L)	McDougall <i>et al</i> 1994; Muir 1992.
	Gippsland Plains	Threatened (L)	Frood 1994; Lunt 1994.
	Wimmera Plains	Effectively unreserved	McDougall <i>et al</i> 1994.

**Table 2: Status of native grasslands by region. (L = listed under state threatened species legislation).**

<sup>2</sup> Information on the status and distribution of grassy ecosystems in other regions can be found in Fensham (1997; 1998; *in press*) [Darling Downs and Queensland Central Highlands], Sim & Urwin (1984) [Liverpool Plains], McDougall *et al* (1994) [East Gippsland] and McIntyre *et al* (1993) [New England Tablelands].

Compounding these threats is the paucity of resources available for management, survey and protection of remnants and a general lack of political will to enforce legislative controls to conserve native grassland areas.

A decade of programs directed at addressing threats and achieving long-term conservation for species and communities has generated considerable interest in the conservation of native grassland communities throughout south-eastern Australia. Specifically these programs have:

- Increased awareness of the conservation values of native grasslands;
- Placed specific grassland extension and planning officers in most regions;
- Provided biological surveys of major grassland regions, and research into the composition of grassland communities;
- Protected several significant grassland sites as conservation reserves;
- Developed some management agreements for sites on public and private land;
- Recognised the importance of protecting native grasslands on both private and public lands;
- Identified the benefits of native grassland for sustainable land management;
- Increased knowledge of appropriate management for grassland communities and species;
- Included grassland communities and species in threatened species legislation;
- Incorporated grassland conservation into regional planning processes and works programs; and
- Placed the conservation of native grasslands on the political conservation agenda.

However, despite these successes, the decline in area and quality of native grasslands continues. Indeed, it is probable that the current rate of loss is the highest for several decades. In Tasmania 2-3% of lowland grasslands are lost each year (Kirkpatrick *pers comm*), the highest clearance rate for any vegetation type in that state. On the Riverina Plain, the Monaro and Victorian Volcanic Plain extensive areas of introduced pasture, rice, canola and other crops have been, and continue to be, established. Inevitably, many 'unimproved' areas that support native grasslands have been and will be destroyed by this shift from low-intensity to high-intensity agriculture. In a little over a decade, half of the sites identified by Stuwe (1986) on the Victorian Volcanic Plain have been destroyed or severely degraded, many of these on public land. Urban development around major cities has destroyed or compromised a number of significant grasslands in the past decade: in Melbourne this process continues virtually unchecked.

As Barlow (1999a) warns:

*Unless all groups (government and others) make a concerted management effort with sufficient resources, 'protected' grassy ecosystems will continue to degrade; unprotected areas will continue to be destroyed.*

