

# Part A: Native vegetation - the forces for change



Part A discusses major elements of the four driving forces that have caused us to develop fundamental changes to the way we manage natural resources –including native vegetation.

1. Scientific knowledge globally shows that there has been a dramatic decline in the quantity, quality and viability of native vegetation, which has considerable consequences for biodiversity, water quality, salinity, agricultural sustainability and the planet's climate.
2. Global and local community attitudes towards environmental issues have changed in the direction of greater responsibility.
3. Community attitudes affect industries and ultimately individual primary producers in that the community – the consumers and company shareholders – are demanding production of environmentally and socially friendly goods. Hence, market forces are playing a large role in determining the actions of producers of goods, including land managers.
4. Government policy and legislation reflect the changes in scientific knowledge and community attitudes and, hopefully, anticipate threats and opportunities.

*This page from the top:* Carpet Python *Morelia spilota*.

Isolated Grey Box remnant *Eucalyptus microcarpa*.

Broad-shelled Tortoise *Chelodina expansa*.

Floodplain River Red Gum forest.

Opposite page: Corridor of  
vegetation – links in  
the landscape.



# 2 About the Catchment

## Native vegetation - a snapshot of what remains

'Native vegetation' refers to more than just trees. Shrubs, grasses and other vegetation types are equally important considerations. It is easier to develop a broad-scale approach to managing native vegetation if we focus on types of remnant trees because these are easy to visualise and communicate. There are relatively few high-value sites of shrub and grasslands and some vegetation types are naturally rare. In the GBCMA area, 95 plant species are classified as 'rare' or 'threatened' and 85 animal species are classified as 'threatened'. A fine-scale but nevertheless strategic approach needs to be developed for important sites that are often relatively small and distant from other remnants.

The stark contrast between pre-European settlement native vegetation cover and that of the present day is shown in Maps 3, 4 and 5.

Plains Grassy Woodland (2% of pre-European cover in the Catchment remaining), Herb-Rich Woodland (8%), and Valley Grassy Forest (9%) are severely depleted Broad Vegetation Types of the Catchment.

Following the Goulburn and Broken Rivers from their origins in the upper catchment down to the River Murray on the plains reveals the diversity of land and vegetation types in the Catchment. There is considerable difference between the amount of vegetation cover on the flat, fertile land types in the lower half of the Catchment and those on the steep and less arable land types in the upper catchment.

Native vegetation in the Catchment falls into three main physical categories:

**Upper catchment.** A combination of high rainfall, high altitude, mountainous topography, and varied climate and soils has produced a range of vegetation types and habitats. Sub-alpine woodland and treeless vegetation environments descend into towering montane moist forests, drier woodlands, riparian forests and a variety of other vegetation types. The hills and mountains are continuously vegetated. Much of this is managed as State Forest, alpine resorts, and National or State Park.

**Mid catchment.** Moist foothill forests give way to drier foothill forests and grassy woodlands and fertile valley forests dominate. The drier climate and variable soil types of the slopes create complex patterns in the distribution of vegetation types. This part of the Catchment contains scattered large and small blocks of remnant vegetation; forests and woodlands along the major rivers; linear networks along creeks, railways and roadsides; wetlands; paddocks of native grass pasture with scattered trees; scattered old trees in exotic pastures. Some large blocks are managed as State Forest with some smaller conservation, streamside and road reserves. Much of the remnant native vegetation is on private land.



**Lower catchment.** Grassy and shrubby woodlands and box-ironbark forests dominate the low undulating hills, while the relatively flat, fertile plains adjacent to the major river systems typically support grassy woodlands. Characterised by their dry, open appearance, the woodland complexes of the lower catchment are surprisingly diverse. Subtle variations in rainfall, topography and soil type have resulted in a variety of vegetation types. Remaining native vegetation exists as scattered, small blocks of remnant woodlands with linear reserves/networks along creeks, railways and roadsides; forests and woodlands along the major rivers; wetlands; grassland remnants in paddocks and along linear reserves and scattered old trees in exotic pastures/crops. The greater proportion of blocks and scattered trees occur on private land.

Generally, in terms of bioregions:

- Loss of vegetation cover in the Goulburn Broken Catchment has been most extensive in the Victorian Riverina, Northern Inland Slopes, Central Victorian Uplands and Goldfields Bioregions.
- The Victorian Riverina Bioregion, with only 7.2% of the original (pre-European) vegetation cover remaining, is one of the most extensively cleared regions in Australia.
- Vegetation cover remains comparatively intact in the Highlands – northern fall, Highlands – southern fall and Victorian Alps Bioregions in the upper catchment.

### Public land

Public land – making up 28% of the Catchment (Map 6) – covers a range of reservation types and supports some of Victoria's most valuable forest industries, National and State Parks and alpine resorts. Most of the remaining native vegetation is on public land. Native vegetation has been largely retained in the mountainous far south-east, where slopes are steepest. Managers of public land resources are:

- Parks Victoria (National, State and Regional Parks, and Reserves)

- Department of Natural Resources and Environment (Forests Management, Commercial Forests, Land Victoria)
- Goulburn-Murray Water
- Alpine resorts management boards
- Goulburn Broken Catchment Management Authority (Licensed Crown Frontages)
- Local Government
- VicRoads
- Public Transport Corporation
- Community-based committees of management.

Public land in the Catchment consists primarily of land less suitable for agriculture and is mostly found on areas of steep or infertile land in the upper catchment and near the River Murray. Reserves managed primarily for biodiversity conservation include National Parks, State Parks, Wilderness Areas, Bushland Reserves, Reference Areas, and Natural Features Reserves.

Although public land use – including forestry, grazing and mining – has altered the structure and, in some cases, composition of native vegetation, in general it remains largely vegetated and contains many of the key sites for nature conservation. The large blocks of vegetation on public land (and occasionally on private land) and the corridors of vegetation along rivers, streams and roadsides is the skeletal framework around which much of the Catchment’s future vegetation management activities will be based. These remnants provide a valuable source of genetic material for rebuilding the landscape.

### **Private land**

Approximately two-thirds of the Catchment’s native vegetation has been cleared for agriculture. Clearing has been most extensive in the valleys and plains – the flatter, more fertile land of the mid and lower catchments. The majority of depleted vegetation types are in parts of the mid catchment and along the riverine floodplain on private land. Preferential development of the most productive areas (Map 7) has resulted in the almost total clearance of some native vegetation types. A system of complementary management for land and vegetation outside the public land estate is required to ensure the future of the range of flora and fauna in the Catchment.

The vegetation cover that does remain in these areas occurs as small, isolated patches or as linear strips along roadsides and streams, and continues to decline in extent and quality. These remnant ‘islands’ are exposed to a range of influences from the surrounding ‘sea’ of cleared agricultural land. Grazing, weeds, pest animals, increased nutrients, wind and run-off are all able to penetrate the remnant islands, degrading the native vegetation and decreasing its habitat value for native species. The smaller the island, the more it is likely to be affected. In the case of larger islands, effects will generally be most severe around the edges.

A key issue for vegetation on private land is the lack of regeneration or loss of native species. On private land, mature trees dominate most remnant patches and few sites contain adequate regeneration to effectively replace the older age classes as they decline. The understorey is generally degraded, which causes a decline in many species and ultimately results in local extinctions. This insidious process is one of the most serious native vegetation management issues facing our community.

### **Threats to native vegetation**

The areas of native vegetation that remain in the Goulburn Broken Catchment are subject to a range of threats. These include (in no particular order):

- Complete clearing of trees and understorey
- Fragmentation (change in pattern of remnants, including disconnection and reduced size)
- Grazing (introduced species – rabbits, domestic stock, goats, deer – and overpopulation of kangaroos)
- Altered hydrological regime (such as changed flows and drainage)
- Salinity (high saline water tables, induced saline groundwater discharge)
- Weed invasion (such as blackberries, St Johns Wort, phalaris, annual grasses, creepers, woody shrubs, willows)
- Introduced predators (such as foxes, cats and dogs)
- Extraction (such as timber, firewood, mining, native plants, eucalyptus oil production)
- Loss of hollow-bearing trees
- Removal of fallen dead timber
- Changed fire regime
- Soil disturbance
- Human disturbance
- Pathogens, such as Cinnamon Fungus
- Pollution
- Soil acidification
- Herbicides and pesticides.

### **Socio-economic trends**

Our Community’s socio-economic structure and our understanding of it are rapidly changing, giving rise to changing needs, changing opportunities, and changing responsibilities that must be integral to the development of any strategic approach to management.

There are thousands of land managers in the Catchment, the majority of whom are farmers. The average age of farmers, particularly in dryland agriculture, is rapidly increasing, mainly due to the number of young people either leaving or choosing not to enter the industry. Fewer farms are being taken on by the next generation of farm families and there is likely to be a large increase in the number of farms on the market. This can lead to farm amalgamation.



**Table 1:**

<b>Land Use in the Goulburn Broken Catchment</b>		
<b>Land Use Type (Land Manager)</b>	<b>Hectares</b>	<b>Reserve Type</b>
<b>Public Land</b>		
State Forest (Forests Management, Commercial Forests, NRE)	439,445	<i>Other</i>
Victorian Plantations Corporation (VPC)	17,352	<i>Other</i>
Gazetted Reserve*	18,792	<i>c.r.</i>
Public Land and Water Frontage Reserve (licensed by GBCMA)	22,107	<i>Other</i>
Proposed Gazetted Reserve*	51,827	<i>Other</i>
National Park Act Reserve (Parks Victoria)	94,421	<i>c.r.</i>
Proposed National Parks Act Reserve (Parks Victoria)	87	<i>Other</i>
Alpine Resort Management Boards	5,049	<i>Other</i>
Commonwealth Land (Ministry of Defence)	41,454	<i>Other</i>
Freehold – vested with Government bodies	69	<i>Other</i>
<b>Total public land</b>	<b>690,603</b>	
<b>Private Land</b>		
Intensive Agriculture	270,655	
General Agriculture (Dryland)	1,397,130	
Urban / Other Private Land	73,266	
<b>Total private land</b>	<b>1,741,051</b>	
<b>Total land</b>	<b>2,431,654</b>	

- Data generated by GIS Unit, NRE Tatura 1998, using 1:100,000 tree coverage layer for 1993 intersected with BVT layer.
- Land may be reserved under the Crown Land (Reserves) Act 1978 for a range of purposes and therefore have a range of managers, including Parks Victoria, Land Victoria (direct or indirect via municipal or other local community Committees of Management), municipalities (roads), and VicRoads (roads).
- ‘c.r.’ are reserves considered to be managed primarily for biodiversity conservation such as National Parks, State Parks, Wilderness Areas, Bushland Reserves, Flora and Fauna Reserves, Natural Features Reserves – data used to generate figures in Appendix 2.
- ‘other’ categories are where balances in resources must be achieved such as State Forest, hardwood production areas, Alpine resorts and other reserves on public land – data used to generate figures in Appendix 2.

In large parts of the region many small farms are not generating sufficient income to be considered viable. Even with off-farm income, most are below the \$45,000 threshold level of income from all sources deemed necessary to maintain investment in the farm business as well as in environmental protection. It is not possible to rely on the capacity of these landholders to commit to native vegetation management without well-targeted assistance. Even then, there will often be insufficient resources in the community to complete the necessary works.

In areas of the Catchment closer to Melbourne – an arc through Euroa, Nagambie and Rushworth – there is enormous pressure for non-traditional agricultural land use and more pressure for dis-aggregation of farm holdings. This means that land prices in large parts of the dryland catchment will not be linked solely to traditional agricultural production. This will restrict the type of activities that investors will be interested in and points to growth in industries such as hobby farming, horticulture, viticulture and other specialist enterprises such as floriculture, horse racing industry, intensive piggeries and poultry.

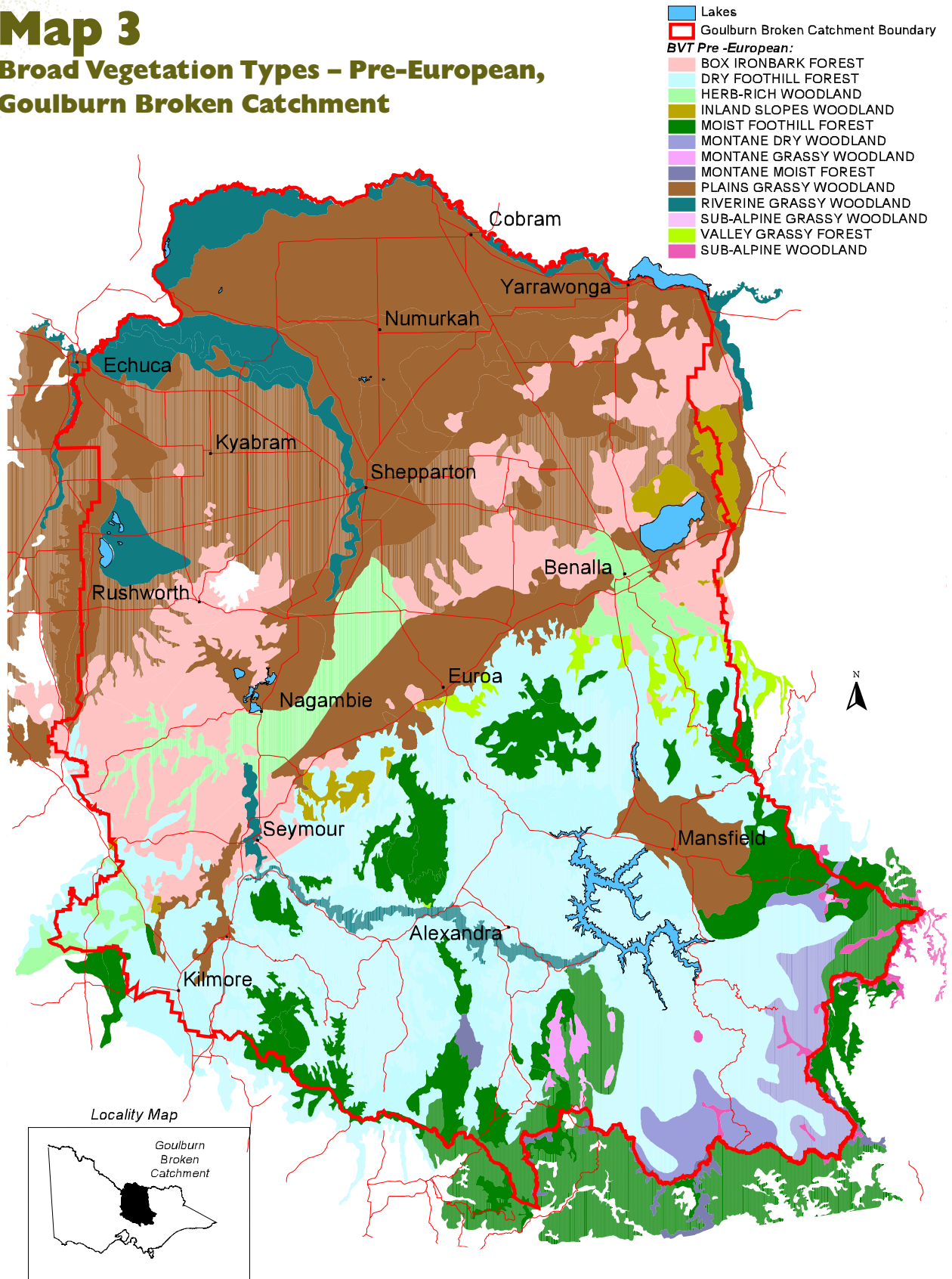
The result of these pressures in many cases will be a new type of landholder with different priorities, attitudes and goals for land management. There is a trend across the Catchment of greater appreciation of natural resource management issues. Identifying the implications of these changes is fundamental to the success of this Strategy. *Further details about the Catchment are given in Appendices 2, 3 and 4.*



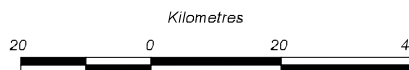
Dense heathy understorey of Snow Gum woodland.

# Map 3

## Broad Vegetation Types – Pre-European, Goulburn Broken Catchment



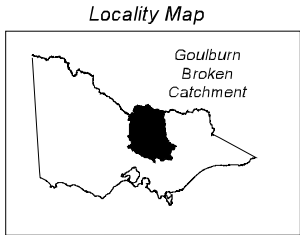
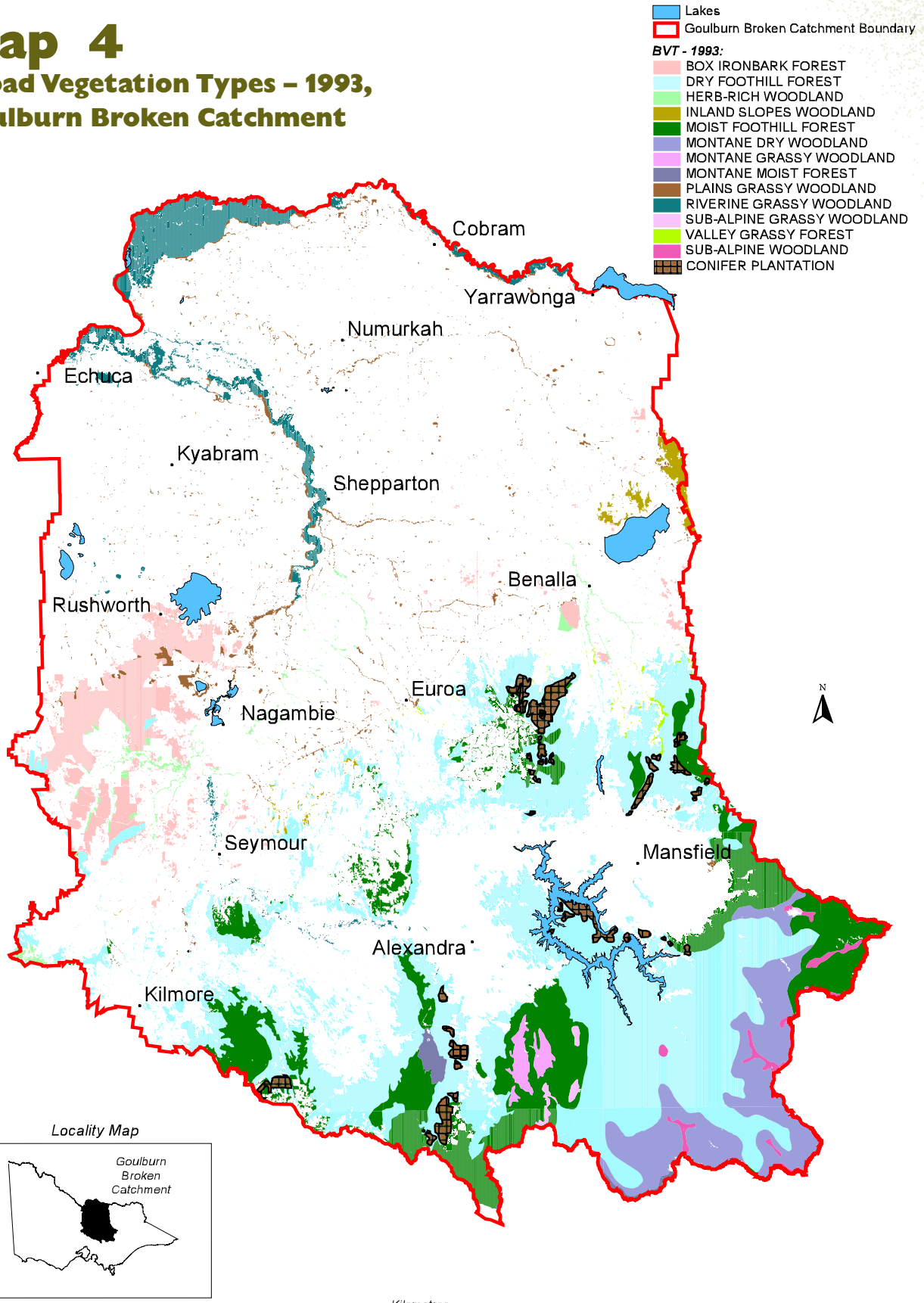
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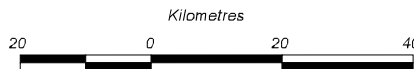
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 Tatura Centre 03 58335222  
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 Ref: HR58038

# Map 4

## Broad Vegetation Types – 1993, Goulburn Broken Catchment



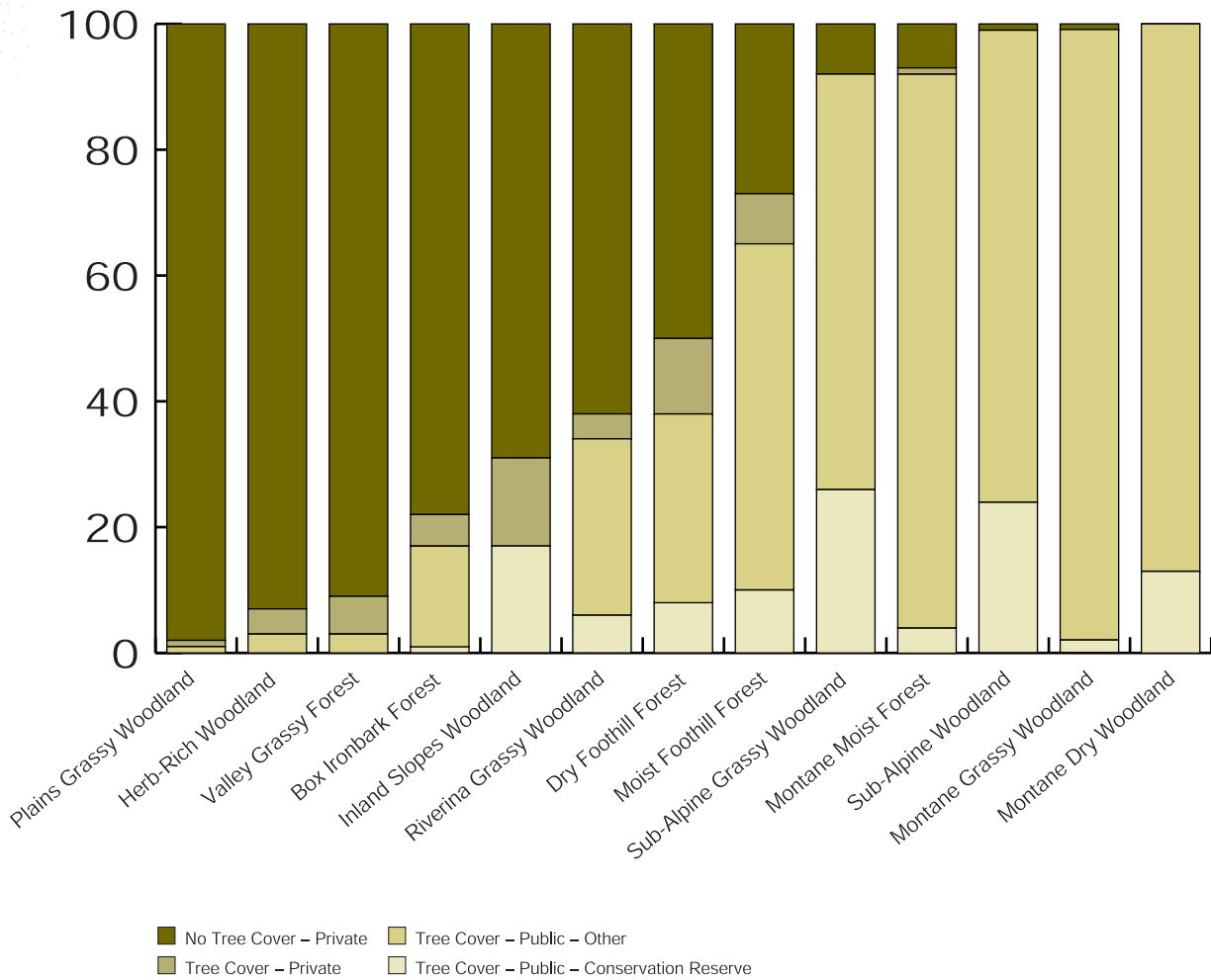
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**Figure 1: Broad Vegetation Types – percentage cover and reservation status, Goulburn Broken Catchment**









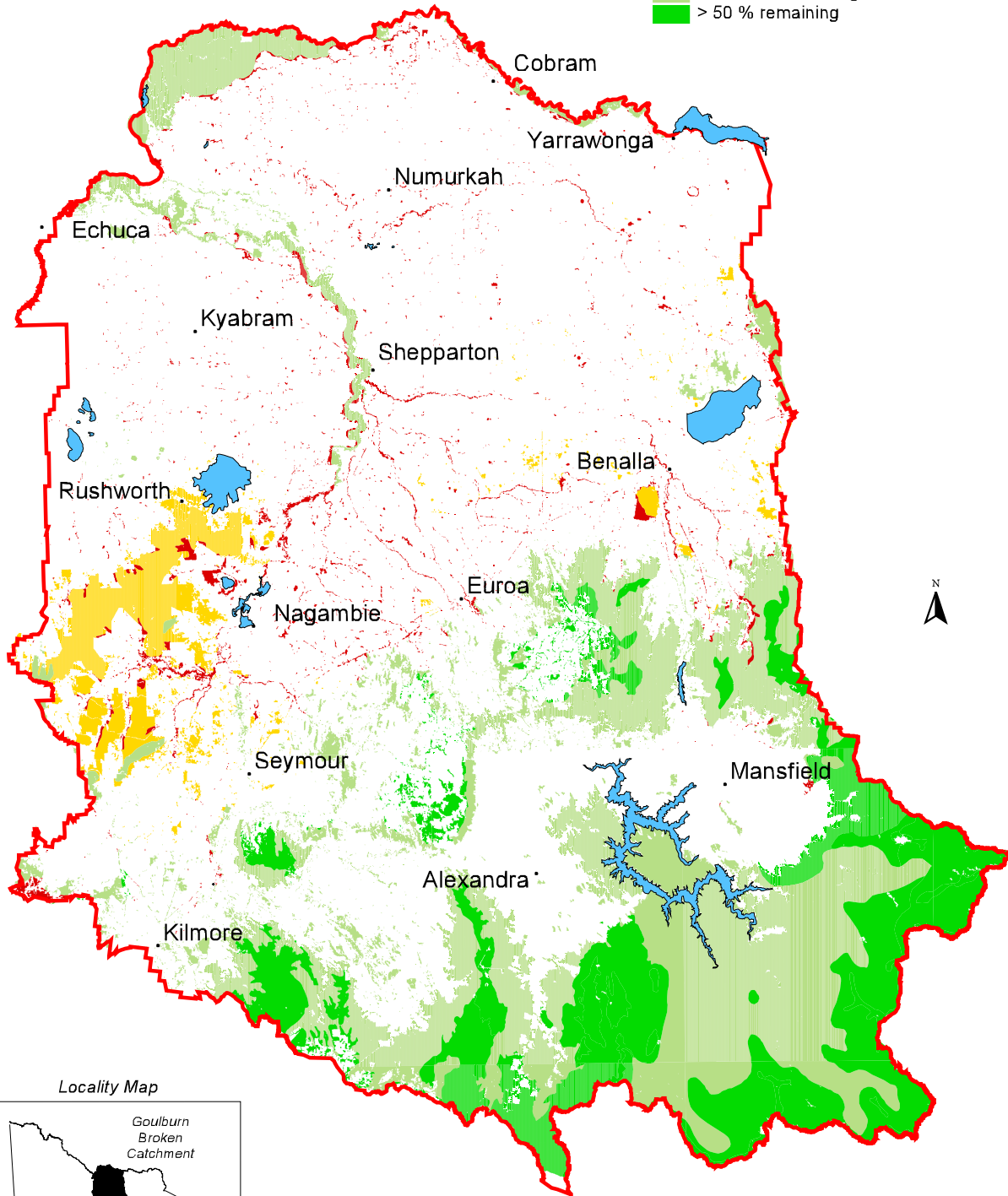
Shingle-back Lizard  
*Trachydosaurus rugosus*

# Map 5

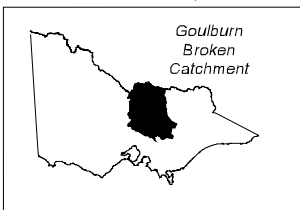
## Broad Vegetation Types – 1993, Classified by Depletion Level

### Goulburn Broken Catchment

-  Lakes
-  Goulburn Broken Catchment Boundary
- BVT Classified by Depletion level
-  < 10 % remaining
-  10 - 30 % remaining
-  30 - 50 % remaining
-  > 50 % remaining



Locality Map



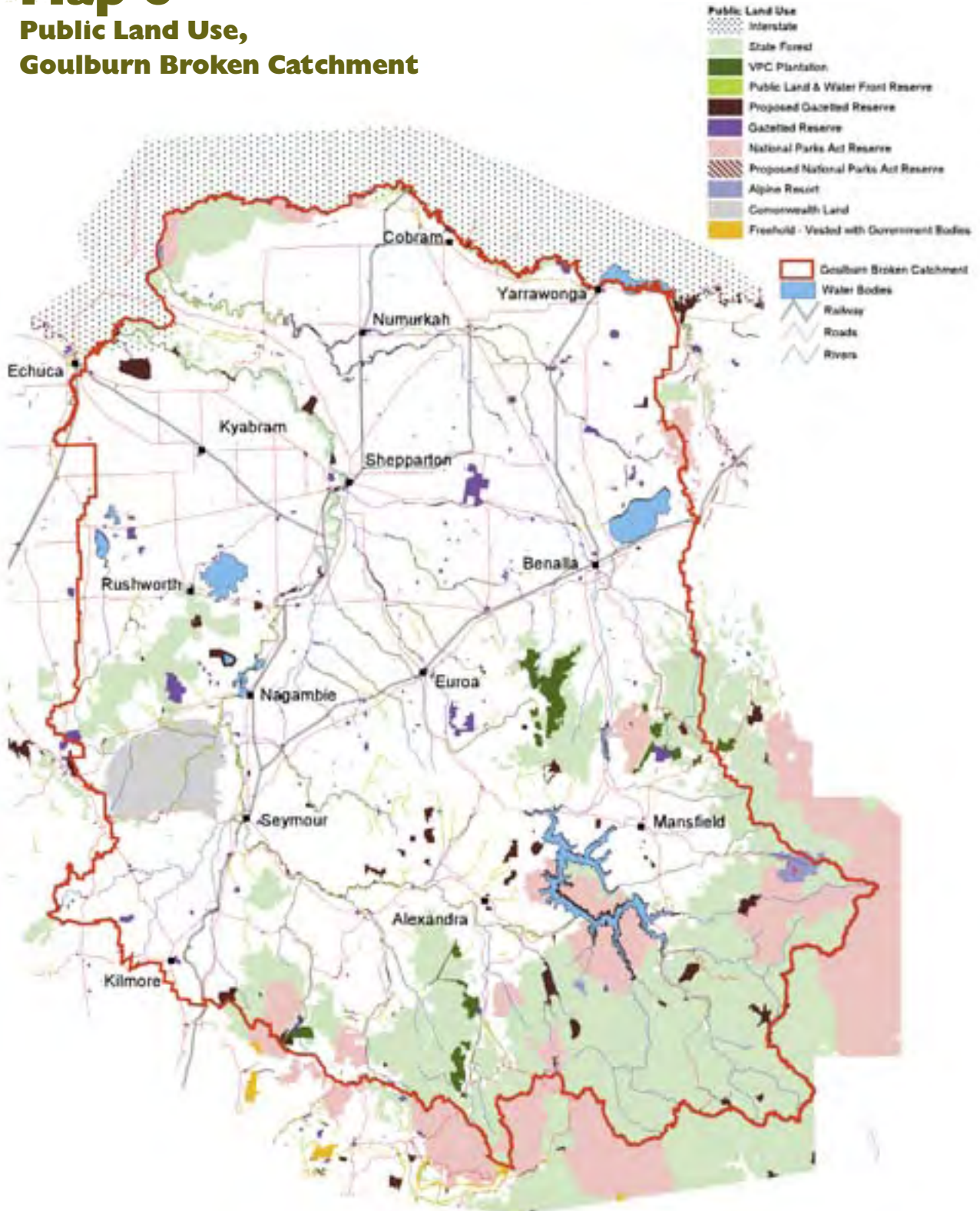
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# Map 6

## Public Land Use, Goulburn Broken Catchment



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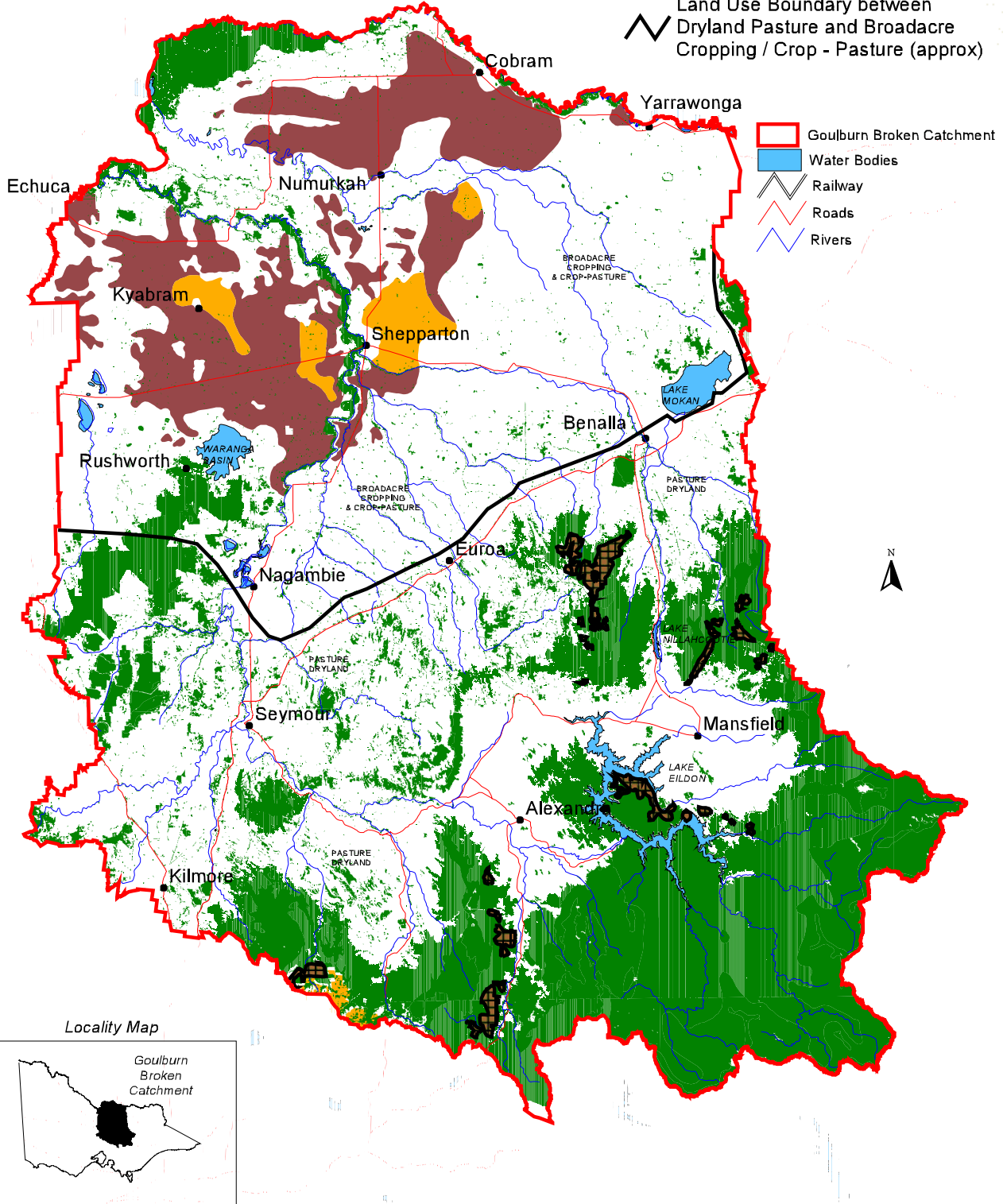
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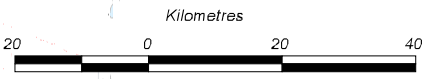
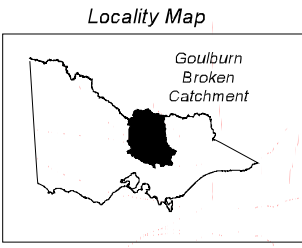
# Map 7

## Generalised Land Use, Goulburn Broken Catchment

- NATIVE VEGETATION
- CONIFER PLANTATION
- Land Use Classifications - 1988:**
- HORTICULTURE
- PASTURE IRRIGATED
- Land Use Boundary between Dryland Pasture and Broadacre Cropping / Crop - Pasture (approx)



- Goulburn Broken Catchment
- Water Bodies
- Railway
- Roads
- Rivers



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## 3 Our responsibilities: policies and legislation

Governments all over the world, at national and local levels, have developed legislation and adopted policies to respond to the urgent need to better manage native vegetation. This section highlights relevant biodiversity, greenhouse and vegetation initiatives. *Further details are given in Appendix 5.*

Victoria is signatory to several national agreements and strategies, including those in Figure 2.

### Victoria's Biodiversity Strategy

The goals for biodiversity management listed in *Victoria's Biodiversity Strategy 1997* are to ensure that within Victoria:

- there is a reversal, across the entire landscape, of the long-term decline in the extent and quality of native vegetation leading to a net gain with the first target being no net loss by the year 2001;
- the ecological processes and the biodiversity dependent upon terrestrial, freshwater and marine environments are maintained and, where necessary, restored;
- the present diversity of species and ecological communities and their viability is maintained or improved across each Bioregion;
- there is no further preventable decline in the viability of any rare species or of any rare ecological community; and
- there is an increase in the viability of threatened species and in the extent and quality of threatened ecological communities.

Directions in the *Biodiversity Strategy* include a range of motivational, voluntary, price-based, property-right and regulatory incentives for the conservation of biodiversity.

### Victoria's Greenhouse Action

The Premier recently launched *Victoria's Greenhouse Action: Responding to a Global Warning*, committing the Victorian Government to invest \$15 million a year over the next three years in initiatives which "reduce greenhouse gas emissions, enhance greenhouse sinks and manage the risks of climate change". The Government is investing \$9 million over the next three years in *Replanting Victoria 2020* to better understand and extend Victoria's greenhouse sink capacity. Approximately half this funding will be committed to funding revegetation programs across the State.

### Legislation

Recent legislation, such as the *Catchment and Land Protection Act 1994*, *Fisheries Act 1995* and the *Coastal Management Act 1995*, has taken an approach to natural resource management in which *partnerships* between the community, business and government are integral to their implementation.

The *Flora and Fauna Guarantee Act 1988* and the *Fisheries Act 1995* together provide a framework and management approach to the protection of biodiversity and the sustainable use of flora and fauna across the State.



The *Planning and Environment Act 1987* is critical to land use and development activities within Victoria. All councils in Victoria are finalising new format Planning Schemes under the Victoria Planning Provisions. The GBCMA may use the features of the new scheme to register its interests by:

- being a party to an enforceable agreement between the Council and a landowner;
- incorporating policy documents into schemes; or
- providing research and data to assist in the identification of zone boundaries and overlays.

Under the *Native Vegetation Retention Controls 1989* introduced into the State Section of the Planning Schemes of Local Government, a permit is required to remove, destroy or lop native vegetation (subject to some exemptions). Landholders and potential purchasers might not be able to proceed with their development plans if the land concerned has significant native vegetation values.

The Goulburn Broken Catchment has significant responsibilities towards maintenance of the health of the Murray Darling Basin. An aim of the Murray Darling Basin Commission’s *Natural Resources Management Strategy 1990* is to “ensure self maintaining populations of native species”. It relies on the community to lead and participate in planning and implementation of on-ground works and measures and to adopt natural resource management practices consistent with sustainable use.

### Goulburn Broken Catchment Management Authority

A number of programs have been planned and implemented in the Catchment since the 1980s. These programs include the *Shepparton Irrigation Region Land and Water Salinity Management Plan 1989* and subsequent *Strategic Plan 1995*, the *Goulburn Broken Dryland Salinity Management Plan 1989* and subsequent *Review 1996*, and the *Goulburn Broken Water Quality Strategy 1997*.

The GBCMA was established in 1997 to integrate and deliver land and water management programs in the Goulburn Broken Region. It has statutory functions including waterway management, floodplain management and regional drainage. In partnership with the State Government and the community, it is responsible for implementing, monitoring and reporting on the *Catchment Strategy*.

The GBCMA’s *Catchment Strategy* was developed as a requirement of the *Catchment and Land Protection Act 1994*



and was adopted by the GBCMA at its first meeting in 1997. Its objectives are to:

- consolidate existing Natural Resource Management Strategies;
- broaden existing strategies to cover identified gaps including weeds, biodiversity and catchment drainage;
- accelerate implementation through other funding sources;
- improve delivery of on-ground works; and
- improve viability of catchment landholders.

The *Catchment Strategy* lists declining biodiversity as one of four “absolutely central” physical issues. Broad Vegetation Types requiring “sensitive planning and management include Grassy Woodlands, Box-Ironbark Forests, Valley Grassy Forest and Dry Foothill Forest”. Our broader, evolving understanding of ‘biodiversity’ suggests that issues other than nature conservation, especially the interface between agricultural practices and the ecosystem processes that support their sustainability, need to be addressed over time. The Mission of the Goulburn Broken Catchment Management Authority is:

*To ensure the sustainable development of natural resource-based industries, the protection of land and water resources and the conservation of natural and cultural heritage.*

*Opposite page from left:*

Moss beds and open heath of alpine high plains.  
Kangaroo Grass *Themeda triandra* as native pasture.

Moist foothill forest.

*This page:* Tawny Frogmouth *Podargus strigoides*.



**Figure 2: Legislative and Policy Context, Goulburn Broken Native Vegetation Management Strategy**

