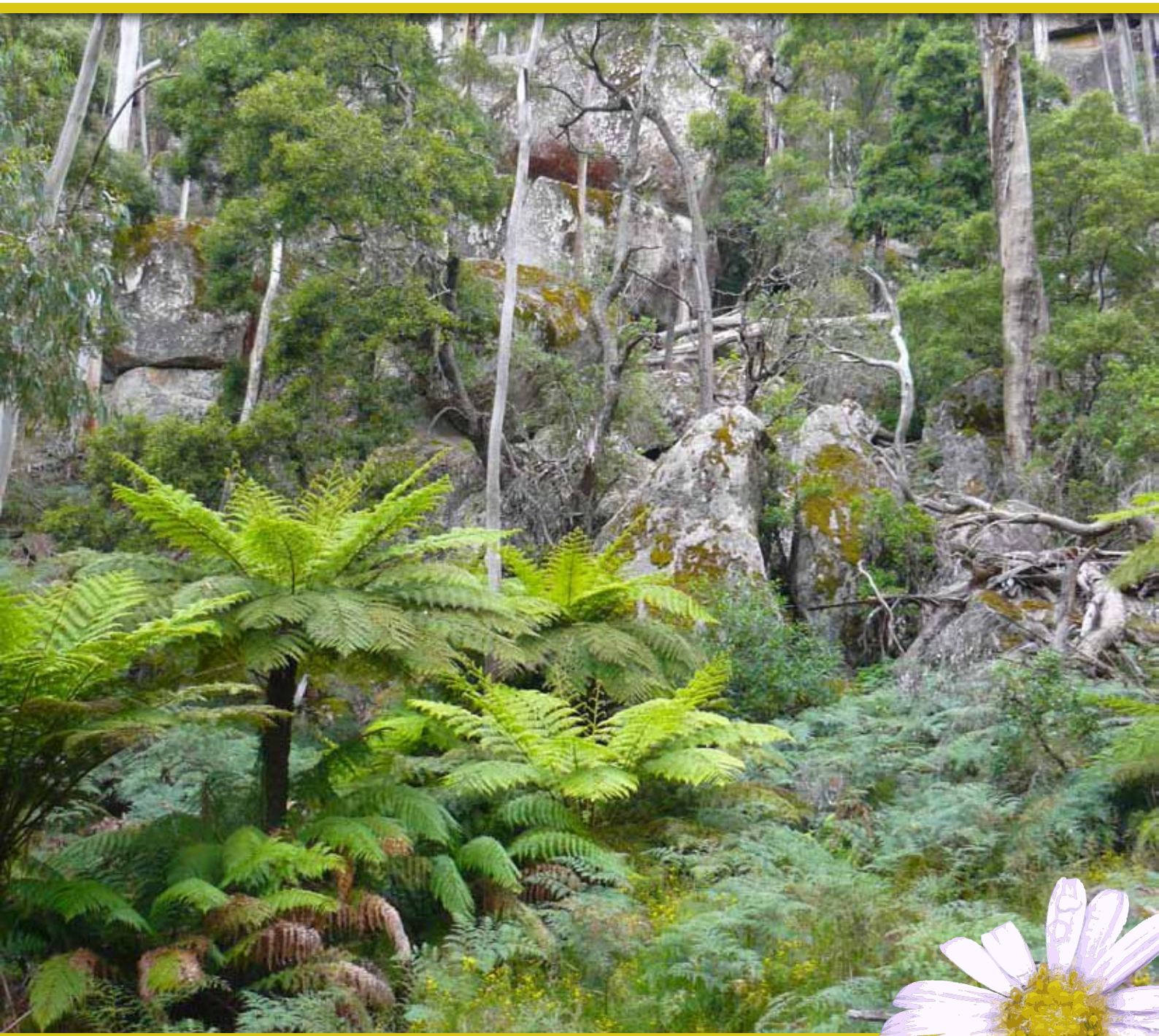
Conservation Values of the Mount Cole & Pyrenees Landscape

An assessment by The Wilderness Society, Ballarat Environment Network, Wombat Forestcare and Bendigo and District Environment Council



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Contents

1.0 Introduction and Overview 4
2.0 Ecological Processes 8
3.0 Native Vegetation Types 12
4.0 Flora 19
5.0 Fauna 22
6.0 Public Land Management 26
7.0 Conservation Management on Private Land 37
8.0 Rebuilding Landscape Connectivity and Ecosystem Resilience 39
References 44
Appendix One: Indigenous Flora in the Landscape Zone 46
Appendix Two: Indigenous Vertebrate Fauna in the Landscape Zone 55
Appendix Three: Non-Indigenous Plants and Weeds in the Landscape Zone 57
Appendix Four: Key Information for Significant Fauna 60

1.0 Introduction & Overview

"Australia's got to make a choice: how much more biodiversity does it want to lose? At the moment we're losing biodiversity as fast as we've ever lost it."

– Professor Hugh Possingham, University of Queensland Centre for Ecology, ABC Radio, 17/12/05

1.1 Victorian Context

Victoria is the most cleared state in Australia. Since European settlement 24 fauna and 51 flora species have become extinct. Currently 44 per cent of native plants and 30 per cent of native animals are listed as extinct or threatened in Victoria (Department of Sustainability and Environment 2009).

Nearly 80% of Victoria is considered fragmented. In fragmented areas there has been 'widespread removal and ongoing use of vegetation of native vegetation for economic development. Here the 'underlying stock' of native vegetation is generally considered to be declining or at risk of decline; degradation and the recovery from degradation are the dominant drivers' (Victorian Environment Assessment Council 2010).

On private land, 80% of native vegetation has been cleared. Due to this preferential clearing of more fertile areas, sixty per cent of the native vegetation types that remain on private land are classified as threatened (Commissioner for Environmental Sustainability Victoria 2008).

The most recent Catchment Condition Report concluded that the ecosystems underpinning Victoria's catchments and human livelihood are under continuing stress and decline, and the number of threatened species listed is still increasing (Victorian Catchment Management Council 2007). Victoria also has the highest proportion of sub-bioregions in Australia considered to be in poor landscape condition (CES 2008).

Despite this disturbing record native vegetation is still being cleared and what remains is declining in quality (DSE 2008). Evidence also suggests that the full impacts of past habitat loss and fragmentation have yet to occur, even from clearing that occurred many decades ago (Victorian Environment Assessment Council 2010).

All this combined with the looming threat of climate change means a very uncertain future for the health of Victoria's biodiversity. This is highlighted by recent research in northern Victoria that found a dramatic loss of woodland bird species over the last 15 years largely due to the impacts of climate change (McNally et al 2009).

1.2 The Mt Cole/Pyrenees Landscape Zone

The Mt Cole/Pyrenees Landscape Zone is located in west central Victoria, and is shown on Map One. The landscape zone is approximately 3,000 square kilometres (50km wide on the east-west axis and 60km long on the north-south axis). The Mount Cole and Pyrenees Ranges are abrupt features on the landscape at the western limits of the Great Dividing Range. The rainfall is mostly between 600-800mm, with smaller areas above 800mm on the divide and below 600mm in the north-west. Average daily mean temperature is 15-21◦C.

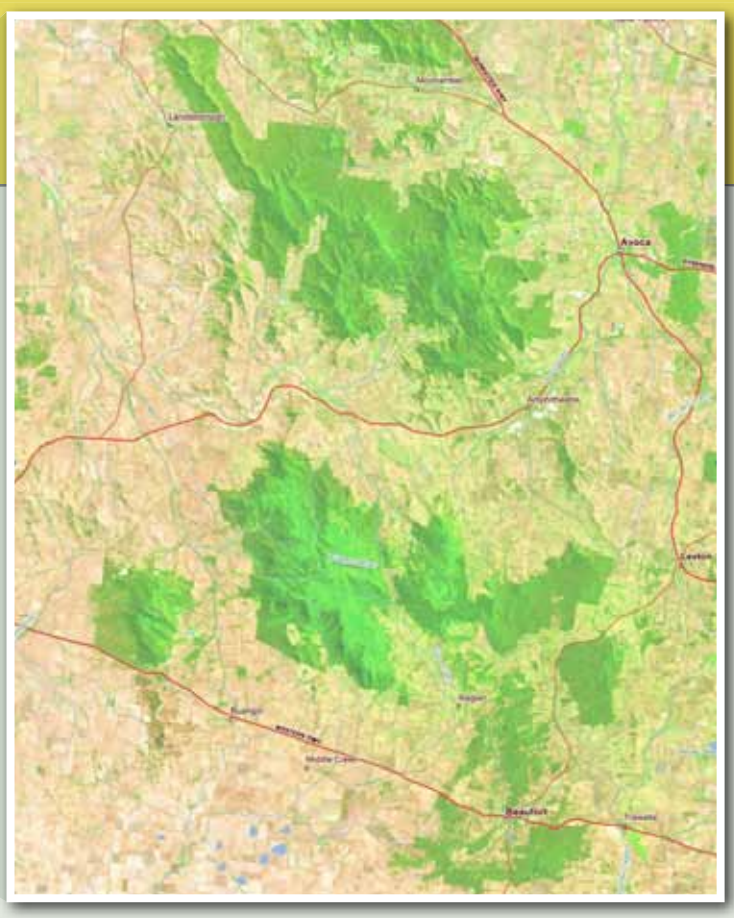
The Goldfields, Central Victorian Uplands and Victorian Volcanic Plain bioregions are the dominant bioregions in the Landscape Zone. A Bioregion is an area with similar ecological, geographical and geological characteristics and provide a natural boundary for regional scale biodiversity planning and management.

The Goldfields bioregion dominates the northern part of the landscape zone and is characterised by a series of low hills and rolling plains, mainly sedimentary in origin. Metaphoric and old volcanic rocks form rugged slopes and ridges. The bioregion has relatively poor soils and uncertain rainfall.

The Central Victorian Uplands bioregion dominates the central part of the landscape zone and is characterised by gently undulating terrain with occasional steeper slopes, ridges and peaks. The geology comprises Palaeozoic sediments transformed and extruded by igneous activity and raised by movements of the earth. Little geological activity has occurred since except erosion subduing the topography, exposing the granitic and associated metamorphic outcrops, and forming outwash fans of sediment.

The Victorian Volcanic Plain bioregion dominates the southern part of the landscape zone and is characterised by extensive flat plains formed by volcanic lava flows and ash. Stony rises, eruption points, extinct craters and shallow lakes are scattered throughout the bioregion.

A diverse range of grassland, woodland and



Map 1.1: The Mount Cole/Pyrenees Landscape Zone (Source: DSE Geospatial Data)

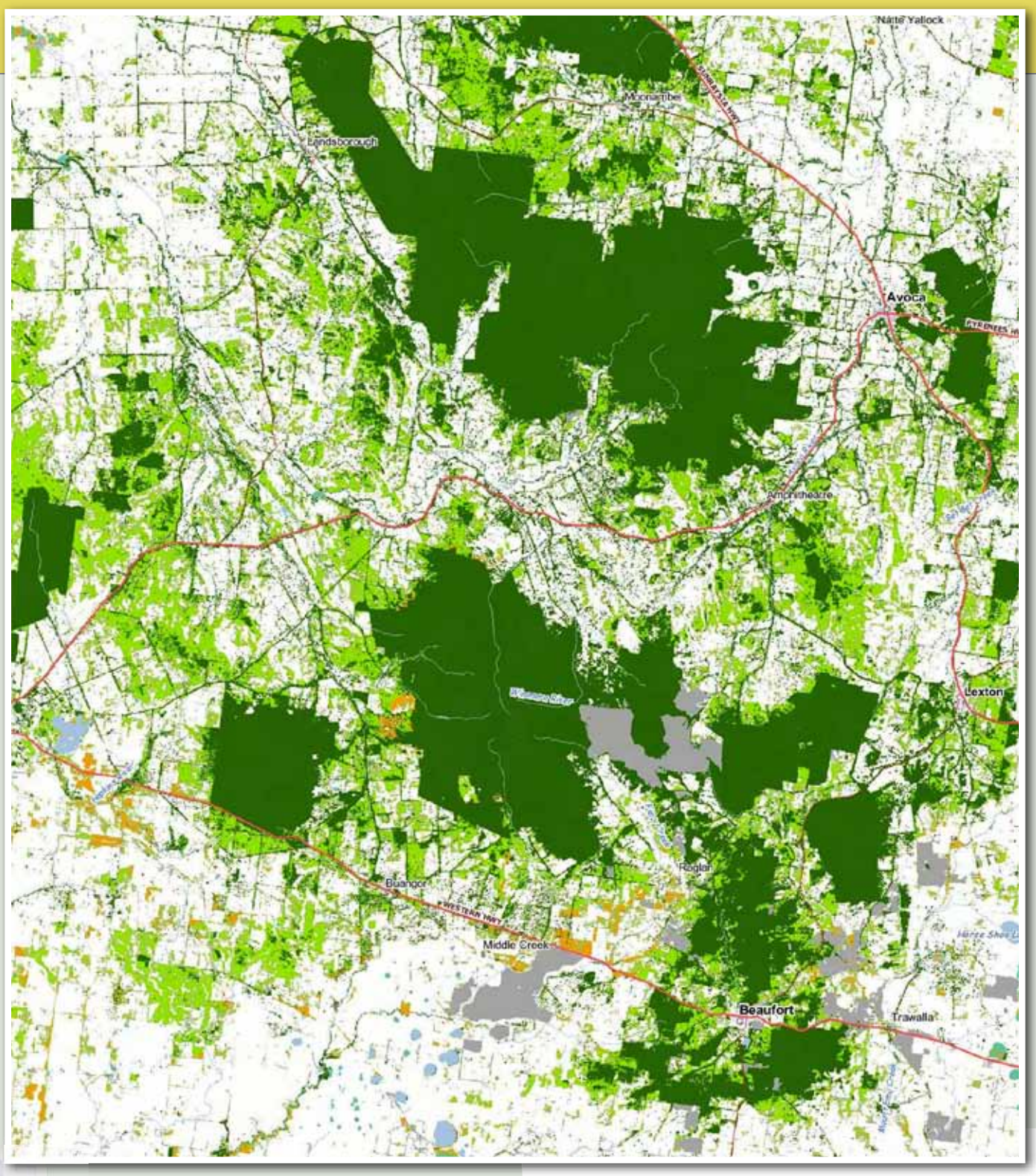
forest vegetation types occur in the landscape zone. Wildlife in the area reflects this diversity of vegetation types and includes a wide range of bird, mammal, reptile, amphibian and invertebrate species. Grasslands and grassy woodlands are the two most threatened ecosystems in Australia (Lindenmayer and Burgman 2005, Tzaros 2006).

Overall the Landscape Zone has moderate levels of native vegetation with approximately 45% tree cover. However, the extent of vegetation clearance varies widely within the landscape zone. In the south the flatter volcanic plains have been highly modified and very little original vegetation remains. The foothills and hills of the Central Victorian Uplands and Goldfields bioregions have retained high vegetation cover, mostly on public land in larger blocks. The more fertile valleys and flatter areas of these bioregions have been extensively cleared and vegetation is highly fragmented.

The Mt Cole/Pyrenees Landscape Zone falls within the boundaries of three Catchment Management Authorities (CMAs) – the Wimmera, North Central and Glenelg-Hopkins. In 2011 the current CMAs will be amalgamated and replaced by larger Natural Resource and Catchment Authorities (NRCAs). Following this the Landscape Zone will be covered by three NRCAs – the Western Districts, Wimmera-Mallee and Northern Rivers NRCAs.

The Landscape Zone also falls within the boundaries of three Local Government Areas – the Pyrenees Shire, Ararat Rural City and Shire of Northern Grampians. Local government plays an important role in planning related to private land and also manages a range of public land.

Map 1.2: Bioregions in the Landscape Zone (Source DSE Geospatial Data)



Map 1.3. Vegetation Extent in the Landscape Zone (Source: DSE Geospatial Data)

Native Vegetation

- *Highly likely native vegetation - grassy*
- *Highly likely native vegetation - structurally modified*
- *Highly likely native vegetation - woody*
- *Possibly native vegetation*
- *Wetland habitat*
- *Unlikely to support native vegetation*
- *Exotic woody vegetation*
- *Artificial impoundment*

Other public land in the Landscape Zone is managed by the Department of Sustainability and Environment (DSE) and Parks Victoria. or leased by the Crown.

1.3 Objectives of the Report

The report is based on WildCountry Science principles, outlining key ecosystem processes and key biodiversity assets, and identifying threats to each. The overall objective of the report is to promote long term conservation in the Landscape Zone including the establishment of a network of protected areas. The report aims to:-

1. Document the extent and condition of natural values in the Landscape Zone.

2. Identify key ecological processes operating in the Landscape Zone and region.

3. Identify key threatening processes to the ecological integrity of the Landscape Zone.

4. Identify areas within the Landscape Zone that have a high potential to rebuild landscape connectivity and to restore landscape resilience.

1.4 Past and Current Land Use in the Mt Cole/Pyrenees Landscape Zone

As demonstrated by the current use of indigenous names for local areas, known archaeological sites and the usage of local species for food and tools, Aboriginal associations with the area date back many thousands of years. The land sustained a lifestyle that serviced basic needs and supported a rich cultural life.

The Mt Cole/Pyrenees Landscape Zone sits at the confluence of four aboriginal language groups – the Dja Dja Wurrung in the north-east, the Watha Wurrung in the south-east, the Djab Wurrung in the south-west and the Jardwadjali in the north-west. Within this a larger number of clan groups occupied various parts of the area. For example Mount Cole or 'Bereep-bereep' was home to the Beeripmo balug clan and The Pyrenees or 'Peerick' was home to the Curvac bulug clan.

Major Thomas Mitchell traveled through the region in 1836 and named the Pyrenees Ranges. He was quickly followed by pastoralists and squatters who cleared the more fertile valleys and plains of native vegetation for the expanding pastoral industry.

Some areas less suitable for agriculture remained with the Crown. In these steeper and more infertile areas, timber harvesting increased dramatically after 1854, when gold was discovered. Gold mining saw a wave of immigration and localised areas cleared and stripped of topsoil.

Over the ensuing decades many areas were heavily logged, including Mt Cole where harvesting eventually ceased in 1904 when virtually all available timber had been cut. Logging recommenced in the Mt Cole and other areas in the 1940s and continued until recently when over harvesting has again led to the cessation of logging. Areas of crown land were also grazed by stock, in some cases until relatively recently.

Other major settlement periods included two waves of soldier settlers after each World War. Currently about 80 per cent of the Landscape Zone is private land. The predominant land use of private land is still agriculture, mostly grazing. Over the last few decades a large number of vineyards have also been established in the region. In more recent times there has been an upsurge in small acreages purchased as lifestyle blocks, reflecting a degree of change in the demographics of the regions landowners. This has resulted, and will continue to result, in broader mix of land uses in the area. An anticipated increase in Victoria's population to six million people by 2020 will further drive land use change (Commissioner for Environmental Sustainability Victoria 2008)..

Approximately 20 per cent of the Landscape Zone is public land. The public land estate is comprised of Parks, Reserves, State Forests and Bushland Reserves. The main land use on public land is apiculture, conservation, recreation and forestry. Of this public land approximately five per cent is devoted to conservation purposes. These larger areas of native vegetation play a critical role in the maintenance of ecological processes across the region and provide vital habitat for large number of native species, including many threatened species.

2.0 Ecological Processes

2.1 Ecological Processes

Ecological processes are the fundamental mechanisms that create and maintain natural ecosystems. They include climatic processes, hydrological cycles and interactions between species (Soule et al 2004, McGregor et al 2008). Maintaining these inter-related processes is essential for sustaining all life now and into the future.

Ecological processes that provide a benefit to humans are referred to as 'ecosystem services'. These include a stable climate, clean air, pest control and pollination. In the USA, the value of ecosystem services provided by insects alone, in the form of pollination, pest control and nutrient recycling, was valued at approximately US $57 billion per annum (Commissioner for Environmental Sustainability Victoria 2008).

Currently ecosystem management in Victoria is focused on a single species approach i.e. protecting and managing individual key biodiversity assets, such as threatened species and threatened vegetation types. However, 'actions that focus solely on particular species, vegetation communities, habitats or sites are unlikely to be effective unless the ecological processes that support these 'assets' are sustained' (McGregor et al 2008).

It is therefore necessary to focus our efforts on protecting and maintaining ecosystems, ecological processes and minimising the loss of biodiversity. Building ecosystem resilience will be vital to ensure that ecosystems have the best chance of adapting to climate change as it occurs (Victorian Environment Assessment Council 2010). However, it should be recognised that there are considerable knowledge gaps in relation to how ecosystems, and particular ecosystem components, function across Victoria and at a continental scale.

Table 2.1 Key Threats to Ecological Processes
• Climate change
• Loss, fragmentation and degradation of habitats
• Alterations to hydrological flows and reduction in aquatic connectivity
• Unsustainable harvesting of natural resources
• Pest plants and animals
• External inputs eg fertiilisers and irrigation
Adapted from Bennett et al 2007.

2.2 Key Threats to Ecological Processes in the Region

Human use of the environment has resulted in a range of threats to other species and ecosystems. These threats modify the function of some or all ecosystem processes. The key threats to ecological processes in Victoria are outlined in Table 3.1.

2.3 Key Ecological Processes in the Region

A wide range of information points to many ecological processes being severely disrupted across Victoria (McGregor et al 2008). Although the Landscape Zone has a relatively high vegetation cover, it is not immune to the disruptions to ecological processes that occur across the wider region. At a regional level, the North Central and Glenelg-Hopkins CMAs are in the poorest overall landscape condition of all CMAs within Victoria (Victorian Catchment Management Council 2007). The condition of key ecological process within the region and Landscape Zone is discussed below.

Climatic Processes

Climatic processes are a major influence on the composition and geographic distribution of plant and animal species and communities. Biodiversity has been identified as the global sector that is most vulnerable to climate change, with inevitable but uncertain effects (Victorian Environment Assessment Council 2010). Climatic processes also have a fundamental impact on human society.

Over the past 6000 years Victoria's climate has been relatively stable (Gell 2009). However, the vast majority of scientists agree that global warming is occurring, and that it is caused by human activity (IPCC 2007). In south-eastern Australia there has been a shift or step change in climatic patterns since 1997 with a 1°C increase in summer temperatures and a 15% reduction in rainfall (Jones 2009). Melbourne recently experienced 123 days above 20°C in a row, easily breaking the previous record of 78 days in 2001. Over the last decade there has also been a 50% reduction in autumn rainfall and a 10-15% reduction in spring rainfall (McAlpine 2009 et al).

It is likely that the flora and fauna of the region are already suffering from the impacts of climate change. Crashes of woodland bird populations have occurred in northern Victoria over the

Map 2.1: Index of Stream Condition in the Landscape Zone (Source: DSE Geospatial Data)

last 15 years due to the reduced rainfall being experienced as a part of climate change (McNally et al 2009, Birds Australia 2009). This would also reflect reductions in invertebrate populations.

Future climate change will only exacerbate these trends, further disrupting natural rainfall patterns, causing more frequent and severe wildfires, and producing an even hotter climate (IPCC 2007). Temperatures in southern Australia are expected to increase a further 1-5°C by 2070 depending on the level of emission reductions that are put in place (IPCC 2007).

Research undertaken by the North Central CMA into the impact of climate change points to major shifts in the ranges of ecosystems and species in the region (Parkes et al 2010). Species under greatest threat include those that have small geographical distributions, limited ability to disperse, low ecological tolerances, low genetic variation, long generation times and specialised requirements (DSE 2010, Victorian Environment Assessment Council 2010). This includes herbivorous possum species which are common in the Landscape Zone (Menkhorst 2009).

However, the capacity of species to adapt to climate change is limited by habitat fragmentation, pest species and inappropriate fire regimes (Mackey et al. 2007). Areas in the region with higher rainfall and at high elevations, such as the Mt Cole Range, may act as refuges for species from northern Victoria that are forced to move south as the climate warms. The Landscape Zone also has a very wide variation in climate and a relatively high level of vegetation extent, which may provide some resilience to climate change.

Hydrological Processes

Hydrological processes drive a range of key ecosystem functions, including the maintenance of riparian and wetland habitat, water tables and salinity, and groundwater systems that feed base river flows and springs in the area. The importance of native vegetation in maintaining hydrological processes is illustrated by the devastating impacts of rising water tables and salinity caused by widespread clearing.

Three major rivers have their headwaters in the Landscape Zone – the Avoca River flowing to the north, the Wimmera River flowing to the north west and the Hopkins River flowing to the south. Based on stream flow, water quality, physical form, riparian zone condition and aquatic life, all these rivers have less than 10% of stream lengths in good to excellent condition (ISC assessment 2004).

This reflects a very poor overall catchment condition and large degree of modification of the surrounding environment, especially the extent of clearing of native vegetation that has occurred (Victorian Catchment Management Council 2007), and reductions in hydrological flows through dams and water extraction. There is little information available on the extent and condition of groundwater input, springs and recharge areas for the Landscape Zone.

Primary Productivity

Primary productivity encompasses energy flows through ecosystems, including the formation of physical habitats, such as vegetation, tree hollows, flower and nectar production and leaf litter accumulation

Productive parts of the landscape have been disproportionately cleared or heavily modified for

Table 2.2 Key Potentially Threatening Processes to Rivers and Streams in Victoria
• Alteration to the Natural Flow Regimes of Rivers and Streams
• Degradation of native riparian vegetation along Victorian rivers and streams
• Increase in Sediment Input to Rivers and Streams Due to Human Activities'
• Input of toxic substances into Victorian rivers and stream
• Introduction of Live Fish into Waters Outside their Natural Range
• Removal of Woody Debris from Victorian Streams
• Prevention of Passage of Aquatic Biota as a Result of the Presence of Instream Structures
• Wetland loss and degradation as a result of changes of water regime, dredging, draining, filling and draining
Source: Victorian Flora and Fauna Guarantee Act 1998.

agriculture. The high loss of vegetation from these areas, such as fertile valleys, flat terrain with rich soil and river flats, is apparent at all scales from the bioregional level to vegetation types. For example, vegetation types (EVC groups) associated with fertile valleys and riparian areas have less than 20% original vegetation remaining, while EVC groups associated with slopes, escarpments or poor soils have more than 70-90% of original vegetation remaining (Victorian Environment Assessment Council 2010).

Native fauna that were characteristic of these productive parts of the landscape have also been disproportionately depleted and a high proportion are threatened (Victorian Environment Assessment Council 2010). These fertile agricultural landscapes were also the most productive for native plants and animals in terms of abundance and distribution, and the widespread loss native vegetation from these areas may have affected a range of ecological processes.

Research indicates that the loss of vital seasonal food resources from these fertile areas, such as winter and spring flowering species like Silver Banksia (Banksia marginata) and Grey Box (Eucalyptus microcarpa), have potentially lead to a major effect on plant pollination at a much wider ecological scale (Paton 2009). These plant species, were also prevalent in some parts of the Landscape Zone.

Ecologically mature trees also play a very important role in both box-ironbark and foothill forest ecosystems (Environment Conservation Council 1997). However, due to widespread clearing on private and public land, large old trees now mostly only remain on roadsides, or in small remnants or as paddock trees on private land.

Many native fauna species in the Landscape Zone are highly dependent on hollows, which are most commonly found in large old trees, mostly over 150 years old (McGibbon and Lindenmayer 2005). Nectar also plays a prominent role in Box-Ironbark ecosystems, and is reportedly produced in greater abundance by older trees (Environment Conservation Council 1997). The loss of these key habitats and resources may have also severely disrupted a range of ecosystem processes in the Landscape Zone.

Interactions between Species

An extremely complex web of interactions between species plays a crucial role in the function of ecosystems. These interactions include competition for resources, symbiotic relationships, predator/prey relationships, plant pollination and seed dispersal. Information on the interactions between species is lacking for many species or ecosystems across Victoria.

However, it is likely that species interactions have been extensively disrupted in the Landscape Zone by a range of threatening processes. For example, vegetation clearance and fragmentation on private land, altered fire regimes on public land, loss of hollow bearing trees on all land types and introduced species.

In woodlands and forests of the Landscape Zone, Honeyeaters and arboreal mammals play a vital role in plant pollination (Paton 2009, Environment Conservation Council 1997). However, the impacts on these species from the loss of hollow and large old trees are unknown. The loss of top predator species, such as the Dingo and Spot–tailed Quolls, may have also lead to imbalances in the numbers of other species.

A range of ground dwelling mammal species, such as the once widespread Southern Brown Bandicoot, small macropods and native rodents, may have played a very important role in soil

health and recycling of nutrients, through burrowing or digging for food and nests. However, introduced predators and competition with rabbits and stock, has lead to the regional extinction of a number of species that were once common in the area. Swamp Rats were once found in southern parts of the Pyrenees Ranges but are now absent (Menkhorst 2009).

Movements of Organisms

The movement of animals and the seeds of plants are also critically important for a range of ecosystem processes and functions within the Landscape Zone. These include genetic diversity within species, the dispersal of young, the colonisation of new territory (including in response to climate change).

Detailed information on the movement patterns of many fauna and flora species in Victoria, including the Landscape Zone, is lacking. However, it is likely that the movement patterns of a many species in the Landscape Zone have been disrupted by a range of threatening processes. For example, vegetation clearance and fragmentation on private land, altered fire regimes on public land, the loss of large old trees on all land types, water extraction from rivers, damming of streams and introduced species. Roads and a range of other infrastructure further contribute to the fragmentation of the landscape.

Evolutionary Processes

Evolutionary processes, such as natural selection, the maintenance of genetic diversity and speciation (the development of new species), are ongoing processes that provide the potential for the development of life and the capacity for species to adapt to changing environmental conditions. Ecosystems have adapted to past changes in climate, volcanic activity and continental drift.

To allow evolutionary processes to continue, especially in the light of climate change, actions to maintain biodiversity should consider '...the conditions necessary for continuing evolution, particularly the potential for adaptation to changing environmental conditions and for speciation' (Frankel and Soulé 1981). In the Landscape Zone disruptions to evolutionary processes are occurring through a range of threatening processes, including climate change, vegetation clearance and fragmentation, the extinction of native species, and altered fire regimes.

Although they play a very important role, refugia are only rarely considered in conservation assessment and planning (Mackey et al. 2007). Refugia are areas that enable species to maintain their presence in landscapes during periods of detrimental change in the surrounding landscape. Refugia will play a very important role for the maintenance of biodiversity during climate changes.

Natural Disturbance Regimes at Local and Regional Scales

Natural disturbance regimes refer to the frequency and intensities of natural events, such as fire and floods, that occur in an area. They play a very important role in the composition and maintenance of ecosystems, influencing plant germination, fish spawning and the flows of water into ephemeral wetlands and floodplains.

Key natural disturbance regimes that operate in the Landscape Zone include wildfire, flooding and grazing by native animals. It is also possible that plant diseases such as Armillaria played a localised role, for example around Mount Cole.

Natural disturbance regimes have been severely disrupted or altered in the Landscape Zone. In agricultural areas, many smaller remnants now lack the capacity to maintain natural disturbance regimes. On public land, social pressures may be leading to the landscape being burned too frequently.

There is need to identify appropriate fire regimes (fire frequency, season, size and spatial arrangement in the landscape) that benefit the vast majority of native flora and fauna of the region, especially threatened species and ecosystems. There has been a range of research into the impacts of fire on native flora in Victoria, however much more research is required with native fauna (Clarke 2008).

3.0 Native Vegetation Types

3.1 Pre 1750 Vegetation of the Mount Cole/Pyrenees Region

Prior to European settlement the Landscape Zone contained a diverse range of wet and dry forest, woodland and grassland native vegetation types. Twenty four Ecological Vegetation Classes (EVCs) have been mapped for the area, with these EVCs forming a complex mosaic across the landscape, depending on variations in rainfall, altitude, aspect, underlying geology, soil fertility, water holding capacity and topography (see Map 3.1).

The flat Victorian Volcanic Plains bioregion dominates the south of the Landscape Zone. Plains Grassland was widespread with small pockets of Rocky Outcrop Shrubland/Rocky Outcrop Herbland/Grassy Dry Forest Complex and Grassy Wetland.

Rising from the plains the foothills of the Great Divide forms part of the Central Victorian Uplands bioregion. The divide runs largely in an east-west direction, with a wide valley separating the Mt Cole and Pyrenees Ranges, towards the centre of the Landscape Zone. Wet and dry foothill forest types occurred along the Mount Cole Range. Wet Forest occurred in very high rainfall areas and Riparian Forest in wetter gullies. Both these EVCs supported a dense multi-layered forest. Small areas of Snow Gum Woodland occurred on the highest peaks of the divide.

On the more fertile and higher slopes of the foothills of the Mount Cole Range and the southern side of the Pyrenees Ranges, Herb-rich Foothill Forest dominated. Common overstorey trees included Blue Gum, Messmate, Manna Gum, Narrow Leaf Peppermint and Candlebark. The understorey was grassy and herb-rich, with sparse shrubs.

On more sheltered sites on the mid and lower slopes of the foothills in the south of the Landscape Zone and on the upper slopes and ridge tops of inland hills in the north of the Landscape Zone, Grassy Dry Forest was very widespread with common overstorey trees including Messmate, Blue Gum and Candlebark. Small pockets of Valley Grassy Forest occurred in more sheltered valleys, creek flats and valley heads, with Yellow Box and Long leaf Box common. Native grasses, herbs and sparse shrubs were a feature of the understorey of both EVCs.

At the top of the Pyrenees Range, the foothills of the Central Victorian Uplands merge with the inland hills and slopes of the Goldfields bioregion.

The upper slopes and ridge tops in the inland hills and lower slopes of the foothills, supported Heathy Dry Forest and Grassy Woodland/Heathy Dry Forest Complex. Common overstorey species included Messmate, Broad-leaf Peppermint, Scent-bark, Yellow Box, Candlebark, Red Stringybark and Red Box. A diverse understorey of shrubs, grasses and herbs were a feature of the understorey.

In the north east of the Landscape Zone, the lower lying valleys and plains, with more fertile soils and better water availability, mostly supported woodlands with grassy or herb-rich understorey.

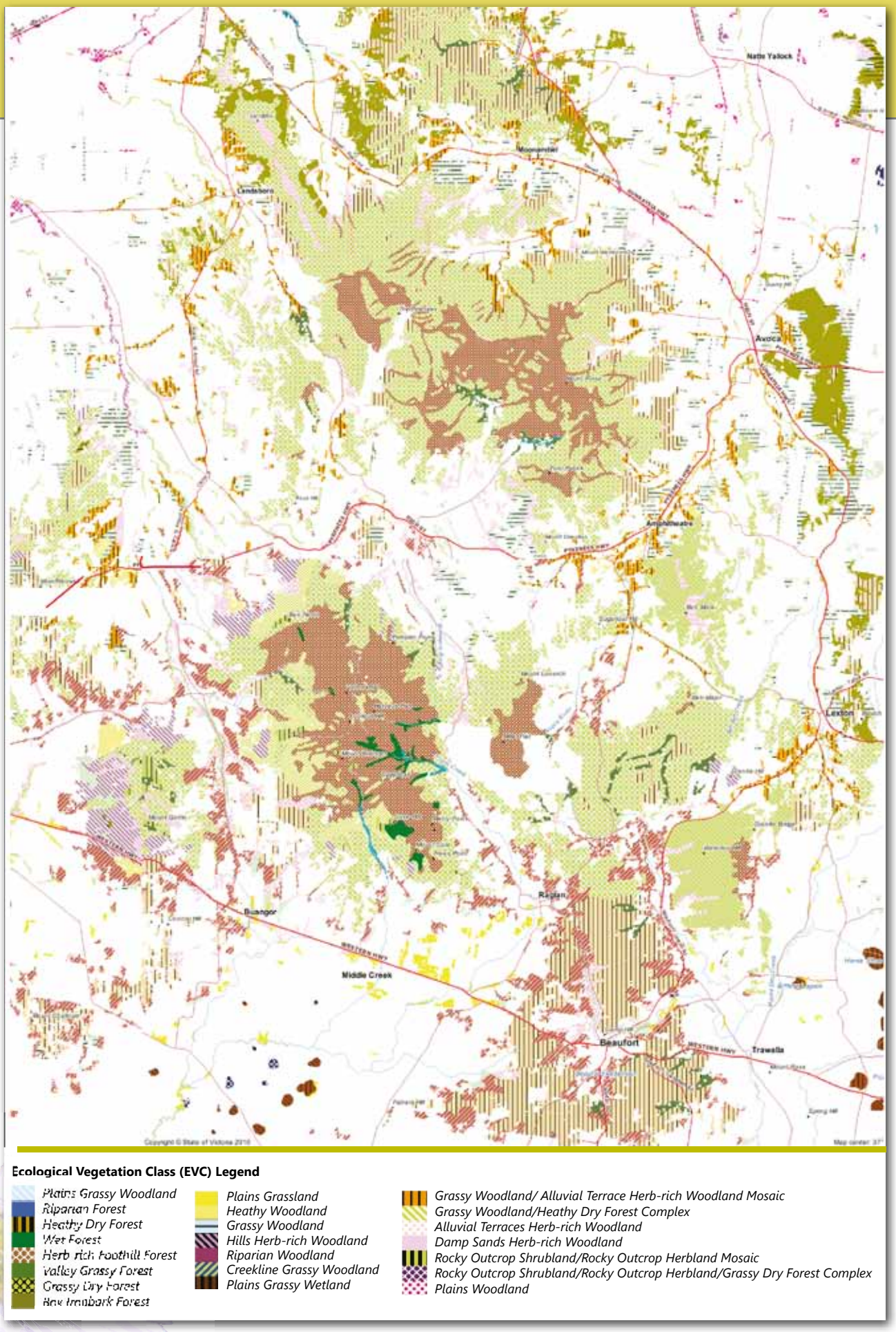
Alluvial Terraces Herb-Rich Woodland occurred on the lower slopes, drainage lines and old alluvial plains of gently undulating landscapes. In the broader and flatter areas adjacent to rivers, minor streams and drainage lines, Grassy Woodland/Alluvial Terraces Herb-Rich Woodland, Grassy Woodland and Plains Woodland were dominant. Overstorey species in these EVCs included Grey Box, Yellow Box, Yellow Gum and Red Gum. The understorey was comprised of grasses and native herbs.

Creekline Grassy Woodland occurred in linear strips along ephemeral drainage lines and smaller intermittent creeks, with a Red Gum overstorey. Box-Ironbark Forest was mostly found on gently undulating and lower slopes with poorer soils and water-holding capacity. The main overstorey trees were Red Ironbark, Grey Box, Yellow Gum and Red Box. Heathy Woodlands occurred as small patches in association with Box Ironbark Forest on low fertility sands and gravels on undulating plains, rises and low hills. Common overstorey trees included Long Leaf box, Yellow Gum and Red Box.

Herb-rich woodlands occurred on the granite hills in the area, including Granitic Hills Herb-rich Woodland, Granitic Hills Woodland and Rocky Outcrop Mosaic.

More widespread EVC's in the Landscape Zone included Grassy Dry Forest, Herb-rich Foothill Forest, Grassy Woodland/Heathy Dry Forest Complex, Heathy Dry Forest and Grassy Woodland. Box-Ironbark Forest, Plains Woodland and Alluvial Terraces Herb-rich Woodland/Plains Grassy Woodland complex were moderately common.

Map 3.1: Pre-1750 Vegetation (EVCs) of the Mt Cole/Pyrenees Landscape Zone (Source: DSE Geospatial Data)



Map 3.2: Current EVCs and Extent in the Mt Cole/Pyrenees Landscape Zone (Source: DSE Geospatial Data)

Blue Pincushion.

Prickly Starwort.

3.2 Current Extent and Types of Native Vegetation (EVCs)

A number of studies indicate that the extent of native vegetation cover in the landscape is one of the most important factors in relation to overall native species diversity (Bennett & Radford 2004). Map 3.2 shows the current extent of vegetation and vegetation types (EVCs) across the Landscape Zone.

The current extent of native vegetation is the result of several periods of extensive land clearance. The map highlights the extensive loss of vegetation types on the more fertile soils due to clearance for agriculture. EVCs that were once relatively widespread in Landscape Zone but were heavily cleared include Plains Grassland, Grassy Woodland/ Alluvial Terraces Herb-rich Woodland Mosaic, Grassy Woodland, Plains Woodland. Alluvial Terraces Herb-rich Woodland and Grassy Woodland/Heathy Dry Forest Complex.

EVCs that were not formerly widespread but were also heavily cleared include Damp Sands Herb-rich Woodland and Creekline Grassy Woodland.

3.3 Native Vegetation Quality

Structurally characteristic and complex native vegetation tends to support more native species than less complex vegetation. This is largely due to a greater availability of habitat resources at a site, for example hollows and woody debris (refs). DSE modeling indicates that across Victoria the average quality of native vegetation is less than 50% of its original quality (Victorian Environment Assessment Council 2010).

Map 3.4 shows the quality of native vegetation in the Landscape Zone. Quality is assessed against a benchmark for each EVC, and is based on a site vegetation quality component (75%) and a landscape context component (25%). Data is modelled from a combination of satellite imagery and ground-truthing.

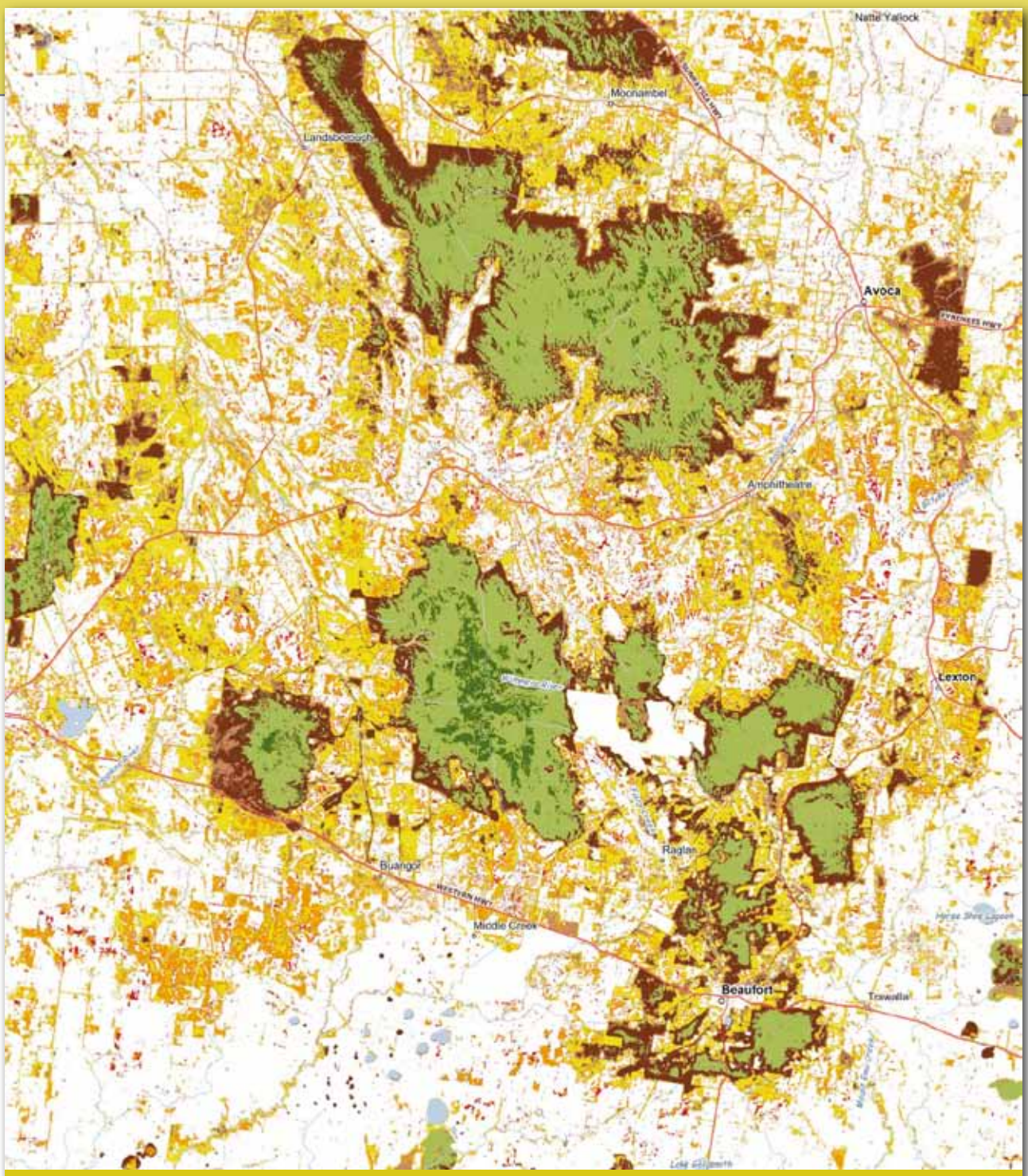
The map indicates that the quality of vegetation on public land is mostly in the 61-70 category, with smaller core areas in 71-80 and edges in the 51-60 category. The quality score for vegetation on private land mostly in 31-40 score category, with smaller but still quite large proportion in 21-30 category.

3.4 Bioregional Conservation Status of Current Vegetation

The conservation status of EVC's is determined on a bioregional basis and is based on the current extent of that EVC remaining compared to its former extent.

Of the 24 EVCs in the Landscape Zone eleven (50%) have a bioregional conservation status of endangered , five are vulnerable, five are depleted and three are least concern (see Table 3.1).

Endangered EVCs in the Landscape Zone include Plains Grassland, Damp Sands Herb-rich Woodland, Plains Grassy Woodland, Alluvial Terraces Herb-rich Woodland, Creekline Grassy Woodland, Grassy Woodland/ Alluvial Terraces Herb-rich Woodland Mosaic and Grassy Woodland/Heathy Dry Forest Complex.

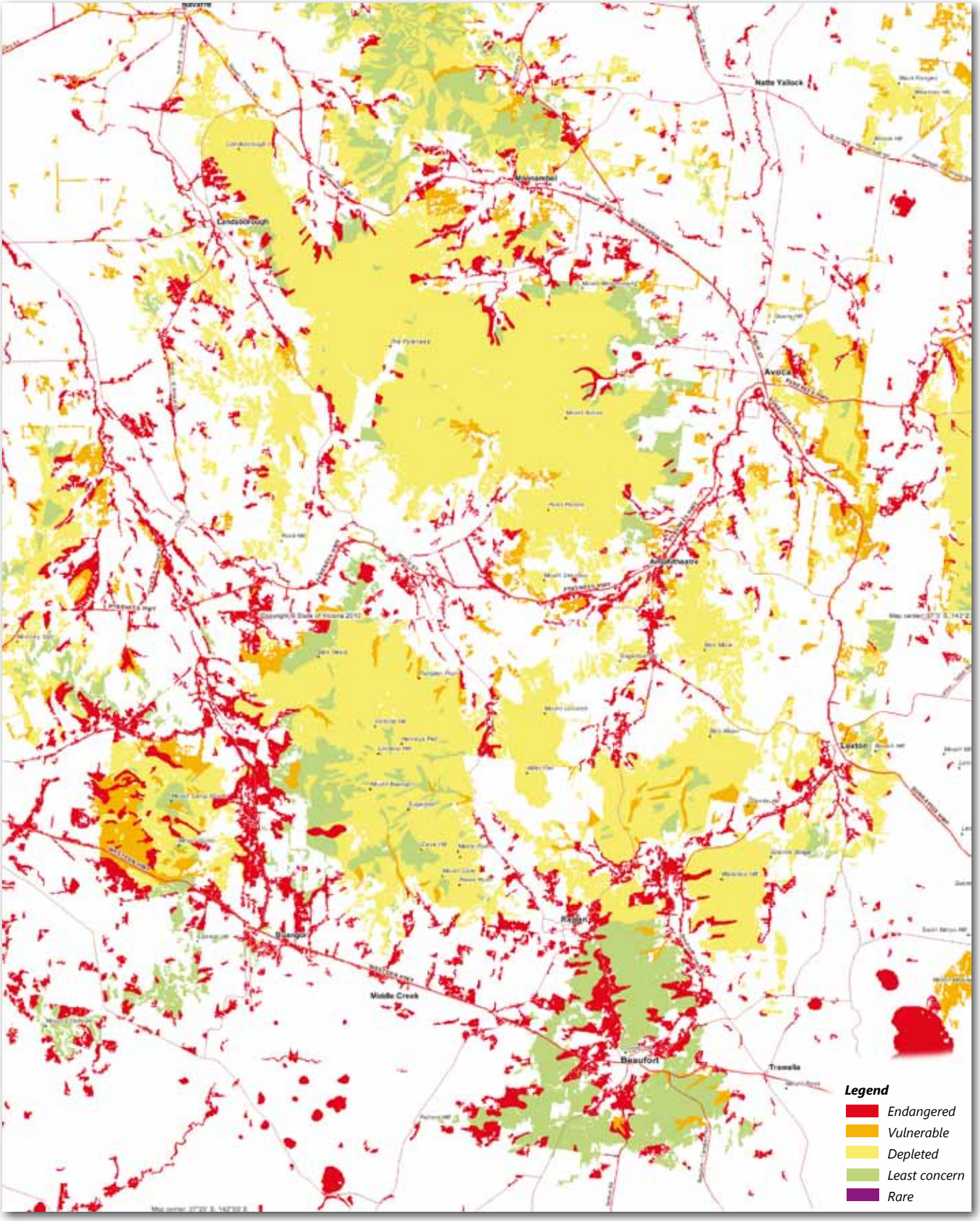


Score	Typical Vegetation Attributes
0.90	**Vegetation Quality:** large old trees present with a good canopy cover, recruitment of young trees, a diverse understorey with very few weeds and logs and leaf litter on the ground **Landscape Context:** larger patches of bush close or close to larger patches of bush.
0.50	**Vegetation Quality:** reduced tree cover and recruitment, few if any old trees, reduced understorey diversity and increased cover of weeds. **Landscape Context:** smaller patches of bush in a cleared landscape.
0.25	**Vegetation Quality:** only relict trees present, very little understorey diversity and high cover of weeds **Landscape Context:** highly cleared and fragmented landscape, greatly reduced vegetation in the landscape

Native vegetation quality

1-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-100

Map 3.3: Modelled Native Vegetation Quality (Source: DSE Geospatial Data)



Map 3.4: Bioregional Conservation Status of Current EVCs in the Mt Cole/Pyrenees Landscape Zone (Source: DSE Geospatial Data)

3.5 Potentially Threatening Processes to EVCs in the Mt Cole/Pyrenees Landscape Zone

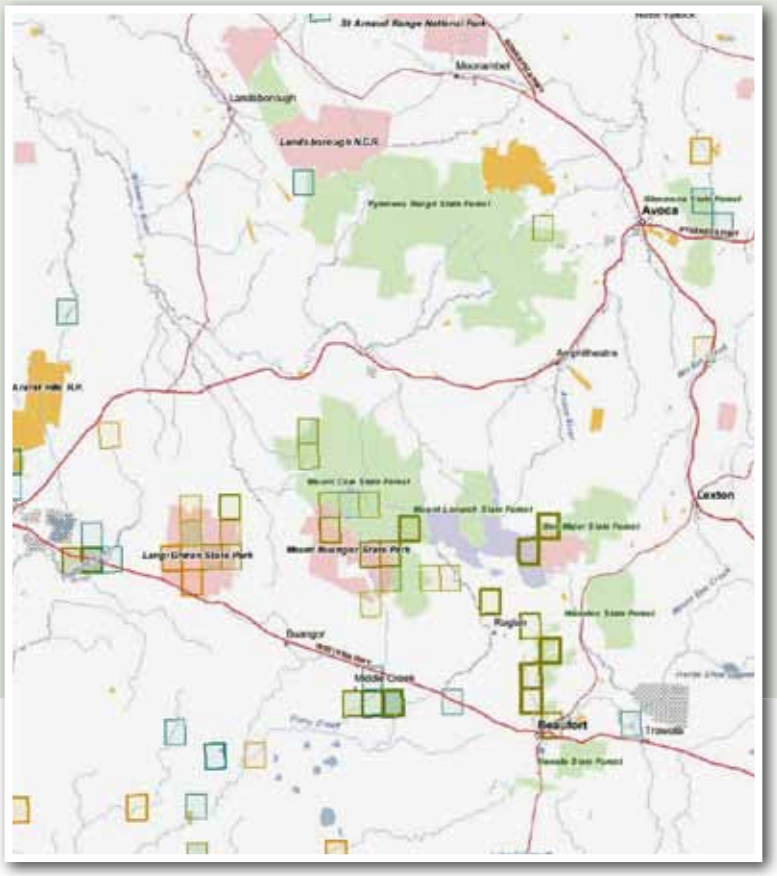
Table 3.1 Potentially Threatening Processes to EVCs in the Mt Cole/Pyrenees Landscape Zone

Evc No	EVC	Bioregional Conservation Status	Current Extent in Landscape Zone	Current Extent in Landscape Zone
3	Damp Sands Herb-rich Woodland	Endangered	small pockets remain mostly on private land	grazing, weed invasion, inappropriate fire regimes, clearing , agriculture
55	Plains Grassy Woodland	Endangered	not formerly widespread, small areas remain mostly on private land	clearing for agriculture, fragmentation, weed invasion, minor forest produce, timber harvesting, inappropriate fire regimes, dieback
67	Alluvial Terraces Herb-rich Woodland	Endangered	not formerly widespread, small areas remain	Vegetation clearance, Fragmentation, Harvesting wood products, Grazing, Environmental weeds
68	Creekline Grassy Woodland	Endangered	not formerly widespread as occurred in linear strips along creeks, small areas remain	Vegetation clearance, Fragmentation, Harvesting wood products, Mining and quarrying, Environmental weeds, Grazing
76	Grassy Woodland/ Alluvial Terraces Herb-rich Woodland Mosaic	Endangered	formerly pretty widespread, heavily cleared but potential to protect in area	
125	Plains Grassy Wetland	Endangered	very few remnants remain	clearing, fragmentation, weed invasion, grazing, inappropriate fire regimes
132	Plains Grassland	Endangered	very few remnants remain	clearing, fragmentation, weed invasion, grazing, inappropriate fire regimes
152	Alluvial Terrace Herb-rich Woodland/Plains Grassy Woodland Complex	Endangered	formerly pretty widespread, but heavily cleared	
641	Riparian Woodland	Endangered	not formerly widespread as occurred in linear strips along creeks, small areas remain	Clearing for agriculture, grazing, weed invasion, recreation, hydrological alteration, minor forest produce.
803	Plains Woodland	Endangered	formerly widespread in north east of Landscape Zone, now only small areas.	clearing, grazing, weed invasion, salinity, and roadside management practices.
896	Grassy Woodland/Heathy Dry Forest Complex	Endangered	formerly pretty widespread, heavily cleared but potential to protect in area	
18	Riparian Forest	Vulnerable	Very small areas top of divide on public land	Weed invasion, Grazing, Recreation, Clearing, Fire, Indirect impacts of road construction and maintenance and timber harvesting, Altered drainage patterns and flooding regimes.
47	Valley Grassy Forest	Vulnerable	small areas remain, needs further protection	Vegetation clearance, Fragmentation, Harvesting wood products, Grazing Weed invasion, Clearing, Grazing, Inappropriate fire regimes
71	Hills Herb-rich Woodland	Vulnerable	small areas remain	Vegetation clearance, Fragmentation, Harvesting wood products, Grazing, Environmental weeds
73	Rocky Outcrop Shrubland/ Rocky Outcrop Herbland Mosaic	Vulnerable	formerly very localized scattered occurrences, widely cleared	weed invasion, recreation, pest animals, inappropriate fire regimes.
175	Grassy Woodland	Vulnerable	formerly very widespread, heavily cleared	grazing, weed invasion, habitat loss, fragmentation, clearing for agriculture, minor forest produce, mining.
22	Grassy Dry Forest	Depleted	Formerly very widespread, now common esp on public land	Vegetation clearance, Fragmentation, Harvesting wood products, Grazing
23	Herb-rich Foothill Forest	Depleted	Common foothills, especially on public land	Timber Harvesting, Clearing for agriculture, Grazing, Weed Invasion, Minor forest produce
48	Heathy Woodland	Depleted	formerly small pockets through area, but heavily cleared	Vegetation clearance, Fragmentation, Inappropriate fire regimes, Harvesting wood products, Grazing, Pest Animals, Weed invasion, mining and quarrying
61	Box Ironbark Forest	Depleted	formerly pretty widespread, heavily cleared but potential to protect in area	Vegetation clearance, Fragmentation, harvesting wood products, Mining and quarrying, grazing, environmental weed invasion
320	Grassy Dry Forest/Heathy Dry Forest Complex	Depleted	Large area in Waterloo State forest otherwise rare in area	
20	Heathy Dry Forest	Least concern	Formerly very widespread, now common esp on public land	Inappropriate fire regimes, Mining/Quarrying, Harvesting wood products, Grazing, Disease, Recreation, Weed invasion,
30	Wet Forest	Least Concern	Very small areas top of divide on public land	Timber harvesting, inappropriate fire regimes, weed invasion, altered hydrology from road construction
351	Rocky Outcrop Shrubland/ Rocky Outcrop Herbland/ Grassy Dry Forest Complex	Least Concern	formerly very localized scattered occurrences, not widely cleared	

(Source Commonwealth of Australia 2000 and Environment Conservation Council 2001)

4.0 Flora

Map 4.1. Locations of Threatened Native Flora in the Landscape Zone. (Source: DSE Geospatial Data)



Over 1000 indigenous plants have been recorded in the Landscape Zone. This includes a diverse range of species typical of grassland, grassy woodland and foothills ecosystems. A number of species are endemic to the region, including Ben Major Grevillea, Mount Cole Grevillea and Langi Ghiran Grevillea.

4.1 Threatened Flora of the Landscape Zone

Sixty three flora species in the Landscape Zone are listed as threatened at a State or National level. See Table 4.1.

4.2 Regionally Significant Flora of the Landscape Zone

A number of flora species within the region are considered regionally significant. This is due to the Landscape Zone being at the western end of the Great Dividing Range, and the therefore at the edge of the biogeographic range of a number of species.

4.3 Potentially Threatening Processes to Flora in the Region and Landscape Zone

The Potentially Threatening Processes outlined for the Landscape Zone are based on processes listed in the Flora and Fauna Guarantee Act 1988, ECC Box-Ironbark Investigation (Environment Conservation Council 2001) and Western Region Regional Forest Agreement (Commonwealth of Australia 2000).

4.4 Key Environmental Weeds in the Region and Landscape Zone

A range of environmental weeds occur in the Landscape Zone. Woody weed species common in the Landscape Zone include Blackberry, Gorse, various Broom species, Radiata Pine, various Willow species, Spanish Heath, Hawthorn, Boneseed, Sweet Briar and Tree Lucerne.

Exotic grasses that are common weeds in the area include Toowoomba Canary Grass (*Phlaris aquatica*), Wild Oats (*Avena species*), various Brome (*Bromus*) species, Yorkshire Fog Grass (*Holcus lanatus*), Cocksfoot, various Barley Grasses, Quaking Grasses (*Briza species*), Needle Grasses (*Nasella species*) Fescues (*Vulpia species*), Clovers (*Trifolium species*) and various Rye Grasses (*Lolium species*).

Herbaceous weeds include Angled Onion (*Allium triquestrum*), various thistles, Cat's Ears (*Hypochoeris sp*), Blue Periwinkle, Bridal Creeper, Chicory, Paterson's Curse, Soursob, Vetches and Watsonia.

A full list of exotic species recorded in the Landscape Zone is contained in Appendix Three.

Table 4.1 Threatened Flora in the Landscape Zone						
Scientific Name	**Common Name**	**Family Name**	**FFG**	**EPBC**	**VROTS**	**Bioregion**
Acacia aspera subsp. parviceps	Rough Wattle	Mimosaceae			r	
Acacia deanei	Deane's Wattle	Mimosaceae			r	
Allocasuarina luehmannii	Buloke	Casuarinaceae	FFG			VVP/G
Alternanthera sp. 1 (Plains)	Plains Joyweed	Amaranthaceae			k	VVP
Austrodanthonia monticola	Small-flower Wallaby-grass	Poaceae			r	VVP
Austrostipa exilis	Heath Spear-grass	Poaceae			r	VVP
Austrostipa hemipogon	Half-bearded Spear-grass	Poaceae			r	
Boronia nana var. pubescens	Dwarf Boronia	Rutaceae			r	
Bossiaea cordigera	Wiry Bossiaea	Fabaceae			r	
Caladenia venusta	Large White Spider-orchid	Orchidaceae			r	VVP
Carex chlorantha	Green-top Sedge	Cyperaceae			k	VVP
Centipeda pleiocephala	Tall Sneezeweed	Asteraceae			x	VVP
Choretrum glomeratum var. chrysanthum	Golden Sour-bush	Santalaceae			r	VVP
Comesperma polygaloides	Small Milkwort	Polygalaceae	FFG		v	VVP
Correa aemula	Hairy Correa	Rutaceae			r	
Correa lawrenceana var. grampiana	Grampians Mountain-correa	Rutaceae			r	
Corunastylis ciliata	Fringed Midge-orchid	Orchidaceae			k	VVP
Daviesia genistifolia s.s.	Broom Bitter-pea	Fabaceae			r	
Daviesia laevis	Grampians Bitter-pea	Fabaceae	FFG	V	v	
Diuris behrii	Golden Cowslips	Orchidaceae			v	
Diuris palustris	Swamp Diuris	Orchidaceae	FFG		v	
Eucalyptus polybractea	Blue Mallee	Myrtaceae			r	
Eucalyptus pyrenea	Pyrenees Gum	Myrtaceae			r	
Eucalyptus yarraensis	Yarra Gum	Myrtaceae			r	
Galium curvihirtum	Tight Bedstraw	Rubiaceae			r	
Glycine latrobeana	Clover Glycine	Fabaceae	FFG	V	v	
Goodenia lineata	Grampians Goodenia	Goodeniaceae			r	
Goodia medicaginea	Western Golden-tip	Fabaceae			r	
Grevillea dryophylla	Goldfields Grevillea	Proteaceae			r	
Grevillea floripendula	Ben Major Grevillea	Proteaceae	FFG	V	v	CVU
Grevillea montis-cole	Mount Cole Grevillea	Proteaceae			r	CVU
Grevillea montis-cole subsp. brevistyla	Langi Ghiran Grevillea	Proteaceae	FFG	V	v	
Grevillea montis-cole subsp. montis-cole	Mount Cole Grevillea	Proteaceae			r	
Helichrysum aff. rutidolepis (Lowland Swamps)	Pale Swamp Everlasting	Asteraceae			v	
Hibbertia humifusa subsp. humifusa	Rising Star Guinea-flower	Dilleniaceae			r	
Lachnagrostis adamsonii	Adamson's Blown-grass	Poaceae	FFG	E	v	VVP
Lachnagrostis punicea subsp. filifolia	Purple Blown-grass	Poaceae	FFG		r	VVP
Lachnagrostis punicea subsp. punicea	Purple Blown-grass	Poaceae			r	VVP
Lachnagrostis robusta	Salt Blown-grass	Poaceae			r	VVP
Lepidosperma canescens	Hoary Rapier-sedge	Cyperaceae			r	
Leptorhynchos elongatus	Lanky Buttons	Asteraceae			e	
Leptorhynchos waitzia	Button Immortelle	Asteraceae			v	
Leptospermum turbinatum	Shiny Tea-tree	Myrtaceae			r	
Lepyrodia flexuosa	Twisting Scale-rush	Restionaceae			r	
Leucochrysum albicans subsp. albicans var. tricolor	White Sunray	Asteraceae		E	e	
Leucopogon neurophyllus	Veined Beard-heath	Ericaceae			r	

Table 4.1 Threatened Flora in the Landscape Zone

Nematolepis squamea subsp. squamea	Satinwood	Rutaceae			r	
Olearia asterotricha	Rough Daisy-bush	Asteraceae			r	
Olearia speciosa	Netted Daisy-bush	Asteraceae			k	
Olearia tubuliflora	Rayless Daisy-bush	Asteraceae			r	
Picris squarrosa	Squat Picris	Asteraceae			r	CVU/G???
Pimelea spinescens	Spiny Rice-flower	Thymelaeaceae	FFG		e	
Pimelea spinescens subsp. spinescens	Spiny Rice-flower	Thymelaeaceae		C	v	
Podolepis sp. 1	Basalt Podolepis	Asteraceae			e	VVP
Pterostylis despectans	Lowly Greenhood	Orchidaceae	FFG	E	e	?
Ptilotus erubescens	Hairy Tails	Amaranthaceae	f			VVP
Rutidosis leptorhynchoides	Button Wrinklewort	Asteraceae	FFG	E	e	
Schoenus nanus	Tiny Bog-sedge	Cyperaceae			r	
Senecio macrocarpus	Large-headed Fireweed	Asteraceae	FFG	V	e	
Stylidium calcaratum var. ecorne	Foot Triggerplant	Stylidiaceae			k	
Swainsona behriana	Southern Swainson-pea	Fabaceae			r	?
Utricularia uniflora	Single Bladderwort	Lentibulariaceae			k	VVP
Wurmbea uniflora	One-flower Early Nancy	Colchicaceae			r	

Listed under national EPBC Act (C = critically endangered, E = endangered, V = vulnerable, R = rare). Victorian Rare or Threatened (VROT) c = critically endangered, e = endangered, v = vulnerable, n = near threatened, k = poorly known. Listed under Flora and Fauna Guarantee Act = FFG. Source Flora Information System, Victoria.

Table 4.2 Regionally Significant Flora of the Landscape Zone

Species	Common Name	Biogeographic Significance
Astroloma conostephioides	Flame Heath	South-eastern limit of range
Austrostipa rudis	Veined Spear-grass	Western limit of range
Calytrix alpertris	Snow Myrtle	Eastern limit of range
Goodia latifolia var. pubescens	Golden-tip	Western limit of range
Helichrysum rutidolepsis	Pale Everlasting	Western limit of range
Hibbertia humifusa	Rising Star Guinea-flower	South-eastern limit of range
Ixodia achillaeoides	Ixodia	Eastern limit of range
Melaleuca gibbosa	Slender Honey-myrtle	Eastern limit of range
Platylobium alternifolium	Victorian Flat-pea	Eastern limit of range
Poa tenera	Slender Tussock-grass	Western limit of range
Pterostylis furcata	Forked Greenhood	Western limit of range
Sambucus gaudichaudiana	White elderberry	Western limit of range
Senecio odoratus	Leafy Bog-sedge	Western limit of range
Urtica incise	Scrub Nettle	Western limit of range
Xyris operculata	Tall Yellow-eye	Western limit of range

(Source Commonwealth of Australia 2000)

Table 4.3 Potentially Threatening Processes to Flora in the Region and Landscape Zone

Potentially Threatening Processes	References
Climate change	FFG Act, ECC
Clearing of native vegetation	RFA, ECC
Habitat fragmentation	ECC
Timber harvesting	RFA, ECC
Firewood collection	RFA, ECC
Loss of hollow-bearing trees and coarse woody debris in Victorian forests	RFA, FFG Act
Alterations to hydrological flows	FFG Act
invasion of native vegetation by 'environmental weeds'	FFG Act, ECC
Grazing by rabbit and sambar deer	FFG Act
Stock grazing/trampling	RFA
Inappropriate fire regimes, including fuel reduction burning and unplanned fire	RFA, ECC
Road construction and maintenance	RFA
Fertilisers	ECC
The spread of Phytophthora cinnamomi (Cinnamon fungus)	FFG Act
Collection of native orchids	FFG Act
Tree dieback	RFA, ECC
Mining and quarrying	RFA, ECC
Feral bees and Apiary	RFA, ECC
Recreation	RFA

5.0 Fauna

Over 280 indigenous vertebrate fauna species have been recorded in the Landscape Zone. A full list is provided in Appendix Two. Information on selected fauna species is also included in Appendix Four.

5.1 Key Fauna Groups in the Landscape Zone

Mammals have suffered the greatest declines of all native fauna since the arrival of Europeans (Tzaros 2006). This is mainly due to introduced predators, competition with rabbits and stock, loss of tree hollows and hunting by European settlers. Two species, the White-footed Rat and Rufous Bettong that were once widespread in woodlands, but have become extinct in all areas. Other species, such as The Eastern Quoll and Dingo, have become regionally extinct.

Twenty seven mammal species currently occur in the Landscape Zone. This includes arboreal and ground dwelling mammals, and a large number of bats. In northern Victoria, 25 mammal species remain widespread, although many of these are probably in decline (Menkhorst 2009).

Bird species in the Landscape Zone are rich and varied, with over 190 species. This especially the case in the Box-Ironbark regions in the north of the Landscape Zone. Eucalypt nectar plays a key role these areas, resulting in the prominence of nomadic and migratory nectarivorous birds species (Environment Conservation Council 1997).

A number of woodland bird species in the Landscape Zone have shown a marked decline in population sizes and suffered severe range restrictions since European settlement (Tzaros 2006), including a large decline over the last fifteen years (Bennett et al 2009). Grey Crowned Babblers have become regionally extinct, as may a number of other bird species. No comparative studies have been undertaken with forest bird species.

Reptiles and Amphibians have suffered from

Varied Sittella
Photo: Chris Tzaros

The Decline of Woodland Birds in northern Victoria

A recent long term study by Deakin and Monash Universities undertaken in Northern Victoria has found that populations of woodland birds have crashed in the region over the last 15 years. Two thirds of woodland bird species have declined in occurrence and abundance in northern Victoria during the period. The declines have occurred across a wide range of species with different habitat requirements, and included many common and iconic species such as the Laughing Kookaburra and Rufous Whistler.

The State of Australian Birds 2009 also highlights the alarming decline of woodland birds and woodlands, which are among the most extensively cleared and degraded habitat in Australia (Birds Australia 2009).

The declines in northern Victoria were attributed to dramatic reductions in food resources, such as nectar and insects, as a result of climate change in the region. The research indicates that Australian birds are even less resilient to climate change than previously thought. As species declines occurred in both large core areas of native vegetation and cleared areas, it suggests the current reserve system cannot be relied upon to sustain species.

The authors of the study concluded that current levels of habitat protection and revegetation were insufficient to stop regional species losses, and that "The urgency and magnitude of remedial action required is many fold greater than current practice'.

Three main options were outlined to help address the crisis. Firstly, the restoration of habitat quality in large forests blocks. Secondly, the preferential restoration in more fertile areas of the landscape. Thirdly, the need to establish multiple scale pathways for movement of native species by strategic enhance of existing vegetation and revegetation. More research is also required to understand the ecological processes that influence viability of populations and ecosystems.

Menkhorst (2008) also outlines a range of on-ground actions that take account of wider ecological processes, including:

- **Manage predation and competition from alien and 'invasive' native species.**
- **Manage processes that effect extent and suitability of habitat eg fire regimes and land degradation.**
- **Active revegetation of suitable habitat.**
- **long term (20 yr) monitoring.**

widespread clearing and modification of the ground layer, for example, fallen timber removal and grazing (Environment Conservation Council 1997). Declines have been detected for a number of species in the Landscape Zone, including Tree Goanna, Southern Toadlet, Growling Grass Frog and Brown Toadlet. No reptiles and amphibians are known to have become extinct in the area.

Invertebrate fauna of the area is poorly known and studied. Invertebrates are often abundant around prolifically flowering trees, suggesting that the invertebrate fauna of Box-Ironbark areas may be very diverse (Environment Conservation Council 1997).

5.2 Fauna Distribution across the Landscape Zone

Fauna typical of grasslands and grassy woodlands once dominated the volcanic plains in the south of the Landscape Zone. However, as a result of very extensive clearing of native grasslands much of this fauna has disappeared. Mammal species are few but include Grey Kangaroos, and ground dwelling species such as the very rare Eastern-barred Bandicoot and Fat-tailed Dunnart. Ring–tail Possums and bats can be found in wooded areas adjacent to creeks.

Common birds include Australian Magpie, Little Raven, Banded Lapwing, Willie Wagtail, Brown Falcon, Black Kite, Nankeen Kestrel, Crested Pigeon, White-throated Treecreeper, various Honeyeaters, Crimson Rosella, Hooded Robin, Little Corella and Red-browed Finch. Reptiles tend to be small and ground-dwelling or burrowing. Skinks are common as was the now rare Striped Legless Lizard. The most common snakes are the Eastern Brown and Tiger Snakes. Frogs are relatively uncommon but include Plains Froglet (Gullan 2007).

The central part of the Landscape Zone contains species that occur in the foothill forests and the higher rainfall areas of Box-Ironbark habitats. Mammals include the Koala, Common Ringtail Possum, Feathertail Glider and Brush-tailed Phascogale. Birds include Crimson Rosella, Scarlet Robin, Red-browed Finch, White-Browed Scrub-wren, Striated Thornbill and Eastern Spinebill. Bats include Large Forest Bat, Goulds Wattled Bat and Chocolate Wattled Bat. Reptiles include the Eastern Brown Snake and Red-bellied Snake, and many Skink species that are common in both habitats.

A small number of fauna are only found in the wet and moister forests on the Mt Cole Range and the

Brush-tailed Phascogale.

southern side of the Pyrenees Range. This includes mammals such as the Mountain Brushtail Possum and Common Wombat.

Woodland and Dry Forest fauna species are mostly found in the drier regions in the north of the Landscape Zone. These include 'Box-Ironbark stronghold species' that favour woodland habitats.

Mammals include Yellow-footed Antechinus and Common Dunnart. Birds include Fuscous Honeyeater, Black-chinned Honeyeater, Painted Honeyeater, Swift Parrot, and Diamond Firetail.

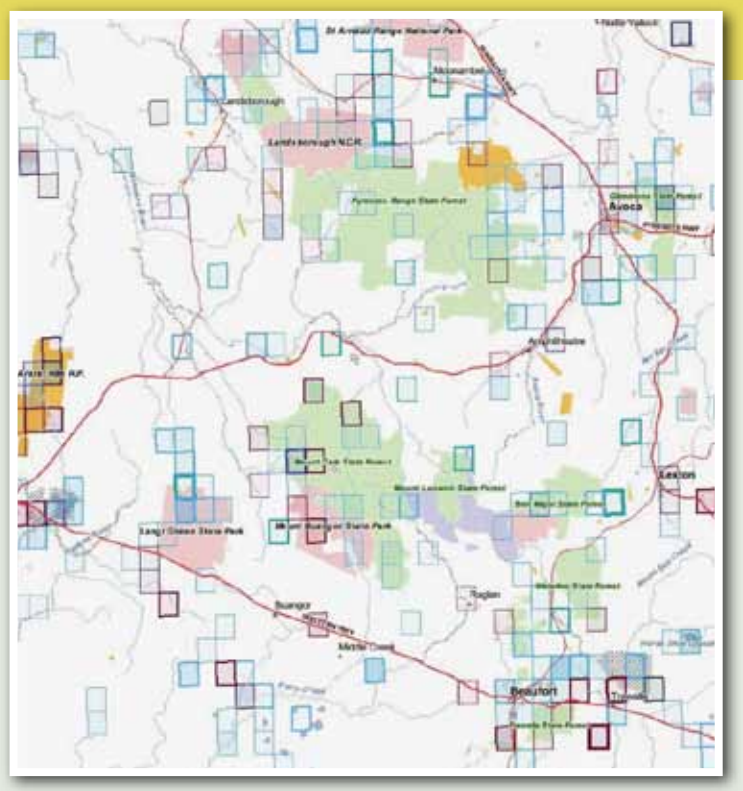
Reptiles that are woodland specialists, include Tree Goannas and the snake species Bandy Bandy.

Widespread species prefer a range of habitats. A number of species occur across the entire Landscape Zone, these include mammals such as the Common Brush-tail Possum, Eastern Grey Kangaroo, Sugar Glider, Lesser Long-eared Bat, Short-beaked Echidna and Swamp Wallaby.

Birds such as Willie Wagtail, Australian Magpie, Grey Shrike-thrush, Rufous Whistler, Southern Boobook, Brown Goshawk, Australian Raven, Superb Fairy-wren, and Brown-headed Honeyeater. It also includes amphibians such as the Common Froglet.

5.3 Fauna Movement in the Landscape Zone

A range of nectar feeding birds move seasonally from the damper foothill forests of the Great Dividing Range to the Box Ironbark Forests in the north, to exploit nectar from winter flowering Eucalypts, such as Grey Box, Red Ironbark and Yellow Gum (MacNally and McGoldrick 1997). This includes the White-naped Honeyeater, Yellow-faced Honeyeater and Eastern Spinebill. Species such as Swift Parrot, Stiated Pardolote and Silvereyes migrate from Tasmania.



Map 5.1. Locations of Threatened Native Fauna in the Landscape Zone (Source: DSE Geospatial Data)

Small insect feeders, such as the Golden Whistler, Scarlet Robin, Spotted Pardalote and Grey Fantail, that occur in smaller numbers in the Box-Ironbark habitats, have their numbers augmented over the winter by birds moving in from the larger population in the foothills in the south. The Flame Robin, Pink Robin, Yellow-tailed Black Cockatoo, Crimson Rosella, Powerful Owl and Pied Currawong also move from wetter forests to the milder north over winter (Environment Conservation Council 1997, Tzaros 2006).

A number of bird species, typically from drier inland or tropical areas, arrive in Box-ironbark areas in September to March then depart in February/ March. This includes Yellow-plumed Honeyeater, Southern Scrub-robin, Black Honeyeater and White-fronted Honeyeater. Little is known about the movement of species between the grassland ecosystems of the south and forest and woodland ecosystems on the Great Divide. However apart from bird species and highly mobile species, fauna movement may not have been extensive.

5.4 Key Threatening Processes to Fauna in the Mt Cole/Pyrenees Landscape Zone

Potentially threatening processes are actions, activities or processes that threaten or may threaten the survival, abundance or evolutionary development of a species, native vegetation, ecosystem or ecological process. The Potentially Threatening Processes for the Landscape Zone are listed in the Table 5.1.

5.5 Threatened and Regionally Significant Fauna of the Landscape Zone

Fifty invertebrate fauna species in the Landscape Zone are listed as threatened (see Table 5.1). Threatened species in the Landscape Zone tend to be hollow dependant, highly mobile species or ground dwelling species. Of great concern is the continuing decline of many other species that occur in the region (Tzaros 2006, Bennett 2004). Regionally significant species include the Mountain Brush-tail Possum which occurs in Mount Cole State Forest, at the western edge of its range. Powerful Owls also breed in the Landscape Zone.

Table 5.1 Potentially Threatening Processes to Fauna in the Landscape Zone

Potentially Threatening Processes	References
Climate change	FFG Act, ECC
Clearing of native vegetation	RFA, ECC
Degradation, fragmentation and loss of native vegetation and habitat	
Habitat fragmentation	ECC
Timber harvesting	RFA, ECC
Firewood collection	RFA, ECC
Loss of hollow-bearing trees and coarse woody debris in Victorian forests	RFA, FFG Act
Alterations to hydrological flows	
invasion of native vegetation by 'environmental weeds'	FFG Act, ECC
Pest animals eg cats, fox, rabbit, feral pigs, feral bees, sambar deer,	FFG Act
Stock grazing/trampling	RFA
Inappropriate fire regimes, including fuel reduction burning and Unplanned fire	RFA, ECC
Recreation	RFA
Road construction and maintenance	RFA
Fertilisers	ECC
The spread of Phytophthora cinnamomi (Cinnamon fungus)	FFG Act
Tree dieback	RFA, ECC
Mining and quarrying	RFA, ECC
Feral bees and apiary	RFA, ECC

Source: FFG Act 1998, Environment Conservation Council Box-Ironbark Report (1997, 2001) and Western Region of Victoria Regional Forest Agreement (2000).

Blue-billed duck.
Photo: Valorix

Bearded dragon.
Photo: http://en.wikipedia.org/wiki/User:Jjron

Table 5.1 Threatened Fauna in the Landscape Zone

Common Name	Scientific Name	FFG	EPBC	VROTS
Altona Skipper	Hesperilla flavescens flavescens	f		
Australasian Shoveler	Anas rhynchotis			v
Australian Bustard	Ardeotis australis	f		c
Baillon's Crake	Porzana pusilla	f		v
Barking Owl	Ninox connivens	f		e
Bearded Dragon	Pogona barbata			d
Black-chinned Honeyeater	Melithreptus gularis			n
Black-eared Cuckoo	Chrysococcyx osculans			n
Blue-billed Duck	Oxyura australis	f		e
Brolga	Grus rubicunda	f		v
Brown Toadlet	Pseudophryne bibronii	f		e
Brown Treecreeper (south-eastern ssp.)	Climacteris picumnus victoriae			n
Brush-tailed Phascogale	Phascogale tapoatafa	f		v
Bush Stone-curlew	Burhinus grallarius	f		e
Common Dunnart	Sminthopsis murina			v
Diamond Firetail	Stagonopleura guttata	f		v
Eastern Barred Bandicoot	Perameles gunnii	f	E	c
Eastern Great Egret	Ardea modesta	f		v
Eastern Pygmy-possum	Cercartetus nanus			n
Elegant Parrot	Neophema elegans			v
Fat-tailed Dunnart	Sminthopsis crassicaudata			n
Freckled Duck	Stictonetta naevosa	f		e
Glenelg Spiny Cray	Euastacus bispinosus	f		d

Common Name	Scientific Name	FFG	EPBC	VROTS
Glossy Ibis	Plegadis falcinellus			n
Golden Perch	Macquaria ambigua			v
Golden Sun Moth	Synemon plana	f	C	e
Growling Grass Frog	Litoria raniformis	f	V	e
Gull-billed Tern	Gelochelidon nilotica	f		e
Hardhead	Aythya australis			v
Hooded Robin	Melanodryas cucullata	f		n
Inland Dotterel	Charadrius australis			v
Lace Goanna	Varanus varius			v
Latham's Snipe	Gallinago hardwickii			n
Musk Duck	Biziura lobata			v
Nankeen Night Heron	Nycticorax caledonicus			n
Painted Honeyeater	Grantiella picta	f		v
Pied Cormorant	Phalacrocorax varius			n
Powerful Owl	Ninox strenua	f		v
Red-backed Kingfisher	Todiramphus pyrrhopygia			n
Regent Honeyeater	Anthochaera phrygia	f	E	c
River Blackfish	Gadopsis marmoratus			d
Royal Spoonbill	Platalea regia			v
Southern Toadlet	Pseudophryne semimarmorata			v
Speckled Warbler	Pyrrholaemus sagittatus	f		v
Spotted Harrier	Circus assimilis			n
Square-tailed Kite	Lophoictinia isura	f		v
Squirrel Glider	Petaurus norfolcensis	f		e
Striped Legless Lizard	Delma impar	f	V	e
Swift Parrot	Lathamus discolor	f	E	e
Whiskered Tern	Chlidonias hybridus			n

6.0 Public Land Management

A characteristic of the Landscape Zone is the relatively large number of public land areas, including Parks, Reserves and State Forests (see Map 6.1 below). Other public land in the study includes numerous smaller bushland reserves, roadsides and streamside reserves.

6.1 Larger Parks and Reserves in the Mt Cole/Pyrenees Landscape Zone

Parks and reserves cover only approximately 13,570 ha. or 4.5% of the Landscape Zone (approximately 1200ha of the St Arnaud Range National Park is in the Landscape Zone). They are also relatively small, with most areas below 4,000 ha in size.

Parks and reserves in the Landscape Zone are managed by Parks Victoria. Larger parks and reserves in the Landscape Zone are outlined in Table 6.2. These reserves play a very important role in maintaining ecological processes, landscape connectivity and provide a large contribution to the overall extent of vegetation in the region.

6.2 Smaller Reserves in the Mt Cole/ Pyrenees Landscape Zone

A large number of small reserves, mainly Bushland Reserves, are also scattered across the Landscape Zone. These smaller reserves play a role in maintaining landscape connectivity and contribute to the overall extent of vegetation in the region.

However, currently these reserves receive very little management. Bushland Reserves with high conservation values are shown in Table 6.1.

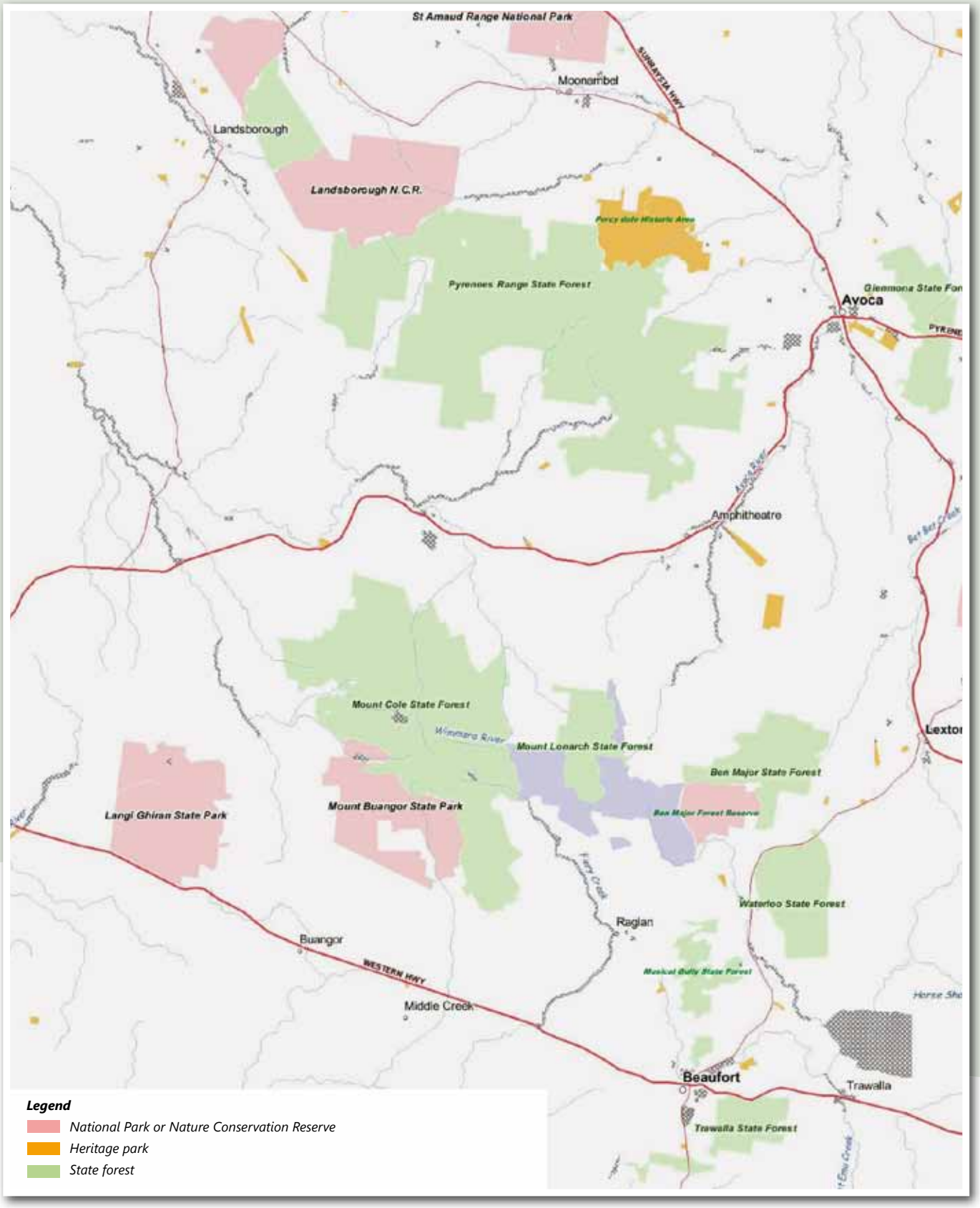
6.3 Public Land Management in the Mt Cole/Pyrenees Landscape Zone

The most recent Victorian State of the Environment report highlighted a significant lack of resources for biodiversity conservation on public land within Victoria (Commissioner for Environmental Sustainability 2008). The recent Biodiversity White Paper also emphasised the need for public land to be managed as the core of resilient ecosystems, with an increasing emphasis on management of natural values and ecosystem processes. This includes addressing wider landscape connectivity issues and the impacts of climate change, including expanding the reserve system.

However, current public land management within the Landscape Zone has been identified in a recent report by the Victorian National Parks Association as uncoordinated and lacking the necessary resources to ensure management of conservation values, especially in State Forests (VNPA 2010). Despite being a relatively small area, three different DSE offices (in Beaufort, Daylesford and Ballarat) manage State Forests in the Landscape Zone, while parks and reserves in the Landscape Zone are managed by two different Parks Victoria offices in Maryborough and Creswick (VNPA 2010).

Table 6.1 Smaller Reserves with High Conservation Values in the Mt Cole/Pyrenees Landscape Zone

Reserve	**Size (ha)**	**Conservation value** (d) depleted, (v) vulnerable, (e) endangered
Homebush Bushland Reserve	14	Grassy Woodland (v), Alluvial Terraces Herb-rich Woodland (e)
Lower Homebush Bushland Reserve	29	Grassy Woodland (v)
Avoca Rifle Range Bushland Reserve	111	Box Ironbark Forest (d)
Avoca Bush Reserve	20	Grassy Woodland (v), Grassy Woodland/ Alluvial Terraces Herb-rich Woodland mosaic (e)
Ben More Bushland Reserve	133	Grassy Dry Forest/Heathy Dry Forest Complex (d), Hillcrest Herb-rich Woodland (d)
Amphitheatre Bushland Reserve	83.8	Grassy Dry Forest/Heathy Dry Forest Complex (d), Grassy woodland (v)
Porcupine Bushland Reserve	15	Grassy Woodland (v)
Snow Gum Bushland Reserve	27	Grassy Woodland/Heathy Dry Forest Complex (e)
Main Lead Bushland Reserve	12	
Raglan Bushland Reserve	14	Grassy Woodland/Heathy Dry Forest Complex (e)
Granite Hills Scenic Reserve	55	Hills Herb-rich Woodland (v)
Melakoff Lead – Historic Area	32	Grassy Woodland/ Alluvial Terraces Herb-rich Woodland mosaic (e), Valley Grassy Forest (v), Box Ironbark Forest (d)
Landsborough West Bush Reserve	8	Grassy Woodland/ Alluvial Terraces Herb-rich Woodland mosaic (e)
Wimmera River Streamside Reserve	21	Alluvial Terraces Herb-rich Woodland/Plains Grassy Woodland Complex
Total (ha.)	**586.8**	



Map 6.1. Public Land in the Landscape Zone (Source: DSE Geospatial Data)

Larger Parks and Reserves in the Mt Cole/Pyrenees Landscape


Chocolate Lily
Photo: Yesmin Kelsall

Landsborough Nature Conservation Reserve (3,374 hectares)

Located in the Goldfields bioregion. The reserve is mainly comprised of Grassy Dry Forest with smaller areas of Alluvial Terraces Herb-rich Woodland, Heathy Dry Forest, Grassy Woodland/ Alluvial Terraces Herb-rich Woodland Mosaic, Box-Ironbark Forest. Common Eucalypt species include Yellow Box, Red Stringybark, Long –leaf Box and Red Box. A number of threatened fauna species are found in the reserve, including the endangered Brown Toadlet, the vulnerable Lace Goanna and Speckled Warbler and near threatened Brown Treecreeper.

Langi Ghiran State Park (3,042 hectares)

Located in the Central Victorian Uplands. Contains a range of forest and woodland vegetation types. Peaks and slopes support an open forest of Red Stringybark and Long-leaf Box, sheltered slopes and gullies support Messmate and Blue Gum forests, with River Red Gum, Yellow Box and Candlebark woodlands on the plains. EVCs include Heathy Woodland, Grassy Dry Forest, Valley Grassy Forest, Damp Sands Herb-rich Woodland, Hills Herb-rich Woodland and Rocky Outcrop Shrubland/Rocky Outcrop Herbland Mosaic.

A range of threatened species flora are found in the park including Heath Spear Grass, Shiny Tea-tree, Langi Ghiran Grevillea, Hairy Correa, Half Bearded spear Grass (rare), Golden Cowslips, Wiry Bossiaea, Yarra Gum, Swamp Diuris and Mt William Beard Heath. Threatened species fauna include the endangered Swift Parrot and Brown Toadlet, vulnerable Speckled Warbler, Diamond Firetail, Painted Honeyeater, Black Falcon and near threatened Red-backed Kingfisher, Black-eared Cuckoo and Brown Treecreeper are found in the park.

Mount Buangor State Park (2,484 hectares)

Located in Central Victorian Uplands bioregion. Contains a diverse range of vegetation types. Snow Gums are found on the higher peaks, Blue Gum and Messmate dominate higher and southern slopes, Tree Ferns and Manna Gums grow in wet gullies and Narrow-leaf Peppermint and Red Stringybark in the drier areas. Main EVCs include Grassy Dry Forest and Herb-rich Foothill Forest. Smaller areas of Wet Forest, Heathy Dry Forest, Alluvial Terraces Herb-rich Woodland, Rocky Outcrop Shrubland/Rocky Outcrop Herbland Mosaic and Rocky Outcrop Shrubland/Rocky Outcrop Herbland/Grassy Dry Forest Complex. Abuts Mt Cole State Forest.

More than 130 species of birds are recorded for the area. The area also contains a range of mammal and reptile species. Threatened fauna species found in the Park include the Brown Treecreeper and Brush-tailed Phascogale. Threatened flora species include One Flower Nancy, Netted Daisy Bush, Mt Cole Grevillea, Shiny Tea-tree, Yarra Gum, Pale Swamp Everlasting, Victorian Flat-pea, Rising Star Guinea-flower, and Large-river Buttercup.

St Arnaud Range National Park (10,402 hectares with estimated 1200 ha in Landscape Zone)

Located in the Goldfields bioregion. The park contains one of the largest relatively intact areas of box-Ironbark vegetation in Victoria (Tzaros 2006). Provides significant habitat for Powerful Owl, Brush-tailed Phascogale, Tree Goanna and Swift Parrot. Main EVCs in the southern part of the Park include Heathy Dry Forest and Grassy Dry Forest with smaller areas of Box-Ironbark Forest, Valley Grassy Forest and Grassy Woodland/Alluvial Terraces Herb-rich Woodland Mosaic.

Percydale Historic Area (1,456 hectares)

Located in the Goldfields bioregion. The area is mainly Grassy Dry Forest, with smaller areas of Herb-rich Foothill Forest, Heathy Dry Forest and Alluvial Terraces Herb-rich Woodland. A number of threatened fauna species are found in the park, including Tree Goanna and Brown Treecreeper.

Redbank Nature Conservation Reserve (1201 hectares)

Located in the Goldfields bioregion. The reserve is mainly Heathy Dry Forest and Grassy Dry Forest with smaller areas of Box-Ironbark Forest, Valley Grassy Forest and Grassy Woodland/Alluvial Terraces Herb-rich Woodland Mosaic. Threatened fauna include the endangered Brown Toadlet.

Ben Major Forest Reserve (819 hectares)

Located in the Central Victorian Uplands. The forest is mainly Grassy Dry Forest with smaller areas of Heathy Dry Forest and Valley Grassy Forest. No threatened flora or fauna species are known in the reserve.

A significant increase in resources is required to adequately deliver clearly defined nature conservation outcomes in both Parks and State Forests in the Landscape Zone, including addressing threatening processes, threatened species protection and research and monitoring (VNPA 2010). The need to address threatening processes on public land has also been identified in a range of recent scientific papers (McNally et al 2007, Bennett et al 2009)

Key threatening processes on public land in the landscape zone includes timber and firewood harvesting (applies to State Forests only and is discussed in Section 6.4), inappropriate fire management, pest plants and animals and certain types of recreation (VNPA 2010, Commonwealth of Australia 2000).

Inappropriate fire management is currently listed as a threatening process in a range of literature (Commonwealth of Australia 2000, FFG Act, VNPA 2010). However, it is possible that a large increase in fuel reduction burning may occur on public land in the Landscape Zone and across the State due to recommendations arising from the Black Saturday Royal Commission.

The lack of scientific information on the impacts of fuel reduction burning on native fauna has been highlighted by Clarke (2008). There is also a far greater need to consider the impacts of undertaking large fuel reduction burning programs on broader ecological processes, such climatic, hydrological and primary productivity processes (see Section Two). Any such increases should only be undertaken following greater research and monitoring to determine the impacts of repeated fuel reduction burning on native flora, fauna and ecosystem function.

The steep topography of Mt Cole and the Pyrenees Ranges also presents difficulties in controlling prescribed burning on large areas of public land in the Landscape Zone. This is evidenced by a number of escaped fuel reduction burns in the region, including one this year at Mt Cole that threatened local towns. A dramatic increase in fuel reduction burning will only add to this risk.

Recommendations regarding fire management, including fuel reduction burning, are outlined in Section 8.2.

A significant increase in investment is also required to control pest animals and plants in parks and State Forests. The main problem pest animal species on public land in the Landscape Zone are Foxes, feral Cats, Sambar Deer (especially in Mt Cole), Pigs and Rabbits. Integrated management plans and programs for control of these species should be developed for all parks and state forests in the region. Control of a variety of environmental weeds, such as Blackberry, Broom and Gorse is also required on public land, especially along tracks and in riparian areas.

A range of recreational activities also causes management issues for parks and State forests in the Landscape Zone. Trail bike riding has been identified as a problem in some State Forests and parks, and can lead to localised erosion, sedimentation of waterways and disturbance. A Trail Bike Management Plan has been developed for the Pyrenees Ranges State Forest. This plan needs to be followed up with increased surveillance to monitor compliance and similar plans developed for other problem areas. Unregulated camping in designated and non-designated areas has also been identified as an issue for Mt Cole State Forest (VNPA 2010). Illegal hunting of wildlife was also raised on numerous occasions as a problem on public land in the area.

Poor perimeter fencing and inadequate maintenance of vehicle tracks were also identified as management issues for Mt Cole and Pyrenees Ranges State Forests (VNPA 2010). Improved surveillance and enforcement is also required on a range of activities, including illegal firewood collection and shooting.

6.4 Timber and Firewood Harvesting in State Forests in the Mt Cole/ Pyrenees Landscape Zone

State Forests cover a total area of 30,917 hectares and occupy the largest area of any public land type in the Landscape Zone. Eight State Forests are contained in the Landscape Zone, with most below 2,000 hectares in size (see Section 9.5). The Department of Sustainability and Environment (DSE) is responsible for the management of these areas and has an obligation to protect biodiversity under a range of legislation and as signatories to international protocols.

Only limited volumes of sawlogs (500 cubic metres over a three year period) and no woodchips are currently being removed from State Forests in the Landscape Zone. This is primarily due to periods of widespread over-harvesting, but a general reduction in demand for native hardwood timber

Table 6.2 Timber and Firewood Harvesting (3 years schedule from 2010 to 2013)			
State forest	**Sawlogs**	**Firewood & minor produce**	**Area Harvested (Ha)**
Mt Cole/Mt Lonarch	No	2695	435.7
Trewalla	No	2300	81
Pyrenees Range	500	7,225	649
Total	**500**	**12220**	**1,165.7**

products has also contributed. It is unlikely that local forests could support a viable logging industry in the forseeable future, and as a result most local timber mills have closed. However, recent changes granting rights over timber allocations to Vicforests in the west of the State has lead to a great deal of uncertainty over the re-introduction of logging and woodchipping in Mount Cole and the Pyrenees Ranges State Forests.

Logging and firewood harvesting have been identified as threatening processes. Logging negatively affects vegetation structure and species composition, and does not mimic fire (Commissioner for Environmental Sustainability Victoria 2008). Following logging, changes to the composition of faunal assemblages can have a marked influence on forest biodiversity (Gibbons and Lindenmeyer 2002). The most severe impacts on native fauna of past and current timber harvesting within State Forests is the lack of old trees containing numerous hollows and the loss of logs on ground.

Firewood harvesting continues in the area, especially in the Pyrenees Ranges (see Table 6.2). Firewood removal from native forests is also a major threatening process, resulting in a loss of species diversity and ecosystem function through the loss of hollows, loss of dead standing trees and removal of logs on the ground (Environment Conservation Council 2001). At least 6 mammal species, 18 bird species and 7 reptile species in Box-Ironbark forests are likely to be affected by firewood collection (Environment Conservation Council 2001). Firewood collection in the foothill forests also negatively impacts upon fauna (RFA 1994).

Various examples of very poor biodiversity and silvicultural management practices were found in recent inspections of State Forests in the Landscape Zone. Following poor regeneration in a large logging coupe at Mount Lonarch State Forest, nearly all vegetation was pushed into windrows and the entire site was scalped of topsoil. The operation resulted in the removal of nearly all native vegetation and habitat on site, and massive soil disturbance with potential for erosion and siltation of adjacent drainage lines. Most likely the area was reseeded with Blue Gum, converting a diverse forest area to essentially a Blue Gum plantation.

These types of operations essentially amount to a subsidy for the timber industry to further degrade the local environment. Yet even in terms of potential future timber harvesting, the outcomes of these operations do not come close to covering costs.

Areas of large old Yellow Box (Eucalyptus melliodora) trees have also recently been clearfelled in the Pyrenees Range State Forest. This is despite these large old Yellow Box trees being specifically identified as a biodiversity asset for the Pyrenees State Forest by the Environment Conservation Council (ECC 2001). Following these operations, the areas also appear to be have been reseeded only with Blue Gum (as evidenced by the new regrowth compared to adjacent areas), rather than Yellow Box and the full range of species previously present on the site (as required under the Code of Forest Practice).

The Environment Conservation Council (2001) review of firewood harvesting in Box-Ironbark areas (including the Pyrenees Range State Forest) found issues with the longer term sustainability of firewood harvesting, illegal collection, difficulty in supervising domestic collection and poor attitudes of commercial harvesters. These issues do not appear to have been resolved within State Forests in the Landscape Zone.

The ECC report concluded it was in the best economic and social interest of rural communities to establish firewood plantations on private land. The recent VEAC River Red Gum Forests Investigation also recommended that firewood paltations be established on cleared private and public land (VEAC 2008).

'Silviculture' operation at Mount Lonarch State Forest showing a small portion of entire site that was scalped and windrowed.

A study undertaken by the Goulburn Broken CMA demonstrates the establishment of firewood plantations at the rate of 100 hectares per year for 15 years would provide 15,000 tonnes of firewood per year by 2020 and could play an important role in providing carbon credits (VEAC 2008). One of the main disincentives to firewood plantations on private land is the low royalties paid for wood products from public forests, making it virtually impossible for private plantations to compete.

In relation to firewood harvesting on public land in the Landscape Zone it is recommended that:

- **Domestic and commercial harvesting only occurs as a byproduct of scientifically based ecological thinning.**
- **Stricter controls are placed on domestic firewood collection to reduce illegal harvesting and habitat loss.**
- **Commercial harvesting be progressively phased out and the establishment of firewood plantations on private land encouraged.**

6.5 Apiary in State Forests in the Mt Cole/Pyrenees Landscape Zone

Apiary is the largest industry conducted in State Forests in the Landscape Zone, with the Pyrenees Ranges a key area for honey production. A lack of research and technical obstacles have constrained assessment of the impacts of honey bees on Australian ecosystems (ECC 2001). However, some studies indicate that introduced bees may adversely affect native ecosystems (Paton 1993), and apiary and feral bees are noted as threatening processes to biodiversity in some literature (Commonwealth of Australia 2000).

Recommendations regarding apiary are outlined in Section 8.2.

Conservation Values of State Forests in the Mt Cole/Pyrenees Landscape Zone

Mount Cole/ Beeripmo State Forest (8,926 hectares)

Located within the Central Victorian Uplands, Mount Cole State Forest was identified as having high conservation values under the VNPA's Small Parks Project (VNPA 2010). The area is rich in bird life with over 130 species. Nine threatened fauna species occur in the forest including the nationally endangered Regent Honey-eater and critically endangered Australian Bustard, the endangered Growling Grass Frog and Brown Toadlet, the vulnerable Brush-tailed Phascogale, Square-tailed Kite, Speckled Warbler and Southern Toadlet and near threatened Hooded Robin.

Thirteen threatened flora species occur in the forest - Dean's Wattle, Wiry Bossiaea, Swamp Diuris, Yarra Gum, Tight Bedstraw, Western Golden-tip, Grampians Bitter-pea, Mount Cole Grevillea, Shiny Tea-tree, Netted Daisy-bush, Rough Daisy-bush, Southern Swainson-pea and One Flower Early Nancy.

A total of 87% of EVCs in the forest are under-represented in the Central Victorian Uplands bioregion. Mt Cole contains small patches of three endangered EVCs (Alluvial Terraces Herb-rich Woodlands, Alluvial Terraces Herb-rich Woodlands/ Plains Grassy Woodland Complex and Creekline Grassy Woodland) and two vulnerable EVCs (Riparian Forest and Valley Grassy Forest).

Many plants, such as Flame Heath, and animals such as the Mountain Brushtail Possum, are at the extremities of their range, underling the ecological importance of the area and the significant contribution the area would make to the CAR reserve system. Currently about 33% (2964ha) of the forest is a Special Protection Zone (SPZ), about 36% (3198ha) Special Management Zone (SMZ) and about 31% (2762ha) General Management Zone (GMZ). The forest has good links to the south-west and is moderately linked to north and east. A wildlife corridor between Mt Cole and Mt Lonarch State Forest/Ben Major Forest Reserve through the pine plantations should be established.

Pyrenees Range State Forest (15,790 hectares)

Located within the Central Victorian Uplands and Goldfields bioregions. The Pyrenees Ranges State Forest was identified as having high conservation value area under the VNPA's Small Parks Project (VNPA 2010). Occurs in two sections (14,573 ha eastern section and 1,210 ha western section). Southern parts of the forest contain large areas of Herb-rich Foothill Forest (depleted in the CVU), while northern sections include Alluvial Terraces Herb-rich Woodlands which is endangered in both bioregions. Thirty per cent of EVCs in the forest are under-represented in the Central Victorian Uplands and Goldfields Bioregions.

Contains over 100 bird species, 15 mammal species and 16 reptile species, including legless lizards, Bearded Dragons, Tree Goannas and breeding pairs of Powerful Owls. It contains one

Mount Cole State Forest contains many beautiful fern gullys. Photo courtesy Yasmin Kelsall

Grass Trees in the Ben Major State Forest.

entire significant old tree site and part of another (ECC 2001). Six threatened fauna species occur in the forest including the endangered Brown Toadlet, vulnerable Brush-tailed Phascogale, Diamond Firetail and Speckled Warbler and near threatened Brown Treecreeper and Black-chinned Honeyeater. Over 240 native plant species occur in the forest, including the rare Rayless Daisy-bush, Shiny Tea-tree and Squat Picris.

The forest is part of a large block of public land that includes the Landsborough Nature Conservation Reserve and has potential for linkages to both the St Arnaud National Park in the north and Mt Cole in the south. There was wide support for the Pyrenees Ranges to form part of a National Park in the investigation into the Box-Ironbark areas (ECC 2001). Currently approximately 42% (6,174 ha) of the forest is a designated SPZ. Past sheep grazing has impacted on native vegetation and habitat values in some areas.

Ben Major State Forest (1,855 hectares)

Located within the Central Victorian Uplands and Goldfields bioregions. The area is mainly Grassy Dry Forest (depleted) with smaller areas of Creekline Grassy Woodland (endangered), Valley Grassy Forest and Hills Herb-rich Woodland (vulnerable), Herb-rich Foothill Forest (depleted) and Heathy Dry Forest (least concern).

The forest is very floristically diverse with over 320 native plant species recorded, including the vulnerable Ben Major Grevillea and Yarra Gum. Threatened fauna species include the nationally endangered Regent Honeyeater, endangered Brown Toadlet, and vulnerable Speckled Warbler and Southern Toadlet. Over three quarters of the forest is currently an SPZ with the remaining 423 ha. an SMZ. Given that the majority of the forest is comprised of EVCs that are under-represented in the Central Victorian Uplands and Goldfields Bioregions, and the relatively small areas available for harvesting timber products, this area should be combined with the adjacent Ben Major Forest Reserve, and management of both areas undertaken by Parks Victoria.

Mt Lonarch/ Berumgower State Forest (1,170 hectares)

Located within the Central Victorian Uplands and Goldfields bioregions. The forest is comprised of Herb-rich Foothill Forest and Grassy Dry Forest which are both depleted.

All EVCs are under-represented in the Central Victorian Uplands and Goldfields Bioregions. Threatened fauna species include the nationally endangered Regent Honeyeater, endangered Brown Toadlet, and vulnerable Speckled Warbler. Over 115 species of native plants have been recorded in the area, including the rare Yarra Gum

and Wiry Bossiaea. The forest is fragmented from other larger forest areas by pine plantations on the south and east, and private land to the north. Corridors of native vegetation should be established through and adjacent to these plantations to enhance links with the Mount Cole and Ben Major forests. Currently about 27% (315 ha) of the forest is SPZ.

Musical Gully State Forest (727 hectares)

The bulk of the forest is Heathy Dry Forest (Least Concern) with small areas of the endangered Alluvial Terraces Herb-rich Woodland and depleted Grassy Dry Forest. A total of 66% of EVCs are under-represented in the Central Victorian Uplands bioregion.

Over sixty native species fauna species are recorded for the forest. Threatened fauna species include the vulnerable Brush-tailed Phascogale, Southern Toadlet, and Hardhead, and near threatened Brown Treecreeper. Over 200 species of native plants occur in the forest, including the nationally vulnerable Ben Major Grevillea. The forest lacks large old trees, but appears to contain a good range of medium and small trees. The forest does not require thinning. On slopes the understorey is in good condition with good diversity. Lower areas tend to have poorer understorey diversity. Many areas appeared to have good quality of logs on the ground. Few weed species were seen in the forest. About 64% (471ha) of the forest is SPZ. A designated water supply area of 208ha is an SMZ.

Glenmona State Forest (717 hectares)

Located within the Goldfields bioregion Glenmona State Forest has high conservation values. It contains over 80 native fauna species and 160 native flora species. Fauna includes nine threatened species. The forest is a key site for the nationally endangered Swift Parrot. The endangered Brown Toadlet, vulnerable Lace Goanna and Diamond Firetail and threatened Black-eared Cuckoo, Hooded Robin, Black-chinned Honeyeater, Brown Treecreeper and Bearded Dragon are also present. Threatened flora species include the nationally endangered Pterostylis despectans.

The vegetation is predominantly Box-Ironbark Forest (depleted). Small areas of Creekline Grassy Woodland (endangered), moderate areas of Grassy Woodland (vulnerable) and smaller areas of and Heathy Dry Forest (least concern) are also present. 80% of EVCs present are under-represented in the Goldfields Bioregions. The forest is an important area for woodland birds, being strategically located between the Pyrenees Ranges and more extensive areas of forest in the Maryborough area. Widespread bird activity was apparent during a site visit in March this year. The forest contains two significant large old tree sites (ECC 2001). Approximately 35% (253 ha.) of the forest is protected in an SPZ, including large old tree sites and some threatened EVCs and flora sites. There is also a 90ha. SMZ for Pterostylis despectans. The forest is fragmented by the Pyrenees Highway. In many areas the forest structure has been significantly altered, with higher densities of small trees.

Waterloo State Forest (1678 hectares)

The entire forest is an SPZ. It is mainly Grassy Dry Forest/ Heathy Dry Forest Complex (Depleted), with Herb-rich Foothill Forest (depleted) and Alluvial Terraces Herb-rich Woodland (endangered).

All EVCs are under-represented in the Central Victorian Uplands and Goldfields Bioregions, and should be formally protected. Over fifty native fauna species have been recorded for the area, including the nationally vulnerable Growling Grass Frog. Powerful Owls are also present. Over 170 native plant species have been recorded in the forest. The understorey lacks diversity in many areas, but cover is generally good. Smaller trees are common in the forest, although in some area medium trees are relatively common. Tree density does not appear to be overly high, and thinning is not required. The forest has good links to Ben Major State Forest and Ben Major Flora Reserve in the north. Linkages between Waterloo and Musical Gully State Forest could also be strengthened.

Trawalla State Forest (853 hectares)

Mainly Heathy Dry Forest (Least Concern) with some small areas of Valley Grassy Forest. 50% of EVCs under-represented in the Central Victorian Uplands and Goldfields Bioregions. Nearly fifty native fauna species are recorded for the forest. Threatened fauna species include the vulnerable Brush-tailed Phascogale, and near threatened Black-chinned Honeyeater and Brown Treecreeper. Over 230 native plant species have been recorded for the forest. Threatened flora species include the rare Yarra Gum and Rough Wattle.

The forest lacks big old trees, but medium trees are quite common. The forest does not require thinning. The understorey has been simplified by past grazing, but still has good diversity in areas. There appears to be few weeds within the forest, except at the edges. Logs on the ground appear to be well below benchmarks, especially in the north east corner. Signs of rabbits and past mining are evident. Approximately 20% of the forest is currently SPZ and the remainder GMZ.

6.6 Conservation Values of State Forests in the Landscape Zone

Despite being significantly impacted by continued timber harvesting, all State Forests in the Landscape Zone have good to high conservation and ecological values, including threatened flora and fauna and threatened vegetation types. Mount Cole and Pyrenees Range State Forest were also identified as having high conservation values under the VNPA's Small Parks Project (VNPA 2010).

In fragmented areas, such as the Landscape Zone, larger blocks of native vegetation on public land are essential to maintaining species diversity and sustainable populations of native species in the landscape. The recent move of Vicforests into the west of State highlights the need for a change in tenure to provide clarity on management intentions for the region.

Recommended additions to the conservation reserve system are outlined in Section 8.2.

6.7 Other Public Land in the Landscape Zone – Roadsides and Crown River Frontages

Public land within the Landscape Zone also includes roadsides reserves that are managed by local councils or Vicroads and Crown Stream Frontages that are mostly grazed under license.

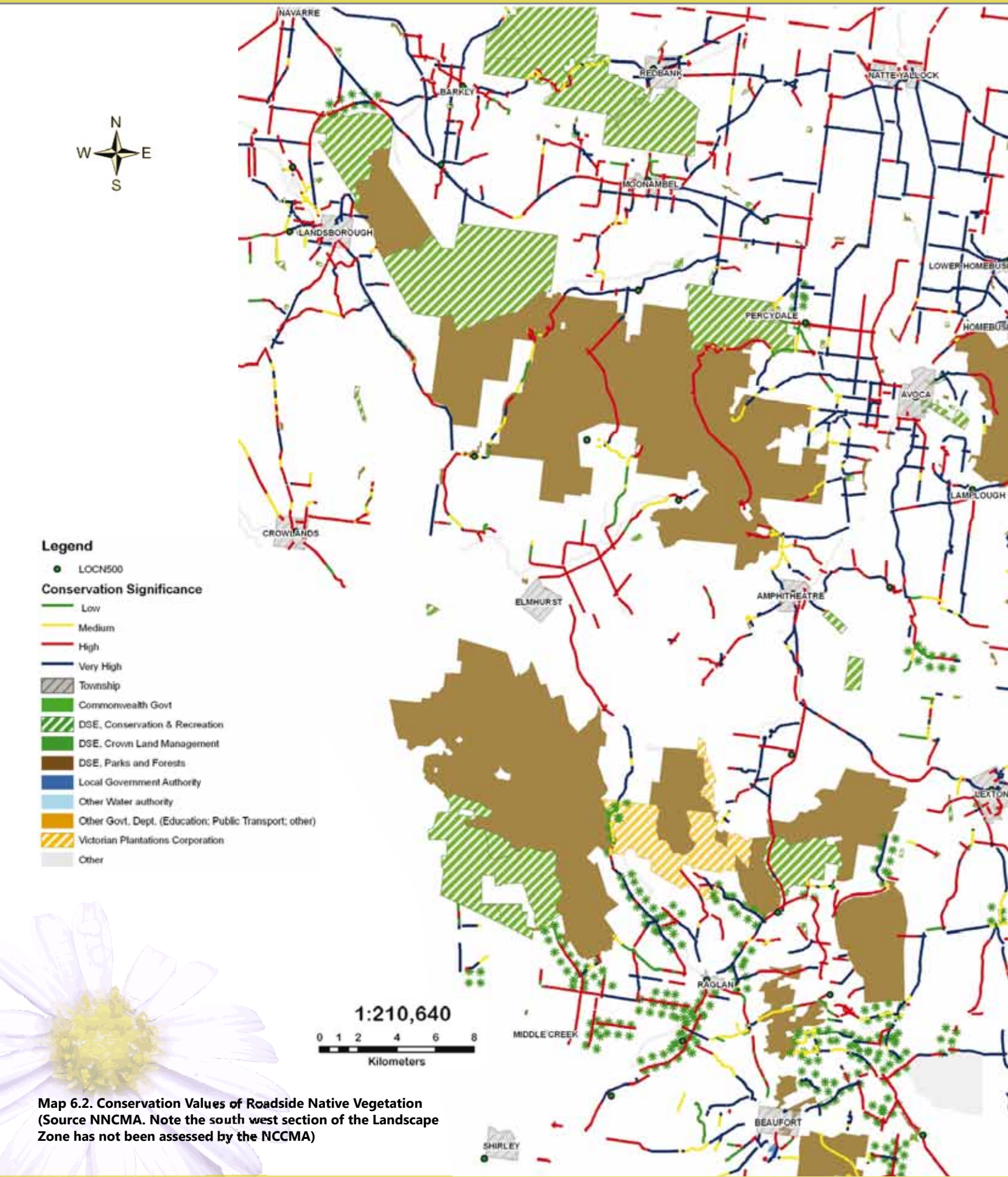
Roadside reserves often contain vegetation types that have otherwise been heavily cleared in the surrounding landscape. One of the key findings of the current VEAC Remnant Vegetation investigation has been the importance of roadside vegetation in maintaining landscape connectivity and providing habitat in fragmented landscapes (Victorian Environment Assessment Council 2010). In the Goldfield bioregion 10% of native vegetation on public land is found on roadsides (Victorian Environment Assessment Council 2010).

Given this it is important that roadside vegetation is managed appropriately. Roadside Management Plans and Strategies have been developed by all local councils in conjunction with CMAs. Roadside vegetation within the Landscape Zone has also been assessed for conservation values (see Map 6.2). However, roadside vegetation continues to decline in many areas due to poor management and neglect.

Most frontages of permanent streams in Victoria are public land, often containing riparian vegetation (over 100,000 ha of these frontages are found across the State). As with roadside vegetation, these stream frontages have been identified by VEAC as critical areas for maintaining landscape connectivity and providing habitat in fragmented landscapes (Victorian Environment Assessment Council 2010). Riparian areas are very important for native fauna as they are very productive parts of the landscape, reliably providing resources, such as nectar and bark, for most of the year (Palmer 2009). In northern Victoria, riparian areas have also been found to provide refuge areas during drought and climate change (Bennett et al 2009).

Most of these river frontages are currently grazed under license by adjacent landowners. Despite opposition from a number of environmental groups and advice from the Health Department not to renew licenses because of water quality issues, the state government recently renewed grazing licenses for a further five years. The network of these stream frontages could play a very important future role in rebuilding landscape connectivity within the area. A proportion of these riparian areas in Landscape Zone have had riparian vegetation entirely removed or the vegetation has been reduced to narrow strips, often weed infested and of poor quality.

Recommendations regarding Stream Frontages and roadside reserves are outlined in Section 8.2.



Map 6.2. Conservation Values of Roadside Native Vegetation (Source NNCMA. Note the south west section of the Landscape Zone has not been assessed by the NCCMA)

7.0 Conservation Management on Private Land

Approximately 80 per cent of the Landscape Zone is private land, with the predominant land use being agricultural activities, mostly grazing. However, over the last few decades, an increasing number of 'lifestyle' properties have been established in the area.

Vegetation on private land, including small pockets of natural bushland and large solitary trees in paddocks, is a critical component of our natural ecosystems, providing habitat for wildlife, and often forming the last strongholds of otherwise depleted local plants and animals. The incremental loss of these small patches and single paddock trees leads to further loss of habitat, further fragmentation and degradation of landscape processes. This further undermines the functioning and resilience of ecosystems.

Although tree cover is relatively high compared to other regions, up to sixty percent of native vegetation on private land in the Landscape Zone has been cleared. As a result of selective clearing of the vegetation that occurred in the more fertile parts of the Landscape Zone, these vegetation types are now mostly classified as endangered or vulnerable (see below). A number of threatened native species also occur on private land in the Landscape Zone, including the endangered Growling Grass Frog and rare Yarra Gum.

7.1 High Conservation Value Areas on Private Land

Although it is important to focus on how native species use all landscape components, including habitat remnants, corridors and the surrounding landscape mosaic, some key areas on private land with high conservation values are outlined below. Sites on private land in the Landscape Zone that include endangered vegetation types, larger remnants and higher quality remnants, should be identified as part of a overall conservation action plan for the region. Financial assistance could be provided to ensure these areas are protected and managed appropriately.

Threatened Vegetation Types include Endangered EVCs that predominantly occur on private land in the Landscape Zone. EVCs that were once relatively widespread in Landscape Zone but were heavily cleared include Grassy Woodland/ Alluvial Terraces Herb-rich Woodland Mosaic, Grassy Woodland, Plains Woodland. Alluvial Terraces Herb-rich Woodland and Grassy Woodland/Heathy Dry Forest Complex. EVCs that were not formerly widespread but were also heavily cleared include Damp Sands Herb-rich Woodland and Creekline Grassy Woodland.

Larger Remnants are an irreplaceable resource. The size of a remnant has a major influence on types of species present, species richness and the size of populations. In northern Victoria remnants greater than 40ha had an average of 25.7 species compared to 7.8 species on roadsides (Bennett et al). Remnants greater than 100ha are required for some fauna species, such as the Brush-tailed Phascogale and White Browed Babbler.

High Vegetation/Habitat Quality areas tend to support more species than lower quality areas. Although habitat requirements are species specific, some habitat elements are critical to a wide range of species. In the forest and woodlands of this region, key habitat elements include tree hollows, dead standing trees, logs on ground and shrubby thickets or tussock grasses.

The quality of vegetation on private land tends to lower than on public land. Based on modeling by DSE the quality score for vegetation on private land in the region is mostly in the 31-40 score category. This typically indicates smaller patches of bush in a cleared landscape, with reduced tree cover and tree recruitment, few if any old trees, reduced understorey diversity and increased cover of weeds. A smaller but still relatively large proportion of private land in the Landscape Zone is in 21-30 category. In terms of vegetation quality this equates to only relict larger trees being present, with very little understorey diversity and a high cover of weeds.

Remnant patches that are close to other remnant patches will tend to provide more habitat than similar sized isolated remnants. The shape of a remnant determines the amount of edge that a remnant has compared to its overall area. Edges of remnants tend to have reduced habitat value also important habitat quality. Riparian areas in the landscape also tend to produce higher quality habitat (Palmer 2009).

Large Old Trees play a very important role in maintaining landscape connectivity and providing habitat in fragmented landscapes (Victorian Environment Assessment Council 2010). However, due to a lack of recruitment over the decades these trees are not being replaced by younger trees. Unless action is taken there will be a gradual loss of these old trees from the landscape over time, with dire consequences for hollow dependant fauna.

Research indicates that for a range of native fauna species, closely spaced (less than 100m apart) large old paddock trees appear to be as good as continuous corridors for facilitating movement between habitat patches (Doerr 2009). Large old trees could be strategically identified for fencing, sources of natural regeneration and enhancement plantings to improve the important role these play as stepping stones.

7.2 Protecting High Conservation Value Areas on Private Land

Key threatening processes to biodiversity on private land in the Landscape Zone include vegetation clearing, habitat fragmentation, grazing by stock, loss of hollow bearing trees, loss of logs on the ground, pest plants and animals, and altered fire regimes.

There is very strong consensus in the scientific literature that retention of existing vegetation is the primary and most cost effective way to minimise biodiversity loss (Victorian Environment Assessment Council 2010). However, despite historical levels of clearing abating, the incremental losses of native vegetation still occurs for residential houses and subdivisions of rural lifestyle properties, upgrading of roads, fire protection. agricultural activities and fencing. Approximately 4600 ha of native vegetation is still being cleared annually in Victoria.

It is important that clearing of native vegetation on private land in the Landscape Zone is avoided wherever possible. Existing regulations for vegetation clearance should also be enforced by the relevant authorities.

Statewide modelling undertaken by DSE indicates a chronic loss of vegetation quality that has occurred over a long period (Victorian Environment Assessment Council 2010). According to DSE these losses in quality are still occurring and have become the main driver in vegetation loss in the State (DSE 2009).

Actions to prevent further declines in vegetation quality, such as fencing to protect from stock, weed control, pest animal control and enhancement plantings, should be undertaken in high conservation values remnants. Preferential restoration of more fertile parts of the landscape is considered a key way to increase landscape resilience and improve ecological function (MacNally et al 2009).

Changing demographics and land use in the area has resulted in an increasing number of conservation agreements to protect native vegetation on private land, for example through the Bush Heritage, Trust for Nature and Land for Wildlife programs. Map 7.1 identifies properties in the Landscape Zone that are part of the Trust for Nature and Land for Wildlife program. These programs are a very effective way to protect native vegetation on private land, and expand the 'private' reserve system.

As well as voluntary and legal agreements, financial incentives for land owners to protect and manage higher conservation value native vegetation on private land should also be significantly increased, through programs such as BushTender and Bushbroker (Commissioner for Environmental Sustainability Victoria 2008). However, this will require increased public funding, as well as potential market-based mechanisms.

Public land on its own is inadequate to meet the requirements of the national conservation reserve system (Commissioner for Environmental Sustainability Victoria 2008). The reserve system will need to be implemented as widely as possible across all land tenures to ensure all ecosystem types are protected (Dunlop 2008). The Victorian State of the Environment Report recommended a significant increase in funds for the acquisition of private land to compliment the reserve system on public land (Commissioner for Environmental Sustainability Victoria 2008).

8.0 Rebuilding Landscape Connectivity and Ecosystem Resilience

The Mt Cole/Pyrenees Landscape Zone has very high conservation values. Over 1000 indigenous plants and 280 indigenous vertebrate fauna species have been recorded in the Landscape Zone. This reflects the wide range of ecosystems that occur in the area, including the two most threatened ecosystems in Australia, grasslands and grassy woodlands (Lindenmayer and Burgman 2010, Tzaros 2006).

Sixty three flora species and fifty fauna species that occur in the Landscape Zone are listed as threatened at a State or National level. Of the 24 EVCs in the Landscape Zone eleven have a bioregional conservation status of endangered, five are vulnerable and five are depleted.

If we are to stem the decline and loss of biodiversity within the region, ecosystem function, ecosystem resilience and landscape connectivity must be restored. To achieve this, especially in the face of climate change, will involve a wide range actions at multiple geographic scales, including the rebuilding of larger-scale ecological processes.

8.1 Key Recommendations and Actions at a Regional, State and National Scale

Address Climate Change

- Reduce carbon emissions.
- Protect and manage native vegetation as permanent stores of carbon and establish indigenous vegetation as carbon offsets.
- Reduce stresses on other ecological processes to build landscape resilience.
- Establish a comprehensive, adequate and representative reserve system across all land tenures that addresses the potential impacts of climate change and need to restore connectivity to the landscape.

Increase Resourcing for Biodiversity Conservation

- Significantly increase investment in management of conservation values and ecological processes on public land.

Public Policy, Legislation and Strategic Planning

- Consider ecological processes in conservation planning, including strategic plans by CMA's.
- Develop science based targets for biodiversity conservation and maintenance of ecological processes.
- Enforce existing conservation and biodiversity related legislation eg Flora and Fauna Guarantee Act and Native Vegetation Retention regulations.

Research, Monitoring and Education

- Increase funding for research, data collection, monitoring and information exchange into ecological processes, ecological restoration and rebuilding ecological connectivity.

Develop Sustainable Rural Landscapes

- Support landowners to manage and protect native vegetation and waterways using a range of measures.
- Provide mechanisms for landowners to establish biodiverse native vegetation as carbon offsets.
- The State government should allocate $10 million over four years for the establishment of small scale firewood plantations or woodlots on private land across the State.

8.2 Key Recommendation and Actions in the Mt Cole/Pyrenees Landscape Zone

Manage Public Land to Sustain Ecological Processes and Landscape Resilience

Public land has been identified in a range of recent State government reports – The State of the Environment Report, The Land and Biodiversity White Paper and the VEAC Discussion Paper on Remnant Vegetation - as key locations to rebuild ecosystem resilience and function, protect ecosystems from the impacts of climate change and maintain the provision of ecosystem services.

The network of parks, reserves and state forests in the Landscape Zone provide an ideal framework to restore local and regional connectivity, ecosystem function and resilience. (DSE 2009). Public land forms a series of stepping stones extending from the volcanic plains in the south, through the foothill forests of the Great Divide and Box-Ironbark areas of the inland hills to the grassy woodlands on the riverine plains in the north. Relatively short distances separate these areas of

public land, providing ideal locations to restore landscape connectivity and build on the many smaller remnant patches and large old paddock trees on private land.

Public land is also estimated to store 15% of all terrestrial carbon in Australia, thereby playing a key role in the mitigation of climate change (Dudley VNPA). There is '...substantial potential for carbon sequestration in forest areas that have been logged if they are allowed to re-grow undisturbed by further intensive land-use activities' (Mackey et al 2008). As climate change impacts, areas such as Great Divide Range with higher rainfall and wider variations in topography, could be vital for susceptible species that may need to move their range south as rainfall further declines in the north of the State.

Public land in the Landscape Zone also includes Crown Stream Frontages, roadsides reserves and smaller reserves that require better management of conservation values.

Recommendations for improved management of conservation values and ecological processes on public land in the Landscape Zone:

Tenure, Resourcing and Management

- Reassess current management status and tenure of high conservation value State Forests (see below).
- Significantly increase resources for management of conservation values and ecological processes on public land. Parks Victoria and DSE should establish a clear management stream with a clearly identified budget for management of biodiversity and ecological systems on public land.
- Coordinate public land management into one land management agency based at one local location.
- Manage larger core areas to sustain ecological processes, especially in relation to fire regimes, resource extraction and invasive species.
- Site-specific ecological management plans should be established for all public land.
- Control threatening processes such as pest plant and animals and inappropriate recreation.
- Achieve a net gain in the condition of native vegetation on public land.

Timber and Firewood Harvesting

- End logging in all State Forests.
- Firewood harvesting in State Forests should only occur as a byproduct of ecological thinning.
- Regulation of domestic firewood collection should be improved.
- Commercial firewood harvesting should be progressively phased out and resources allocated to the establishment of small scale firewood plantations or woodlots on private land.

Fire Management

- Long term research and monitoring should be undertaken to determine the impacts of fuel reduction burning on biodiversity, especially native fauna.
- Specific prescriptions outlining temporal and spatial burning mosaics should be developed for each EVC based on expertise from all relevant ecological, biological and zoological disciplines.
- Defined long term objectives and clear prescriptions for each Ecological Management Zone (Fire Operations Plan Zone Three).

Apiary

- An advisory body (including stakeholder participation) be established to monitor and research the impacts of introduced bees and apiary on native flora and fauna on public land.
- Provide funding to establish Eucalypt 'honey' species plantations on private land.
- Existing apiary licenses continue in any new State Parks subject to the outcomes of the above recommendations.

Crown Stream Frontages

- Convert existing Crown Stream Frontages to Conservation Licences and double funding for fencing to exclude stock and undertake habitat restoration.
- High conservation value and key linkage areas of Crown Stream Frontage be added to the reserve system and managed by Parks Victoria.

Roadside Reserves

- Local councils and Vicroads should provide

better management and greater resources for management of native habitat and vegetation on roadsides.

- Where appropriate roadside vegetation should be enhanced to improve landscape connectivity.

Expand the Conservation Reserve System in the Landscape Zone and Region

National and State governments have committed to the development of a comprehensive, adequate and representative (CAR) national reserve system that conserves biodiversity across Australia. Building the reserve system is one of six national priorities under the Australian Government's Caring for our Country initiative. According to the Australian Biodiversity Strategy (2009) 'A well planned and managed ...reserve system is the most effective and immediate way to build landscape reliance in a changing climate', and '...to secure critical habitats of vulnerable species'.

The Goldfields and Central Victorian Uplands (CVU) bioregions were identified in the State of Environment Report as having significant areas of public land not included in the reserve system (Commissioner for Environmental Sustainability Victoria 2008).

Only 4.4% of the CVU bioregion is contained in conservation reserves, with VEAC specifically identifying significant patches of remnant native vegetation of high quality and connectivity that ' ... are centred on conservation reserves such as Mt Buangor and Langi Ghiran' (Victorian Environment Assessment Council 2010).

The Goldfields has 8.9% of the bioregion contained in conservation reserves, however less than a quarter of all remaining vegetation is found on public land (VEAC 2010). The Victorian Volcanic Plain has the lowest levels of all bioregions in terms of area in conservation reserves (1.3%), however the only public land in this bioregion in the Landscape Zone are roadsides, therefore presenting no opportunities for more conservation reserves (VEAC 2010).

Parks and reserves occupy less than 5% of the Landscape Zone providing very significant scope to increase the extent of parks and reserves in the area to meet regional reserve system targets (compared to State Forests which occupy approximately 10%). The 2007 Catchment Condition Report notes that parks and reserves in the region tend to be small in extent and somewhat fragmented (Victorian Catchment Management Council 2007). Parks and reserves in the Landscape Zone are also small and fragmented, with the majority being less than 4,000 hectares.

Table 8.1 EVCs in Landscape Zone Under-represented in Reserve System in Goldfield and CVU Bioregions

Goldfields Bioregion	Bioregional Conservation Status	Central Victorian Uplands	Bioregional Conservation Status
55 Plains Grassy Woodland	Endangered	152 Alluvial Terrace Herb-rich	Endangered
67 Alluvial Terraces Herb-rich Woodland	Endangered	Woodland/Plains Grassy Woodland	
68 Creekline Grassy Woodland	Endangered	Complex	
76 Grassy Woodland/ Alluvial Terraces	Endangered	68 Creekline Grassy Woodland	Vulnerable
Herb-rich Woodland Mosaic		28 Grassy Forest	Vulnerable
81 Alluvial Terrace Herb-rich	Vulnerable	71 Hills Herb-rich Woodland	Vulnerable
Woodland/Creekline Grassy		164 Creekline Herb-rich Woodland	Vulnerable
Woodland Mosaic		147 Valley Grassy Forest	Depleted
47 Valley Grassy Forest	Vulnerable	23 Herb-rich Foothill Forest	Depleted
175 Grassy Woodland	Vulnerable	22 Grassy Dry Forest	Depleted
48 Heathy Woodland	Depleted		

The State government has also committed to protect at least 80% of all bioregional ecosystems in each interim Biogeographic Region by 2015. In the Goldfields and Central Victorian Uplands bioregions only 12% of ecosystems (EVCs) meet these reservation targets. The EVCs outlined in Table 6.3 occur in the Landscape Zone and require extensive additions to meet bioregional reserve targets.

Most State Forests in the Landscape Zone have significant conservation values including threatened vegetation types and a range of declining and threatened species including the endangered Swift Parrot, Growling Grass Frog, Brown Toadlet and Golden Sun Moth and rare flora such as Ben Major Grevillea and Mount Cole Grevillea.

These conservation values would be significantly improved and their long term protection guaranteed by reclassification as State Parks. It would also end the uncertainty generated by the transfer of timber allocations for Western Victoria to Vicforests and allow the entire network of public

Recommendations for Additions to the Conservation Reserve System in the Landscape Zone:					
State Forest	**Size (ha.)**	**Conservation Value**	**Reserve System Contribution**	**Linkages**	**Recommended Tenure**
Mt Cole	8,926	High	High	High	State Park
Pyrenees Ranges	15,790	High	High	High	State Park
Glenmona	717	High	High	High	State Park
Mount Lonarch	1,170	High	High	Moderate	State Park
Ben Major	1,855	High	High	High	State Park
Waterloo	1678	Moderate	High	High	State Park
Musical Gully	727	High	Moderate	High	State Park
Trawalla	835	Moderate	Moderate	High	State Park

land in the Landscape Zone to be managed in a integrated manner by a single land manager – Parks Victoria.

These public land areas exist in a highly modified landscape and have been exploited for over 150 years, with a range of negative impacts on local ecosystems. State Forests in the Landscape Zone now only a sustain a small local firewood industry. An industry that would produce greater regional economic and environmental returns (tree planting on cleared private land, more sympathetic land use, etc.) if shifted to private plantations.

Protect and Expand Riparian Vegetation

Protection and restoration of riparian areas, such as the Avoca River, Hopkins and Wimmera River forms an integral part of rebuilding landscape connectivity in the Landscape Zone. The network of streamside frontages that exist along these rivers should be converted to Riparian Conservation Licences. Where appropriate these areas should be fenced to exclude stock access. Natural regeneration should be encouraged and revegetation undertaken where necessary to enhance these voluble and productive riparian areas. For recommendations see earlier in this section.

Protect and Expand Native Vegetation on Private Land

Vegetation on private land is a critical component of our natural ecosystems, providing habitat for wildlife and often forming the last strongholds of otherwise depleted local plants and animals. As a result of selective clearing of the vegetation that occurred in the more fertile parts of the Landscape Zone, these vegetation types are now mostly classified as endangered or vulnerable.

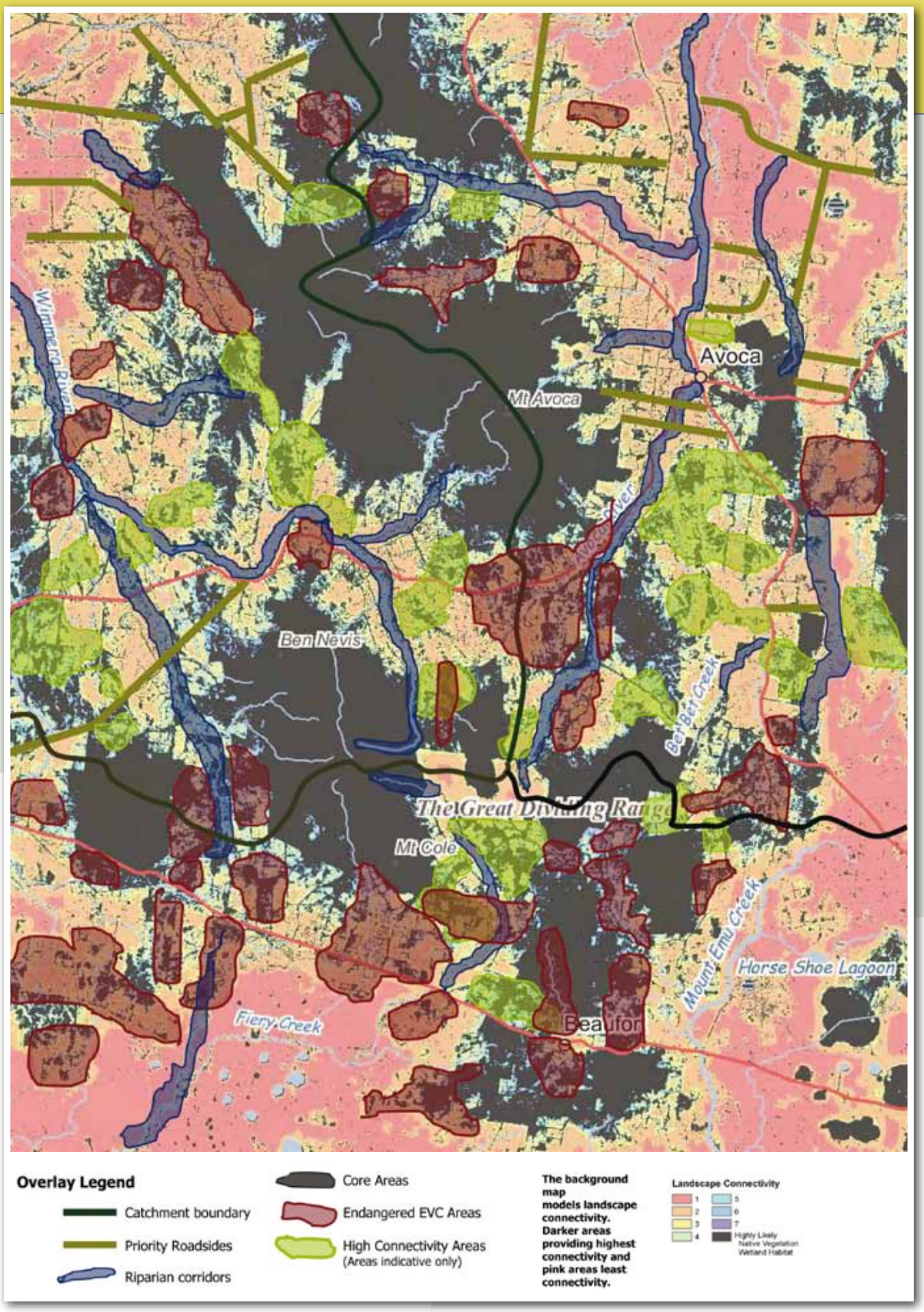
The following actions are required to protect and enhance native vegetation and habitat on private land:

- Avoid the loss of existing native vegetation.
- Achieve a net gain in the extent and condition of native vegetation and key habitat elements by controlling threatening processes (e.g. pest plants and animals) and undertaking actions such as enhancement plantings, buffer plantings and encouraging natural regeneration.
- Encourage voluntary conservation mechanisms
- Identify high priority remnants for protection and enhancement

Develop a Conservation Action Plan

The development of a Conservation Action Plan by environmental groups, local councils and CMAs, would help to outline a clear vision for the Landscape Zone. The Plan should be based on informed goals that are specific, achievable and measurable, and identify a range of actions to achieve these goals and vision. Actions include outlining specific areas and priorities for on-ground actions, such as weed or pest control, fencing, enhancement planting or wildlife corridors, priority remnants for protection on private land and priority areas of public land for further protection and enhancement.

Map 8.1 identifies potential areas to rebuild connectivity in the Landscape Zone. The areas outlined are indicative as more detailed planning is required. The High Connectivity Areas highlighted do not consider the specific needs of local fauna but are based on general landscape ecology principles.



Map 8.1: Potential areas to rebuild connectivity in the Landscape Zone (Map Source: DSE Geospatial Data)

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Appendices

Appendix One: Indigenous Flora in the Landscape Zone

Scientific name	Common name	Family name
Acacia acinacea s.l.	Gold-dust Wattle	Mimosaceae
Acacia aculeatissima	Thin-leaf Wattle	Mimosaceae
Acacia aspera subsp. aspera	Rough Wattle	Mimosaceae
Acacia aspera subsp. parviceps	Rough Wattle	Mimosaceae
Acacia dealbata	Silver Wattle	Mimosaceae
Acacia deanei	Deane's Wattle	Mimosaceae
Acacia genistifolia	Spreading Wattle	Mimosaceae
Acacia gunnii	Ploughshare Wattle	Mimosaceae
Acacia implexa	Lightwood	Mimosaceae
Acacia mearnsii	Black Wattle	Mimosaceae
Acacia melanoxylon	Blackwood	Mimosaceae
Acacia montana	Mallee Wattle	Mimosaceae
Acacia myrtifolia	Myrtle Wattle	Mimosaceae
Acacia obliquinervia	Mountain Hickory Wattle	Mimosaceae
Acacia oxycedrus	Spike Wattle	Mimosaceae
Acacia paradoxa	Hedge Wattle	Mimosaceae
Acacia pycnantha	Golden Wattle	Mimosaceae
Acacia salicina	Willow Wattle	Mimosaceae
Acacia spp.	Wattle	Mimosaceae
Acacia stricta	Hop Wattle	Mimosaceae
Acacia verniciflua	Varnish Wattle	Mimosaceae
Acacia verticillata	Prickly Moses	Mimosaceae
Acacia verticillata subsp. verticillata	Prickly Moses	Mimosaceae
Acaena agnipila	Hairy Sheep's Burr	Rosaceae
Acaena echinata	Sheep's Burr	Rosaceae
Acaena novae-zelandiae	Bidgee-widgee	Rosaceae
Acaena ovina	Australian Sheep's Burr	Rosaceae
Acaena spp.	Sheep's Burr	Rosaceae
Achrophyllum dentatum	Toothed Mitre-moss	Hookeriaceae
Acrocladium chlamydophyllum	Spear Moss	Plagiotheciaceae
Acrotriche prostrata	Trailing Ground-berry	Ericaceae
Acrotriche serrulata	Honey-pots	Ericaceae
Actinobole uliginosum	Flannel Cudweed	Asteraceae
Adiantum aethiopicum	Common Maidenhair	Adiantaceae
Agrostis s.l. spp.	Bent/Blown Grass	Poaceae
Agrostis venusta	Misty Bent	Poaceae
Ajuga australis	Austral Bugle	Lamiaceae
Allittia cardiocarpa	Swamp Daisy	Asteraceae
Allittia uliginosa	Small Swamp-daisy	Asteraceae
Allocasuarina luehmannii	Buloke	Casuarinaceae
Allocasuarina misera	Slender Sheoak	Casuarinaceae
Allocasuarina muelleriana subsp. muelleriana	Slaty Sheoak	Casuarinaceae
Allocasuarina paludosa	Scrub Sheoak	Casuarinaceae
Allocasuarina paradoxa	Green Sheoak	Casuarinaceae
Allocasuarina pusilla s.l.	Dwarf Sheoak	Casuarinaceae
Allocasuarina verticillata	Drooping Sheoak	Casuarinaceae
Alternanthera sp. 1 (Plains)	Plains Joyweed	Amaranthaceae
Amphibromus archeri	Pointed Swamp Wallaby-grass	Poaceae
Amphibromus macrorhinus	Long-nosed Swamp Wallaby-grass	Poaceae
Amphibromus neesii	Southern Swamp Wallaby-grass	Poaceae
Amphibromus nervosus	Common Swamp Wallaby-grass	Poaceae
Amphibromus spp.	Swamp Wallaby-grass	Poaceae
Amphipogon strictus	Grey-beard Grass	Poaceae
Amyema miquelii	Box Mistletoe	Loranthaceae
Amyema pendula	Drooping Mistletoe	Loranthaceae
Amyema quandang var. quandang	Grey Mistletoe	Loranthaceae
Amyema spp.	Mistletoe	Loranthaceae
Aphanes australiana	Australian Piert	Rosaceae
Aphanes spp.	Piert	Rosaceae
Aphelia gracilis	Slender Aphelia	Centrolepidaceae
Aphelia pumilio	Dwarf Aphelia	Centrolepidaceae
Argentipallium obtusifolium	Blunt Everlasting	Asteraceae
Aristida behriana	Brush Wire-grass	Poaceae
Arthropodium fimbriatum	Nodding Chocolate-lily	Anthericaceae
Arthropodium milleflorum s.l.	Pale Vanilla-lily	Anthericaceae
Arthropodium minus	Small Vanilla-lily	Anthericaceae
Arthropodium spp. (s.s.)	Vanilla Lily	Anthericaceae
Arthropodium strictum s.l.	Chocolate Lily	Anthericaceae
Arthropodium strictum s.s.	Chocolate Lily	Anthericaceae
Asperula conferta	Common Woodruff	Rubiaceae
Asperula scoparia	Prickly Woodruff	Rubiaceae
Asplenium bulbiferum subsp. gracillimum	Mother Spleenwort	Aspleniaceae
Asplenium flabellifolium	Necklace Fern	Aspleniaceae
Astroloma conostephioides	Flame Heath	Ericaceae
Astroloma humifusum	Cranberry Heath	Ericaceae
Astroloma spp.	Heath	Ericaceae
Astrotricha asperifolia s.l.	Rough Star-hair	Araliaceae
Austrodanthonia auriculata	Lobed Wallaby-grass	Poaceae
Austrodanthonia bipartita s.l.	Leafy Wallaby-grass	Poaceae
Austrodanthonia caespitosa	Common Wallaby-grass	Poaceae
Austrodanthonia carphoides	Short Wallaby-grass	Poaceae
Austrodanthonia duttoniana	Brown-back Wallaby-grass	Poaceae
Austrodanthonia eriantha	Hill Wallaby-grass	Poaceae
Austrodanthonia fulva	Copper-awned Wallaby-grass	Poaceae
Austrodanthonia geniculata	Kneed Wallaby-grass	Poaceae
Austrodanthonia induta	Shiny Wallaby-grass	Poaceae
Austrodanthonia laevis	Smooth Wallaby-grass	Poaceae
Austrodanthonia monticola	Small-flower Wallaby-grass	Poaceae
Austrodanthonia penicillata	Weeping Wallaby-grass	Poaceae
Austrodanthonia pilosa	Velvet Wallaby-grass	Poaceae
Austrodanthonia racemosa var. racemosa	Slender Wallaby-grass	Poaceae
Austrodanthonia setacea	Bristly Wallaby-grass	Poaceae
Austrodanthonia setacea var. setacea	Bristly Wallaby-grass	Poaceae
Austrodanthonia spp.	Wallaby Grass	Poaceae
Austrodanthonia tenuior	Purplish Wallaby-grass	Poaceae
Austrostipa bigeniculata	Kneed Spear-grass	Poaceae
Austrostipa curticoma	Short-crown Spear-grass	Poaceae
Austrostipa densiflora	Dense Spear-grass	Poaceae
Austrostipa exilis	Heath Spear-grass	Poaceae
Austrostipa gibbosa	Spurred Spear-grass	Poaceae
Austrostipa hemipogon	Half-bearded Spear-grass	Poaceae
Austrostipa mollis	Supple Spear-grass	Poaceae
Austrostipa nodosa	Knotty Spear-grass	Poaceae

Threatened flora are listed in Section. Source: FloraInformation System, Victoria.

Appendix One: Indigenous Flora in the Landscape Zone

Scientific name	Common name	Family name
Austrostipa oligostachya	Fine-head Spear-grass	Poaceae
Austrostipa pubinodis	Tall Spear-grass	Poaceae
Austrostipa rudis	Veined Spear-grass	Poaceae
Austrostipa rudis subsp. rudis	Veined Spear-grass	Poaceae
Austrostipa scabra	Rough Spear-grass	Poaceae
Austrostipa scabra subsp. falcata	Rough Spear-grass	Poaceae
Austrostipa semibarbata	Fibrous Spear-grass	Poaceae
Austrostipa setacea	Corkscrew Spear-grass	Poaceae
Austrostipa spp.	Spear Grass	Poaceae
Austrostipa stuposa	Quizzical Spear-grass	Poaceae
Azolla pinnata	Ferny Azolla	Azollaceae
Banksia marginata	Silver Banksia	Proteaceae
Barbula calycina	Common Beard-moss	Pottiaceae
Bauera rubioides	Wiry Bauera	Cunoniaceae
Baumea acuta	Pale Twig-sedge	Cyperaceae
Baumea rubiginosa s.l.	Soft Twig-rush	Cyperaceae
Baumea tetragona	Square Twig-sedge	Cyperaceae
Billardiera mutabilis	Common Apple-berry	Pittosporaceae
Billardiera scandens s.l.	Common Apple-berry	Pittosporaceae
Blechnum cartilagineum	Gristle Fern	Blechnaceae
Blechnum minus	Soft Water-fern	Blechnaceae
Blechnum nudum	Fishbone Water-fern	Blechnaceae
Blechnum wattsii	Hard Water-fern	Blechnaceae
Bolboschoenus spp.	Club Sedge	Cyperaceae
Boronia nana	Dwarf Boronia	Rutaceae
Boronia nana var. nana	Dwarf Boronia	Rutaceae
Boronia nana var. pubescens	Dwarf Boronia	Rutaceae
Boronia spp.	Boronia	Rutaceae
Bossiaea buxifolia	Matted Bossiaea	Fabaceae
Bossiaea cordigera	Wiry Bossiaea	Fabaceae
Bossiaea prostrata	Creeping Bossiaea	Fabaceae
Brachyloma ciliatum	Fringed Brachyloma	Ericaceae
Brachyloma daphnoides	Daphne Heath	Ericaceae
Brachyloma ericoides subsp. ericoides	Brush Heath	Ericaceae
Brachyscome aculeata	Branching Daisy	Asteraceae
Brachyscome basaltica var. gracilis	Woodland Swamp-daisy	Asteraceae
Brachyscome decipiens	Field Daisy	Asteraceae
Brachyscome diversifolia	Tall Daisy	Asteraceae
Brachyscome leptocarpa	Downy Daisy	Asteraceae
Brachyscome multifida	Cut-leaf Daisy	Asteraceae
Brachyscome parvula	Coast Daisy	Asteraceae
Brachyscome perpusilla	Rayless Daisy	Asteraceae
Breutelia affinis	Common Breutelia	Bartramiaceae
Breutelia pendula	Mountain Breutelia	Bartramiaceae
Bromus spp.	Brome	Poaceae
Brunonia australis	Blue Pincushion	Brunoniaceae
Bryum argenteum	Silver Moss	Bryaceae
Bulbine bulbosa	Bulbine Lily	Asphodelaceae
Burchardia umbellata	Milkmaids	Colchicaceae
Bursaria spinosa	Sweet Bursaria	Pittosporaceae
Bursaria spinosa subsp. lasiophylla	Hairy Bursaria	Pittosporaceae
Bursaria spinosa subsp. spinosa	Sweet Bursaria	Pittosporaceae
Bursaria spp.	Bursaria	Pittosporaceae
Caesia calliantha	Blue Grass-lily	Hemerocallidaceae
Caladenia carnea s.s.	Pink Fingers	Orchidaceae
Caladenia carnea sensu Willis (1970)	Pink Fingers	Orchidaceae
Caladenia catenata s.l.	Pink Fingers/White Fingers	Orchidaceae
Caladenia clavigera	Plain-lip Spider-orchid	Orchidaceae
Caladenia cucullata	Hood Orchid	Orchidaceae

Scientific name	Common name	Family name
Caladenia dilatata s.l.	Green-comb Spider-orchid	Orchidaceae
Caladenia fuscata	Dusky Fingers	Orchidaceae
Caladenia gracilis	Musk Hood-orchid	Orchidaceae
Caladenia iridescens	Western Bronzehood Orchid	Orchidaceae
Caladenia patersonii s.l.	Common Spider-orchid	Orchidaceae
Caladenia phaeoclavia	Brown-clubbed Spider-orchid	Orchidaceae
Caladenia spp.	Caladenia	Orchidaceae
Caladenia tentaculata	Mantis Orchid	Orchidaceae
Caladenia venusta	Large White Spider-orchid	Orchidaceae
Calandrinia calyptrata	Pink Purslane	Portulacaceae
Calandrinia eremaea	Small Purslane	Portulacaceae
Calandrinia granulifera	Pigmy Purslane	Portulacaceae
Calandrinia spp.	Purslane	Portulacaceae
Callitriche spp.	Water Starwort	Veronicaceae
Callitris spp.	Cypress-pine	Cupressaceae
Calocephalus citreus	Lemon Beauty-heads	Asteraceae
Calocephalus lacteus	Milky Beauty-heads	Asteraceae
Calocephalus sonderi	Pale Beauty-heads	Asteraceae
Calocephalus spp.	Beauty Heads	Asteraceae
Calochilus robertsonii	Purple Beard-orchid	Orchidaceae
Calochilus spp.	Beard Orchid	Orchidaceae
Calochlaena dubia	Common Ground-fern	Culcitaceae
Calotis anthemoides	Cut-leaf Burr-daisy	Asteraceae
Calotis scabiosifolia var. scabiosifolia	Rough Burr-daisy	Asteraceae
Calytrix alpestris	Snow Myrtle	Myrtaceae
Calytrix tetragona	Common Fringe-myrtle	Myrtaceae
Campylopus bicolor	Swan-neck Moss	Leucobryaceae
Campylopus clavatus	Broody Swan-neck Moss	Leucobryaceae
Campylopus introflexus	Heath Star Moss	Leucobryaceae
Cardamine gunnii s.l.	Common Bitter-cress	Brassicaceae
Carex appressa	Tall Sedge	Cyperaceae
Carex breviculmis	Common Grass-sedge	Cyperaceae
Carex chlorantha	Green-top Sedge	Cyperaceae
Carex fascicularis	Tassel Sedge	Cyperaceae
Carex gaudichaudiana	Fen Sedge	Cyperaceae
Carex incomitata	Hillside Sedge	Cyperaceae
Carex inversa	Knob Sedge	Cyperaceae
Carex spp.	Sedge	Cyperaceae
Carex tereticaulis	Poong'ort	Cyperaceae
Carpobrotus modestus	Inland Pigface	Aizoaceae
Cassinia aculeata	Common Cassinia	Asteraceae
Cassinia arcuata	Drooping Cassinia	Asteraceae
Cassinia complanata	Sticky Cassinia	Asteraceae
Cassinia longifolia	Shiny Cassinia	Asteraceae
Cassinia spp.	Cassinia	Asteraceae
Austrostipa gibbosa	Spurred Spear-grass	Poaceae
Austrostipa hemipogon	Half-bearded Spear-grass	Poaceae
Austrostipa mollis	Supple Spear-grass	Poaceae
Austrostipa nodosa	Knotty Spear-grass	Poaceae
Cassytha glabella	Slender Dodder-laurel	Lauraceae
Cassytha melantha	Coarse Dodder-laurel	Lauraceae
Cassytha pubescens s.s.	Downy Dodder-laurel	Lauraceae
Centaurium spicatum	Spiked Centaury	Gentianaceae
Centella cordifolia	Centella	Apiaceae
Centipeda cunninghamii	Common Sneezeweed	Asteraceae
Centipeda minima s.l.	Spreading Sneezeweed	Asteraceae
Centipeda pleiocephala	Tall Sneezeweed	Asteraceae
Centrolepis aristata	Pointed Centrolepis	Centrolepidaceae
Centrolepis fascicularis	Tufted Centrolepis	Centrolepidaceae

Appendix One: Indigenous Flora in the Landscape Zone

Scientific name	Common name	Family name
Centrolepis glabra	Smooth Centrolepis	Centrolepidaceae
Centrolepis polygyna	Wiry Centrolepis	Centrolepidaceae
Centrolepis strigosa subsp. strigosa	Hairy Centrolepis	Centrolepidaceae
Ceratodon purpureus subsp. convolutus	Redshank Moss	Ditrichaceae
Chamaescilla corymbosa var. corymbosa	Blue Stars	Anthericaceae
Cheilanthes austrotenuifolia	Green Rock-fern	Adiantaceae
Cheilanthes sieberi subsp. sieberi	Narrow Rock-fern	Adiantaceae
Cheilanthes spp.	Rock Fern	Adiantaceae
Cheiranthera cyanea var. cyanea	Blue Finger-flower	Pittosporaceae
Chenopodium pumilio	Clammy Goosefoot	Chenopodiaceae
Chiloglottis gunnii s.l.	Common Bird-orchid	Orchidaceae
Chiloglottis spp.	Bird Orchid	Orchidaceae
Chiloglottis valida	Common Bird-orchid	Orchidaceae
Chiloscyphus latifolius	Grassy Crestwort	Geocalycaceae
Chiloscyphus planiusculus	Crestwort	Geocalycaceae
Chiloscyphus semiteres	Common Crestwort	Geocalycaceae
Chloris truncata	Windmill Grass	Poaceae
Choretrum glomeratum var. chrysanthum	Golden Sour-bush	Santalaceae
Chorizandra enodis	Black Bristle-sedge	Cyperaceae
Chrysocephalum apiculatum s.l.	Common Everlasting	Asteraceae
Chrysocephalum apiculatum s.s.	Common Everlasting	Asteraceae
Chrysocephalum baxteri	White Everlasting	Asteraceae
Chrysocephalum semipapposum	Clustered Everlasting	Asteraceae
Cladia spp.	Coral Lichen	Cladiaceae
Cladonia spp.	Candelabra Lichen	Cladoniaceae
Clematis aristata	Mountain Clematis	Ranunculaceae
Comesperma ericinum	Heath Milkwort	Polygalaceae
Comesperma polygaloides	Small Milkwort	Polygalaceae
Comesperma volubile	Love Creeper	Polygalaceae
Convolvulus erubescens spp. agg.	Pink Bindweed	Convolvulaceae
Convolvulus remotus	Grass Bindweed	Convolvulaceae
Coprosma hirtella	Rough Coprosma	Rubiaceae
Correa aemula	Hairy Correa	Rutaceae
Correa glabra var. glabra	Rock Correa	Rutaceae
Correa lawrenceana	Mountain Correa	Rutaceae
Correa lawrenceana var. grampiana	Grampians Mountain-correa	Rutaceae
Correa lawrenceana var. latrobeana	Mountain Correa	Rutaceae
Correa reflexa	Common Correa	Rutaceae
Correa reflexa var. speciosa	Eastern Correa	Rutaceae
Corunastylis ciliata	Fringed Midge-orchid	Orchidaceae
Corunastylis sp. aff. rufa (Goldfields)	Dark Midge-orchid	Orchidaceae
Corybas diemenicus s.l.	Veined Helmet-orchid	Orchidaceae
Corybas incurvus	Slaty Helmet-orchid	Orchidaceae
Corybas spp.	Helmet Orchid	Orchidaceae
Cotula australis	Common Cotula	Asteraceae
Craspedia glauca spp. agg.	Common Billy-buttons	Asteraceae
Craspedia paludicola	Swamp Billy-buttons	Asteraceae
Craspedia variabilis	Variable Billy-buttons	Asteraceae
Crassula closiana	Stalked Crassula	Crassulaceae
Crassula colorata	Dense Crassula	Crassulaceae
Crassula decumbens var. decumbens	Spreading Crassula	Crassulaceae
Crassula helmsii	Swamp Crassula	Crassulaceae
Crassula pedicularis	Purple Crassula	Crassulaceae
Crassula sieberiana s.l.	Sieber Crassula	Crassulaceae
Crassula spp.	Crassula	Crassulaceae
Crassula tetramera	Australian Stonecrop	Crassulaceae
Crepidomanes venosum	Veined Bristle-fern	Hymenophyllaceae
Cryptandra tomentosa	Prickly Cryptandra	Rhamnaceae

Scientific name	Common name	Family name
Cuscuta spp.	Dodder	Cuscutaceae
Cyanicula caerulea	Blue Fairy	Orchidaceae
Cyathea australis	Rough Tree-fern	Cyatheaceae
Cymbonotus preissianus	Austral Bear's-ear	Asteraceae
Cynodon dactylon	Couch	Poaceae
Cynoglossum australe	Australian Hound's-tongue	Boraginaceae
Cynoglossum suaveolens	Sweet Hound's-tongue	Boraginaceae
Cyperus gunnii subsp. gunnii	Flecked Flat-sedge	Cyperaceae
Cyperus lucidus	Leafy Flat-sedge	Cyperaceae
Cyperus spp.	Flat Sedge	Cyperaceae
Danthonia s.l. spp.	Wallaby Grass	Poaceae
Daucus glochidiatus	Australian Carrot	Apiaceae
Daviesia benthamii subsp. humilis	Spiny Bitter-pea	Fabaceae
Daviesia genistifolia s.l.	Broom Bitter-pea	Fabaceae
Daviesia genistifolia s.s.	Broom Bitter-pea	Fabaceae
Daviesia laevis	Grampians Bitter-pea	Fabaceae
Daviesia latifolia	Hop Bitter-pea	Fabaceae
Daviesia leptophylla	Narrow-leaf Bitter-pea	Fabaceae
Daviesia mimosoides s.l.	Blunt-leaf Bitter-pea	Fabaceae
Daviesia ulicifolia	Gorse Bitter-pea	Fabaceae
Daviesia ulicifolia subsp. ruscifolia	Gorse Bitter-pea	Fabaceae
Derwentia derwentiana	Derwent Speedwell	Veronicaceae
Derwentia perfoliata	Digger's Speedwell	Veronicaceae
Desmodium gunnii	Southern Tick-trefoil	Fabaceae
Deyeuxia quadriseta	Reed Bent-grass	Poaceae
Deyeuxia rodwayi	Tasman Bent-grass	Poaceae
Deyeuxia spp.	Bent-grass	Poaceae
Dianella longifolia s.l.	Pale Flax-lily	Hemerocallidaceae
Dianella longifolia var. longifolia s.l.	Pale Flax-lily	Hemerocallidaceae
Dianella revoluta s.l.	Black-anther Flax-lily	Hemerocallidaceae
Dianella revoluta var. revoluta s.l.	Black-anther Flax-lily	Hemerocallidaceae
Dianella tasmanica	Tasman Flax-lily	Hemerocallidaceae
Dichelachne crinita	Long-hair Plume-grass	Poaceae
Dichelachne hirtella	Hairy Plume-grass	Poaceae
Dichelachne rara	Common Plume-grass	Poaceae
Dichelachne sciurea spp. agg.	Short-hair Plume-grass	Poaceae
Dichelachne sieberiana	Rough Plume-grass	Poaceae
Dichelachne spp.	Plume Grass	Poaceae
Dichondra repens	Kidney-weed	Convolvulaceae
Dichopogon spp.	Chocolate Lily	Anthericaceae
Dicksonia antarctica	Soft Tree-fern	Dicksoniaceae
Dicranoloma billarderi	Fork Moss	Dicranaceae
Dillwynia cinerascens s.l.	Grey Parrot-pea	Fabaceae
Dillwynia cinerascens s.s.	Grey Parrot-pea	Fabaceae
Dillwynia glaberrima	Smooth Parrot-pea	Fabaceae
Dillwynia hispida	Red Parrot-pea	Fabaceae
Dillwynia phylicoides	Small-leaf Parrot-pea	Fabaceae
Dillwynia ramosissima	Bushy Parrot-pea	Fabaceae
Dillwynia sericea	Showy Parrot-pea	Fabaceae
Dillwynia spp.	Parrot Pea	Fabaceae
Dipodium punctatum s.l.	Hyacinth Orchid	Orchidaceae
Dipodium punctatum s.s.	Purple Hyacinth-orchid	Orchidaceae
Dipodium roseum s.l.	Rosy Hyacinth-orchid	Orchidaceae
Distichlis distichophylla	Australian Salt-grass	Poaceae
Ditrichum difficile	Common Ditrichum	Ditrichaceae
Diuris behrii	Golden Cowslips	Orchidaceae
Diuris lanceolata s.l.	Golden Moths	Orchidaceae

Appendix One: Indigenous Flora in the Landscape Zone

Scientific name	Common name	Family name
Diuris orientis	Wallflower Orchid	Orchidaceae
Diuris palustris	Swamp Diuris	Orchidaceae
Diuris pardina	Leopard Orchid	Orchidaceae
Diuris spp.	Diuris	Orchidaceae
Diuris sulphurea	Tiger Orchid	Orchidaceae
Dodonaea spp.	Hop Bush	Sapindaceae
Dodonaea viscosa subsp. angustissima	Slender Hop-bush	Sapindaceae
Dodonaea viscosa subsp. cuneata	Wedge-leaf Hop-bush	Sapindaceae
Dodonaea viscosa subsp. spatulata	Sticky Hop-bush	Sapindaceae
Drosera binata	Forked Sundew	Droseraceae
Drosera glanduligera	Scarlet Sundew	Droseraceae
Drosera macrantha	Climbing Sundew	Droseraceae
Drosera peltata	Pale Sundew	Droseraceae
Drosera peltata subsp. auriculata	Tall Sundew	Droseraceae
Drosera peltata subsp. peltata	Pale Sundew	Droseraceae
Drosera pygmaea	Tiny Sundew	Droseraceae
Drosera whittakeri subsp. aberrans	Scented Sundew	Droseraceae
Drymophila cyanocarpa	Turquoise Berry	Luzuriagaceae
Echinopogon ovatus	Common Hedgehog-grass	Poaceae
Einadia nutans subsp. nutans	Nodding Saltbush	Chenopodiaceae
Elatine gratioloides	Waterwort	Elatinaceae
Eleocharis acuta	Common Spike-sedge	Cyperaceae
Eleocharis atricha	Tuber Spike-sedge	Cyperaceae
Eleocharis gracilis	Slender Spike-sedge	Cyperaceae
Eleocharis pusilla	Small Spike-sedge	Cyperaceae
Eleocharis sphacelata	Tall Spike-sedge	Cyperaceae
Eleocharis spp.	Spike Sedge	Cyperaceae
Elymus scaber var. scaber	Common Wheat-grass	Poaceae
Empodisma minus	Spreading Rope-rush	Restionaceae
Epacridaceae spp.	Heath	Ericaceae
Epacris impressa	Common Heath	Ericaceae
Epilobium billardierianum	Variable Willow-herb	Onagraceae
Epilobium billardierianum subsp. billardierianum	Smooth Willow-herb	Onagraceae
Epilobium billardierianum subsp. cinereum	Grey Willow-herb	Onagraceae
Epilobium billardierianum subsp. intermedium	Variable Willow-herb	Onagraceae
Epilobium hirtigerum	Hairy Willow-herb	Onagraceae
Epilobium pallidiflorum	Showy Willow-herb	Onagraceae
Epilobium spp.	Willow Herb	Onagraceae
Eragrostis brownii	Common Love-grass	Poaceae
Eragrostis infecunda	Southern Cane-grass	Poaceae
Erodium crinitum	Blue Heron's-bill	Geraniaceae
Erodium spp.	Heron's Bill	Geraniaceae
Eryngium ovinum	Blue Devil	Apiaceae
Eryngium spp.	Eryngium	Apiaceae
Eryngium vesiculosum	Prickfoot	Apiaceae
Eucalyptus aromaphloia	Scentbark	Myrtaceae
Eucalyptus baxteri s.l.	Brown Stringybark	Myrtaceae
Eucalyptus baxteri s.s.	Brown Stringybark	Myrtaceae
Eucalyptus behriana	Bull Mallee	Myrtaceae
Eucalyptus camaldulensis	River Red-gum	Myrtaceae
Eucalyptus cypellocarpa	Mountain Grey-gum	Myrtaceae
Eucalyptus dives	Broad-leaf Peppermint	Myrtaceae
Eucalyptus globulus subsp. bicostata	Eurabbie	Myrtaceae
Eucalyptus globulus subsp. pseudoglobulus	Gippsland Blue-gum	Myrtaceae
Eucalyptus goniocalyx s.l.	Bundy	Myrtaceae
Eucalyptus goniocalyx s.s.	Bundy	Myrtaceae
Eucalyptus leucoxylon subsp. leucoxylon	Yellow Gum	Myrtaceae
Eucalyptus leucoxylon subsp. pruinosa	Waxy Yellow-gum	Myrtaceae
Eucalyptus macrorhyncha	Red Stringybark	Myrtaceae
Eucalyptus melliodora	Yellow Box	Myrtaceae
Eucalyptus microcarpa	Grey Box	Myrtaceae
Eucalyptus nortonii	Silver Bundy	Myrtaceae
Eucalyptus obliqua	Messmate Stringybark	Myrtaceae
Eucalyptus ovata	Swamp Gum	Myrtaceae
Eucalyptus ovata var. ovata	Swamp Gum	Myrtaceae
Eucalyptus pauciflora	Snow Gum	Myrtaceae
Eucalyptus pauciflora subsp. pauciflora	White Sallee	Myrtaceae
Eucalyptus polyanthemos	Red Box	Myrtaceae
Eucalyptus polyanthemos subsp. marginalis	Western Red-box	Myrtaceae
Eucalyptus polyanthemos subsp. vestita	Red Box	Myrtaceae
Eucalyptus polybractea	Blue Mallee	Myrtaceae
Eucalyptus pyrenea	Pyrenees Gum	Myrtaceae
Eucalyptus radiata	Narrow-leaf Peppermint	Myrtaceae
Eucalyptus radiata subsp. radiata	Narrow-leaf Peppermint	Myrtaceae
Eucalyptus rubida	Candlebark	Myrtaceae
Eucalyptus spp.	Eucalypt	Myrtaceae
Eucalyptus tricarpa	Red Ironbark	Myrtaceae
Eucalyptus tricarpa subsp. tricarpa	Red Ironbark	Myrtaceae
Eucalyptus viminalis	Manna Gum	Myrtaceae
Eucalyptus viminalis subsp. viminalis	Manna Gum	Myrtaceae
Eucalyptus yarraensis	Yarra Gum	Myrtaceae
Euchiton collinus s.l.	Clustered/Creeping Cudweed	Asteraceae
Euchiton collinus s.s.	Creeping Cudweed	Asteraceae
Euchiton involucratus s.l.	Common Cudweed	Asteraceae
Euchiton involucratus s.s.	Star Cudweed	Asteraceae
Euchiton sphaericus	Annual Cudweed	Asteraceae
Euchiton spp.	Cudweed	Asteraceae
Euphrasia collina	Purple Eyebright	Orobanchaceae
Euphrasia collina subsp. paludosa	Purple Eyebright	Orobanchaceae
Eutaxia microphylla	Common Eutaxia	Fabaceae
Eutaxia microphylla var. microphylla	Common Eutaxia	Fabaceae
Exocarpos cupressiformis	Cherry Ballart	Santalaceae
Ficinia nodosa	Knobby Club-sedge	Cyperaceae
Fissidens leptocladus	Limestone Pocket-moss	Fissidentaceae
Fissidens spp.	Pocket Moss	Fissidentaceae
Frullania probosciphora	Chocolate Scalewort	Frullaniaceae
Gahnia clarkei	Tall Saw-sedge	Cyperaceae
Gahnia radula	Thatch Saw-sedge	Cyperaceae
Gahnia sieberiana	Red-fruit Saw-sedge	Cyperaceae
Galium australe	Tangled Bedstraw	Rubiaceae
Galium binifolium	Reflexed Bedstraw	Rubiaceae
Galium curvihirtum	Tight Bedstraw	Rubiaceae
Galium gaudichaudii	Rough Bedstraw	Rubiaceae
Galium propinquum	Maori Bedstraw	Rubiaceae
Galium spp.	Bedstraw	Rubiaceae
Gastrodia sesamoides s.l.	Cinnamon Bells	Orchidaceae
Gastrodia sesamoides s.s.	Cinnamon Bells	Orchidaceae

Appendix One: Indigenous Flora in the Landscape Zone

Scientific name	Common name	Family name
Geranium potentilloides	Soft Crane's-bill	Geraniaceae
Geranium retrorsum s.l.	Grassland Crane's-bill	Geraniaceae
Geranium solanderi s.l.	Austral Crane's-bill	Geraniaceae
Geranium sp. 2	Variable Crane's-bill	Geraniaceae
Geranium spp.	Crane's Bill	Geraniaceae
Gleichenia microphylla	Scrambling Coral-fern	Gleicheniaceae
Glossodia major	Wax-lip Orchid	Orchidaceae
Glyceria australis	Australian Sweet-grass	Poaceae
Glycine clandestina	Twining Glycine	Fabaceae
Glycine latrobeana	Clover Glycine	Fabaceae
Glycine spp.	Glycine	Fabaceae
Glycine tabacina s.l.	Variable Glycine	Fabaceae
Gnaphalium indutum	Tiny Cudweed	Asteraceae
Gnaphalium spp.	Cudweed	Asteraceae
Gompholobium huegelii	Common Wedge-pea	Fabaceae
Gonocarpus elatus	Tall Raspwort	Haloragaceae
Gonocarpus humilis	Shade Raspwort	Haloragaceae
Gonocarpus micranthus subsp. micranthus	Creeping Raspwort	Haloragaceae
Gonocarpus spp.	Raspwort	Haloragaceae
Gonocarpus tetragynus	Common Raspwort	Haloragaceae
Goodenia blackiana	Black's Goodenia	Goodeniaceae
Goodenia geniculata	Bent Goodenia	Goodeniaceae
Goodenia gracilis	Slender Goodenia	Goodeniaceae
Goodenia heteromera	Spreading Goodenia	Goodeniaceae
Goodenia humilis	Swamp Goodenia	Goodeniaceae
Goodenia lanata	Trailing Goodenia	Goodeniaceae
Goodenia lineata	Grampians Goodenia	Goodeniaceae
Goodenia ovata	Hop Goodenia	Goodeniaceae
Goodenia pinnatifida	Cut-leaf Goodenia	Goodeniaceae
Goodenia spp.	Goodenia	Goodeniaceae
Goodia lotifolia	Golden Tip	Fabaceae
Goodia lotifolia var. lotifolia	Common Golden-tip	Fabaceae
Goodia medicaginea	Western Golden-tip	Fabaceae
Goodia spp.	Golden-tip	Fabaceae
Gratiola peruviana	Austral Brooklime	Veronicaceae
Gratiola pubescens	Glandular Brooklime	Veronicaceae
Grevillea alpina	Cat's Claw Grevillea	Proteaceae
Grevillea dryophylla	Goldfields Grevillea	Proteaceae
Grevillea floripendula	Ben Major Grevillea	Proteaceae
Grevillea montis-cole	Mount Cole Grevillea	Proteaceae
Grevillea montis-cole subsp. brevistyla	Langi Ghiran Grevillea	Proteaceae
Grevillea montis-cole subsp. montis-cole	Mount Cole Grevillea	Proteaceae
Grevillea spp.	Grevillea	Proteaceae
Grimmia pulvinata var. africana	Blunt-beak Grimmia	Grimmiaceae
Gymnoschoenus sphaerocephalus	Button Grass	Cyperaceae
Hakea decurrens subsp. physocarpa	Bushy Needlewood	Proteaceae
Hakea sericea s.l.	Bushy Needlewood	Proteaceae
Hakea spp.	Hakea	Proteaceae
Hakea tephrosperma	Hooked Needlewood	Proteaceae
Haloragis aspera	Rough Raspwort	Haloragaceae
Haloragis heterophylla	Varied Raspwort	Haloragaceae
Hardenbergia violacea	Purple Coral-pea	Fabaceae
Hedwigia ciliata	Grey Hoar-moss	Hedwigiaceae
Hedycarya angustifolia	Austral Mulberry	Monimiaceae
Helichrysum aff. rutidolepis (Lowland Swamps)	Pale Swamp Everlasting	Asteraceae
Helichrysum leucopsideum	Satin Everlasting	Asteraceae
Helichrysum rutidolepis s.l.	Pale Everlasting	Asteraceae
Helichrysum scorpioides	Button Everlasting	Asteraceae

Scientific name	Common name	Family name
Heliotropium europaeum	Common Heliotrope	Boraginaceae
Hemarthria uncinata var. uncinata	Mat Grass	Poaceae
Hibbertia australis	Upright Guinea-flower	Dilleniaceae
Hibbertia exutiacies	Spiky Guinea-flower	Dilleniaceae
Hibbertia fasciculata var. prostrata	Bundled Guinea-flower	Dilleniaceae
Hibbertia humifusa subsp. humifusa	Rising Star Guinea-flower	Dilleniaceae
Hibbertia riparia	Erect Guinea-flower	Dilleniaceae
Hibbertia stricta s.l.	Upright Guinea-flower	Dilleniaceae
Histiopteris incisa	Bat's Wing Fern	Dennstaedtiaceae
Hovea heterophylla	Common Hovea	Fabaceae
Hovea spp.	Hovea	Fabaceae
Hyalosperma demissum	Moss Sunray	Asteraceae
Hyalosperma praecox	Mayweed Sunray	Asteraceae
Hydrocotyle callicarpa	Small Pennywort	Apiaceae
Hydrocotyle foveolata	Yellow Pennywort	Apiaceae
Hydrocotyle hirta	Hairy Pennywort	Apiaceae
Hydrocotyle laxiflora	Stinking Pennywort	Apiaceae
Hydrocotyle pterocarpa	Wing Pennywort	Apiaceae
Hydrocotyle sibthorpioides	Shining Pennywort	Apiaceae
Hydrocotyle spp.	Pennywort	Apiaceae
Hymenophyllum cupressiforme	Common Filmy-fern	Hymenophyllaceae
Hypericum gramineum	Small St John's Wort	Clusiaceae
Hypericum japonicum	Matted St John's Wort	Clusiaceae
Hypnum cupressiforme	Common Plait-moss	Hypnaceae
Hypnum cupressiforme var. lacunosum	Great Plait-moss	Hypnaceae
Hypolepis glandulifera	Downy Ground-fern	Dennstaedtiaceae
Hypolepis rugosula	Ruddy Ground-fern	Dennstaedtiaceae
Hypoxis glabella s.l.	Yellow star	Hypoxidaceae
Hypoxis glabella var. glabella	Tiny Star	Hypoxidaceae
Hypoxis hygrometrica	Golden Weather-glass	Hypoxidaceae
Hypoxis spp.	Hypoxis	Hypoxidaceae
Hypoxis vaginata	Yellow Star	Hypoxidaceae
Indigofera australis	Austral Indigo	Fabaceae
Isoetes drummondii	Plain Quillwort	Isoetaceae
Isoetes drummondii subsp. drummondii	Plain Quillwort	Isoetaceae
Isoetopsis graminifolia	Grass Cushion	Asteraceae
Isolepis cernua var. cernua	Nodding Club-sedge	Cyperaceae
Isolepis cernua var. platycarpa	Broad-fruit Club-sedge	Cyperaceae
Isolepis fluitans	Floating Club-sedge	Cyperaceae
Isolepis fluitans var. fluitans	Floating Club-sedge	Cyperaceae
Isolepis hookeriana	Grassy Club-sedge	Cyperaceae
Isolepis inundata	Swamp Club-sedge	Cyperaceae
Isolepis marginata	Little Club-sedge	Cyperaceae
Isolepis spp.	Club Sedge	Cyperaceae
Isopogon ceratophyllus	Horny Cone-bush	Proteaceae
Isotoma fluviatilis subsp. australis	Swamp Isotome	Campanulaceae
Ixodia achillaeoides	Ixodia	Asteraceae
Ixodia achillaeoides subsp. alata	Ixodia	Asteraceae
Joycea pallida	Silvertop Wallaby-grass	Poaceae
Juncus amabilis	Hollow Rush	Juncaceae
Juncus bufonius	Toad Rush	Juncaceae
Juncus flavidus	Gold Rush	Juncaceae

Appendix One: Indigenous Flora in the Landscape Zone

Scientific name	Common name	Family name
Juncus fockei	Slender Joint-leaf Rush	Juncaceae
Juncus holoschoenus	Joint-leaf Rush	Juncaceae
Juncus homalocaulis	Wiry Rush	Juncaceae
Juncus kraussii subsp. australiensis	Sea Rush	Juncaceae
Juncus pallidus	Pale Rush	Juncaceae
Juncus pauciflorus	Loose-flower Rush	Juncaceae
Juncus planifolius	Broad-leaf Rush	Juncaceae
Juncus procerus	Tall Rush	Juncaceae
Juncus radula	Hoary Rush	Juncaceae
Juncus remotiflorus	Diffuse Rush	Juncaceae
Juncus sarophorus	Broom Rush	Juncaceae
Juncus semisolidus	Plains Rush	Juncaceae
Juncus spp.	Rush	Juncaceae
Juncus subsecundus	Finger Rush	Juncaceae
Kennedia prostrata	Running Postman	Fabaceae
Kunzea ericoides spp. agg.	Burgan	Myrtaceae
Kunzea parvifolia	Violet Kunzea	Myrtaceae
Lachnagrostis adamsonii	Adamson's Blown-grass	Poaceae
Lachnagrostis aemula s.l.	Leafy Blown-grass	Poaceae
Lachnagrostis aemula s.s.	Leafy Blown-grass	Poaceae
Lachnagrostis billardierei subsp. billardierei	Coast Blown-grass	Poaceae
Lachnagrostis filiformis	Common Blown-grass	Poaceae
Lachnagrostis punicea subsp. filifolia	Purple Blown-grass	Poaceae
Lachnagrostis punicea subsp. punicea	Purple Blown-grass	Poaceae
Lachnagrostis robusta	Salt Blown-grass	Poaceae
Lagenophora huegelii	Coarse Bottle-daisy	Asteraceae
Lagenophora montana	Mountain Bottle-daisy	Asteraceae
Lagenophora spp.	Bottle Daisy	Asteraceae
Lagenophora stipitata	Common Bottle-daisy	Asteraceae
Leiocarpa websteri	Stalked Plover-daisy	Asteraceae
Lemna spp.	Duckweed	Lemnaceae
Lepidium spp.	Peppercress	Brassicaceae
Lepidosperma canescens	Hoary Rapier-sedge	Cyperaceae
Lepidosperma carphoides	Black Rapier-sedge	Cyperaceae
Lepidosperma congestum	Clustered Sword-sedge	Cyperaceae
Lepidosperma curtisiae	Little Sword-sedge	Cyperaceae
Lepidosperma filiforme	Common Rapier-sedge	Cyperaceae
Lepidosperma laterale	Variable Sword-sedge	Cyperaceae
Lepidosperma longitudinale	Pithy Sword-sedge	Cyperaceae
Lepidosperma semiteres	Wire Rapier-sedge	Cyperaceae
Lepidosperma spp.	Sword Sedge	Cyperaceae
Lepidosperma viscidum	Sticky Sword-sedge	Cyperaceae
Leptoceras menziesii	Hare Orchid	Orchidaceae
Leptodontium paradoxum	Tall Beard-moss	Pottiaceae
Leptorhynchos elongatus	Lanky Buttons	Asteraceae
Leptorhynchos squamatus	Scaly Buttons	Asteraceae
Leptorhynchos squamatus subsp. squamatus	Scaly Buttons	Asteraceae
Leptorhynchos tenuifolius	Wiry Buttons	Asteraceae
Leptorhynchos tetrachaetus	Beauty Buttons	Asteraceae
Leptorhynchos waitzia	Button Immortelle	Asteraceae
Leptospermum continentale	Prickly Tea-tree	Myrtaceae
Leptospermum lanigerum	Woolly Tea-tree	Myrtaceae
Leptospermum myrsinoides	Heath Tea-tree	Myrtaceae
Leptospermum scoparium	Manuka	Myrtaceae
Leptospermum turbinatum	Shiny Tea-tree	Myrtaceae
Leptostomum inclinans	Pincushion Moss	Leptostomataceae
Leptotheca gaudichaudii var. gaudichaudii	Pale Tree-fern Moss	Rhizogoniaceae
Lepyrodia flexuosa	Twisting Scale-rush	Restionaceae
Lepyrodia muelleri	Common Scale-rush	Restionaceae
Leucochrysum albicans subsp. albicans var. tricolor	White Sunray	Asteraceae
Leucopogon ericoides	Pink Beard-heath	Ericaceae
Leucopogon neurophyllus	Veined Beard-heath	Ericaceae
Leucopogon virgatus	Common Beard-heath	Ericaceae
Levenhookia dubia	Hairy Stylewort	Stylidiaceae
Lilaeopsis polyantha	Australian Lilaeopsis	Apiaceae
Liliaceae spp. (sensu lato)	Lily	Liliaceae
Limosella australis	Austral Mudwort	Scrophulariaceae
Linum marginale	Native Flax	Linaceae
Lissanthe strigosa subsp. subulata	Peach Heath	Ericaceae
Lobelia anceps	Angled Lobelia	Campanulaceae
Lobelia gibbosa s.l.	Tall Lobelia	Campanulaceae
Lobelia gibbosa s.s.	Tall Lobelia	Campanulaceae
Lobelia irrigua	Salt Pratia	Campanulaceae
Lobelia pratioides	Poison Lobelia	Campanulaceae
Lobelia spp.	Lobelia	Campanulaceae
Lomandra filiformis	Wattle Mat-rush	Xanthorrhoeaceae
Lomandra filiformis subsp. coriacea	Wattle Mat-rush	Xanthorrhoeaceae
Lomandra filiformis subsp. filiformis	Wattle Mat-rush	Xanthorrhoeaceae
Lomandra juncea	Desert Mat-rush	Xanthorrhoeaceae
Lomandra longifolia	Spiny-headed Mat-rush	Xanthorrhoeaceae
Lomandra longifolia subsp. longifolia	Spiny-headed Mat-rush	Xanthorrhoeaceae
Lomandra micrantha s.l.	Small-flower Mat-rush	Xanthorrhoeaceae
Lomandra micrantha s.s.	Small-flower Mat-rush	Xanthorrhoeaceae
Lomandra micrantha subsp. micrantha	Small-flower Mat-rush	Xanthorrhoeaceae
Lomandra multiflora subsp. multiflora	Many-flowered Mat-rush	Xanthorrhoeaceae
Lomandra nana	Dwarf Mat-rush	Xanthorrhoeaceae
Lomandra sororia	Small Mat-rush	Xanthorrhoeaceae
Lomandra spp.	Mat-rush	Xanthorrhoeaceae
Luzula meridionalis	Common Woodrush	Juncaceae
Luzula meridionalis var. densiflora	Common Woodrush	Juncaceae
Luzula meridionalis var. flaccida	Common Woodrush	Juncaceae
Luzula meridionalis var. meridionalis	Common Woodrush	Juncaceae
Luzula spp.	Woodrush	Juncaceae
Lythrum hyssopifolia	Small Loosestrife	Lythraceae
Maireana enchylaenoides	Wingless Bluebush	Chenopodiaceae
Marsilea drummondii	Common Nardoo	Marsileaceae
Melaleuca gibbosa	Slender Honey-myrtle	Myrtaceae
Melicytus dentatus s.l.	Tree Violet	Violaceae
Melicytus dentatus s.s.	Tree Violet	Violaceae
Mentha australis	River Mint	Lamiaceae
Mentha laxiflora	Forest Mint	Lamiaceae
Metzgeria furcata	Forked Veilwort	Metzgeriaceae
Microlaena stipoides var. stipoides	Weeping Grass	Poaceae
Micromyrtus ciliata	Heath-myrtle	Myrtaceae
Microseris scapigera spp. agg.	Yam Daisy	Asteraceae
Microseris sp. 3	Yam Daisy	Asteraceae
Microseris spp.	Yam Daisy	Asteraceae
Microtidium atratum	Yellow Onion-orchid	Orchidaceae

Appendix One: Indigenous Flora in the Landscape Zone

Scientific name	Common name	Family name
Microtis arenaria	Notched Onion-orchid	Orchidaceae
Microtis parviflora	Slender Onion-orchid	Orchidaceae
Microtis spp.	Onion Orchid	Orchidaceae
Microtis unifolia	Common Onion-orchid	Orchidaceae
Mielichhoferia sullivanii	Copper Moss	Mniaceae
Millotia muelleri	Common Bow-flower	Asteraceae
Millotia myosotidifolia	Broad-leaf Millotia	Asteraceae
Millotia perpusilla	Tiny Bow-flower	Asteraceae
Millotia tenuifolia var. tenuifolia	Soft Millotia	Asteraceae
Mimulus repens	Creeping Monkey-flower	Phrymaceae
Mitrasacme pilosa	Hairy Mitrewort	Loganiaceae
Mitrasacme pilosa var. pilosa	Hairy Mitrewort	Loganiaceae
Monotoca elliptica s.l.	Tree Broom-heath	Ericaceae
Monotoca scoparia	Prickly Broom-heath	Ericaceae
Montia fontana	Water Blinks	Portulacaceae
Muellerina eucalyptoides	Creeping Mistletoe	Loranthaceae
Myoporum sp. 1	Sticky Boobialla	Scrophulariaceae
Myosotis australis	Austral Forget-me-not	Boraginaceae
Myosotis spp.	Forget-me-not	Boraginaceae
Myriocephalus rhizocephalus	Woolly-heads	Asteraceae
Myriophyllum crispatum	Upright Water-milfoil	Haloragaceae
Myriophyllum glomeratum	Clustered Water-milfoil	Haloragaceae
Myriophyllum integrifolium	Tiny Water-milfoil	Haloragaceae
Myriophyllum simulans	Amphibious Water-milfoil	Haloragaceae
Myriophyllum spp.	Water-milfoil	Haloragaceae
Myriophyllum verrucosum	Red Water-milfoil	Haloragaceae
Nematolepis squamea subsp. squamea	Satinwood	Rutaceae
Neopaxia australasica	White Purslane	Portulacaceae
Neurachne alopecuroidea	Fox-tail Mulga-grass	Poaceae
Notodanthonia semiannularis	Wetland Wallaby-grass	Poaceae
Ochiobryum blandum	Rosy Silver-moss	Bryaceae
Olearia asterotricha	Rough Daisy-bush	Asteraceae
Olearia erubescens	Moth Daisy-bush	Asteraceae
Olearia glandulosa	Swamp Daisy-bush	Asteraceae
Olearia lirata	Snowy Daisy-bush	Asteraceae
Olearia myrsinoides	Silky Daisy-bush	Asteraceae
Olearia ramulosa	Twiggy Daisy-bush	Asteraceae
Olearia ramulosa var. stricta	Twiggy Daisy-bush	Asteraceae
Olearia speciosa	Netted Daisy-bush	Asteraceae
Olearia tubuliflora	Rayless Daisy-bush	Asteraceae
Opercularia ovata	Broad-leaf Stinkweed	Rubiaceae
Opercularia scabrida	Stalked Stinkweed	Rubiaceae
Opercularia varia	Variable Stinkweed	Rubiaceae
Ophioglossum lusitanicum	Austral Adder's-tongue	Ophioglossaceae
Orchidaceae spp.	Orchid	Orchidaceae
Oreomyrrhis eriopoda	Australian Caraway	Apiaceae
Oxalis corniculata s.l.	Yellow Wood-sorrel	Oxalidaceae
Oxalis exilis	Shady Wood-sorrel	Oxalidaceae
Oxalis perennans	Grassland Wood-sorrel	Oxalidaceae
Oxalis spp.	Wood Sorrel	Oxalidaceae
Ozothamnus ferrugineus	Tree Everlasting	Asteraceae
Ozothamnus obcordatus	Grey Everlasting	Asteraceae
Ozothamnus retusus	Rough Everlasting	Asteraceae
Ozothamnus rosmarinifolius	Rosemary Everlasting	Asteraceae
Parietaria cebilis s.l.	Shade Pellitory	Urticaceae
Parietaria cebilis s.s.	Shade Pellitory	Urticaceae
Pelargonium australe	Austral Stork's-bill	Geraniaceae
Pelargonium rodneyanum	Magenta Stork's-bill	Geraniaceae
Pentapogon quadrifidus var. quadrifidus	Five-awned Spear-grass	Poaceae
Persicaria decipiens	Slender Knotweed	Polygonaceae
Persicaria prostrata	Creeping Knotweed	Polygonaceae
Pheladenia deformis	Bluebeard Orchid	Orchidaceae
Philotheca verrucosa	Fairy Wax-flower	Rutaceae
Phragmites australis	Common Reed	Poaceae
Phyllangium distylis	Tiny Mitrewort	Loganiaceae
Phyllangium divergens	Wiry Mitrewort	Loganiaceae
Phylloglossum drummondii	Pygmy Clubmoss	Lycopodiaceae
Picris angustifolia	Native Picris	Asteraceae
Picris angustifolia subsp. angustifolia	Coast Picris	Asteraceae
Picris squarrosa	Squat Picris	Asteraceae
Pimelea axiflora	Bootlace Bush	Thymelaeaceae
Pimelea axiflora subsp. axiflora	Bootlace Bush	Thymelaeaceae
Pimelea curviflora s.l.	Curved Rice-flower	Thymelaeaceae
Pimelea curviflora s.s.	Curved Rice-flower	Thymelaeaceae
Pimelea flava	Yellow Rice-flower	Thymelaeaceae
Pimelea flava subsp. flava	Yellow Rice-flower	Thymelaeaceae
Pimelea glauca	Smooth Rice-flower	Thymelaeaceae
Pimelea humilis	Common Rice-flower	Thymelaeaceae
Pimelea linifolia	Slender Rice-flower	Thymelaeaceae
Pimelea linifolia subsp. linifolia	Slender Rice-flower	Thymelaeaceae
Pimelea octophylla	Woolly Rice-flower	Thymelaeaceae
Pimelea spinescens	Spiny Rice-flower	Thymelaeaceae
Pimelea spinescens subsp. spinescens	Spiny Rice-flower	Thymelaeaceae
Pimelea spp.	Rice Flower	Thymelaeaceae
Pimelea stricta	Gaunt Rice-flower	Thymelaeaceae
Plagiobothrys elachanthus	Hairy Forget-me-not	Boraginaceae
Plantago gaudichaudii	Narrow Plantain	Veronicaceae
Plantago spp.	Plantain	Veronicaceae
Plantago varia	Variable Plantain	Veronicaceae
Platylobium formosum	Handsome Flat-pea	Fabaceae
Platylobium obtusangulum	Common Flat-pea	Fabaceae
Pleurosorus rutifolius s.l.	Blanket Fern	Aspleniaceae
Pleurosorus rutifolius s.s.	Blanket Fern	Aspleniaceae
Poa clelandii	Noah's Ark	Poaceae
Poa ensiformis	Sword Tussock-grass	Poaceae
Poa labillardierei	Common Tussock-grass	Poaceae
Poa labillardierei var. labillardierei	Common Tussock-grass	Poaceae
Poa morrisii	Soft Tussock-grass	Poaceae
Poa rodwayi	Velvet Tussock-grass	Poaceae
Poa sieberiana	Grey Tussock-grass	Poaceae
Poa sieberiana var. hirtella	Grey Tussock-grass	Poaceae
Poa sieberiana var. sieberiana	Grey Tussock-grass	Poaceae
Poa spp.	Tussock Grass	Poaceae
Poa tenera	Slender Tussock-grass	Poaceae
Poaceae spp.	Grass	Poaceae
Podolepis jaceoides s.l.	Showy/Basalt Podolepis	Asteraceae
Podolepis jaceoides s.s.	Showy Podolepis	Asteraceae
Podolepis sp. 1	Basalt Podolepis	Asteraceae
Podolobium alpestre	Alpine Podolobium	Fabaceae
Podolobium procumbens	Trailing Podolobium	Fabaceae
Pogonolepis muelleriana	Stiff Cup-flower	Asteraceae
Polystichum proliferum	Mother Shield-fern	Dryopteridaceae
Polytrichastrum alpinum	Alpine Haircap	Polytrichaceae
Polytrichum juniperinum	Juniper Haircap	Polytrichaceae

Appendix One: Indigenous Flora in the Landscape Zone

Scientific name	Common name	Family name
Polytrichum spp.	Haircap	Polytrichaceae
Pomaderris aspera	Hazel Pomaderris	Rhamnaceae
Pomaderris elachophylla	Lacy Pomaderris	Rhamnaceae
Poranthera microphylla s.l.	Small Poranthera	Euphorbiaceae
Potamogeton spp.	Pondweed	Potamogetonaceae
Potamogeton tricarinatus s.l.	Floating Pondweed	Potamogetonaceae
Prasophyllum odoratum s.l.	Scented Leek-orchid	Orchidaceae
Prasophyllum patens s.l.	Broad-lip Leek-orchid	Orchidaceae
Prostanthera denticulata	Rough Mint-bush	Lamiaceae
Prostanthera lasianthos	Victorian Christmas-bush	Lamiaceae
Prostanthera rotundifolia	Round-leaf Mint-bush	Lamiaceae
Prostanthera spp.	Mint Bush	Lamiaceae
Pseudognaphalium luteoalbum	Jersey Cudweed	Asteraceae
Pteridium esculentum	Austral Bracken	Dennstaedtiaceae
Pterostylis concinna	Trim Greenhood	Orchidaceae
Pterostylis despectans	Lowly Greenhood	Orchidaceae
Pterostylis falcata s.l.	Sickle Greenhood	Orchidaceae
Pterostylis longifolia s.l.	Tall Greenhood	Orchidaceae
Pterostylis melagramma	Tall Greenhood	Orchidaceae
Pterostylis mutica	Midget Greenhood	Orchidaceae
Pterostylis nana	Dwarf Greenhood	Orchidaceae
Pterostylis nutans	Nodding Greenhood	Orchidaceae
Pterostylis parviflora s.l.	Tiny Greenhood	Orchidaceae
Pterostylis pedunculata	Maroonhood	Orchidaceae
Pterostylis plumosa s.l.	Bearded Greenhood	Orchidaceae
Pterostylis spp.	Greenhood	Orchidaceae
Ptilotus erubescens	Hairy Tails	Amaranthaceae
Ptilotus exaltatus var. semilanatus	Lamb Tails	Amaranthaceae
Ptilotus macrocephalus	Feather Heads	Amaranthaceae
Ptilotus spathulatus f. spathulatus	Pussy Tails	Amaranthaceae
Puccinellia stricta var. perlaxa	Plains Saltmarsh-grass	Poaceae
Pultenaea daphnoides	Large-leaf Bush-pea	Fabaceae
Pultenaea dentata	Clustered Bush-pea	Fabaceae
Pultenaea gunnii	Golden Bush-pea	Fabaceae
Pultenaea humilis	Dwarf Bush-pea	Fabaceae
Pultenaea largiflorens	Twiggy Bush-pea	Fabaceae
Pultenaea laxiflora	Loose-flower Bush-pea	Fabaceae
Pultenaea mollis	Soft Bush-pea	Fabaceae
Pultenaea pedunculata	Matted Bush-pea	Fabaceae
Pultenaea scabra	Rough Bush-pea	Fabaceae
Pultenaea spp.	Bush-pea	Fabaceae
Pycnosorus chrysanthes	Golden Billy-buttons	Asteraceae
Racomitrium crispulum var. crispulum	Common Fringe-moss	Grimmiaceae
Ranunculus glabrifolius	Shining Buttercup	Ranunculaceae
Ranunculus inundatus	River Buttercup	Ranunculaceae
Ranunculus lappaceus	Australian Buttercup	Ranunculaceae
Ranunculus pachycarpus	Thick-fruit Buttercup	Ranunculaceae
Ranunculus plebeius s.l.	Forest/Hairy Buttercup	Ranunculaceae
Ranunculus pumilio	Ferny Small-flower Buttercup	Ranunculaceae
Ranunculus robertsonii	Slender Buttercup	Ranunculaceae
Ranunculus scapiger	Hairy Buttercup	Ranunculaceae
Ranunculus sessiliflorus	Annual Buttercup	Ranunculaceae
Ranunculus spp.	Buttercup	Ranunculaceae
Rhodanthe anthemoides	Chamomile Sunray	Asteraceae
Rhodanthe corymbiflora	Paper Sunray	Asteraceae
Rhytidosporum procumbens	White Marianth	Pittosporaceae
Rorippa gigantea	Long-style Bitter-cress	Brassicaceae
Rosulabryum billarderi	Common Thread-moss	Bryaceae
Rosulabryum spp.	Thread Moss	Bryaceae
Rubus parvifolius	Small-leaf Bramble	Rosaceae
Rubus spp.	Bramble	Rosaceae
Rumex brownii	Slender Dock	Polygonaceae
Rumex dumosus	Wiry Dock	Polygonaceae
Rumex spp.	Dock	Polygonaceae
Rutidosis leptorhynchoides	Button Wrinklewort	Asteraceae
Sambucus gaudichaudiana	White Elderberry	Caprifoliaceae
Sarcocornia quinqueflora	Beaded Glasswort	Chenopodiaceae
Schoenus apogon	Common Bog-sedge	Cyperaceae
Schoenus latelaminatus	Medusa Bog-sedge	Cyperaceae
Schoenus maschalinus	Leafy Bog-sedge	Cyperaceae
Schoenus nanus	Tiny Bog-sedge	Cyperaceae
Schoenus tesquorum	Soft Bog-sedge	Cyperaceae
Scirpus spp. (s.l.)	Club Sedge	Cyperaceae
Sclerolaena diacantha	Grey Copperburr	Chenopodiaceae
Sebaea ovata	Yellow Sebaea	Gentianaceae
Selaginella gracillima	Tiny Selaginella	Selaginellaceae
Selliera radicans	Shiny Swamp-mat	Goodeniaceae
Sematophyllum homomallum	Bronze Signal-moss	Sematophyllaceae
Senecio bathurstianus	Dissected Fireweed	Asteraceae
Senecio biserratus	Jagged Fireweed	Asteraceae
Senecio glomeratus	Annual Fireweed	Asteraceae
Senecio hispidulus s.l.	Rough Fireweed	Asteraceae
Senecio hispidulus s.s.	Rough Fireweed	Asteraceae
Senecio linearifolius	Fireweed Groundsel	Asteraceae
Senecio macrocarpus	Large-headed Fireweed	Asteraceae
Senecio minimus	Shrubby Fireweed	Asteraceae
Senecio odoratus	Scented Groundsel	Asteraceae
Senecio phelleus	Stony Fireweed	Asteraceae
Senecio picridioides	Hawkbit Fireweed	Asteraceae
Senecio pinnatifolius	Variable Groundsel	Asteraceae
Senecio prenanthoides	Beaked Fireweed	Asteraceae
Senecio quadridentatus	Cotton Fireweed	Asteraceae
Senecio runcinifolius	Tall Fireweed	Asteraceae
Senecio spp.	Groundsel	Asteraceae
Senecio squarrosus s.l.	Leafy Fireweed	Asteraceae
Senecio tenuiflorus spp. agg.	Slender Fireweed	Asteraceae
Senecio vagus subsp. vagus	Saw Groundsel	Asteraceae
Senecio velleioides	Forest Groundsel	Asteraceae
Sida corrugata	Variable Sida	Malvaceae
Sigesbeckia australiensis	Cobber Weed	Asteraceae
Siloxerus multiflorus	Small Wrinklewort	Asteraceae
Solanum laciniatum	Large Kangaroo Apple	Solanaceae
Solanum spp.	Nightshade	Solanaceae
Solenogyne dominii	Smooth Solenogyne	Asteraceae
Solenogyne gunnii	Hairy Solenogyne	Asteraceae
Solenogyne spp.	Solenogyne	Asteraceae
Sonchus spp.	Sow Thistle	Asteraceae
Sphaerolobium minus	Eastern Globe-pea	Fabaceae
Sphagnum novozelandicum	Peat Moss	Sphagnaceae
Sporobolus virginicus	Salt Couch	Poaceae
Sprengelia incarnata	Pink Swamp-heath	Ericaceae
Spyridium parvifolium	Dusty Miller	Rhamnaceae
Stackhousia monogyna	Creamy Stackhousia	Stackhousiaceae
Stackhousia viminea	Slender Stackhousia	Stackhousiaceae
Stellaria angustifolia	Swamp Starwort	Caryophyllaceae
Stellaria flaccida	Forest Starwort	Caryophyllaceae

Appendix One: Indigenous Flora in the Landscape Zone

Scientific name	Common name	Family name
Stellaria multiflora	Rayless Starwort	Caryophyllaceae
Stellaria pungens	Prickly Starwort	Caryophyllaceae
Stellaria spp.	Starwort	Caryophyllaceae
Stuartina muelleri	Spoon Cudweed	Asteraceae
Stylidium beaugleholei	Beauglehole's Triggerplant	Stylidiaceae
Stylidium calcaratum	Book Triggerplant	Stylidiaceae
Stylidium calcaratum var. ecorne	Foot Triggerplant	Stylidiaceae
Stylidium graminifolium s.l.	Grass Triggerplant	Stylidiaceae
Stylidium inundatum	Hundreds and Thousands	Stylidiaceae
Stylidium perpusillum	Slender Triggerplant	Stylidiaceae
Stypandra glauca	Nodding Blue-lily	Hemerocallidaceae
Swainsona behriana	Southern Swainson-pea	Fabaceae
Swainsona procumbens	Broughton Pea	Fabaceae
Taraxacum spp.	Dandelion	Asteraceae
Templetonia stenophylla	Leafy Templetonia	Fabaceae
Tetraria capillaris	Hair Sedge	Cyperaceae
Tetrarrhena acuminata	Pointed Rice-grass	Poaceae
Tetrarrhena juncea	Forest Wire-grass	Poaceae
Tetratheca ciliata	Pink-bells	Elaeocarpaceae
Tetratheca labillardierei	Glandular Pink-bells	Elaeocarpaceae
Tetratheca pilosa	Hairy Pink-bells	Elaeocarpaceae
Thelymitra antennifera	Rabbit Ears	Orchidaceae
Thelymitra aristata	Great Sun-orchid	Orchidaceae
Thelymitra carnea	Pink Sun-orchid	Orchidaceae
Thelymitra ixioides s.l.	Spotted Sun-orchid	Orchidaceae
Thelymitra juncifolia	Rush-leaf Sun-orchid	Orchidaceae
Thelymitra media s.l.	Tall Sun-orchid	Orchidaceae
Thelymitra megcalyptra	Scented Sun-orchid	Orchidaceae
Thelymitra nuda	Plain Sun-orchid	Orchidaceae
Thelymitra nuda-pauciflora complex	Plain-Slender Sun-orchid complex	Orchidaceae
Thelymitra pauciflora s.l.	Slender Sun-orchid	Orchidaceae
Thelymitra pauciflora s.s.	Slender Sun-orchid	Orchidaceae
Thelymitra rubra	Salmon Sun-orchid	Orchidaceae
Thelymitra spp.	Sun Orchid	Orchidaceae
Themeda triandra	Kangaroo Grass	Poaceae
Thuidiopsis furfurosa	Golden Weft-moss	Thuidiaceae
Thuidiopsis sparsa	Weft Moss	Thuidiaceae
Thuidiopsis sparsa var. sparsa	Common Weft-moss	Thuidiaceae
Thysanotus patersonii	Twining Fringe-lily	Anthericaceae
Thysanotus tuberosus	Common Fringe-lily	Anthericaceae
Tmesipteris obliqua	Long Fork-fern	Psilotaceae
Todea barbara	Austral King-fern	Osmundaceae
Tortula antarctica	Screw Moss	Pottiaceae
Tortula papillosa	Screw Moss	Pottiaceae
Tricoryne elatior	Yellow Rush-lily	Hemerocallidaceae
Triglochin nana	Dwarf Arrowgrass	Juncaginaceae
Triglochin procera s.l.	Water Ribbons	Juncaginaceae
Triglochin procera s.s.	Common Water-ribbons	Juncaginaceae
Triglochin striata	Streaked Arrowgrass	Juncaginaceae
Triptilodiscus pygmaeus	Common Sunray	Asteraceae
Triquetrella papillata	Common Twine-moss	Pottiaceae
Trithuria submersa	Trithuria	Hydatellaceae
Typha domingensis	Narrow-leaf Cumbungi	Typhaceae
Typha spp.	Bulrush	Typhaceae
Urtica incisa	Scrub Nettle	Urticaceae
Utricularia dichotoma s.l.	Fairies' Aprons	Lentibulariaceae
Utricularia tenella	Pink Bladderwort	Lentibulariaceae
Utricularia uniflora	Single Bladderwort	Lentibulariaceae
Velleia paradoxa	Spur Velleia	Goodeniaceae
Veronica calycina	Hairy Speedwell	Veronicaceae
Veronica gracilis	Slender Speedwell	Veronicaceae
Veronica plebeia	Trailing Speedwell	Veronicaceae
Veronica subtilis	Thread Speedwell	Veronicaceae
Villarsia reniformis	Running Marsh-flower	Menyanthaceae
Viminaria juncea	Golden Spray	Fabaceae
Viola betonicifolia	Showy Violet	Violaceae
Viola cleistogamoides	Hidden Violet	Violaceae
Viola hederacea sensu Entwisle (1996)	Ivy-leaf Violet	Violaceae
Viola hederacea sensu Willis (1972)	Ivy-leaf Violet	Violaceae
Viola sieberiana spp. agg.	Tiny Violet	Violaceae
Viola spp.	Violet	Violaceae
Vittadinia cuneata	Fuzzy New Holland Daisy	Asteraceae
Vittadinia cuneata var. cuneata	Fuzzy New Holland Daisy	Asteraceae
Vittadinia dissecta s.l.	Dissected New Holland Daisy	Asteraceae
Vittadinia gracilis	Woolly New Holland Daisy	Asteraceae
Vittadinia spp.	New Holland Daisy	Asteraceae
Wahlenbergia communis s.l.	Tufted Bluebell	Campanulaceae
Wahlenbergia gracilenta s.l.	Annual Bluebell	Campanulaceae
Wahlenbergia gracilenta s.s.	Hairy Annual-bluebell	Campanulaceae
Wahlenbergia gracilis	Sprawling Bluebell	Campanulaceae
Wahlenbergia graniticola s.l.	Granite Bluebell	Campanulaceae
Wahlenbergia luteola	Bronze Bluebell	Campanulaceae
Wahlenbergia multicaulis	Branching Bluebell	Campanulaceae
Wahlenbergia spp.	Bluebell	Campanulaceae
Wahlenbergia stricta subsp. stricta	Tall Bluebell	Campanulaceae
Walwhalleya proluta	Rigid Panic	Poaceae
Wijkia extenuata	Spear Moss	Sematophyllaceae
Wurmbea dioica	Common Early Nancy	Colchicaceae
Wurmbea spp.	Early Nancy	Colchicaceae
Wurmbea uniflora	One-flower Early Nancy	Colchicaceae
Xanthorrhoea australis	Austral Grass-tree	Xanthorrhoeaceae
Xanthorrhoea minor subsp. lutea	Small Grass-tree	Xanthorrhoeaceae
Xanthosia dissecta s.l.	Cut-leaf Xanthosia	Apiaceae
Xanthosia dissecta s.s.	Native Parsley	Apiaceae
Xerochrysum palustre	Swamp Everlasting	Asteraceae
Xerochrysum viscosum	Shiny Everlasting	Asteraceae
Xyris operculata	Tall Yellow-eye	Xyridaceae
Zygodon intermedius	Common Zygodon	Orthotrichaceae
Zygodon menziesii	Zygodon	Orthotrichaceae

Appendix Two: Vertebrate Fauna in the Mt Cole/Pyrenees Landscape Zone

Common name	Scientific name
Agile Antechinus	Antechinus agilis
Altona Skipper	Hesperilla flavescens flavescens
Australasian Grebe	Tachybaptus novaehollandiae
Australasian Pipit	Anthus novaeseelandiae
Australasian Shoveler	Anas rhynchotis
Australian Bustard	Ardeotis australis
Australian Hobby	Falco longipennis
Australian Magpie	Gymnorhina tibicen
Australian Owlet-nightjar	Aegotheles cristatus
Australian Pelican	Pelecanus conspicillatus
Australian Raven	Corvus coronoides
Australian Shelduck	Tadorna tadornoides
Australian White Ibis	Threskiornis molucca
Australian Wood Duck	Chenonetta jubata
Baillon's Crake	Porzana pusilla
Banded Lapwing	Vanellus tricolor
Banded Stilt	Cladorhynchus leucocephalus
Barking Owl	Ninox connivens
Bassian Thrush	Zoothera lunulata
Bearded Dragon	Pogona barbata
Black Kite	Milvus migrans
Black Rock Skink	Egernia saxatilis intermedia
Black Swan	Cygnus atratus
Black Wallaby	Wallabia bicolor
Black-breasted Buzzard	Hamirostra melanosternon
Black-chinned Honeyeater	Melithreptus gularis
Black-eared Cuckoo	Chrysococcyx osculans
Black-faced Cuckoo-shrike	Coracina novaehollandiae
Black-fronted Dotterel	Elseyornis melanops
Black-shouldered Kite	Elanus axillaris
Black-tailed Native-hen	Gallinula ventralis
Black-winged Stilt	Himantopus himantopus
Blotched Blue-tongued Lizard	Tiliqua nigrolutea
Blue-billed Duck	Oxyura australis
Blue-winged Parrot	Neophema chrysostoma
Bougainville's Skink	Lerista bougainvillii
Boulenger's Skink	Morethia boulengeri
Brolga	Grus rubicunda
Brown Falcon	Falco berigora
Brown Goshawk	Accipiter fasciatus
Brown Thornbill	Acanthiza pusilla
Brown Toadlet	Pseudophryne bibronii
Brown Treecreeper (south-eastern ssp.)	Climacteris picumnus victoriae
Brown-headed Honeyeater	Melithreptus brevirostris
Brush Bronzewing	Phaps elegans
Brush-tailed Phascogale	Phascogale tapoatafa
Budgerigar	Melopsittacus undulatus
Buff-banded Rail	Gallirallus philippensis
Buff-rumped Thornbill	Acanthiza reguloides
Bush Stone-curlew	Burhinus grallarius
Cattle Egret	Ardea ibis
Chestnut Teal	Anas castanea
Chocolate Wattled Bat	Chalinolobus morio
Clamorous Reed Warbler	Acrocephalus stentoreus
Cockatiel	Nymphicus hollandicus
Collared Sparrowhawk	Accipiter cirrhocephalus
Common Blue-tongued Lizard	Tiliqua scincoides
Common Bronzewing	Phaps chalcoptera
Common Brushtail Possum	Trichosurus vulpecula
Common Dunnart	Sminthopsis murina
Common Froglet	Crinia signifera
Common Greenshank	Tringa nebularia
Common Long-necked Turtle	Chelodina longicollis
Common Ringtail Possum	Pseudocheirus peregrinus
Common Spadefoot Toad	Neobatrachus sudelli
Common Wombat	Vombatus ursinus
Common Yabbie	Cherax destructor
Coventry's Skink	Niveoscincus coventryi
Crescent Honeyeater	Phylidonyris pyrrhoptera
Crested Pigeon	Ocyphaps lophotes
Crested Shrike-tit	Falcunculus frontatus
Crimson Rosella	Platycercus elegans elegans
Cunningham's Skink	Egernia cunninghami
Darter	Anhinga novaehollandiae
Diamond Firetail	Stagonopleura guttata
Dingo/Dog (feral)	Canis lupus
Dusky Antechinus	Antechinus swainsonii
Dusky Moorhen	Gallinula tenebrosa
Dusky Woodswallow	Artamus cyanopterus
Eastern Barred Bandicoot	Perameles gunnii
Eastern Brown Snake	Pseudonaja textilis
Eastern False Pipistrelle	Falsistrellus tasmaniensis
Eastern Great Egret	Ardea modesta
Eastern Grey Kangaroo	Macropus giganteus
Eastern Pygmy-possum	Cercartetus nanus
Eastern Rosella	Platycercus eximius
Eastern Spinebill	Acanthorhynchus tenuirostris
Eastern Striped Skink	Ctenotus orientalis
Eastern Three-lined Skink	Bassiana duperreyi
Eastern Yellow Robin	Eopsaltria australis
Elegant Parrot	Neophema elegans
Emu	Dromaius novaehollandiae
Eurasian Coot	Fulica atra
Fairy Martin	Hirundo ariel
Fan-tailed Cuckoo	Cacomantis flabelliformis
Fat-tailed Dunnart	Sminthopsis crassicaudata
Feathertail Glider	Acrobates pygmaeus
Flame Robin	Petroica phoenicea
Freckled Duck	Stictonetta naevosa
Fuscous Honeyeater	Lichenostomus fuscus
Galah	Eolophus roseicapilla
Galaxias (1 species)	Galaxias sp.
Gang-gang Cockatoo	Callocephalon fimbriatum
Garden Skink	Lampropholis guichenoti
Glenelg Spiny Cray	Euastacus bispinosus
Glossy Ibis	Plegadis falcinellus
Golden Perch	Macquaria ambigua
Golden Sun Moth	Synemon plana
Golden Whistler	Pachycephala pectoralis
Golden-headed Cisticola	Cisticola exilis
Gould's Long-eared Bat	Nyctophilus gouldi
Gould's Wattled Bat	Chalinolobus gouldii
Great Cormorant	Phalacrocorax carbo
Great Crested Grebe	Podiceps cristatus
Grey Butcherbird	Cracticus torquatus
Grey Currawong	Strepera versicolor
Grey Fantail	Rhipidura albiscarpa
Grey Shrike-thrush	Colluricincla harmonica
Grey Teal	Anas gracilis
Growling Grass Frog	Litoria raniformis
Gull-billed Tern	Gelochelidon nilotica
Hardhead	Aythya australis
Hoary-headed Grebe	Poliocephalus poliocephalus
Hooded Robin	Melanodryas cucullata
Horsfield's Bronze-Cuckoo	Chrysococcyx basalis
Horsfield's Bushlark	Mirafra javanica
Inland Dotterel	Charadrius australis
Jacky Winter	Microeca fascinans
Koala	Phascolarctos cinereus
Lace Goanna	Varanus varius
Large Forest Bat	Vespadelus darlingtoni
Large Striped Skink	Ctenotus robustus
Latham's Snipe	Gallinago hardwickii
Laughing Kookaburra	Dacelo novaeguineae
Lesser Long-eared Bat	Nyctophilus geoffroyi
Little Black Cormorant	Phalacrocorax sulcirostris
Little Corella	Cacatua sanguinea
Little Eagle	Hieraaetus morphnoides
Little Forest Bat	Vespadelus vulturnus
Little Grassbird	Megalurus gramineus
Little Lorikeet	Glossopsitta pusilla
Little Pied Cormorant	Microcarbo melanoleucos
Little Raven	Corvus mellori
Little Whip Snake	Suta flagellum
Long-billed Corella	Cacatua tenuirostris
Lowland Copperhead	Austrelaps superbus
Magpie-lark	Grallina cyanoleuca
Mallee Spadefoot Toad	Neobatrachus pictus
Marbled Gecko	Christinus marmoratus
Masked Lapwing	Vanellus miles
Masked Woodswallow	Artamus personatus
Mistletoebird	Dicaeum hirundinaceum
Mountain Brushtail Possum	Trichosurus cunninghami
Mountain Galaxias	Galaxias olidus
Musk Duck	Biziura lobata
Musk Lorikeet	Glossopsitta concinna
Nankeen Kestrel	Falco cenchroides
Nankeen Night Heron	Nycticorax caledonicus
New Holland Honeyeater	Phylidonyris novaehollandiae
Noisy Miner	Manorina melanocephala
Olive Legless Lizard	Delma inornata
Olive-backed Oriole	Oriolus sagittatus
Pacific Barn Owl	Tyto javanica
Pacific Black Duck	Anas superciliosa
Painted Button-quail	Turnix varia
Painted Honeyeater	Grantiella picta
Pallid Cuckoo	Cuculus pallidus
Peaceful Dove	Geopelia striata
Peregrine Falcon	Falco peregrinus
Pied Cormorant	Phalacrocorax varius
Pied Currawong	Strepera graculina
Pink-eared Duck	Malacorhynchus membranaceus

Threatened fauna are listed in Section. Source: Wildlife Atlas of Victoria.

Appendix Two: Vertebrate Fauna in the Mt Cole/Pyrenees Landscape Zone

Common name	Scientific name
Plains Froglet	Crinia parinsignifera
Platypus	Ornithorhynchus anatinus
Plumed Whistling-Duck	Dendrocygna eytoni
Powerful Owl	Ninox strenua
Purple Swamphen	Porphyrio porphyrio
Purple-crowned Lorikeet	Glossopsitta porphyrocephala
Rainbow Bee-eater	Merops ornatus
Rainbow Lorikeet	Trichoglossus haematodus
Red Wattlebird	Anthochaera carunculata
Red-backed Kingfisher	Todiramphus pyrrhopygia
Red-bellied Black Snake	Pseudechis porphyriacus
Red-browed Finch	Neochmia temporalis
Red-capped Plover	Charadrius ruficapillus
Red-capped Robin	Petroica goodenovii
Red-kneed Dotterel	Erythrogonys cinctus
Red-necked Avocet	Recurvirostra novaehollandiae
Red-necked Wallaby	Macropus rufogriseus
Red-rumped Parrot	Psephotus haematonotus
Regent Honeyeater	Anthochaera phrygia
Restless Flycatcher	Myiagra inquieta
River Blackfish	Gadopsis marmoratus
Rose Robin	Petroica rosea
Royal Spoonbill	Platalea regia
Rufous Fantail	Rhipidura rufifrons
Rufous Songlark	Cincloramphus mathewsi
Rufous Whistler	Pachycephala rufiventris
Sacred Kingfisher	Todiramphus sanctus
Sand Goanna	Varanus gouldii
Satin Flycatcher	Myiagra cyanoleuca
Scarlet Robin	Petroica boodang
Sharp-tailed Sandpiper	Calidris acuminata
Shining Bronze-Cuckoo	Chrysococcyx lucidus
Short-beaked Echidna	Tachyglossus aculeatus
Silver Gull	Chroicocephalus novaehollandiae
Silvereye	Zosterops lateralis
Singing Honeyeater	Lichenostomus virescens
Small rodent	Muridae sp.
Southern Boobook	Ninox novaeseelandiae
Southern Brown Tree Frog	Litoria ewingii
Southern Bullfrog	Limnodynastes dumerilii
Southern Bullfrog (northern form)	Limnodynastes dumerilii dumerilii
Southern Forest Bat	Vespadelus regulus
Southern Freetail Bat (long penis)	Mormopterus sp. 1
Southern Grass Skink	Pseudemoia entrecasteauxii
Southern Pigmy Perch	Nannoperca australis
Southern Toadlet	Pseudophryne semimarmorata
Southern Water Skink	Eulamprus tympanum tympanum
Southern Whiteface	Aphelocephala leucopsis
Speckled Warbler	Pyrrholaemus sagittatus
Spencer's Skink	Pseudemoia spenceri
Spotted Harrier	Circus assimilis
Spotted Marsh Frog	Limnodynastes tasmaniensis
Spotted Pardalote	Pardalotus punctatus
Square-tailed Kite	Lophoictinia isura
Squirrel Glider	Petaurus norfolcensis

Common name	Scientific name
Straw-necked Ibis	Threskiornis spinicollis
Striated Pardalote	Pardalotus striatus
Striated Thornbill	Acanthiza lineata
Striped Legless Lizard	Delma impar
Striped Marsh Frog	Limnodynastes peronii
Stubble Quail	Coturnix pectoralis
Stumpy-tailed Lizard	Tiliqua rugosa
Sugar Glider	Petaurus breviceps
Sulphur-crested Cockatoo	Cacatua galerita
Superb Fairy-wren	Malurus cyaneus
Swamp Harrier	Circus approximans
Swamp Rat	Rattus lutreolus
Swift Parrot	Lathamus discolor
Tawny Frogmouth	Podargus strigoides
Thick-tailed Gecko	Nephrurus milii
Three-toed Skink	Hemiergis decresiensis
Tiger Snake	Notechis scutatus
Tree Dragon	Amphibolurus muricatus
Tree Martin	Hirundo nigricans
Tussock Skink	Pseudemoia pagenstecheri
Unidentified Antechinus	Antechinus sp.
Unidentified bat	Unidentified bat
Unidentified brushtail possum	Trichosurus sp.
Unidentified copperhead	Austrelaps sp.
Unidentified cormorant	Phalacrocoracidae sp.
Unidentified ducks	Anatidae sp.
Unidentified Eptesicus	Eptesicus sp.
Unidentified frog	Unidentified frog
Unidentified gekkonid	Gekkonidae sp.
Unidentified grass skink	Pseudemoia sp.
Unidentified ibis	Threskiornis sp.
Unidentified kangaroo	Macropus sp.
Unidentified long-eared bat	Nyctophilus sp.
Unidentified macropod	Macropodidae sp.
Unidentified predator	Unidentified predator
Unidentified pygmy-possum	Cercartetus sp.
Unidentified scincid	Scincidae sp.
Unidentified small dasyurid	Dasyuridae sp.
Unidentified spoonbill	Platelea sp.
Unidentified water skink	Eulamprus sp.
Unknown Raven	Corvus sp.
Varied Sittella	Daphoenositta chrysoptera
Victorian Smooth Froglet	Geocrinia victoriana
Water Rat	Hydromys chrysogaster
Weasel Skink	Saproscincus mustelinus
Wedge-tailed Eagle	Aquila audax
Weebill	Smicrornis brevirostris
Welcome Swallow	Hirundo neoxena
Whiskered Tern	Chlidonias hybridus
Whistling Kite	Haliastur sphenurus
White-bellied Cuckoo-shrike	Coracina papuensis
White-browed Babbler	Pomatostomus superciliosus
White-browed Scrubwren	Sericornis frontalis
White-browed Woodswallow	Artamus superciliosus
White-eared Honeyeater	Lichenostomus leucotis
White-faced Heron	Egretta novaehollandiae

Common name	Scientific name
White-fronted Chat	Epthianura albifrons
White-fronted Honeyeater	Phylidonyris albifrons
White-lipped Snake	Drysdalia coronoides
White-naped Honeyeater	Melithreptus lunatus
White-necked Heron	Ardea pacifica
White-plumed Honeyeater	Lichenostomus penicillatus
White's Skink	Egernia whitii (group)
White-striped Freetail Bat	Tadarida australis
White-throated Needletail	Hirundapus caudacutus
White-throated Treecreeper	Cormobates leucophaeus
White-winged Chough	Corcorax melanorhamphos
White-winged Triller	Lalage sueurii
Willie Wagtail	Rhipidura leucophrys
Wood Gecko	Diplodactylus vittatus
Yellow Rosella	Platycercus elegans flaveolus
Yellow Thornbill	Acanthiza nana
Yellow-bellied Glider	Petaurus australis
Yellow-billed Spoonbill	Platalea flavipes
Yellow-faced Honeyeater	Lichenostomus chrysops
Yellow-footed Antechinus	Antechinus flavipes
Yellow-rumped Pardalote	Pardalotus punctatus xanthopygus
Yellow-rumped Thornbill	Acanthiza chrysorrhoa
Yellow-tailed Black-Cockatoo	Calyptorhynchus funereus
Yellow-tufted Honeyeater	Lichenostomus melanops

Appendix Three: Non Indigenous Plant and Weed Species in the Landscape Zone

Scientific name	Common name	Family name
Acacia baileyana	Cootamundra Wattle	Mimosaceae
Acacia decurrens	Early Black-wattle	Mimosaceae
Acacia longifolia	Sallow Wattle	Mimosaceae
Acacia longifolia subsp. longifolia	Sallow Wattle	Mimosaceae
Acetosella vulgaris	Sheep Sorrel	Polygonaceae
Agapanthus spp.	Agapanthus	Alliaceae
Agrostis capillaris	Brown-top Bent	Poaceae
Agrostis capillaris var. aristata	Highland Bent	Poaceae
Agrostis stolonifera	Creeping Bent	Poaceae
Ailanthus altissima	Tree of Heaven	Simaroubaceae
Aira caryophyllea	Silvery Hair-grass	Poaceae
Aira cupaniana	Quicksilver Grass	Poaceae
Aira elegantissima	Delicate Hair-grass	Poaceae
Aira praecox	Early Hair-grass	Poaceae
Aira spp.	Hair Grass	Poaceae
Allium spp.	Garlic	Alliaceae
Allium triquetrum	Angled Onion	Alliaceae
Allium vineale	Crow Garlic	Alliaceae
Anagallis arvensis	Pimpernel	Primulaceae
Anagallis minima	Chaffweed	Primulaceae
Anthoxanthum odoratum	Sweet Vernal-grass	Poaceae
Aphanes arvensis	Parsley Piert	Rosaceae
Aponogeton distachyos	Cape Pond-lily	Aponogetonaceae
Arctotheca calendula	Cape Weed	Asteraceae
Asparagus asparagoides	Bridal Creeper	Asparagaceae
Aster subulatus	Aster-weed	Asteraceae
Avellinia michelii	Avellinia	Poaceae
Avena barbata	Bearded Oat	Poaceae
Avena fatua	Wild Oat	Poaceae
Avena sativa	Oat	Poaceae
Avena spp.	Oat	Poaceae
Avena strigosa	Bristle Oat	Poaceae
Brachypodium distachyon	False Brome	Poaceae
Brachythecium albicans	Whitish Feather-moss	Brachytheciaceae
Brassica oleracea	Cabbage	Brassicaceae
Briza maxima	Large Quaking-grass	Poaceae
Briza minor	Lesser Quaking-grass	Poaceae
Bromus catharticus	Prairie Grass	Poaceae
Bromus catharticus var. catharticus	Prairie Grass	Poaceae
Bromus diandrus	Great Brome	Poaceae
Bromus hordeaceus subsp. hordeaceus	Soft Brome	Poaceae
Bromus lanceolatus	Mediterranean Brome	Poaceae
Bromus madritensis	Madrid Brome	Poaceae
Bromus rubens	Red Brome	Poaceae
Calicotome spinosa	Spiny Broom	Fabaceae
Callitriche hamulata	Thread Water-starwort	Veronicaceae
Callitriche stagnalis	Common Water-starwort	Veronicaceae
Cardamine hirsuta s.l.	Common Bitter-cress	Brassicaceae
Carduus pycnocephalus	Slender Thistle	Asteraceae
Carduus spp.	Slender Thistle	Asteraceae
Carduus tenuiflorus	Winged Slender-thistle	Asteraceae
Carthamus dentatus	Toothed Thistle	Asteraceae
Carthamus lanatus	Saffron Thistle	Asteraceae
Centaurea calcitrapa	Star Thistle	Asteraceae
Centaurium erythraea	Common Centaury	Gentianaceae
Centaurium spp.	Centaury	Gentianaceae
Centaurium tenuiflorum	Slender Centaury	Gentianaceae
Cerastium comatum	Levantine Mouse-ear Chickweed	Caryophyllaceae
Cerastium glomeratum s.l.	Common Mouse-ear Chickweed	Caryophyllaceae
Cerastium glomeratum s.s.	Sticky Mouse-ear Chickweed	Caryophyllaceae
Cerastium semidecandrum s.l.	Mouse-ear Chickweed	Caryophyllaceae
Chamaecytisus palmensis	Tree Lucerne	Fabaceae
Chenopodium album	Fat Hen	Chenopodiaceae
Chondrilla juncea	Skeleton Weed	Asteraceae
Chrysanthemoides monilifera	Boneseed	Asteraceae
Cicendia filiformis	Slender Cicendia	Gentianaceae
Cicendia quadrangularis	Square Cicendia	Gentianaceae
Ciclospermum leptophyllum	Slender Celery	Apiaceae
Cirsium vulgare	Spear Thistle	Asteraceae
Cortaderia selloana	Pampas Grass	Poaceae
Cotoneaster spp.	Cotoneaster	Rosaceae
Cotula bipinnata	Ferny Cotula	Asteraceae
Cotula coronopifolia	Water Buttons	Asteraceae
Crataegus monogyna	Hawthorn	Rosaceae
Cuscuta epithymum	Common Dodder	Cuscutaceae
Cynara cardunculus	Artichoke Thistle	Asteraceae
Cynosurus cristatus	Crested Dog's-tail	Poaceae
Cynosurus echinatus	Rough Dog's-tail	Poaceae
Cynosurus spp.	Dog's Tail	Poaceae
Cyperus eragrostis	Drain Flat-sedge	Cyperaceae
Cytisus scoparius	English Broom	Fabaceae
Dactylis glomerata	Cocksfoot	Poaceae
Diplotaxis tenuifolia	Sand Rocket	Brassicaceae
Dittrichia graveolens	Stinkwort	Asteraceae
Echium plantagineum	Paterson's Curse	Boraginaceae
Echium spp.	Bugloss	Boraginaceae
Ehrharta calycina	Perennial Veldt-grass	Poaceae
Ehrharta erecta var. erecta	Panic Veldt-grass	Poaceae
Ehrharta longiflora	Annual Veldt-grass	Poaceae
Elodea canadensis	Canadian Pondweed	Hydrocharitaceae
Elytrigia repens	English Couch	Poaceae
Epilobium ciliatum	Glandular Willow-herb	Onagraceae
Eragrostis curvula	African Love-grass	Poaceae
Erica lusitanica	Spanish Heath	Ericaceae
Erodium botrys	Big Heron's-bill	Geraniaceae
Erodium cicutarium	Common Heron's-bill	Geraniaceae
Euphorbia peplus	Petty Spurge	Euphorbiaceae
Foeniculum vulgare	Fennel	Apiaceae
Freesia alba x Freesia leichtlinii	Freesia	Iridaceae
Freesia spp.	Freesia	Iridaceae
Fumaria bastardii	Bastard's Fumitory	Fumariaceae
Fumaria muralis subsp. muralis	Wall Fumitory	Fumariaceae
Fumaria spp.	Fumitory	Fumariaceae
Galinsoga parviflora	Gallant Soldier	Asteraceae
Galium aparine	Cleavers	Rubiaceae
Galium divaricatum	Slender Bedstraw	Rubiaceae
Galium murale	Small Goosegrass	Rubiaceae
Gamochaeta purpurea s.l.	Purple Cudweed	Asteraceae
Gamochaeta purpurea s.s.	Spiked Cudweed	Asteraceae
Genista linifolia	Flax-leaf Broom	Fabaceae
Genista monspessulana	Montpellier Broom	Fabaceae
Gladiolus tristis	Evening-flower Gladiolus	Iridaceae
Gomphocarpus cancellatus	Broad-leaf Cotton-bush	Asclepiadaceae

Source: Flora Information System, Victoria.

Appendix Three: Non Indigenous Plant and Weed Species in the Landscape Zone

Scientific name	Common name	Family name
Hedera helix	English Ivy	Araliaceae
Hedypnois cretica	Cretan Hedypnois	Asteraceae
Helminthotheca echioides	Ox-tongue	Asteraceae
Hieracium spp.	Hawkweed	Asteraceae
Holcus annuus	Annual Fog	Poaceae
Holcus lanatus	Yorkshire Fog	Poaceae
Hordeum hystrix	Mediterranean Barley-grass	Poaceae
Hordeum leporinum	Barley-grass	Poaceae
Hordeum marinum	Sea Barley-grass	Poaceae
Hordeum murinum s.l.	Barley-grass	Poaceae
Hordeum spp.	Barley Grass	Poaceae
Hypericum perforatum subsp. veronense	St John's Wort	Clusiaceae
Hypochoeris glabra	Smooth Cat's-ear	Asteraceae
Hypochoeris radicata	Flatweed	Asteraceae
Iris spp.	Iris	Iridaceae
Isolepis hystrix	Awned Club-sedge	Cyperaceae
Isolepis levynsiana	Tiny Flat-sedge	Cyperaceae
Ixia maculata	Yellow Ixia	Iridaceae
Ixia spp.	Ixia	Iridaceae
Juncus acutus subsp. acutus	Spiny Rush	Juncaceae
Juncus articulatus	Jointed Rush	Juncaceae
Juncus bulbosus	Bulbous Rush	Juncaceae
Juncus capitatus	Capitate Rush	Juncaceae
Juncus microcephalus	Tiny-headed Rush	Juncaceae
Kickxia elatine	Hairy Toadflax	Veronicaceae
Kickxia elatine subsp. elatine	Woolly Toadflax	Veronicaceae
Lactuca saligna	Willow-leaf Lettuce	Asteraceae
Lactuca serriola	Prickly Lettuce	Asteraceae
Lagurus ovatus	Hare's-tail Grass	Poaceae
Leontodon taraxacoides subsp. taraxacoides	Hairy Hawkbit	Asteraceae
Lepidium africanum	Common Peppercress	Brassicaceae
Logfia gallica	French Cudweed	Asteraceae
Lolium loliaceum	Stiff Rye-grass	Poaceae
Lolium multiflorum	Italian Rye-grass	Poaceae
Lolium perenne	Perennial Rye-grass	Poaceae
Lolium rigidum	Wimmera Rye-grass	Poaceae
Lolium spp.	Rye Grass	Poaceae
Lotus corniculatus	Bird's-foot Trefoil	Fabaceae
Lycium ferocissimum	African Box-thorn	Solanaceae
Malus pumila	Apple	Rosaceae
Malus spp.	Apple	Rosaceae
Marrubium vulgare	Horehound	Lamiaceae
Medicago polymorpha	Burr Medic	Fabaceae
Medicago spp.	Medic	Fabaceae
Melilotus albus	Bokhara Clover	Fabaceae
Mentha spicata	Spearmint	Lamiaceae
Mimulus guttatus	Monkey Musk	Phrymaceae
Mimulus moschatus	Musk Monkey-flower	Phrymaceae
Moenchia erecta	Erect Chickweed	Caryophyllaceae
Molineriella minuta	Small Hair-grass	Poaceae
Moraea flaccida	One-leaf Cape-tulip	Iridaceae
Moraea miniata	Two-leaf Cape-tulip	Iridaceae
Moraea spp	Moraea	Iridaceae
Myosotis discolor	Yellow-and-blue Forget-me-not	Boraginaceae
Nassella neesiana	Chilean Needle-grass	Poaceae
Nassella trichotoma	Serrated Tussock	Poaceae
Nasturtium officinale	Watercress	Brassicaceae
Navarretia squarrosa	Californian Stinkweed	Polemoniaceae

Scientific name	Common name	Family name
Onopordum acanthium subsp. acanthium	Scotch Thistle	Asteraceae
Opuntia spp.	Prickly Pear	Cactaceae
Oxalis pes-caprae	Soursob	Oxalidaceae
Oxalis purpurea	Large-flower Wood-sorrel	Oxalidaceae
Panicum hillmanii	Witch Panic	Poaceae
Parapholis incurva	Coast Barb-grass	Poaceae
Paraserianthes lophantha subsp. lophantha	Cape Wattle	Mimosaceae
Parentucellia latifolia	Red Bartsia	Orobanchaceae
Paspalum dilatatum	Paspalum	Poaceae
Paspalum distichum	Water Couch	Poaceae
Pennisetum macrourum	African Feather-grass	Poaceae
Petrorhagia dubia	Velvety Pink	Caryophyllaceae
Petrorhagia nanteuilii	Childling Pink	Caryophyllaceae
Phalaris aquatica	Toowoomba Canary-grass	Poaceae
Phalaris spp.	Canary Grass	Poaceae
Pinus radiata	Radiata Pine	Pinaceae
Pinus spp.	Pine	Pinaceae
Plantago bellardii	Silky Plantain	Veronicaceae
Plantago coronopus	Buck's-horn Plantain	Veronicaceae
Plantago coronopus subsp. coronopus	Buck's-horn Plantain	Veronicaceae
Plantago lanceolata	Ribwort	Veronicaceae
Poa annua	Annual Meadow-grass	Poaceae
Poa bulbosa	Bulbous Meadow-grass	Poaceae
Poa bulbosa var. bulbosa	Bulbous Meadow-grass	Poaceae
Polycarpon tetraphyllum	Four-leaved Allseed	Caryophyllaceae
Polygonum aviculare s.l.	Prostrate Knotweed	Polygonaceae
Polypogon monspeliensis	Annual Beard-grass	Poaceae
Populus alba	White Poplar	Salicaceae
Populus spp.	Poplar	Salicaceae
Potamogeton acutifolius	Sharp Pondweed	Potamogetonaceae
Prunella vulgaris	Self-heal	Lamiaceae
Prunus cerasifera	Cherry Plum	Rosaceae
Prunus spp.	Prunus	Rosaceae
Psilurus incurvus	Bristle-tail Grass	Poaceae
Puccinellia fasciculata	Borrer's Saltmarsh-grass	Poaceae
Ranunculus muricatus	Sharp Buttercup	Ranunculaceae
Reseda luteola	Weld	Resedaceae
Romulea minutiflora	Small-flower Onion-grass	Iridaceae
Romulea rosea	Onion Grass	Iridaceae
Romulea rosea var. australis s.s.	Common Onion-grass	Iridaceae
Rosa canina	Dog Rose	Rosaceae
Rosa rubiginosa	Sweet Briar	Rosaceae
Rostraria cristata	Annual Cat's-tail	Poaceae
Rubus fruticosus spp. agg.	Blackberry	Rosaceae
Rubus laciniatus	Cut-leaf Bramble	Rosaceae
Rubus polyanthemus	Blackberry	Rosaceae
Rumex conglomeratus	Clustered Dock	Polygonaceae
Rumex crispus	Curled Dock	Polygonaceae
Rumex spp. (naturalised)	Dock (naturalised)	Polygonaceae
Ruta graveolens	Rue	Rutaceae
Salix babylonica s.l.	Weeping Willow	Salicaceae
Salix cinerea	Grey Sallow	Salicaceae
Salix spp.	Willow	Salicaceae
Salix X reichardtii	Pussy Willow	Salicaceae
Salpichroa origanifolia	Pampas Lily-of-the-Valley	Solanaceae
Sambucus nigra	Common Elder	Caprifoliaceae

Appendix Three: Non Indigenous Plant and Weed Species in the Landscape Zone

Scientific name	Common name	Family name
Scolymus hispanicus	Golden Thistle	Asteraceae
Sherardia arvensis	Field Madder	Rubiaceae
Silene gallica	French Catchfly	Caryophyllaceae
Silene gallica var. gallica	French Catchfly	Caryophyllaceae
Sisymbrium orientale	Indian Hedge-mustard	Brassicaceae
Solanum nigrum s.s.	Black Nightshade	Solanaceae
Solanum nigrum sensu Willis (1972)	Black Nightshade	Solanaceae
Soliva sessilis	Jo Jo	Asteraceae
Sonchus asper s.l.	Rough Sow-thistle	Asteraceae
Sonchus asper subsp. asper	Rough Sow-thistle	Asteraceae
Sonchus oleraceus	Common Sow-thistle	Asteraceae
Sparaxis bulbifera	Harlequin Flower	Iridaceae
Sparaxis tricolor	Tricolor Harlequin-flower	Iridaceae
Spergularia rubra s.l.	Red Sand-spurrey	Caryophyllaceae
Stellaria media	Chickweed	Caryophyllaceae
Stellaria pallida	Lesser Chickweed	Caryophyllaceae
Tradescantia fluminensis	Wandering Jew	Commelinaceae
Tragopogon porrifolius	Salsify	Asteraceae
Tribolium acutiflorum s.l.	Desmazeria	Poaceae
Tribolium obliterum	Desmazeria	Poaceae
Tribolium spp.	Desmazeria	Poaceae
Tribulus terrestris	Caltrop	Zygophyllaceae
Trifolium angustifolium var. angustifolium	Narrow-leaf Clover	Fabaceae
Trifolium arvense var. arvense	Hare's-foot Clover	Fabaceae
Trifolium campestre var. campestre	Hop Clover	Fabaceae
Trifolium cernuum	Drooping-flower Clover	Fabaceae
Trifolium dubium	Suckling Clover	Fabaceae
Trifolium glomeratum	Cluster Clover	Fabaceae
Trifolium ornithopodioides	Birdsfoot Clover	Fabaceae
Trifolium repens var. repens	White Clover	Fabaceae
Trifolium spp.	Clover	Fabaceae
Trifolium striatum	Knotted Clover	Fabaceae
Trifolium subterraneum	Subterranean Clover	Fabaceae
Trifolium tomentosum var. tomentosum	Woolly Clover	Fabaceae
Ulex europaeus	Gorse	Fabaceae
Urtica dioica	Giant Nettle	Urticaceae
Urtica urens	Small Nettle	Urticaceae
Vellereophyton dealbatum	White Cudweed	Asteraceae
Verbascum spp.	Mullein	Scrophulariaceae
Verbascum thapsus subsp. thapsus	Great Mullein	Scrophulariaceae
Verbascum virgatum	Twiggy Mullein	Scrophulariaceae
Veronica arvensis	Wall Speedwell	Veronicaceae
Veronica peregrina	Wandering Speedwell	Veronicaceae
Veronica persica	Persian Speedwell	Veronicaceae
Vicia hirsuta	Tiny Vetch	Fabaceae
Vicia sativa	Common Vetch	Fabaceae
Vicia sativa subsp. nigra	Narrow-leaf Vetch	Fabaceae
Vicia sativa subsp. sativa	Common Vetch	Fabaceae
Vinca major	Blue Periwinkle	Apocynaceae
Viola odorata	Common Violet	Violaceae
Vulpia bromoides	Squirrel-tail Fescue	Poaceae
Vulpia ciliata	Fringed Fescue	Poaceae
Vulpia muralis	Wall Fescue	Poaceae
Vulpia myuros	Rat's-tail Fescue	Poaceae
Vulpia myuros f. megalura	Fox-tail Fescue	Poaceae
Vulpia myuros f. myuros	Rat's-tail Fescue	Poaceae
Vulpia spp.	Fescue	Poaceae
Watsonia meriana var. bulbillifera	Bulbil Watsonia	Iridaceae
Watsonia versfeldii	Pink Watsonia	Iridaceae
Xanthium spinosum	Bathurst Burr	Asteraceae

Appendix Four: Key Habitat Requirements and Threatening Processes for Significant Fauna

Species	Minimum patch size road length	Critical distance b/n patches	Maximum dispersal distance	Patch size for viable population	Key Habitat	Key Threats	Key Actions/Management Recommendations
Mammals							
Brush-tailed Phascogale (Phascogale tapoatafa)	>100ha 10-40ha???	10km??/ or 1km???	1.4km??? (Rhind 2002)	1000ha core habitat	EVC – grassy woodland, grassy forest BVT, box Ironbark, heathy Dry Forest, mature rough barked trees, good groundlayer, leaf litter and fallen logs. Will cross open space		protect large remnants, link patches >10ha 1000m from core area to core area, control foxes retain hollow bearing trees
Long-nosed Bandicoot (Perameles nasuta)	3ha	400m	Unknown		EVC – Grassy forests, Herb-rich Footthill forest, Riparian Forests. Dense ground or shrub layer.		
Sugar Glider (Petaurus breviceps)	6ha	50m	500m (Suckling 1984)		EVC – Grassy Woodland, Box-Ironbark. Trees with hollows, wattle layer for food		
Birds							
Azure Kingfisher (Alcedo azurea)	5ha	500m	<2km		Creeklines, waterways with trees close to or overhanging bank		
Black-chinned Honeyeater (Melithreptus gularis)	100ha	1km	1km		EVC - Grassy woodland		
Brolga (e) (Grus rubicunda)	50ha or clusters of wetlands	varies	varies		Wetland (ephemeral 20-30cm depth)		Fow control, canegrass, eleocharis
Brown Tree Creeper (k) (Climacteris pecumnus)	30-50ha	500m	1km		EVC – Grassy Woodland, Box Ironbark, Wetlands	Needs linkages.	Minimising disturbance of understorey on roadsides. Increase width remnants. Develop links >50m wide.
Crested Shrike-tit (Falcunculus frontatus)	>5ha	>1km	1km		EVC – Riparian systems Mature trees with patches dense understorey		
Diamond firetail (Stagonopleura guttata)	>10ha, not roadsides	<1km	Unknown		EVC – Plains Grassy woodland, Creekline Grassy Woodland, Heathy Dry Forest tussock grass patches in in dry forest or woodland. Shrubby understorey important for nesting and cover from predators Seasonally mobile mostly>1000ha only found close to or within core habitat		Cat/Fox control protect large remnats, link patches <500m from core to core areas restore patchy shrub layer protect native grass areas from weed invasion
Eastern Yellow Robin (Eopsaltria australia)	>5ha	<1km	unknown		EVC – Grassy Forest, Herb-rich Foothill Forest, riparian EVCs Patches of shrubs or regeneration, good ground litter layer, fallen logs, partially dependant on hollows		
Golden Whistler (Paxchycephala pectoralis)	1ha	2km	3km		Riparian forests, Grassy Forests BVT, Herb-rich Foothill Forest Needs native understorey, especially Wattles		
Grey Shrike-Thrush (Colluricincla hamonica)	>10	>2	unknown		EVC – most EVCs esp Garssy woodlands and Forests Complex habitat requirements. Mature trees, fallen timber, and good native understorey and ground cover.		
Hooded Robin (Melanodryas cucullata)	>25ha	2km	1-2km		Grassy Dry Forest. Needs fallen timber and native ground cover.		
Jacky Winter (Microeca leucophaea)	10ha	500m tolerant of gaps	<2km	Box Ironbark, Grassy Woodland	Mature trees, both live and dead, hollow-bearing trees, logs and stumps with abundant fallen timber. Short grass cover (< 10 cm high) within the dense tree cover patches. Vegetated links > 50 m wide home range size - <5ha Current estimation breeding units (pairs or groups) - 20.	Noisy Miners.	Increase width remnants. Develop links >50m wide.
Lathams Snipe (Gallinago hardwickii)	Estimate less than 1 ha	Not relevant	not relevant		EVC - Wetlands dry areas in light shrub cover with dense undergrowth. Also rough pasture in agricultural land and young tree plantations. Feeding occurs on un-vegetated open mud or on firm mud between Isparse patches of Eleocharis and Juncus		

Appendix Four: Key Habitat Requirements and Threatening Processes for Significant Fauna

Species	Minimum patch size road length	Critical distance b/n patches	Maximum dispersal distance	Patch size for viable population	Key Habitat	Key Threats	Key Actions/ Management Recommendations
Powerful Owl (Ninox strenua)	500ha/1000ha box-Ironbark Forest	none	20km		EVC – Damp and Dry Forest Hollows, prey abundance, old growth		
Regent Honeyeater (Xanthomyza phrygia)	>5ha, >1km continuous roadside vegetation	none	5km		EVC – Box-Ironbark Forest, Grassy Woodlands Highly mobile, follows nectar		
Rufus Whistler Pachycephala rufiventris)	10ha	1km	2km	All???	home range size - 2ha Current estimation breeding units (pairs or groups) - 20.		
Sacred Kingfisher (Todirhamphus sanctus)	>10ha	Migratory.Depart Victoria in late summer/autumn for northern Qld	>50km	range of EVCs, esp riparian ones	EVC – Hollow bearing trees		
Speckled Warbler (Chthonicola sagittata)	10ha, not roadsides	<500m	<2km		EVC – Dry Forest, Grassy Woodland		
Superb Parrot (e) (Polytalis swainsonii)	Larger the better	Varies for breeding/non breeding	Varies for breeding/non breeding		EVC - Woodlands, River Red Gum forests hollows, shrubs, corridors, dead trees		
White Browed Babbler (Pomatosomos superciliasus)	>100ha in or near core habitat	Will not cross large open spaces			Box ironbark Forest, Grassy woodland EVCs, Heathy Dry Forest. Prefers dry shrubby forests and woodlands. Requires dense shrubs for shelter and nesting.		
White-eared Honeyeater (Lichenostomus leucotis)	>10ha	<1km	2km		EVC – Riparian forests or woodlands, Grassy woodlands, Grassy Forests, Herb-rich foothill forest, Fallen timber, dense understorey, eucalypts that have peeling bark eg Manna Gum		
Reptiles							
Striped Legless-Lizard (Delmar impar)	5ha	50m	200m	Woodlands	EVC – Ground cover of tussock grasses and surface rocks or logs		
Tree Goanna (v) (Varanus varius)	2km roadside	500m	<2km		Large trees, logs on ground. Current estimation breeding units (pairs or groups) - 20.	Foxes, lack of mature trees and logs.	Fox control.
Fish							
River Blackfish (Gadopsis marmoratus)	same reach	same reach	same reach		EVC – waterways Requires clear flowing streams with plentiful rocks and logs under which it shelters and feeds		Carp management
Invertebrates							
Golden Sun Moth (Synemon plana)	Unknown	Unknown	Unknown		Grassy Woodlands Good quality Wallaby Grasslands with soil gaps between tussocks		