Draft Conservation Plan
for the
Eildon Landscape Zone

Biodiversity Action Planning
in the Goulburn Broken Catchment

Department of Sustainability and Environment

Department of Primary Industries

Developed By:

The Water and Biodiversity team, Department of Sustainability and Environment, for the Goulburn Broken Catchment Management Authority. Developed under the guidance of the Biodiversity Action Planning Steering Committee - comprising personnel from the Goulburn Broken Catchment Management Authority, Department of Primary Industries, Department of Sustainability and Environment and Trust for Nature (Vic).

46 Aitken Street
Alexandra Victoria 3714
Phone: (03) 57 720 200
Fax: (03) 57 721 361

Acknowledgments:

This project is funded as part of the Goulburn Broken Catchment Management Authority Regional Catchment Strategy in the Upper Goulburn and is provided with support and funding from the Australian and Victorian Governments, through the Natural Heritage Trust. This project is delivered primarily through partnerships between the Goulburn Broken Catchment Management Authority, Department of Primary Industries, Department of Sustainability and Environment, Trust for Nature and other community bodies. Personnel from these agencies provided generous support and advice during the development of this plan. We also thank numerous Landholders, Landcare groups, Local Area Planning Groups and other individuals, who also provided generous support advice, information and assistance wherever possible.

Front cover: Acheron Cutting near Alexandra, photo: Bronwyn Merritt 2005
Inset: Striped Legless Lizard (Delma impar), photo: Peter Robertson (NRE 2002d)

Published & Printed By:

Water & Biodiversity section
Department of Sustainability & Environment
Alexandra.
Draft: Version 1 May 2008

Authorised by:

Victorian Government
1 Treasury Place
Melbourne, Victoria
3000 Australia

ISSN – To be requested

Disclaimer

For Further Information:

For further information about Biodiversity Action Planning please visit the DPI website at www.dpi.vic.gov.au or the DSE website at www.dse.vic.gov.au or call the Customer Service Centre on 136 186. Or visit the Goulburn Broken Catchment Management Authority website at www.gbcma.vic.gov.au

EXECUTIVE SUMMARY

Biodiversity Action Planning (BAP) is an initiative by the Victorian Government to **identify priorities** for the conservation of native biodiversity, as part of the implementation of the Victorian Biodiversity Strategy 1997. It is not a 'stand-alone' project; rather a process for translating objectives set out in Victoria's Biodiversity Strategy to regional, catchment and local level. Victoria's Biodiversity Strategy fulfils a statutory requirement under Section 17 of the *Flora and Fauna Guarantee Act 1988* and provides the biodiversity action plan for Victoria (Crown 1997).

To **translate objectives** from state to regional, catchment and local landscape level, Victoria was first divided on a bioregional basis (bioregions) and then at a landscape level (landscape zones). The Central Victorian Uplands Bioregional Plan and the Eildon Landscape Zone plan outline biodiversity priorities at the bioregional level. This Eildon Landscape Zone Conservation Plan has been developed at the local (landscape) level and is intended to assist government agencies (primarily extension staff) and the community, to work in partnership towards achieving catchment targets, by setting priority areas for protection and enhancement of native biodiversity. This plan is also intended to enable biodiversity priorities, data and advice to be disseminated to other planning processes, landholders and agencies.

The methodology used to develop the Landscape Zone plans is according to the 'Developer's Manual for Biodiversity Action Planning in the Goulburn Broken Catchment (GBCMA 2004a)'. Two important components in the Biodiversity Action Planning process are the focal species approach and the Key Biodiversity Assets approach. The focal species approach uses the habitat requirements of a particular species, or a group of species, to define the attributes that must be present in a landscape, for these species to persist. Five focal species have been identified in the zone including, Striped Legless Lizard (*Delma impar*), Crested Shrike-tit (*Falcunculus frontatus*), Sacred Kingfisher (*Todirhamphus sanctus*), Grey Shrike Thrush (*Colluricincla harmonica*), Eastern Yellow Robin (*Eopsaltria australis*). Alternative focal species are discussed.

The **Key Biodiversity Assets** approach is a method of grouping biodiversity assets (ie. birds, animals and plants) that use the same type of habitat. Five Key Biodiversity Assets were identified for the Eildon Landscape Zone including; Grassy Woodlands, Grassy Forests, Riparian Systems and Wetlands, Lake Eildon and plants of special concern. The grouping of these assets will assist in targeting actions towards the very high value sites first, down to the lowest priority sites.

The **Eildon Landscape Zone** is located within the Goulburn Broken Catchment of Victoria. The Zone, which is 188,750 hectares, is within the Central Victorian Uplands Bioregion and within the Local Government areas of Benalla Rural City, Mansfield and Murrindindi Shires. Since European settlement much of the vegetation in the zone has been cleared, leaving a fragmented landscape, with many of the remnants that remain being highly modified.

Nine hundred and five **priority environmental sites** have been identified within the Eildon Landscape Zone. The priority sites have been determined and ranked (low, medium, high or very high) based on factors such as, size, quality, Ecological Vegetation Class (EVC) conservation status, threatened species, landscape context and field survey results. These sites contain remnant vegetation and vary greatly in size from a stand of paddock trees, to an area of over 9,500 hectares.Since European settlement much of the original vegetation in the zone has been cleared, leaving a fragmented landscape. Many vegetation remnants are highly modified. Some larger areas of intact vegetation and scattered remnants provide a framework and opportunity for restoration

Management actions have been developed for the Eildon Landscape Zone, based on the results of desktop analysis and surveying. It is intended that government agencies (primarily extension staff) and the community will work together to implement these actions, for the benefit of biodiversity conservation in the Eildon Landscape Zone and the wider area of the Goulburn Broken Catchment.

CONTENTS

SECTIONS PAGE

LIST OF FIGURES

LIST OF TABLES

1.0 BACKGROUND

1.1 INTRODUCTION

Global Convention on Biological Diversity Plan

National Strategy for the Conservation of Australia's Biological Diversity

Victoria's Biodiversity Strategy

Bioregional Strategic Overview

Landscape (Lake Eildon) Zone Conservation Action Plans

Eildon Landscape Zone Conservation Plan

Site Management Plans

Figure 1: BAP Process

Biodiversity Action Planning[1] (BAP) is an initiative by the Victorian Government to identify priorities for the conservation of native biodiversity, as part of the implementation of the State's Biodiversity Strategy (Crown 1997). In particular according to Platt & Lowe 2002, it aims to:

- Conserve native biodiversity by maintaining viable examples of the range of ecosystems that occur naturally in Victoria,
- Promote a more strategic and cost-effective expenditure of public funds for the protection, restoration and ongoing management of priority biodiversity sites, and
- Achieve community support for landscape planning for biodiversity and the conservation of strategic assets, particularly in rural landscapes.

In order to achieve these aims, effective planning of actions for native biodiversity also requires detailed planning at a bioregional and landscape level. Therefore, Victoria was first divided on a bioregional basis (Appendix 1) and then at a landscape level (landscape zones)(Appendix 2). Figure 1 illustrates the Biodiversity Action Planning process and where the Eildon Landscape Zone Conservation Plan (highlighted in red) fits within a policy context.

At the regional scale the 'Landscape Plan for the Goulburn Broken CMA - Lake Eildon Zone' identifies the broad priorities for biodiversity conservation in the region. They also provide the foundation for producing detailed Plans, such as the 'Eildon Landscape Zone Conservation Plan (Ahern et al 2003). At the Landscape Level, this Eildon Landscape Conservation Plan is intended to provide biodiversity conservation actions for the community to implement at a local level.

1.2 OBJECTIVES

The Eildon Landscape Zone Conservation Plan aims to translate state, regional and catchment plans and targets for biodiversity, to a local landscape level. This plan aims to ensure that private and public resources expended for conservation are targeted to priority sites for priority actions. In this way, available resources can be used for the greatest possible outcomes, based on the best science. This plan identifies 905 priority sites, ranging across low, medium, high or very high value. The protection and management of these priority sites is important for the conservation of flora and fauna in the local area. Therefore, this plan is intended primarily for use by extension officers, as well as the community, to guide the management of conservation in the zone.

Broadly, this plan details:

- The landscape, vegetation and significant flora and fauna of the area,
- Conservation objectives for the Eildon Landscape Zone,
- Priority assets to be conserved, and the threats to these biodiversity values,
- Priority actions required to protect and restore the assets, and
- Further monitoring requirements for the zone (Robinson et al 2003).

[1] For further information on Biiodiversity Action Planning visit Department of Sustainability and Environments website at www.dse.vic.gov.au

1.3 A VISION FOR CONSERVATION – EILDON ZONE

The Goulburn Broken Regional Catchment Strategy identifies a vision for biodiversity in the catchment. The vision is that "the community will work in partnership with Federal and State Governments and other agencies, to protect and enhance ecological processes and genetic diversity, to secure the future of native species of plants, animals and other organisms in the catchment" (GBCMA 2003a p87). This Eildon Landscape Conservation Plan is to assist in achieving this vision.

The Goulburn Broken Regional Catchment Strategy (RCS) also identifies targets and priorities for the catchment (refer to Appendix 3 for further details). It is intended that this plan will complement the regional strategy along with other strategies including Victoria's Native Vegetation Management Framework (NRE 2002a), Regional Native Vegetation Plans being developed for each Catchment Management Authority (CMA) region and the Victorian River Health Strategy (NRE 2002b).

The Biodiversity Action Planning (BAP) process uses current scientific knowledge to produce an 'ideal' landscape for biodiversity conservation. This 'ideal' landscape provides for the current levels of species abundance, diversity and interactions. It is therefore intended that this Eildon Landscape Zone Conservation Plan will assist government agencies and the community to work in partnership towards achieving the above catchment targets and an 'ideal' landscape, by setting priority areas for protection and enhancement of native biodiversity.

This plan is not intended to be a method of 'taking over' land, but rather as a resource document which assists with identifying priority assets and methods of action, to protect or restore valuable assets, through voluntary extension principles. The document is by no means 'comprehensive', as the BAP process relies on the regular updating of information, to keep it accurate and timely. The plan has therefore been developed as an adaptive plan, to enable management actions and information to be modified in response to further information, including monitoring actions. The plan will be reviewed when necessary to ensure that it remains a 'living' document. It is also intended that extension staff will utilise GIS programs, databases and DSE/DPI EMP staff, to fully identify and understand the BAP sites and process.

2.0 THE STUDY AREA

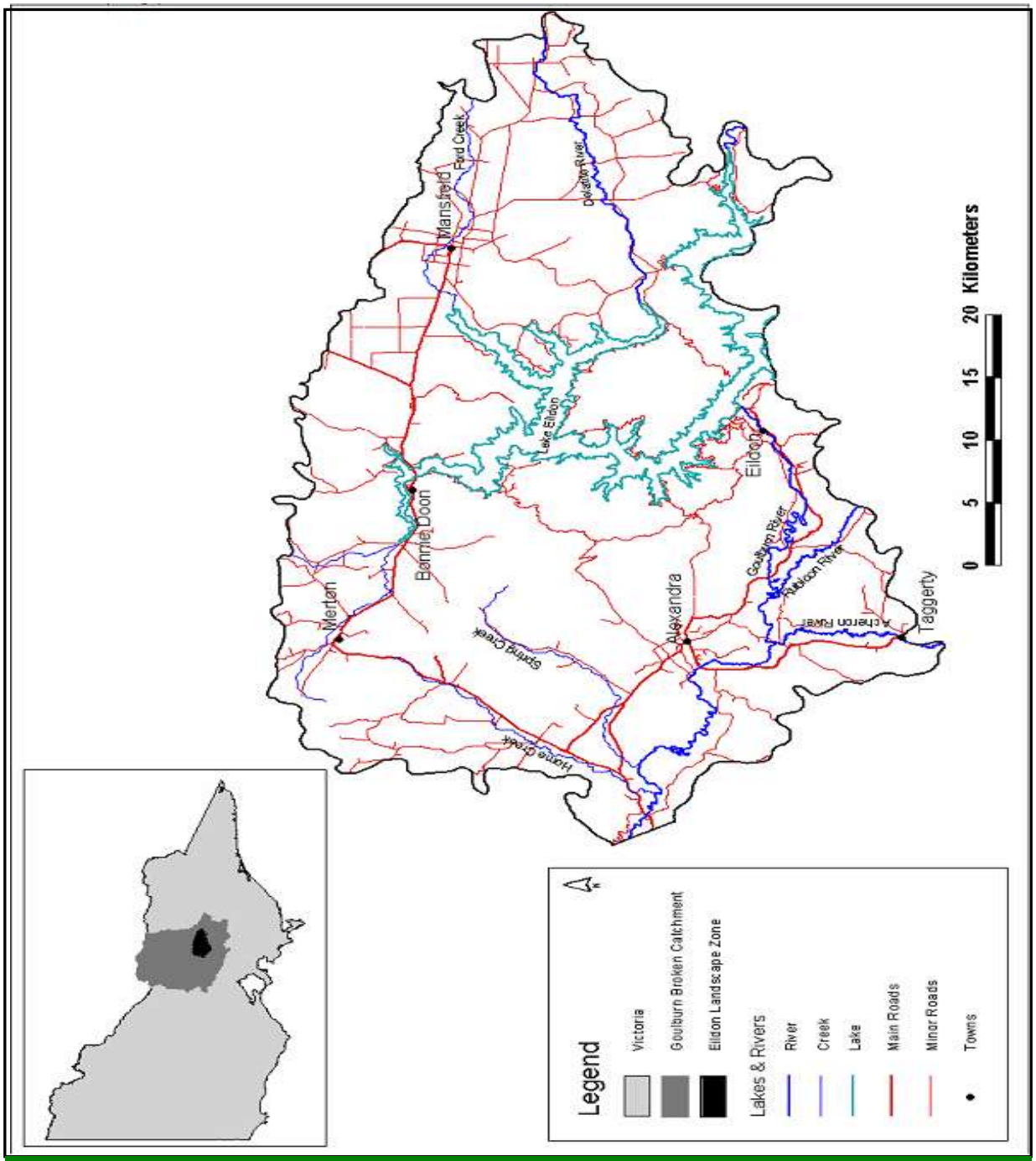


Figure 2: The Eildon Landscape Zone.

2.1 LANDSCAPE

The Eildon Landscape Zone (Figure 2) is located within the Goulburn Broken Catchment of Victoria (Figure 2). The zone (188,750 hectares) falls within the Central Victorian Uplands Bioregion and the Local Government areas of Mansfield and Murrindindi Shires. It is bounded on the north and west by the boundary of the Highlands Northern Fall bioregion and to the east and south by the boundary of the Highlands Southern Fall bioregion. The Goulburn Valley and Maroondah Highways are the major regional arteries traversing the zone (Ahern et al 2003). Major towns in the zone include Merton, Bonnie Doon, Mansfield, Alexandra and Eildon. The Daung Wurrung (Taungurong) Aboriginal tribe/language group are the traditional owners of Eildon Landscape zone (DSE 2003).

Private land covers 81% of the zone (Ahern et al 2003). Extensive clearing or modification of woodlands has historically occurred across most private land in the zone. Native vegetation remaining on private land is often fragmented, and usually occurs as isolated remnants. Larger stands of remnant vegetation, predominantly Grassy Woodlands, occur on private land around Mansfield and in the north-west corner of the zone near Merton and Gobur. Scattered remnants of the listed community, White Box Grassy Woodland, occur on upper slopes throughout the zone.

***Photo: Leafy Greenhood orchid (Pterostylis cucullata* (Photo: Fern Hames)**

Despite extensive clearing, there are still some large areas of original or regenerated forest such as Lake Eildon National Park. Other smaller reserves, roadsides and river frontages,along with privately owned remnants are of important ecological significance. Public land covers approximately 19% of the zone, and occurs mainly in Lake Eildon National Park (Ahern et al 2003).

2.2 VEGETATION

Ecological Vegetation Class (EVC) is a vegetation classification system derived from groupings of vegetation communities based on floristic, structural and ecological functions. Mosaics (combinations of EVC's) are a mapping unit where the individual EVC's could not be separated at the scale of 1:100,000 (Berwick2003).

Prior to European settlement, 17 EVC's were known to have been present within the Eildon Landscape Zone (Figure 3). The vegetation of Eildon Landscape Zone was a mixture of Grassy Forests, Grassy Woodlands, Herb-rich Foothill Forest and Floodplain Riparian Woodland. The Grassy Forests were dominated by Red Box *Eucalyptus polyanthemos*, Yellow Box *E. melliodora*, Red Stringybark *E. macrohyncha*, Long-leaf Box *E. goniocalyx*, White Box *E. albens* and Broad-leaf Peppermint *E. dives* as well as a range of understorey species. The Herb-rich Foothill Forest was dominated by Broad-leaf Peppermint, Messmate *E. obliqua*, Narrow-leaf Peppermint *E. radiata*, Silver Wattle *Acacia dealbata* and Blackwood *A. melanoxylon.* Grassy Woodland communities on the plains were dominated by Grey Box *Eucalyptus microcarpa*, Yellow Box, Red Stringybark and White Box. Ground cover in these woodlands was comprised of grasses, sedges, lilies, orchids and herbs with wattles providing an understorey. The Floodplain Riparian Woodland was dominated by River Red Gum, Yellow Box, Grey Box, Swamp Gum *E. ovata*, Candlebark *E. rubida*, Silver Wattle and Blackwood. In higher elevation areas Riparian Forest is dominated by Manna Gum *E. viminalis*, Narrow-leaf Peppermint, Hazel Pomaderris *Pomaderris aspera*, Silver Wattle and Blackwood.

Today much of the original Herb Rich Foothill Forest remains relatively intact. Parts of Lake Eildon National Park which were previously cleared farm land continue to regenerate both naturally and with assistance. Approximately 1800ha of Delatite Arm Reserve on the eastern shores of Lake Eildon, which was planted to pine in the 1950's and reclaimed farmland is being progressively regenerated to original EVC's, such as Herb Rich Foothill Forest and Valley Grassy forest, as pines are harvested.

Within the private land areas various components of woodland EVC's remain but rarely completely intact. In parts woodland overstorey remains as large paddock trees but native ground flora has been replaced by exotic grasses. In other locations native grasses, usually kangaroo grass, remains but the woodland trees have been removed. In some cases, in hilly country, logs and stumps remain from earlier clearing and remnant specimens of native herbs, forbs and small shrubs persist. River Red Gums *E. camaldulensis* remain the dominant plant of broad river valleys, floodplains and low lying areas. Extensive areas of old red gums remain on private land on the Plains north and west of Mansfield.

Of the17 EVC's that have been identified in the Eildon zone, the dominant groups are Grassy Forests, Grassy Woodlands and Riparian Woodlands. Most EVCs in this zone are considered endangered or vulnerable at a bioregional level. The Goulburn Broken Native Vegetation Plan describes goals and targets that have been set for vegetation communities within the catchment. This includes all EVC's that are at least 15% of their pre-European cover by 2030 (GBCMA 2003). Other than those EVC's well represented in State Forest the majority of EVC's in the Eildon Zone are below the 15% target (note the highlighted EVC's in Tables 1 and 2). Therefore, revegetation of some of the EVC's in this zone could help to achieve bioregional targets. For further details on each EVC see the EVC cards available on the DSE website.

The current extent of native vegetation in the Eildon Zone has dramatically reduced (Figure 4) since European settlement due to clearing. Table 1 identifies the Pre-1750EVC's in the Eildon Landscape Zone, including their Bioregional Conservation Status, their current (as of 2003) extent (in hectares and % cover). The table also identifies the area of 'Private Land No Tree Cover' and Unknown/Unclassified EVC's (Ahern et al 2003).

The Goulburn Broken Regional Catchment Strategy identifies goals and targets that have been set for the vegetation communities within the catchment (Appendix 3). This includes "increasing the cover of all 'Endangered' and 'Vulnerable' (where applicable[3]) EVC's to at least 15% of their pre-European vegetation cover by 2030" (GBCMA 2003). Many EVC's within the Eildon Landscape Zone are below the 15% target (Table 1) and are therefore considered 'Endangered' (six) , 'Vulnerable' (two) or extinct (two) at the Bioregional level (Ahern et al 2003).

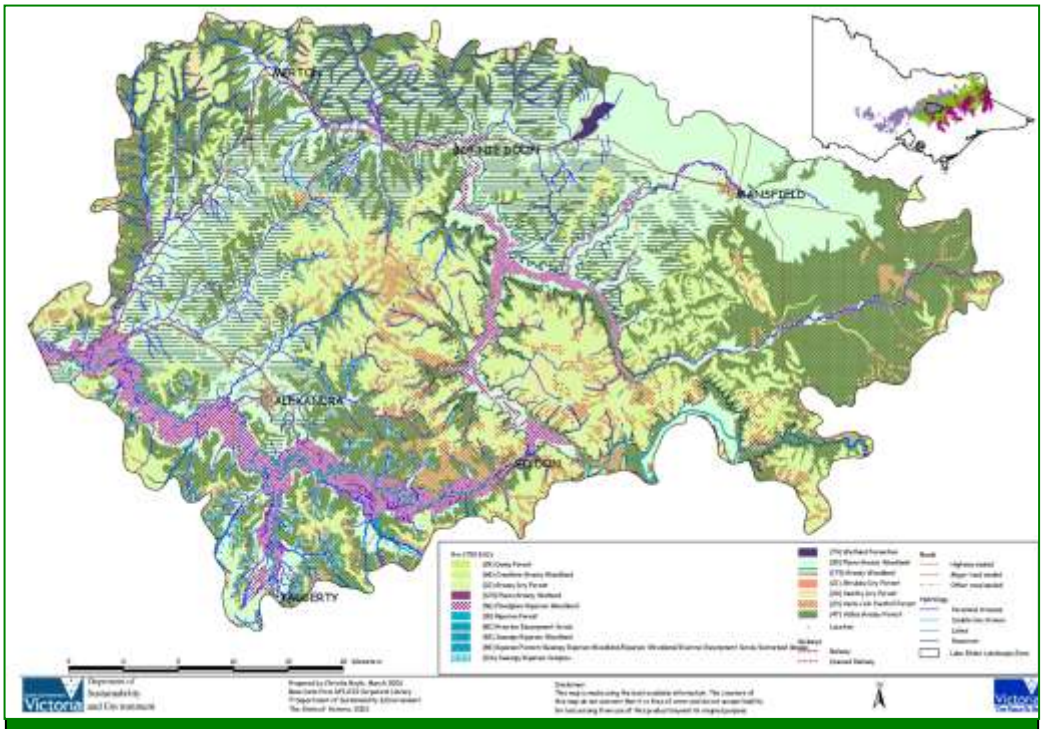


Figure 3: Pre-European Native Vegetation Cover – Eildon Landscape Zone

[3] Applicable to Ecological Vegetation Classes that are 'Vulnerable' and are below 15%

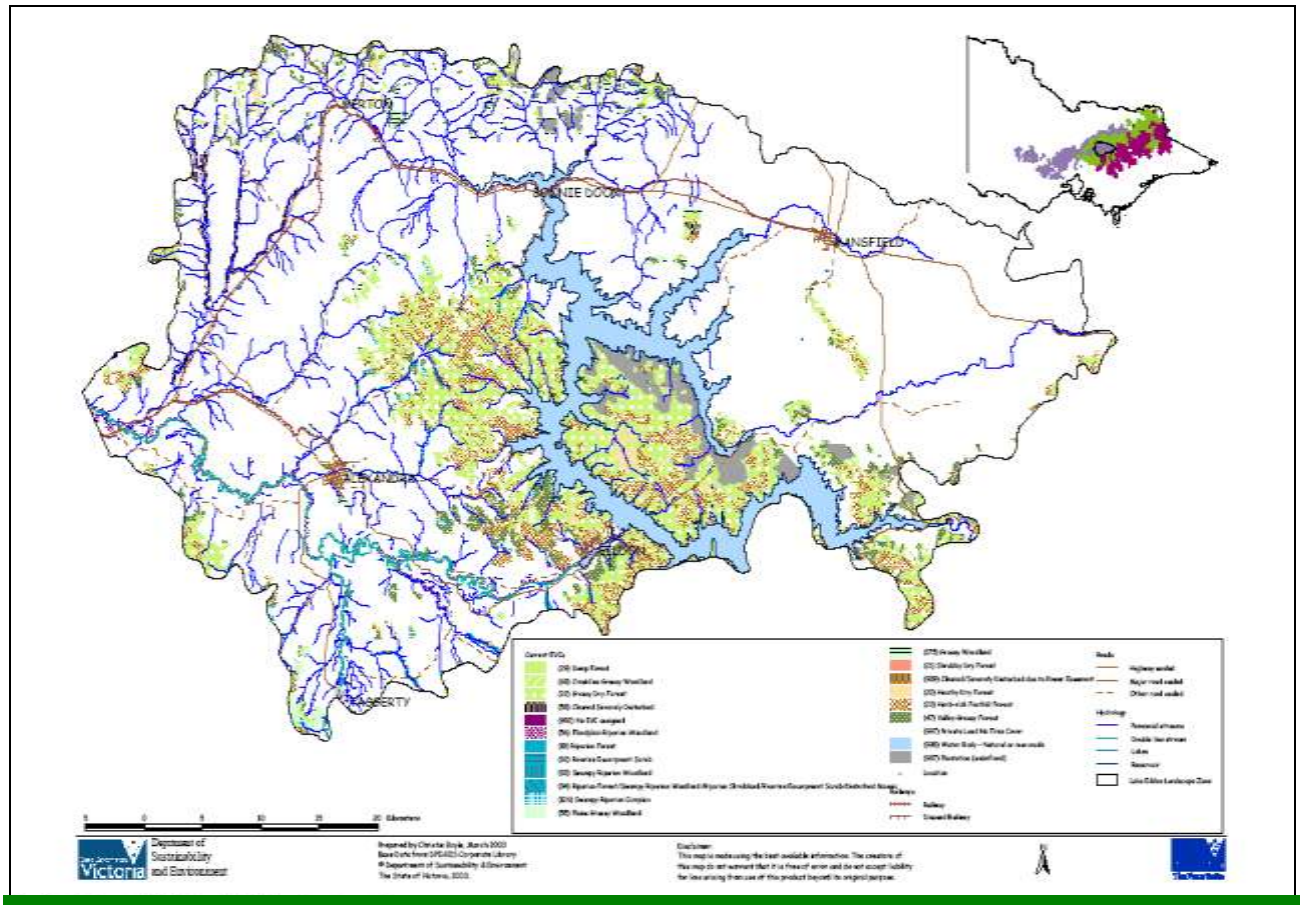


Figure 4: Current extent of Native Vegetation Cover in Eildon Landscape Zone.

Table 1: Eildon Zone Ecological Vegetation Classes (pre-1750 and current)

EVC Group	EVC number	EVC Bioregional Cons. Status	Cons. Status	EVC Name	Pre 1750 Area (ha)	Current Area (ha)	% EVC remaining	15% Pre-1750 Target
5	175	E	E	Grassy Woodland	23613	407	1.7	3542
6	47	V	E	Valley Grassy Forest	55720	2771	5	8358
6	22	D	LC	Grassy Dry Forest	37689	19052	50.5	5653
6	23	D	D	Herb-rich Foothill Forest	15153	7784	51	2273
6	20	LV	LC	Heathy Dry Forest	716	382	53	107
6	21	LV	V	Shrubby Dry Forest	145	22	15	22
7	29	LC	LC	Damp Forest	356	330	92	53
8	126	E	V	Swampy Riparian Complex	2612	338	13	392
8	83	E	E	Swampy Riparian Woodland	206	1	1.5	31
9	18	V	V	Riparian Forest	976	174	17	146
9	84	V	E	Riparian Forest/ Swampy Riparian Woodland/ Riparian Shrubland/ Riverine Escarpment/Disturbed Mosaic	277	2	0.7	42
14	55	E	E	Plains Grassy Woodland	36858	577	1.5	5529
15	56	E	E	Floodplain Riparian Woodland	13599	1059	7.7	2040
15	68	E	E	Creekline Grassy Woodland	509	2	0.4	76
19	74	E	X	Wetland Formation	310	0	0	47
19	125	E	X	Plains Grassy Wetland	10	0	0	2
21	82	E	LC	Riverine Escarpment Scrub	6	3	50	1
				Total	188,757	33,611	17.8	28,314
99	982	NA	NA	No EVC assigned - need editing	0	21		
99	987	NA	NA	Plantation (undefined)	0	3090		
99	58	NA	NA	Cleared Severely Disturbed	0	709		
99	989	NA	NA	Cleared/Severely Disturbed due to Power Easement	0	101		
99	997	NA	NA	Private Land No Tree Cover	0	140110		
99	998	NA	NA	Water Body - Natural or man made	0	11823		

Table Information including column A & B from Ahern et al 2003 *A* *B* *C* *D*

Column C derived from (column B divided by column A) multiplied by 100 (for %)

Column D derived from (column A divided by 100) multiplied by 15

EVC names have altered since Ahern et al 2003, however area and extent remain the same

Explanation of Terms:

- EVC Bioregional Conservation Status refers to the threatened status of the EVC in the bioregion (eg. Central Victorian Uplands). Endangered (E) means that 'less than 10% of the pre-European extent remains, whilst Vulnerable (V) is defined as 10-30% pre-European extent remaining (Platt 2002).
- EVC Number refers to the unique number attributed to that EVC

2.3 SIGNIFICANT FLORA AND FAUNA

2.3.1 Flora:

A range of native flora is found within the Eildon Landscape Zone. Overstorey species include Red Box *Eucalyptus polyanthemos*, Yellow Box *E. melliodora*, Red Stringybark *E. macrohyncha*, Long-leaf Box *E. goniocalyx*, White Box *E. albens* and Broad-leaf Peppermint *E. dives,* Messmate *E. obliqua*, Narrow-leaf Peppermint *E. radiata*, Silver Wattle *Acacia dealbata* and Blackwood *A. melanoxylon*. The range of small trees and shrubs includes species such as Red-stem Wattle (*Acacia rubida*), Common Correa (*Correa reflexa*), Narrow-leaf Bitter-pea (*Daviesia leptophylla*), Sweet bursaria (*Bursaria spinosa*) and Common Cassinia (*Cassinia aculeata*). The zone also contains a range of groundcover plants including Wallaby Grass (*Austrodanthonia spp*), Kangaroo Grass (*Themeda triandra*), Flax lilies (*Dianella* spp) and Bidgee-widgee (*Acaena novae-zelandiae*) (Ahern et al 2003).

Photo: Bronze Bird-Orchid (Chiloglottis X pescottiana) (NRE 2002c)

There are 14 species of threatened flora recorded within the Eildon Landscape Zone (FIS 2005). These species are noted in Appendix 4, along with their threatened status, as per the Flora Information System, the State level *(Flora and Fauna Guarantee Act (FFG Act) 1998)* and the National level (*Environment Protection and Biodiversity Act (EPBC) 1999*) (Ahern et al 2003). An example of a nationally significant threatened species is the Leafy Greenhood which occurs near the eastern shores of Lake Eildon. The population is regularly monitored by DSE and community groups and is relatively secure within National Park. In contrast Tough scurf-pea, *Cullen tenax,is endangered in Victoria and occurs in Grassy Woodland, which has been largely modified by agriculture in this zone. There have been no records from the Eildon zone since the 1890's.*

Photo: Hypsela (Hypsela tridens) By John Echler (NRE)

2.3.2 Fauna:

There are 43 threatened fauna species recorded in the Eildon Zone (refer to Appendix 5 for species, their threatened status and relevant acts) (Ahern et al 2003). Eildon zone contains priority habitat and therefore high conservation significance for some of the listed species while others are records due to vagrancy or edge of distribution.

Examples of threatened woodland species recorded in the Eildon Landscape Zone and where Eildon zone can make a significant conservation contribution include:

- Striped Legless lizard (*Delma impar*)
- Regent Honeyeater (*Xanthomyza Phrygia)*
- Golden Sun Moth (*Synemon plana)*
- Brush tailed Phascogale (*Phascogale tapoatafa)*
- Eastern Horseshoe Bat (*Rhinolophus megaphyllus*)

Photo: Blue-billed Duck (Oxyura australis) By Wendy Opie (NRE 2002d)

Examples of threatened species recorded within the Eildon Landscape Zone, predominantly associated with wetlands and where Eildon zone can make a significant conservation contribution include:

- White bellied Sea-eagle (*Haliaeetus leucogaster)*
- Growling Grass frog (Litoria raniformes)
- Damsel fly *Hemiphlebia mirabilis*

Threatened fish recorded within the Eildon Landscape Zone include species extant in the zone such as River Blackfish (*Gadopsis marmoratus*) and those that have been restocked into waters such as Lake Eildon but which previously occurred including:

- Golden Perch (*Macquaria ambigua*)
- Murray Cod (*Maccullochella peelii peelii*)

3.0 PREPARING A CONSERVATION PLAN

3.1 METHODOLOGY

The methodology used to prepare this plan contained eight main elements. These were:
1) Identification of Conservation Features and Threatened Species,
2) Ground Potential BAP Sites,
3) Field Survey BAP sites,
4) Prioritise BAP Sites,
5) Generate Focal Species List,
6) Generate Key Biodiversity Asset List,
7) Develop Actions for Key Biodiversity Assets, and
8) Landscape Context Analysis.

Step 1. Identification of Conservation Features and Threatened Species
Features in the landscape that are of potential priority for conservation were identified, as well as flora and fauna species of conservation significance (ie. threatened under State or Commonwealth legislation). This involved desktop analysis of data including literature reviews, spatial data (eg. EVC, tree cover, wetlands, flora and fauna records, aerials), corporate databases (eg. Biosites, Victorian Fauna Display and Flora Information Systems), local knowledge investigations, and the Landscape Context Model (refer to Step 8). From this analysis, a series of sites likely to have conservation values and threatened species were identified and mapped using GIS.

Step 2. Ground-Truthing of Potential BAP Sites
This involved surveying of the zone from the roadside, to compare desktop analysis data with the on-ground sites in regards to presence and type of vegetation and its condition.

Step 3. Field Survey BAP Sites
Sites were prioritised for survey as per Robinson et al 2003 method (Appendix 6). Ninety three sites were field surveyed (on-site or from the nearest public land), by:
3.1) Bird surveys were undertaken in accordance with the Birds of Australia – Atlas Search Methods (search a 2-hectare area for 20 minutes) (Birds Australia 2001, http://www.birdsaustralia.com.au/our-projects/atlas-birdata.html).
3.2) Vegetation Quality Assessment (VQA)(DSE 2004) – Site-based habitat and landscape components were assessed against a pre-determined 'benchmark' relevant to the vegetation type being assessed (ie. grasslands, wetlands, plains grassy woodlands) (Refer to Appendix 7).
3.3) Threat Identification – Whilst undertaking the Vegetation Quality Assessment, a list of threatening processes (ie. pest plants and animals) on the priority sites, were recorded.

Step 4. Prioritise BAP Sites
The 93 sites were given a ranked value of very high (VH), high (H), medium (M) or low (L), based on a range of factors (conservation status of the EVC, presence of threatened species, size, VQA score). Sites not surveyed, nor automatically ranked (as per Appendix 6), were given a ranked value to the lesser of the available options until surveying occurs.

Step 5. Generate Focal Species List
The focal species approach (Lambeck 1997) uses the habitat requirements of a particular species, or group of species, to define the attributes that must be present in a landscape for these species to persist. For example, if a species that requires the largest remnant size is selected, then fulfilling the needs of that species may result in the conservation of all species with smaller remnant size

requirements. The factors used in this plan to select focal species were remnant size and isolation distances (Robinson et al 2003).

Step 6. Generate Key Biodiversity Asset List

The identified environmental features, including flora and fauna species, were categorised into a series of 'nested' environmental assets. For example, similar species or environmental features may be located in 'nested assets' such as creek lines or ecological vegetation classes.

Step 7. Develop Actions for Key Biodiversity Assets

This involved the development of a list of actions aimed at protecting and enhancing the biodiversity values in the Zone by reducing the identified threats for each Key Biodiversity Asset. Available information (eg. Actions for Biodiversity Conservation (ABC) database) (DSE 2005a) and the Eildon Landscape Plan (Ahern et al 2003) were also used to compile the actions.

Step 8. Landscape Context Analysis

To achieve long-term viability of the priority sites, they need to be linked together to form a viable, functioning landscape. The Landscape Context Model (LCM) (Ferwerda 2003) uses a model of "known habitat" (based on mapping for tree cover, wetland, and major watercourses) to identify large remnants, key remnant clusters and the key linkages between them. However, because of potential limitations of the input data, areas of conservation significance (particularly grasslands and sparse woodlands) may not be identified. Similarly, areas with minimal conservation significance may be included because habitat quality data is not included in the model.

The LCM identifies areas that have the highest (or least) probability of containing additional sites of conservation interest (as per Step 1). The model is useful in identifying the areas of the landscape that should be used to link and strengthen a network of conservation sites, and create a sustainable landscape. The model can be used to further determine the major linkages between the priority sites. The Eildon Landscape Zone priority sites and Landscape Context overlay are shown in Appendix 8.

4.0 IDENTIFYING PRIORITY SITES

In the Eildon Landscape Zone, 905 sites have been identified as Biodiversity Action Planning priority sites for conservation management. These sites are termed BAP sites. They contain remnant vegetation and vary greatly in size from an area such as a stand of paddock trees, to large areas such as Lake Eildon National Park. Ninety three of these BAP sites have been ground-truthed and surveyed (refer to Section 5.0 for further information on surveying).

In order to identify the BAP sites, each site was assigned a number that identifies its location (maps) and the associated data (attribute table). This unique number has been calculated using the map-index number (1:25,000 maps) and a site number (ie. 1-267). An example of the site identification numbering system (how the site(s) are identified using the site number system) is illustrated below (figure 5). An example of the data that is contained in the database (attribute table), for each BAP site is detailed below (figure 6).

The location and mapping of all of the 905 BAP sites is available (Appendix 11). Information relating to each site (eg. site number, asset type, conservation status, EVC, focal species), a bird list for every site and asset maps is also provided (refer to Appendix 11).

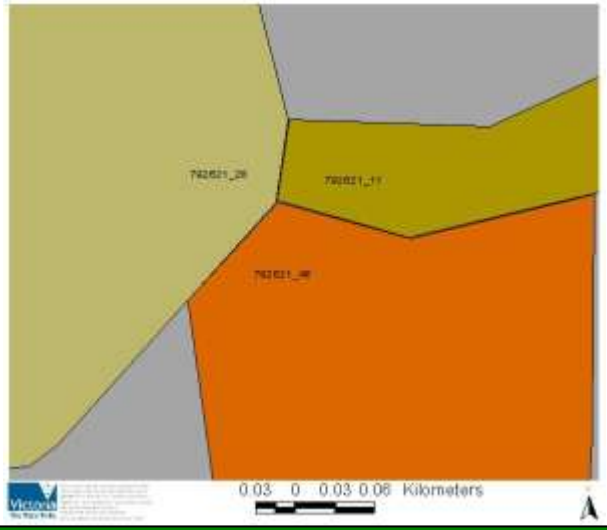


Figure 5– An example of the site identified numbering system

Site Number:	792623_1
Biodiversity Asset	Plains Woodland (Section 6.0)
Conservation Status	Very High
Management Action	Protect
EVC	55 (Section 2.2)
EVC status	E (Endangered)
Focal Species	Bush-Stone Curlew (*Burhinus grallarius*) (Section 6.1)
Threatened Spp Record?	Yes (Y) (and name included)
Buffered for Focal Species?	No (N)
Vegetation Quality Score	16/20 (Section 5.1)
Management	Private
Threats	Pest plants, land clearance

Figure 6– An example of the data contained in the database (attribute table)

5.0. SUMMARY OF PRIORITY SITE SURVEYING

5.1. VEGETATION QUALITY ASSESSMENTS

Ninety three of the 905 BAP sites were assessed based on Habitat Features of, 1) Large trees, 2) Canopy Cover, 3) Understorey, 4) Weediness, 5) Recruitment, 6) Organic Litter, and 7) Logs, and Landscape Component Scores of, 8) Size, 9) Neighbourhood and 10) Core Area. They were scored out of a maximum score of 20 (intact habitat). An example of the assessment sheet is provided in Appendix 7. Graphical illustration of the results is also provided in Appendix 9.

The sites in the Eildon Landscape Zone scored between 3.0 and 18.0 for the Vegetation Quality Assessment. The highest scored site was in The Paps Reserve area (north of the zone) while the lowest scored site was in a highly disturbed agricultural area.

The graphical results (Appendix 9) highlight some of the challenges for biodiversity conservation in the Eildon Zone. In summary, the assessments identified that,

- Only 17% of sites scored the highest for large trees (more than 7/ha),
- 72% of the sites scored the highest for canopy cover (more than 50%),
- Only 1% of sites scored adequate understorey (more than 75% and more than two forms),
- Only 2.5% of sites scored less than 25% weed cover,
- Only 27% of sites have adequate regeneration (10% or more of total species population),
- 83% of sites have adequate % of organic litter (more than 50% total),
- Only 10% of sites have adequate number of logs (25m/ha),
- 26% of sites were larger than 10 hectares and 67% between 2-10 hectares,
- Only 11% of sites were surrounded (1km radius) by more than 50% vegetation, and
- 22% of sites were less than 1km from a block of native vegetation greater than 50-hectares.

(Note: Scored in relation to requirements for Ecological Vegetation Class Benchmark. Refer to Appendix 7 for further information on surveying).

Therefore, in general, the surveys show that in much of the zone there is:
less than desirable understorey or regeneration, a high percentage of pest plants, a lack of connectivity, small sized remnants (2-10 hectares) and areas with low numbers of large trees. These habitat elements should be targeted within the zone.

The VQA scores for each of the sites provide a valuable monitoring system that can be repeated over time. It is also intended that the remaining priority sites will also be assessed over time.

5.2 BIRD SURVEYS

Some of the ninety three priority BAP sites assessed for vegetation quality also had bird surveys completed. Fifty three bird species were identified from these surveys in the zone (Appendix 10).

The only threatened species noted from the bird surveys was the Brown Treecreeper (*Climacteris picumnus)*. A list of threatened fauna (including birds) recorded from surveys and other sources in the zone, is shown in Appendix 5.

5.3 CONSERVATION THREATS

Threats to the conservation values for the Eildon Landscape Zone were identified, as:

- Land Clearance (removal of native vegetation)
- Habitat Fragmentation (isolation of remnants and species due to land clearance)

- Changes in hydrology (inappropriate wetting/drying/flow regimes; operation of dams and reservoirs)
- Grazing (by introduced and native animals)
- Removal of habitat (eg. firewood collection, 'cleaning' up)
- Pest Plants
- Pest Animals (including soil disturbance, predation)

Whilst some of the identified threats (eg. land clearance, habitat fragmentation and changes in hydrology) are primarily a result of historical activities (wide spread clearing, wetland drainage etc), they continue to have impacts on the biodiversity in the zone.

Land clearance (a key threatening process under the *EPBC Act* 1999) (Wierzbowski et al 2002) continues to be a threat to conservation values within the zone. Clearing of trees is now generally confined to small areas and is regulated under the Native Vegetation Framework however the effects of extensive, historical clearing are evident with areas of fragmented and highly modified landscape. Despite a technical requirement to gain permits to remove native grassland changing agricultural systems and new land use such as vines, olives and tree plantations continue to result in losses.

Habitat fragmentation (a potentially threatening process for fauna in Victoria under the *FFG Act* 1988 (Wierzbowski et al 2002)), is usually the result of land clearance. A range of species such as the Brush tailed Phascogale (Pahascogale tapoatafa) are detrimentally affected by habitat fragmentation, as it affects their ability to source food and suitable habitat required for their survival.

Changes in hydrology (eg. wetting/drying/flow regimes) are a threat to native vegetation and associated fauna, particularly in and around wetlands, which have evolved to function with the natural cycles of flood and drought. The historical construction of lake Eildon has permanently changed hydrology cycles for wetlands along the Goulburn river valley and has changed the Goulburn River temperature regime in favour of cold water species. Alteration to natural flow regimes of rivers and streams is listed as a threat to Victorian waterways under the *FFG Act* 1988 (Wierzbowski et al 2002). The construction of dams and reservoirs also affects the hydrology of the landscape by preventing water from flowing into the lower catchments.

Grazing by introduced animals affects biodiversity conservation through soil compaction, removal of vegetation (ie. regeneration), changed nutrient levels in and around native vegetation, contributing to tree dieback, and resulting in competition for fodder by native herbivores and small mammals and reptiles that require tussocky grass for shelter (Wilson et al 2002). A large percentage of remnants (both fenced and unfenced) within the landscape are grazed, often resulting in minimal shrub or ground cover (only 1% of BAP sites surveyed had adequate understorey).., Native mammals (eg. kangaroos and wallabys) can also have an impact on remnant vegetation if their numbers are too high for a given remnant. Large numbers of kangaroos are often sustained in small remnants by accessing crops or pasture in adjoining land.

Photo: Firewood Collection in remnant vegetation

The removal of fallen timber (or 'cleaning up') occurs along roadsides and within private remnants Removal of fallen timber results in a loss of key habitat For a range of fauna species. Fallen timber provides shelter for regenerating seedlings and hollows for ground mammals, amphibians and reptiles. Education on details of fallen timber is likely to be a useful in providing an understanding

that it can be managed so that farm enterprise is not compromised, some firewood collection is possible and environmental benefits can be improved.

Pest Plants (Weeds) are a major threat to biodiversity because they compete for space, light and nutrients with native species. Invasion of native vegetation by environmental weeds is listed as a potentially threatening process under the *FFG Act* 1988 (Wierzbowski et al 2002). Some of the weeds evident and significant in the zone include Blackberry *(Rubus fruticosus* spp.agg.), St. John's Wort (*Hypericum perforatum*), Cape Broom (*Genista monspessulana*), English Broom (*Cytisus scoparius*), Gorse (*Ulex europaeus*), Spear Thistle (*Cirsium vulgare*), Canary Grass (*Phalaris* sp.) and other introduced pasture grasses, Paterson's Curse (*Echium plantagineum*), Willows (*Salix spp*), Blue Periwinkle (*Vinca major*) and Japanese Honeysuckle (*Lonicera japonica*). Weeds are evident on some roadsides, where edge effects and machinery create disturbance and vehicles spread weed seed throughout the area. Pest plants invading remnants can also be a result of adjacent land practices (eg. agricultural weeds).

Pest Animals are a major threat to the conservation values of the area. Predation of native wildlife by the cat (*Felis catus*) and by the introduced Red Fox (*Vulpes vulpes*) are listed as potentially threatening processes under the *FFG Act* 1988 (Wierzbowski et al 2002). Species such as the Brush tailed phascogale are preyed upon by these species, whilst the European rabbit *(Oryctolagus cuniculus*) and European Hares (*Lepus europaeus*) compete for habitat, remove native vegetation and disturb soil structure. Indian Mynah's have established acolony in Alexandra township and have the potential to become a serious threat by competing with native species for nest hollows.

6.0 CONSERVATION ASSETS

6.1 FOCAL SPECIES

The focal species approach uses the habitat requirements of a particular species or group of species to define the attributes that must be present in a landscape for these species to persist. Broadly, the focal species are considered to be the most sensitive species (in a given landscape) to the threat or ecological process, such that their conservation should also conserve other less-sensitive species found in the same vegetation type (Lambeck1997).

Additional benefits of a focal species approach are that it allows for the monitoring of the actions, and allows the community and organisations implementing on-ground works to have an 'iconic' species, which in turn is envisaged to enhance enthusiasm for implementing works.

The five focal species currently identified in the Eildon Landscape Zone, and their ecological requirements (thresholds) are identified below (Table 2). Definitions of the ecological terms used include:

- Minimum patch size (patch size threshold) – refers to the minimum patch size of vegetation required for the species to maintain viable populations,
- Critical distance between habitat patches (isolation threshold) – refers to the size of the gap between habitats beyond which the animal doesn't generally cross on a daily basis (Robinson et al 2003),
- Dispersal threshold – refers to the distance (km) for which the species has been known to travel, but generally not on a daily basis,
- Ecological Vegetation Class (EVC) – the vegetation type that the species prefers, and
- Other requirements – identifies some other requirements (not comprehensive) for the species to survive or to inhabit the area.

It is envisaged that the community groups and agencies may target one, or a combination of, the focal species identified (Table 2), for planning and implementation of on-ground works. The focal species are a suggestion of species to focus on-ground works on in the zone. Other species may also be the focus for on-ground works, given new information and community desire to implement works for another species. For Eildon zone other options for focal species include Brush tailed phascogale, Sugar Glider, Growling Grass Frog and River Blackfish.

Table 2: Focal Species and their Habitat Requirements – Eildon Zone		
	**Striped Legless Lizard (*Delma impar*)**	
	Minimum patch size (threshold)	5ha
	Critical distance between patches	50m
	Dispersal threshold	200m
	Ecological Vegetation Class	Grassy Woodlands
	Some other requirements (general)	Good ground cover of tussock grasses and surface rocks or logs.
	**Crested Shrike-tit (*Falcunculus frontatus*)**	
	Minimum patch size	> 5 ha
	Critical distance between patches	<1 km
	Dispersal threshold	1km
	Ecological Vegetation Class	Riparian systems
	Some other requirements (general)	Sites containing mature trees with patches of dense understorey
	**Sacred Kingfisher (*Todirhamphus sanctus*)**	
	Minimum patch size (threshold)	>10 ha
	Critical distance between patches	NA – Sacred Kingfishers in Victoria are migratory and depart in late summer or autumn and move to northern Queensland
	Dispersal threshold	>50 km
	Ecological Vegetation Class	A range of EVCs, especially Riparian vegetation
	Some other requirements (general)	Needs vegetation with hollow bearing trees
	**Grey Shrike-Thrush (Colluricincla harmonica)**	
	Minimum patch size (threshold)	>10 ha
	Critical distance between patches	>2 km
	Dispersal threshold	Unknown
	Ecological Vegetation Class	Most EVCs, especially Grassy Woodlands and Grassy Forests
	Some other requirements (general)	Need mature trees, fallen timber and good native understorey and ground cover. Complex habitat
	**Eastern Yellow Robin (*Eopsaltria australis*)**	
	Minimum patch size (threshold)	>5 km
	Critical distance between patches	< 1 km
	Dispersal threshold	Unknown
	Ecological Vegetation Class	Grassy Forests, Herb Rich Foothill Forest, Riparian systems
	Some Other requirements (general)	Patches of shrubs or regeneration, good ground litter layer, fallen timber; partially dependant on hollows.

Habitat Requirement Source: Variety of Sources in Robinson et al 2003
Photo Credits (NRE 2002d): Striped Legless Lizard (Peter Robertson), Crested Shrike-tit (Len Robinson), Sacred Kingfisher (Wendy Opie), Grey Shrike-Thrush (Paul Gullan), Eastern Yellow Robin (Wendy Opie)

6.2 KEY BIODIVERSITY ASSETS

The identification of the appropriate biodiversity assets to focus conservation effort is the most critical part of the BAP process. The approach of using 'Key Biodiversity Assets' has been used to group together the animals and plants that utilise the same type of habitat. For example, by choosing 'Wetlands' as a key biodiversity asset, it incorporates all of the species that live in and use a wetland, as well as the individual species (eg. Lewin's Rail, White-bellied Sea Eagle, Powerful Owl, Striped Legless Lizard, Growling Grass Frog, Spotted Tree Frog, Mountain Galaxias, Flat headed Galaxias, Murray Cod, Golden Perch, Macquarie Perch, River Blackfish, Platypus, Murray Spiny Cray, *Hemiphlebia* Damselfly, River Swamp Wallaby Grass, Plump Swamp Wallaby Grass, Summer Fringe Sedge).

There are five Key Biodiversity Assets, which have been identified for the Eildon Landscape Zone (Table 3). The 905 priority sites have been mapped in accordance with the correlating Key Biodiversity Asset (Figure 7).

The benefit of this approach is that specific actions (Section 7.0), based on the requirements of each asset (to counter the threats and improve the status of the asset), can be developed. Planning and implementation of on-ground works and actions that specifically target each of these assets can then occur.

Photo: Growling Grass Frog (Litoria ranifornis) reliant on Key Biodiversity Asset – Wetlands. By Graeme Gillespie (NRE 2002d)

Table 3: Key Biodiversity Assets – Eildon Landscape Zone

Key Biodiversity Assets	Examples of Locally Significant Species per Asset
1)* Grassy Woodland Pre 1750 Grassy Woodlands used to cover 32% of the zone but now only 1.6% of the original area remains intact EVCs included in calculation Nos. 175,55,68.	Woodland Bird Community, Striped Legless Lizard, Brown Quail, Glossy Grass Skink, Tough Scurf Pea, White Box, , Slender Tick-trefoil, Including Plains Grassy Woodland and Grassy Woodland EVCs.
2) Grassy Forests Historically the most dominant vegetation group in the zone covering approximately 50% of the zone but now only 29% of the original remains. With some EVCs such as Valley Grassy Forest having only 5% remaining. EVCs Nos used are 47,22. listed in Table 1, Group 6.	Woodland Bird Community, Masked Owl, Regent Honeyeater , Brush-tailed Phascogale, , Eastern Horseshoe Bat, Common Bent Wing Bat, , Golden Sun Moth,
3) Riparian Systems and Wetlands Pre 1750 Riparian Vegetation used to cover 9.5% of the zone but is now reduced to 8.6% of the original (0.83% of the zone). Most importantly over 50% of all Floodplain Riparian Woodland in the Central Victorian Uplands Bioregion is found in the Eildon Landscape Zone. EVCs Nos. 126, 83,18, 84, 56, 74, 125, listed in table 1, Group 8 and 15.	Waterbirds, Lewin's Rail, White-bellied Sea Eagle Growling Grass Frog, Flat headed Galaxias, Murray Cod, Golden Perch, Macquarie Perch, River Blackfish, Platypus, Murray Spiny Cray, *Hemiphlebia* Damselfly,
4) Lake Eildon A dominant artificially created feature of the zone. It provides important habitat and food source for numerous animals, in particular waterbirds and fish.	Waterbirds, White-bellied Sea Eagle, Golden Perch, Murray Cod,
5) Plants of special concern Threatened plants with small populations and/or restricted occurrences and/or no recruitment where protection from grazing will not be sufficient to ensure their survival	White Box, Drooping She-Oak, Snow Gum, Lightwood Wattle, Gold Dust Wattle, Tough Scurf Pea, Hypsela, River Leafless Bossiaea, Slender Tick-trefoil, Western Golden Tip, Austral Trefoil.

* The numbering of the Key Biodiversity Assets (1-5) is only intended to assist with the identification of the assets throughout the remainder of the report. Scientific names listed only once.

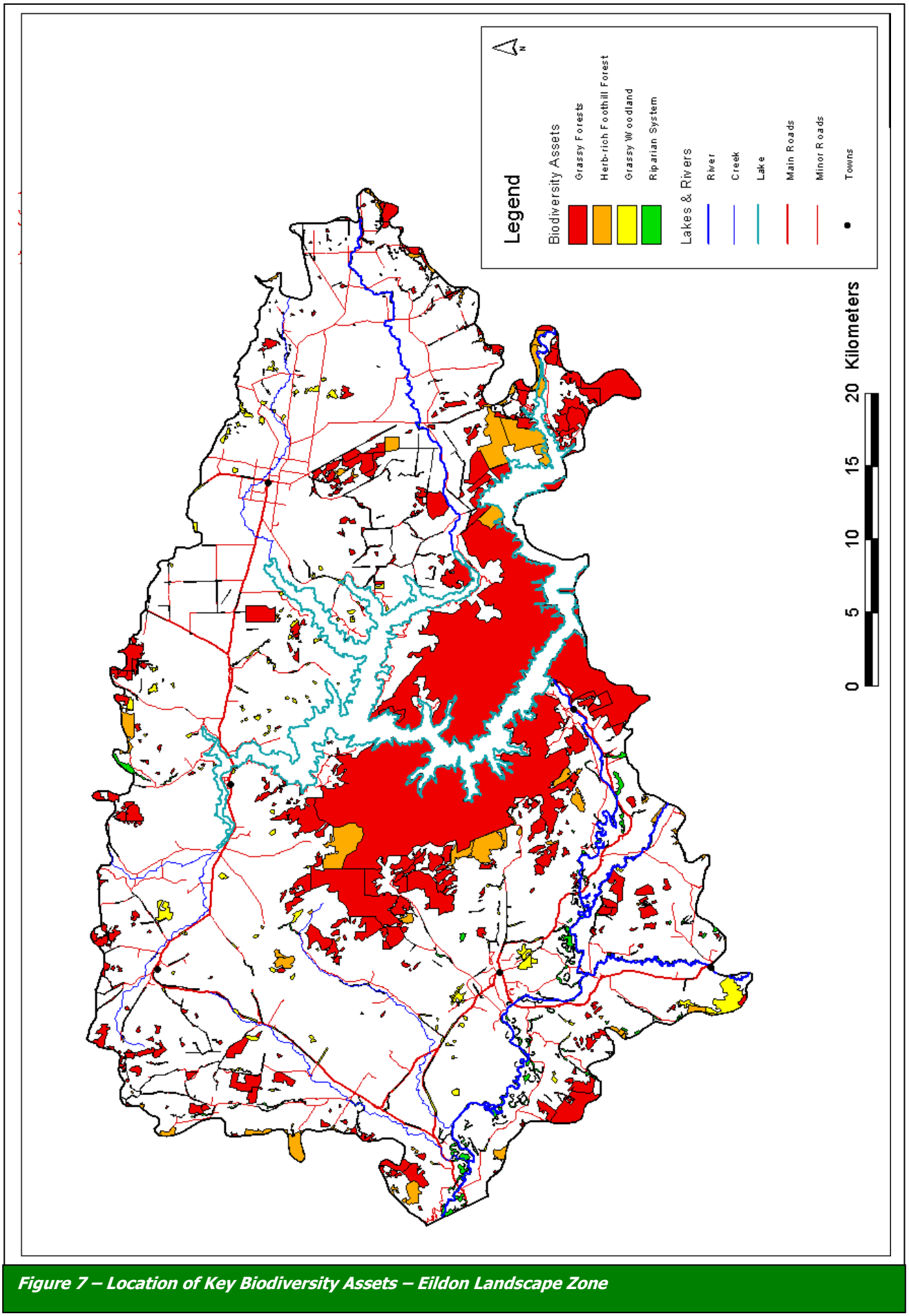


Figure 7 – Location of Key Biodiversity Assets – Eildon Landscape Zone

7.0 PRIORITY ACTIONS FOR KEY BIODIVERSITY ASSETS

Priority actions for the 'Key Biodiversity Assets' (Section 6.2) were based on (1) size/extent (2) condition and (3) landscape processes (eg. habitat connectivity, appropriate water regimes).

For each of the five Key Biodiversity Assets (1-5), the following pages identify:
A) An introduction to the Asset in the Eildon Landscape Zone,
B) Photographic example of the Asset in good condition in the zone, and
C) The Actions for each of the Assets in the zone (broader actions are also identified for the Eildon Landscape Zone in Ahern et al 2003).

It is intended that the community and agencies in the Eildon Landscape Zone area, will work together to plan and implement works in relation to the identified actions for the Key Biodiversity Assets. Within each Asset there will be several BAP sites. These BAP sites should be targeted in order of priority (Very High, High, Medium to Low) This forms the basis of BAP, where the very high value sites, that require less cost for long-term protection, will provide the highest prospect for conservation (Robinson et al 2003). The location of the Assets (maps) and the photographic examples of the condition of the Assets will assist with the planning and implementation of the actions.

Photo: Focal Species Striped Legless Lizard (Delma impar) - reliant on the Key Biodviersity Asset Grassy Woodland. By Peter Robertson (NRE2002d)

1) KEY BIODIVERSITY ASSET – GRASSY WOODLANDS

1A) Introduction – Grassy Woodlands:

Grassy woodlands were one of the dominant vegetation types in the Eildon zone. It has since been substantially cleared, and requires large increases in extent in order to sustain healthy populations of the fauna that rely on it (see Table 3). Grassy Woodlands occur on lower slopes of foothills and low rounded hills above plains and floodplains, at elevations of 150-500m, and 500-750mm annual rainfall. They are predominantly open grassy Box woodlands with a variety of grasses, including Kangaroo Grass, Red-leg Grass, Wallaby Grasses and Spear Grasses plus sedges, lilies, orchids and herbs. The overstorey usually consists of Box species (mainly Grey Box, or White Box with Yellow Box) and some River Red Gum, and Black Wattle in the rockier areas. The medium to low scattered shrub layer has characteristic species of local wattles (Golden Wattle, Hedge Wattle, Gold-dust Wattle), Drooping Cassinia and Sweet Bursaria.

More than 97% of Grassy Woodlands in the Goulburn Broken Catchment have disappeared or been highly modified since European settlement. Over 81% of what remains is on private land. Many of the plants and animals that rely on this habitat are now also threatened, and some are extinct. Therefore, the support of private landholders is essential for the ongoing conservation of Grassy Woodlands.

High value Grassy Woodlands in the zone include the rail reserve and roadsides near Merton, private land areas in the Gobur area and adjacent to the Gobur – Kanumbra road. Paddocks with native grasses and original overstorey remain scattered throughout the zone but are generally fragmented and isolated.

The main threats affecting Grassy Woodlands in the zone are land clearing, inappropriate grazing regimes, cultivation and pest plants and animals. The role of grazing is important in maintaining the health of native grass ecosystems. Periodic grazing provides biomass removal and generally assists health and biodiversity. No grazing or over grazing remain athreat.The actions identified below are intended to assist in the protection of the remaining Grassy Woodlands within the Eildon Landscape Zone. However, these actions are specific to the zone and are by no means comprehensive for the region. Other strategies, eg. Victoria's Native Vegetation Management framework (DNRE 2002), provide a framework for net gain and are overarching strategies for the State and Goulburn Broken Catchment (DSE 2005d).

1B) Photographic Example – Grassy Woodlands:

Example of Grassy Woodland BAP Site of Good Condition - Eildon Zone

Photo: Grassy Woodland – A Key Biodiversity Asset - Eildon Landscape Zone

The site (802544_180) pictured left is an example of a Grassy Woodland in good condition. It contains a relatively good diversity of grassland species, but is lacking shrubs, and the woodland is regenerating as a result of a low stocking rate. There are large hollow bearing trees with some recruitment of these species. The site is lacking in fallen timber

1C) Actions – Grassy Woodlands:

Size/Extent:
• Encourage neighbouring landholders to fence and regenerate areas adjacent to the roadside • Identify additional native grassland paddocks for protection and restoration • Support and encourage Murrindindi Shire to manage and enhance the remnant White Box Grassy Woodland community opposite McKenzie Reserve which has been secured under a Trust for Nature covenant.
Condition:
• Manage grazing and stocking rates and timing to enhance and maintain grassy woodlands • Leave fallen timber to provide shelter and habitat for ground dwelling fauna • Actively control weeds such as *Phalaris* and *Briza* species and manage the causes of weed invasion at priority sites • Active feral herbivore and native macropod (kangaroo and wallaby) control to encourage recruitment. • Manage grazing, stocking rates and timing in Woodlands to control exotic flora and encourage native flora to exist
Landscape Processes (ie. hydrological regime, habitat connectivity):
• Improve condition of woodlands by retaining hollow bearing trees and allow younger trees to persist so that over time they become large and hollow bearing. • Expand patch size and improve connectivity of isolated or partly disconnected patches through planting/direct seeding or fencing off remnants • Protect significant roadsides, such as Maroondah Highway (between Alexandra and Yarck), Goulburn Valley Highway(Yarck to Mansfield, Spring Creek Rd, McGuigan, UT Creek, Green and Olivers Road, Creightons and Grannies Lane. • Encourage Murrindindi and Mansfield Shires to complete roadside surveys and produce a Roadside Management Plan to identify and manage significant roadside areas.

2) KEY BIODIVERSITY ASSETS – GRASSY FORESTS

2A) Introduction – Grassy Forests:

Grassy Forests occur on hills, generally with very shallow soil, at elevations at 230-900m. Grassy Forests occur in protected aspects at low rainfall, and on steeper, north facing aspects at higher rainfall and altitude. These are typically open forests of Red Stringybark and Long-leaf Box at lower altitudes. Occasionally Blakely's Red Gum occurs. Broad-leaf Peppermint and Brittle Gum occur at higher altitudes. The shrub layer consists of few medium and low shrubs such as Guinea-flowers, Wattles and peas. The diverse grassy understorey occurs on more protected south-east slopes with species such as Silver-top Wallaby-grass, Grey Tussock-grass, Plume Grass, Common Wheat-grass and Wallaby-grasses. There is often sparse but diverse range of herbs, lilies and orchids.

High value Grassy Forests in the zone include The Paps, Lake Eildon National Park and Delatite Bushland Reserve

Many plant and animal species rely on these forests and the ecological services they provide. More than 48% of Grassy Forests in the Goulburn Broken Catchment have disappeared since European settlement. It is important to protect the remaining area for the continued survival of the species that rely on it and for the ecological services these forests provide. Of the remaining area of Grassy Forest, 38% occurs on private land. The support of private landholders is essential for the ongoing conservation of Grassy Forests (DSE 2005d).

2B) Photographic Example – Grassy Forests:

Example of a Grassy Forest BAP Site of Good Condition –Eildon Zone

The site pictured below is a flora reserve and is a very good example of Grassy Dry Forests in the zone as it has a diverse and largely intact structure. It has a good, mixed understorey cover and some fallen timber. There are also many large hollow bearing trees present.

Photo: Grassy Forest – A Key Biodiversity Asset – Eildon Landscape Zone

2C) Actions – Grassy Forests:

Size/Extent:
• Identify and prioritise potential sites for habitat expansion and improved connectivity using the Landscape Context as a guide
Condition:
• Fence off the sites and manage grazing and stocking rates to maintain and enhance the grassy woodlands • Actively control weeds such as Phalaris and Broom and manage the causes of weed invasion at priority sites • Active control of feral herbivore and native macropod (wallaby and kangaroo) to encourage recruitment. • Leave fallen timber and logs as shelter and habitat for ground dwelling fauna • Improve the condition of priority sites by eradication of weeds

- Manage grazing, stocking rates and timing in Woodlands to control exotic flora and encourage native flora to exist
- Restore native understorey by replanting or direct seeding
- Encourage Murrindindi and Mansfield Shires to complete roadside surveys and produce a Roadside Management Plan to identify and manage significant roadside areas.

Landscape Processes (ie. habitat connectivity):

- Expand patch size and improve connectivity of isolated or partly disconnected patches
- Encourage revegetation of key gaps in landscape by overlaying BAP sites with areas identified as having a high rating
- Encourage landholders to revegetate adjacent to roadsides with significant vegetation (BAP sites) and to connect roadside vegetation to other remnant vegetation in local landscapes.
- Link important reserves such as The Paps, Lake Eildon National Park and Delatite Bushland Reserve to other vegetation and manage to protect and enhance their biodiversity values.

3) KEY BIODIVERSITY ASSET – RIPARIAN SYSTEMS AND WETLANDS

3A) Introduction – Riparian Systems and Wetlands:

Riparian Systems, such as rivers, streams and creeks are the lifeblood upon which most of the other assets depend. Significant waterways in this zone include Delatite River, Goulburn River, Rubicon River, Acheron River, Ford Creek, Spring Creek, Home Creek and their associated riparian vegetation. These areas are of high conservation value as they provide essential corridors for species movement and provide habitat, food and shelter for a range of species.

Land management responsibility for riparian areas varies. Some streams have frontage which may be leased under certain conditions to adjoining land owners. In some cases there is no crown frontage and land is privately owned. The Goulburn Broken Catchment Management Authority is responsible for regulating works in or on waterways. Other streams are within crown land such as national parks or State Forest.

A number of threats to waterways include land clearing, adjacent land use practices (eg. nutrient run-off), hydrological cycle changes, pest plants (eg. willow invasion) and pest animals (eg. carp). The actions identified below are intended to assist with the conservation of Waterways within the Eildon Landscape Zone. However, these actions are specific to the zone and are by no means comprehensive for the region. Other strategies, such as the Victorian River Health Strategy (NRE 2002b) and the Draft Goulburn Broken River Health Strategy (GBCMA 2004b), provide a framework for managing and restoring rivers, streams and floodplains in Victoria and are overarching strategies for all areas.
Many streams in the zone have previously had native vegetation removed and have become infested with weeds. Restoration of riparian zones requires a large and long lasting commitment to ensure that weeds are replaced by self sustaining native vegetation. A number of examples show that a partnership of community and agency efforts can sustain the required level of work and commitment eg. U.T. creek restoration in Alexandra township.

3B) Photographic Example – Riparian Systems and Wetlands:

Example of a Riparian BAP Site of Good Condition- Eildon Zone

The site (802342-42) pictured below is an example of wetland in good condition. The site has emergent and semi emergent aquatic vegetation, areas of open water and some large adjacent trees. The site lacks fallen timber. Grazing has reduced adjacent vegetation cover.

Photo: Wetland - a Key Biodiversity Asset – Lake Eildon Landscape Zone

3C) Actions – Riparian Systems and Wetlands:

Size/Extent:
• Encourage (through incentives and voluntary programs) restoration and revegetation works of riparian areas • Revegetate and allow regeneration to occur around remnants to buffer from pasture and link to other remnants • Widen riparian zone through revegetation and stock exclusion.
Condition:
• Exclude grazing from all riparian zones to minimise disturbance to prevent pugging and weed invasion • Retain fallen timber and dead standing trees. • Actively manage weeds and control their spread • Manage the water supply and do not dam off to maintain watering regimes for associated vegetation • Replant aquatic vegetation such as sedges and Milfoils to act as filters for sediment runoff.
Landscape Processes (ie. hydrological regime, habitat connectivity):
• Ensure that flow regimes and drainage pattern on (and around) reserves in the zone are maintained as close to natural as possible • Where riparian areas are subject to permanent change in flow regimes, eg. Goulburn River, identify areas of significance and investigate options to manage conditions as close as possible to original. • Encourage Murrindindi Shire to add an Environmental significance overlay (ESO) to it's planning scheme

4) KEY BIODIVERSITY ASSET – LAKE EILDON

4A) Introduction – Lake Eildon:

Lake Eildon was completed in 1955 and has a capacity of 3,334,158 megalitres. At full supply it covers an area of 13,832 ha . The lake is managed by Goulburn Murray Water (GMW). Since its construction it has become a habitat for many water birds including Hardhead, Great Egret, Pied Cormorant, Royal Spoonbill, Nankeen Night Heron, Musk Duck and the White Bellied Sea Eagle. Lake Eildon also supports native fish species such as Macquarie Perch, Murray Cod and Golden Perch. A buffer strip of land around the lake contains large areas of natural vegetation, particularly adjacent to

Lake Eildon National Park. An easily over looked biodiversity value is the dead trees which still stand within the lake bed. These trees provide above water perching and nesting sites for birds and below water fish habitat. Those that are hollow are used by both bats and birds for nesting and shelter.

4B) Photographic Example – Lake Eildon

Photo shows school children involved in scientific survey in 2005. Note the standing dead trees which provide bird perching sites and hollows for bats and birds to shelter and breed above the water and fish habitat below water. There is extensive regeneration between the existing water level and the high water mark. This vegetation will be inundated if the lake fills in the future but is currently providing soil stabilisation and feeding and breeding sites for invertebrates, forest birds, reptiles and amphibians. In the background is the forested buffer zone above high water mark in which threatened species such as powerful owl and leafy Greenhood Orchid occur.

Photo: Lake Eildon - a Key Biodiversity Asset – Lake Eildon Landscape Zone. Photo: Steve Smith

4C) Actions – Lake Eildon:

Condition:
• Continue surveys and monitoring effort for the conservation of Leafy Greenhood Orchid and White-bellied Sea Eagle • Update or establish biodiversity values in a management plan for Lake Eildon • Maintain monitoring of tourist and visitor access to the lake and buffer zones so that the conservation of biodiversity values and water quality are not compromised • Restrict access to known breeding sites of waterbirds • Encourage and support Goulburn-Murray Water to enforce access restrictions, particularly regarding trail bikes and 4WD's in the buffer zone of the Lake Eildon National Park, including the sensitive dry lake beds and banks of the lake itself • Educate and regulate to stop removal of standing dead trees within the lake bed. • Encourage recreational fishers to remove as many European Carp as possible in order to remove competition and negative impacts on native fish

5) KEY BIODIVERSITY ASSET – SIGNIFICANT PLANTS OF CONCERN

5A) Introduction – Significant Plants Of Concern:

The significant plants of concern for the Eildon zone are those threatened plants with small populations and/or restricted occurrences and/or no recruitment where protection from grazing will not be sufficient to ensure their survival. The significant plants for the Eildon Zone are White Box, Drooping She-Oak, Snow Gum (outlying remnant populations on hill tops in farmland eg. near Cathkin), Lightwood Wattle, Gold Dust WattleTough Scurf Pea, Hypsela, River Leafless Bossiaea, Slender Tick-trefoil, Western Golden Tip and Austral Trefoil. A significant plant community in the zone generally associated with White Box eucalypt is the EPBC listed "White Box - Yellow Box - Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands". A good example of this community is the Mt. Pleasant Reserve near the township of Alexandra. The land is owned by Murrindindi Shire and is protected by a Trust for Nature conservation covenant.

5B) Actions – Significant Plants Of Concern:

- Undertake surveys for all significant plants to establish baseline data on abundance and distribution in accordance with VROTPop procedures (see Earl 2001)
- Identify current threats to existing populations and manage these threats to increase population sizes
- For taxa ranked as a high conservation priority in the zone, encourage research into their life histories and ecological requirements.
- Continue to educate land managers about options to protect and regenerate significant plant species and communities.

8.0 FURTHER INFORMATION - PRIORITY SITES

Priority Site Data:
Information on the 905 priority BAP sites within the Eildon Landscape Zone is provided in Appendix 11. This information has been derived using the Geographical Information System - Arcview 3.3. It is intended that the priority site information and other information detailed in this plan, will allow groups and staff (ie. extension staff and community groups) to:

- Be pro-active in targeting sites,
- Act as a basis for informed management of the site,
- Provide a rationale for applying incentives,
- Provide a tool for landholders and the wider community,
- Provide a tool to show how a site fits into the wider landscape, and
- Provide a benchmark against which future improvements in management can be monitored.

How To Use The Data Provided:
The data provided is intended for use by a range of organisational, agency and community groups, to assist with biodiversity conservation in the zone. It is particularly targeted towards agency extension officers. For example, it is anticipated that prior to, or following a site visit, an extension officer will investigate the data associated with their site, such as;

- What is the Ecological Vegetation Class of the site?
- How does the site fit in to the wider landscape?
- Are there any management agreements or incentives for the site (ie. covenant, bush tender)?
- Are there threatened or significant species recorded at the site or nearby?
- What is the rating of the site and those near it (ie. Very high, high, medium or low)?
- What is the overarching management recommendation for the site (ie. protect or restore)?
- What are the actions recommended for the site (ie. pest plant management)? (Negotiations need to occur to get the best possible outcome for all involved.)
- What are the options available to the landholders to fulfil these actions (ie. fencing incentive)?
- What are the options for joining the site to public land (ie. widening roadsides to provide a corridor/link)?
- Using the Landscape Context Model (Appendix 8), determine where possible linkages (revegetation) may be of the most benefit – think about the landscape, what we could do to help the area.
- It is also important to remember that sites with scattered trees are still a vital link in the landscape and especially in an area where much of the original vegetation has given way to agriculture. Officers need to determine, on site, where the best possible linkages could occur, and often this should include scattered vegetation, as although they generally have not been identified as a site in this plan, they form an important element for providing links between the identified sites.

Keeping The Data Current:
The data contained in this report is by no means 'comprehensive', as this process relies on the regular updating of information, to keep it accurate and timely. Therefore this plan is adaptive, to enable management actions and information to be modified in response to further information, including monitoring actions. The plan will also be reviewed when necessary to ensure that it remains a 'living' document. In order for the data and associated maps to remain as up to date and relevant as possible, it is important that site data continue to be added to the database. For example, the Department is not always aware of sightings of flora and fauna by individual landholders or community groups and there are still a number of sites that require Vegetation Quality Assessments and Bird Surveys.

Further Information or To Provide Data:
For clarification of information or to provide further data see (Appendix 11) or contact the Department Sustainability and Environment, Alexandra on (03) 5772 0200.

9.0 ASSISTANCE AVAILABLE FOR LANDHOLDERS

There is a range of assistance available to landholders in regards to planning for biodiversity conservation, and implementing works, on their properties. This section is designed to provide an overview of some of the property planning, management tools and incentives available to landholders and the community, within the Upper Goulburn Region. Also included are some of the programs within the community that will benefit from the information provided in this plan.

LOCAL AREA PLANS	WHOLE FARM PLANS
Biodiversity Action Planning Conservation Plans will provide an extra resource for Local Area Planning groups, in relation to their Local Area Plans. It can assist groups with both implementation and further information for conducting biodiversity planning in their area.	Protecting biodiversity on a farm is an important element when developing and implementing a Whole Farm Plan. Biodiversity Action Planning can inform the process and provide extra information for landholders.

Advice and Information:
Please contact your local Department of Primary Industries/Department of Sustainability and Environment Office, the Goulburn Broken Catchment Management Authority or the Upper Goulburn Landcare Network for further information on biodiversity conservation. There are extension officers within these organisations who can provide advice on a range of aspects such as whole farm planning, revegetation and protection of remnant vegetation, threatened species protection, best management practices, erosion, soils and waterways.

Incentives for On-Ground Works:
There is a range of incentives available for landholders within the Upper Goulburn Region for catchment works; including,

- Environmental incentives to assist with the protection and/or enhancement of remnant vegetation, including wetlands and grasslands
  For the above point, contact the Goulburn Broken Catchment Management Authority, Yea or Department of Sustainability and Environment, Alexandra.
- Tree Growing incentives to assist with the re-establishment of native vegetation,
- Whole Farm Planning, to assist with the development of Whole Farm Plans,
  For Whole Farm Planning, contact Department of Primary Industries, Benalla.
- Waterways Incentives – for on-ground works along rivers and creeks.
  For the above point, contact the Goulburn Broken Catchment Management Authority, Yea.

Management Arrangements:
Stewardship Programs such as Carbon Tender, Bush Returns, EcoTender and Bush Broker, may periodically, by tender, provide incentives and advice for long-term conservation management on properties. *Contact the Department of Primary Industries, Alexandra or the Goulburn Broken Catchment Management Authority, Yea office for further information.*

Permanent Protection:
A Conservation Covenant permanently protects sites for conservation. It may provide assistance for rate relief, tax concessions and incentives for the costs of on-ground works. *Trust for Nature (Vic) is the managing organisation in regards to Conservation Covenants; visit the website at www.tfn.org.au*

Other Assistance:

- Landcare Network through Goulburn Broken Catchment Management Authority, Yea, provides Landcare related advice.
- Land for Wildlife – a voluntary scheme aiming to encourage and assist landholders to protect and enhance biodiversity values on their properties. *Managed by the Department of Sustainability and Environment – for further information visit internet site at* www.dse.vic.gov.au.
- Local Government (Murrindindi and Mansfield Shires) – managing authority for native vegetation statutory planning requirements.

10.0 Further Requirements (Monitoring and Research)

The following table identifies the Key Biodiversity Asset (as per Section 7), key indicators for monitoring and evaluation, and the frequency and intensity of monitoring. Continued monitoring and research is required for the Eildon Zone to enhance the knowledge of the biodiversity values and manage for their on-going protection. The overarching monitoring framework for Biodiversity Action Planning in the Goulburn Broken Catchment is currently being developed. This will provide a more strategic basis for monitoring and evaluation, for which this table does not provide. Monitoring for the Longwood Plains near Euroa provides an example of on-ground monitoring for Biodiversity Action Planning (Robinson undated).

Key Biodiversity Asset	Key Indicators for Monitoring and Evaluation	Frequency/Intensity of Monitoring
1)* Grassy Woodland	• Changes in extent (Increase to 15% pre-1750 cover by 2030) • Changes in condition (10% improvement in the quality of 90% of existing vegetation through fencing, protection and public land management programs) • Changes in condition based on VQA at sites (20% improvement in the quality of protected sites) • Changes in landscape context (Increases in total cover, connectivity and the number of large patches) • Changes in the matrix – land use, % native pasture, abundance of scattered trees • Changes in landscape functionality	Every 5 years Every 5 years Every 5 years Every 5 years Every 5 years Every 5 years
2) Grassy Forests	• Changes in extent (Increase to 15% pre-1750 cover by 2030) • Changes in condition (10% improvement in the quality of 90% of existing vegetation) • Changes in condition based on VQA at sites (20% improvement in the quality of protected sites) • Changes in landscape context (Increases in total cover, connectivity and the number of large patches)	Every 5 years Every 5 years Every 5 years Every 5 years
3) Riparian Systems and Wetlands	• Changes in extent (Increase to 15% pre-1750 cover by 2030) • Changes in condition (10% improvement in the quality of 90% of existing vegetation) • Increase the diversity of the native fish community and the proportion of native/exotic fish • Changes in landscape functionality of the riparian zone	Every 5 years Every 5 years Every 5 years Every 5 years

4) Lake Eildon	• Increase the diversity of the native fish community and the proportion of native/exotic fish • Increase in numbers of water birds breeding on the lake • Increase in the populations of native aquatic plants	Every 5 years Every 5 years Every 5 years
5) Plants of special concern	• Increase the number of populations of every species to > 5 populations, each with > 50 plants • Repeat VROTPop assessments at known sites and translocation sites • Successful recruitment of young individuals into the population	Every 5 years Every Year Every Year

11.0 REFERENCES

Ahern, L.D., Lowe, K.W., Berwick, S., Robinson, D. & Handley, K. (2003). Biodiversity Action Planning: landscape plans for the Goulburn Broken CMA- Shepparton Irrigation Region – North Zones. Department of Sustainability and Environment, Victoria.

Berwick, S (2003b). Map Unit Descriptions of Lower Goulburn Broken (draft). State of Victoria, Melbourne.

Birds Australia (2001). Bird Surveying Techniques. Available at: http://www.birdsaustralia.org.au.

CGDL (2005). Corporate Geographical Database Library. State of Victoria, Melbourne.

Crown (1997). Victoria's Biodiversity: Directions in Management. State of Victoria, Melbourne.

DPI (2005). Dairying for Tomorrow: Dairy Sat- The Guide. State of Victoria, Melbourne.

DSE (2003). Biodiversity Action Planning – Landscape plans for the Goulburn Broken CMA – South East Goulburn Broken

DSE (2004). Environmental Management in Agriculture: Worksheet Series 1-8. State of Victoria, Melbourne.

DSE (2005a). Actions for Biodiversity Conservation Database (ABC). Department of Sustainability and Environment. State of Victoria, Melbourne.

DSE (2005c). Murray-Darling Basin Salinity Management Strategy. State of Victoria, Melbourne.

EA (2001). Directory of Important Australian Wetlands (3rd ed.) Environment Australia. Available at: http://www.ea.gov.au.

Ferwerda, F. (2003). Landscape Context Model. State of Victoria, Melbourne.

GBCMA (2003a). Goulburn Broken Regional Catchment Strategy. Goulburn Broken Catchment Management Authority, Shepparton. Available at: http://www.gbcma.vic.gov.au.

GBCMA (2004a), Developers Manual for Biodiversity Action Planning in the Goulburn Broken Catchment. Goulburn Broken Catchment Management Authority, Shepparton.

GBCMA (2004b). Goulburn Broken River Health Strategy (draft). Goulburn Broken Catchment Management Authority, Shepparton. Available at: http://www.gbcma.vic.gov.au.

Howell, M. (2002). Wetland Directions Paper for the Goulburn Broken Catchment. Goulburn Broken Catchment Management Authority, Shepparton. Available at: http://www.gbcma.vic.gov.au.

Lambeck, R.J. (1997). Landscape planning for biodiversity conservation in agricultural regions. Biodviersity Technical paper No. 2. Commonwealth of Australia, Canberra.

NRE (2002a). Victoria's Native Vegetation Management: a Framework for Action. Department of Natural Resources and Environment, Victoria.

NRE (2002b). Healthy rivers, healthy communities and regional growth: the Victorian River Health Strategy. Department of Natural Resources and Environment, Victoria.

NRE (2002c). Victorian Flora Site Database – May 2002. Department of Natural Resources and Environment, Victoria.

NRE (2002d). Atlas of Victorian Wildlife. March 2002. Department of Natural Resources and Environment, Victoria.

Platt, S.J. (2002). How to plan wildlife landscapes: a guide for community organisations. State of Victoria, Melbourne.

Platt, S.J. & Lowe, K.W. (2002). Biodiversity Action Planning: planning for native biodiversity at multiple scales – catchment, bioregional, landscape, local. Department of Natural Resources and Environment, State of Victoria, Melbourne.

Robinson, D. (undated). A monitoring, evaluation and reporting strategy for the Longwood Plains Biodiversity Project. Trust for Nature & Department of Sustainability and Environment, Benalla.

Robinson, D., Colbourne, D. & Merritt, B. (2003). A User's Manual to Biodiversity Action Planning in the Goulburn Broken Catchment. State of Victoria, Melbourne.

Simpson, K., Day, N. & Trusler, P. (1993). Field Guide to the Birds of Australia (4th ed.). Penguin Books, Ringwood, Australia.

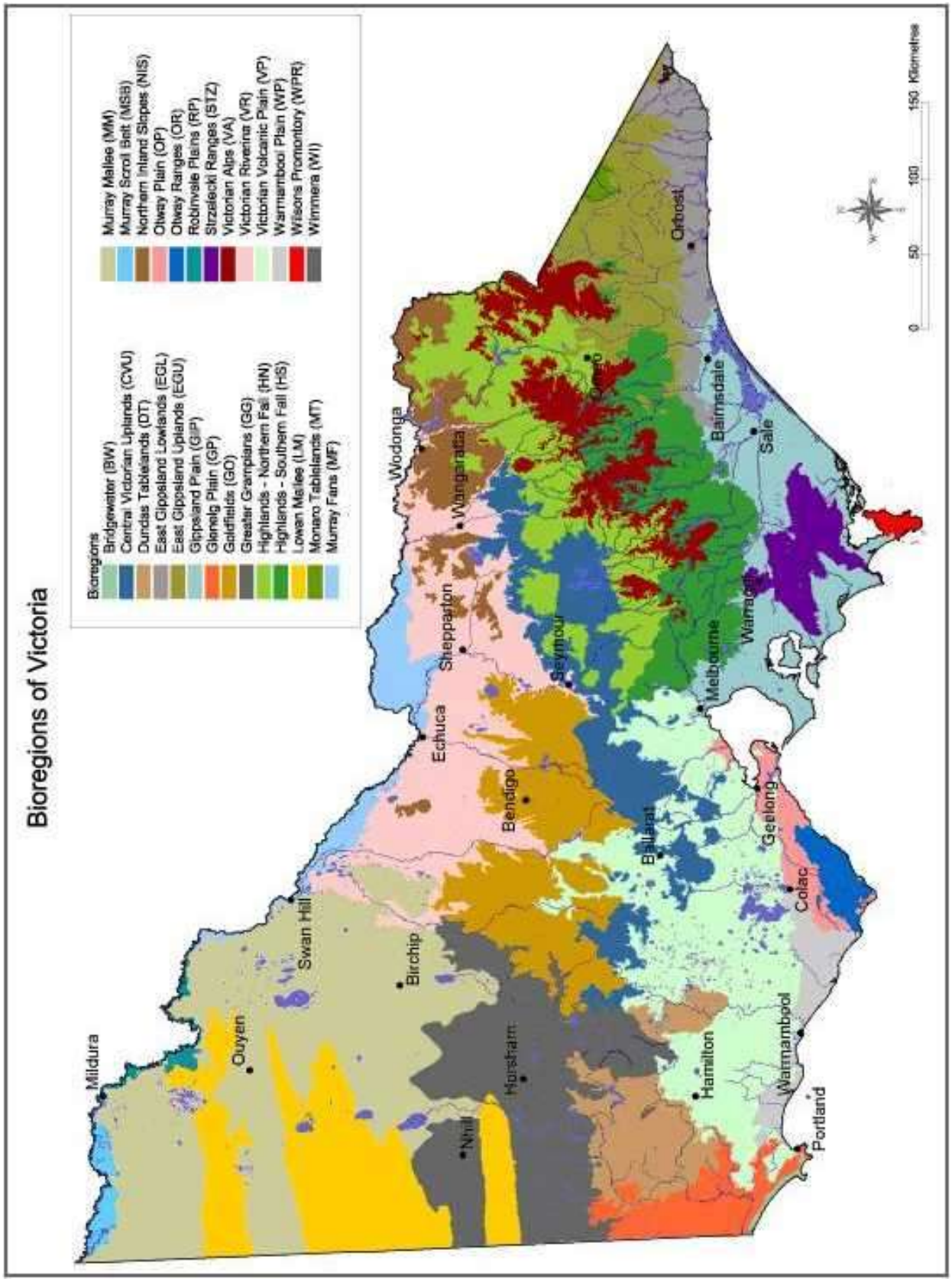
Wilson, J.A & Lowe, K.W. (2002). Planning for the conservation of native biodiversity within catchments using biophysical modelling. Department of Natural Resources and Environment, State of Victoria, Melbourne.

Wierzbowski, P., Lowe, K.W., Handley, K, Berwick, S., Robinson, D. & Ahern, L.D. (2002). Biodiversity Action Planning: Strategic Overview for the Victorian Riverina Bioregion. Department of Natural Resources and Environment, State of Victoria, Melbourne.

12.0 APPENDICES

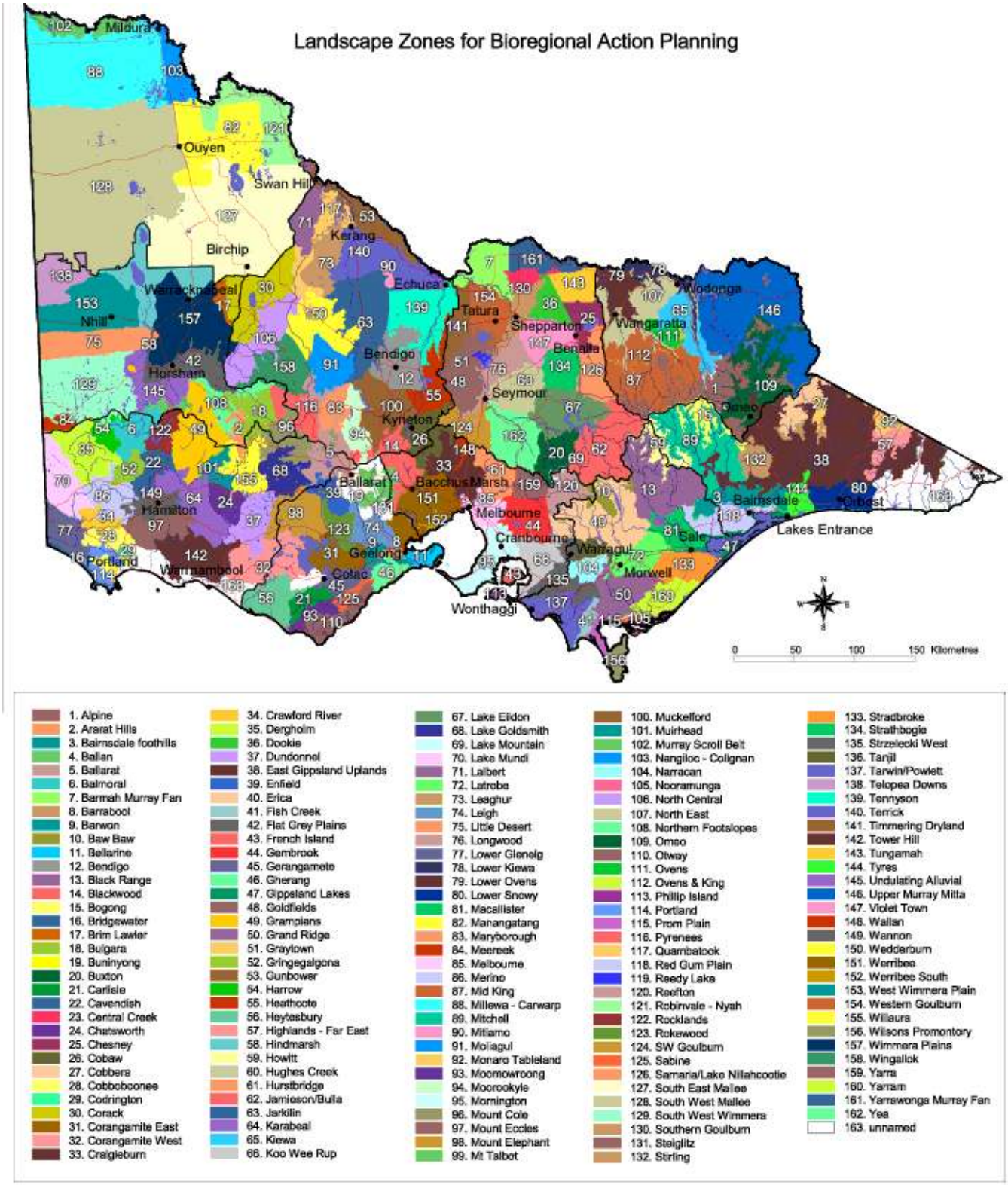
APPENDIX 1 – VICTORIAN BIOREGIONS

Source: www.dse.vic.gov.au



APPENDIX 2 – VICTORIAN LANDSCAPE ZONES

Source: www.dse.vic.gov.au



APPENDIX 3 – GOULBURN BROKEN CATCHMENT TARGETS

This Appendix is intended to provide a summary of the Goulburn Broken Regional Catchment Strategy targets and priorities for biodiversity conservation. For further information please refer to GBCMA 2003a.

The Goulburn Broken Catchment Management Strategy identifies the following biodiversity resource condition targets for native vegetation in the catchment:

1. Maintain the extent of all native vegetation types at 1999 levels in keeping with the goal of 'Net Gain' listed in Victoria's Biodiversity Strategy 1997,
2. Improve the quality of 90% of existing (2003) native vegetation by 10% by 2030,
3. Increase the cover of all endangered and applicable vulnerable Ecological Vegetation Classes to at least 15% of their pre-European vegetation cover by 2030,
4. Increase 2002 conservation status of 80% threatened flora and 60% threatened fauna by 2030,
5. Maintain the extent of all wetland types at 2003 levels where the extent (area and number) has declined since European settlement, and
6. Improve the condition of 70% of wetlands by 2030, using 2003 as the benchmark for condition (GBCMA 2003a p11).

Priorities for action to conserve biodiversity in the Goulburn Broken are driven by the conservation significance of the biodiversity asset. Regional investments in biodiversity conservation in the Goulburn Broken Catchment are driven by the following goals (in order of priority):

1. Protecting existing viable remnant habitats and the flora and fauna populations they contain (ie. through reservation, covenants, management agreements, fencing and statutory planning),
2. Enhancing the existing viable habitats that are degraded (management by controlling threats such as pest plants and animals, grazing, salinity, promotion of natural regeneration and/or revegetation with understorey), and
3. Restoring under-represented biodiversity assets to their former extent by revegetation (to create corridors, buffers, patches of habitat) (GBCMA 2003a).

APPENDIX 4 – THREATENED FLORA

List of threatened flora and their conservation status in the Eildon Landscape Zone (NRE 2002c). Table modified from Ahern et al 2003.

Botanical Name	Common Name	Australian Status	Victorian Status	FFG Listed	FFG Action Statement Number	Recovery Plan	Notes
Acacia daviesii	Timbertop Wattle		v				
Chiloglottis X pescottiana	Bronze Bird-orchid		r				
Cullen tenax	Tough Scurf-pea		e	✓			3 records 1890's
Desmodium varians	Slender Tick-trefoil		k				
Discaria pubescens	Australian Anchor Plant		r	✓	47		1 record 1980
Diuris punctata var.punctata	Purple Diuris		v	✓	200		
Epilobium curtisiae	Bald-seeded Willow-herb		r				1 record 1989
Goodia medicaginea	Western Golden-tip		r				1 record 1989
Hypsela tridens	Hypsela		k				1 record 1980
Lotus australis	Austral Trefoil		k				1 record 1980
Pellaea calidriupium	Inland Sickle-fern		k				1 record 1979
Pterostylis cucullata	Leafy Greenhood	V	v	✓	54		
Racomitrium pruinosum	Hoary Fringe-moss		k				1 record 1853
Solanum cinereum	Narrawa Burr		k				1 record 1956

APPENDIX 5 – THREATENED FAUNA

List of threatened fauna and their conservation status in the Eildon Landscape Zone (NRE 2002d). Table adapted from VFD 2005.

Common Name	Scientific Name	Australian Status	Victorian Status	FFG	FFG Statement number	Notes
Australasian Shoveler	*Anas rhynchotis*		v			
Azure Kingfisher	*Alcedo azurea*		n			
Blue-billed Duck	*Oxyura australis*		e	✓	174	#
Brown Quail	*Coturnix ypsilophora*		n			
Brown Toadlet	*Pseudophryne bibronii*		e			
Brown Treecreeper	*Climacteris picumnus*		n			
Brush-tailed Phascogale	*Phascogale tapoatafa*		v	✓	79	
Damselfly	*Hemiphlebia mirabilis*		v	✓	46	
Diamond Firetail	*Stagonopleura guttata*		v	✓		
Eastern Horseshoe Bat	*Rhinolophus megaphyllus*		v	✓		
Flat-headed Galaxias	*Galaxias rostratus*		d			
Glossy Grass Skink	*Pseudemoia rawlinsoni*		n			#
Glossy Ibis	*Plegadis falcinellus*		n			#
Golden Perch	*Macquaria ambigua*		v			+
Golden Sun Moth	*Synemon plana*	C	e	✓	106	
Great Egret	*Ardea alba*		v	✓	120	
Growling Grass Frog	*Litoria raniformis*	V	e	✓		
Hardhead	*Aythya australis*		v			
Hooded Robin	*Melanodryas cucullata*		n	✓		
Latham's Snipe	*Gallinago hardwickii*		n			
Lewin's Rail	*Rallus pectoralis*		v	✓		
Little Bittern	*Ixobrychus minutus*		e	✓		
Little Egret	*Egretta garzetta*		e	✓	120	
Macquarie Perch	*Macquaria australasica*	E	e	✓		+
Masked Owl	*Tyto novaehollandiae*		e	✓	124	#
Murray Cod	*Maccullochella peelii peelii*	V	e	✓		+
Murray Spiny Cray	*Euastacus armatus*		d	✓	184	
Musk Duck	*Biziura lobata*		v			
Nankeen Night Heron	*Nycticorax caledonicus*		n			
Painted Honeyeater	*Grantiella picta*		v	✓	193	#
Pied Cormorant	*Phalacrocorax varius*		n			
Powerful Owl	*Ninox strenua*		v	✓	92	
Regent Honeyeater	*Xanthomyza phrygia*	E	c	✓	41	
River Blackfish	*Gadopsis marmoratus*		d			
Royal Spoonbill	*Platalea regia*		v			
Speckled Warbler	*Chthonicola sagittata*		v	✓		
Spot-tailed Quoll	*Dasyurus maculatus*	V	e	✓	15	
Spotted Harrier	*Circus assimilis*		n			#
Spotted Quail-thrush	*Cinclosoma punctatum*		n			
Striped Legless Lizard	*Delma impar*	V	e	✓	17	
Tree Goanna	*Varanus varius*		v			
White-bellied Sea-Eagle	*Haliaeetus leucogaster*		v	✓	60	
White-footed Dunnart	*Sminthopsis leucopus*		v			

old records or vagrants in Eildon Landscape Zone
+ non-natural populations

APPENDIX 6 – SITE PRIORITISATION METHOD

To determine the conservation significance and the need for ground-truthing (surveying), sites were prioritised according to the following table (Robinson et al 2003). If ground-truthing was required and no survey was completed (eg. more than 100 sites required survey), the minimum priority status was applied. *LCM refers to the Landscape Context Model.

Conservation status of EVC	Potential habitat within known dispersal range of threatened taxon or focal species, or within priority areas as identified by LCM*	EVC Patch Size	Ground-truthing required to confirm priority rank on basis of vegetation condition	Priority Status: Very High, High, Medium, Low
Endangered	Y	<5ha	Ground-truthing needed	VH or H
E	N	<5ha	Ground-truthing needed	VH or H
E	Y	5-10ha	Ground-truthing needed	VH or H
E	N	5-10ha	Ground-truthing needed	VH or H
E	Y	11-40ha		VH
E	N	11-40ha		VH
E	Y	>40ha		VH
E	N	>40ha		VH
Vulnerable	Y	<5ha	Ground-truthing needed	M, H or VH
V	N	<5ha	Ground-truthing needed	M or H or VH
V	Y	5-10ha	Ground-truthing needed	M, H or VH
V	N	5-10ha	Ground-truthing needed	M or H or VH
V	Y	11-40ha		VH
V	N	11-40ha	Ground-truthing needed	H or VH
V	Y	>40ha		VH
V	N	>40ha		VH
Rare	Y	<5ha	Ground-truthing needed	M, H or VH
R	N	<5ha	Ground-truthing needed	M or H or VH
R	Y	5-10ha	Ground-truthing needed	M, H or VH
R	N	5-10ha	Ground-truthing needed	M or H or VH
R	Y	11-40ha		VH
R	N	11-40ha	Ground-truthing needed	H or VH
R	Y	>40ha		VH
R	N	>40ha		VH
Depleted	Y	<5ha	Ground-truthing needed	M or H
D	N	<5ha	Ground-truthing needed	L or M
D	Y	5-10ha	Ground-truthing needed	M or H
D	N	5-10ha	Ground-truthing needed	L, M or H
D	Y	11-40ha		H
D	N	11-40ha	Ground-truthing needed	M or H
D	Y	>40ha		VH
D	N	>40ha		VH
Least Concern	Y	<5ha		M
LC	N	<5ha		L
LC	Y	5-10ha		M
LC	N	5-10ha	Ground-truthing needed	L or M
LC	Y	11-40ha	Ground-truthing needed	M or H
LC	N	11-40ha	Ground-truthing needed	L or M
LC	Y	>40ha	Ground-truthing needed	H or VH
LC	N	>40ha	Ground-truthing needed	H or VH

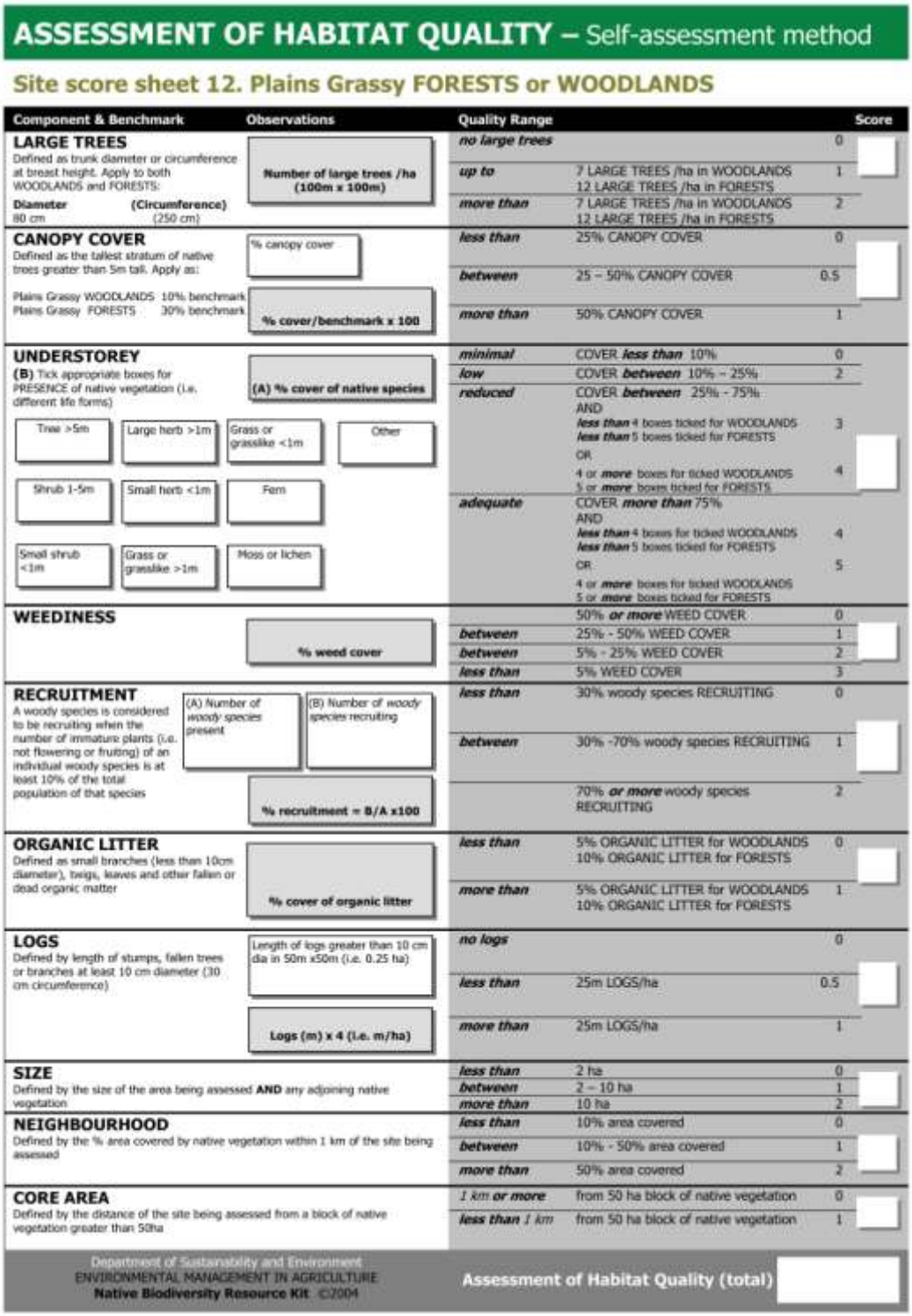
APPENDIX 7 – BAP ASSESSMENT SHEETS

BAP is an evolving database requiring annual updates. The BAP CD (Appendix 11) provides assessment sheets to enable users to provide feedback on the following:

- Adding a new BAP site
- Information which may change the priority or listing of a BAP site
- New priority site rating
- Providing Vegetation Quality Assessments and Bird Survey data
- Ammendments to Zone Conservation Plans

All information can be sent to bap@gbcma.vic.gov.au or BAP Officer, DSE Benalla, PO Box 124, Benalla, 3672.

Below is an example of the plains grassy forests or woodland assessment sheet.



ASSESSMENT OF HABITAT QUALITY – Self-assessment method

Site score sheet 12. Plains Grassy FORESTS or WOODLANDS

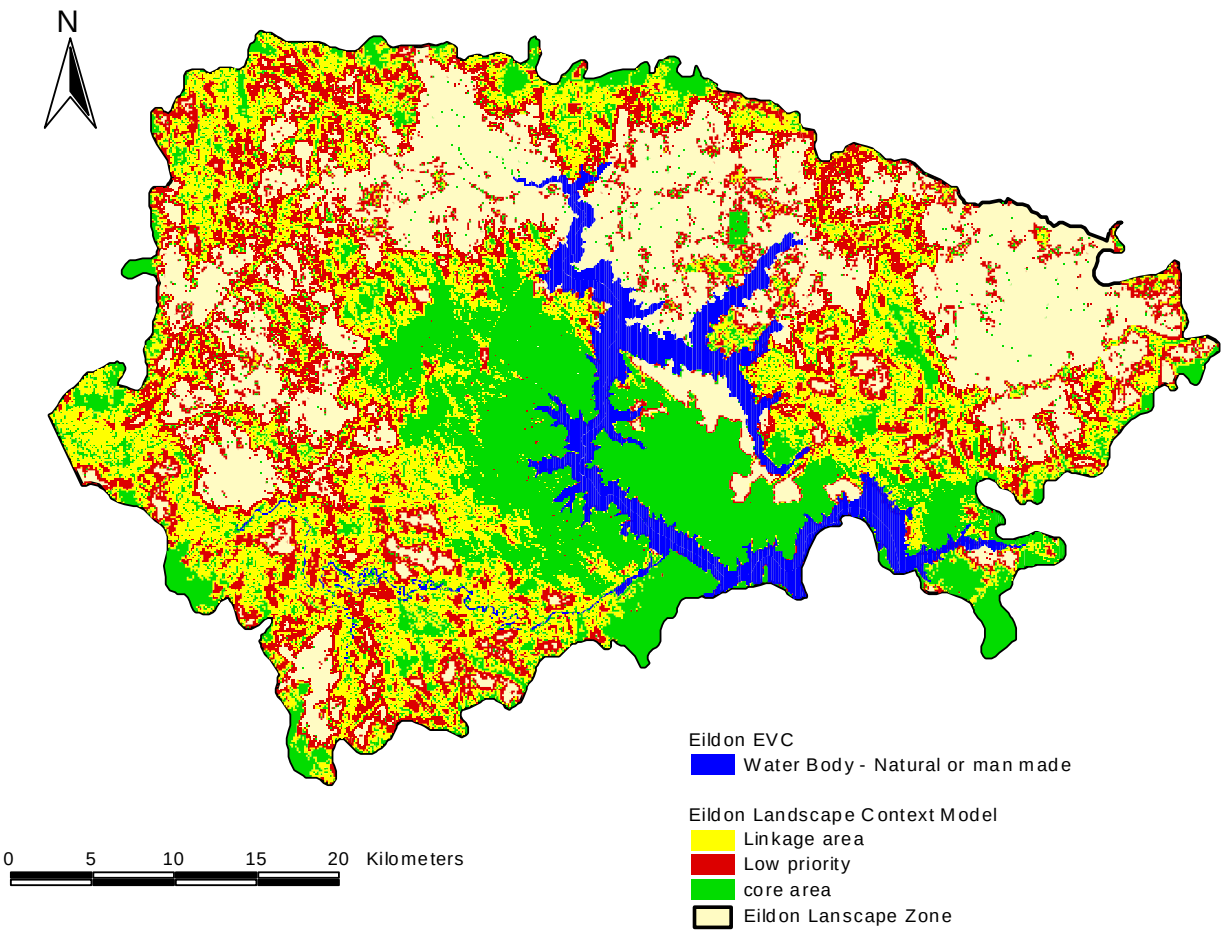
Component & Benchmark	Observations	Quality Range		Score
LARGE TREES Defined as trunk diameter or circumference at breast height. Apply to both WOODLANDS and FORESTS: **Diameter** (80 cm) **(Circumference)** (250 cm)	**Number of large trees /ha (100m x 100m)**	*no large trees*	0	
		up to	7 LARGE TREES /ha in WOODLANDS 12 LARGE TREES /ha in FORESTS 1	
		more than	7 LARGE TREES /ha in WOODLANDS 12 LARGE TREES /ha in FORESTS 2	
CANOPY COVER Defined as the tallest stratum of native trees greater than 5m tall. Apply as: Plains Grassy WOODLANDS 10% benchmark Plains Grassy FORESTS 30% benchmark	% canopy cover **% cover/benchmark x 100**	*less than*	25% CANOPY COVER 0	
		between	25 – 50% CANOPY COVER 0.5	
		more than	50% CANOPY COVER 1	
UNDERSTOREY **(B)** Tick appropriate boxes for PRESENCE of native vegetation (i.e. different life forms) Tree >5m; Large herb >1m; Grass or grasslike <1m; Other Shrub 1-5m; Small herb <1m; Fern Small shrub <1m; Grass or grasslike >1m; Moss or lichen	**(A) % cover of native species**	*minimal*	COVER *less than* 10% 0	
		low	COVER *between* 10% – 25% 2	
		reduced	COVER *between* 25% - 75% AND *less than* 4 boxes ticked for WOODLANDS *less than* 5 boxes ticked for FORESTS 3 OR 4 or *more* boxes for ticked WOODLANDS 5 or *more* boxes ticked for FORESTS 4	
		adequate	COVER *more than* 75% AND *less than* 4 boxes for ticked WOODLANDS *less than* 5 boxes ticked for FORESTS 4 OR 4 or *more* boxes for ticked WOODLANDS 5 or *more* boxes ticked for FORESTS 5	
WEEDINESS	**% weed cover**		50% *or more* WEED COVER 0	
		between	25% - 50% WEED COVER 1	
		between	5% - 25% WEED COVER 2	
		less than	5% WEED COVER 3	
RECRUITMENT A woody species is considered to be recruiting when the number of immature plants (i.e. not flowering or fruiting) of an individual woody species is at least 10% of the total population of that species	(A) Number of *woody species* present (B) Number of *woody species* recruiting **% recruitment = B/A x100**	*less than*	30% woody species RECRUITING 0	
		between	30% -70% woody species RECRUITING 1	
			70% *or more* woody species RECRUITING 2	
ORGANIC LITTER Defined as small branches (less than 10cm diameter), twigs, leaves and other fallen or dead organic matter	**% cover of organic litter**	*less than*	5% ORGANIC LITTER for WOODLANDS 10% ORGANIC LITTER for FORESTS 0	
		more than	5% ORGANIC LITTER for WOODLANDS 10% ORGANIC LITTER for FORESTS 1	
LOGS Defined by length of stumps, fallen trees or branches at least 10 cm diameter (30 cm circumference)	Length of logs greater than 10 cm dia in 50m x50m (i.e. 0.25 ha) **Logs (m) x 4 (i.e. m/ha)**	*no logs*	0	
		less than	25m LOGS/ha 0.5	
		more than	25m LOGS/ha 1	
SIZE Defined by the size of the area being assessed **AND** any adjoining native vegetation		*less than*	2 ha 0	
		between	2 – 10 ha 1	
		more than	10 ha 2	
NEIGHBOURHOOD Defined by the % area covered by native vegetation within 1 km of the site being assessed		*less than*	10% area covered 0	
		between	10% - 50% area covered 1	
		more than	50% area covered 2	
CORE AREA Defined by the distance of the site being assessed from a block of native vegetation greater than 50ha		*1 km or more*	from 50 ha block of native vegetation 0	
		less than 1 km	from 50 ha block of native vegetation 1	

Department of Sustainability and Environment
ENVIRONMENTAL MANAGEMENT IN AGRICULTURE
Native Biodiversity Resource Kit ©2004

Assessment of Habitat Quality (total)

APPENDIX 8 – LANDSCAPE CONTEXT MODEL

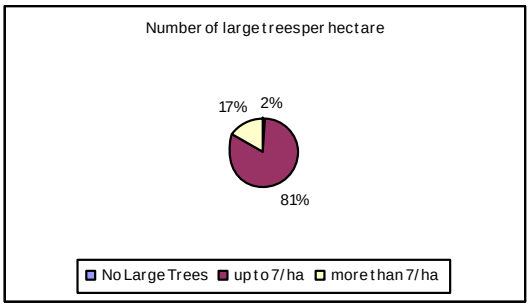
The Landscape Context Model Mapping is now also contained on the BAP CD (Version 1, January 2008)* or on the GBCMA website (www.gbcma.vic.gov.au). This mapping can be used in conjunction with the BAP mapping and this Conservation Plan

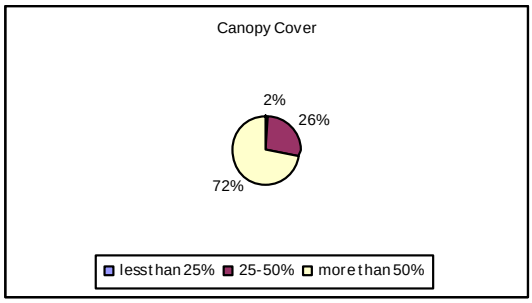


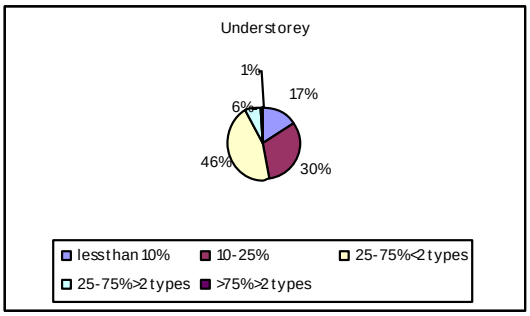
EILDON LANDSCAPE ZONE – LANDSCAPE CONTEXT MODEL.

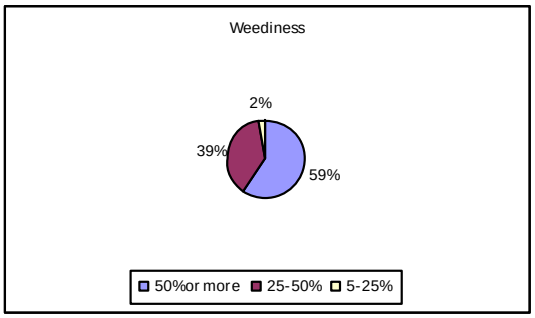
* To obtain copies of the BAP CD (Version 1, January 2008), or for further information on BAP, please contact bap@gbcma.vic.gov.au OR the Biodiversity Action Planning Officer, Department of Sustainability and Environment (DSE) Benalla at Ph: (03) 57 611 611

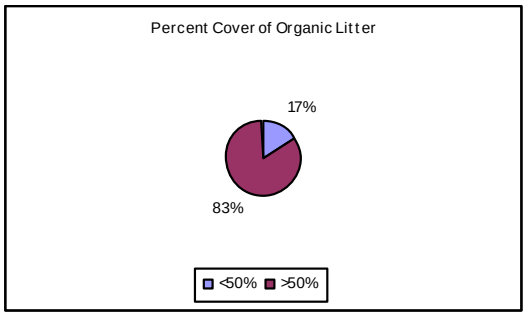
APPENDIX 9 – VEGETATION QUALITY ASSESSMENT RESULTS

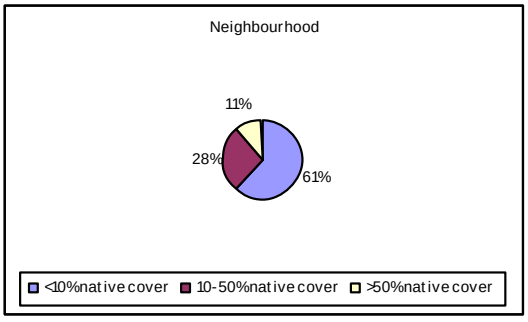


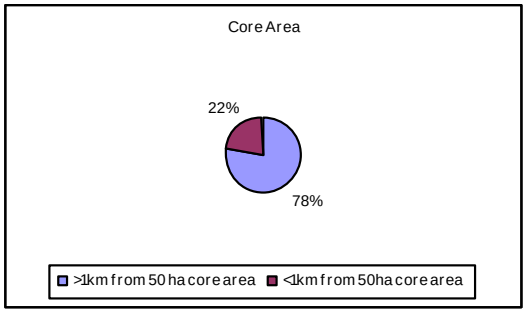


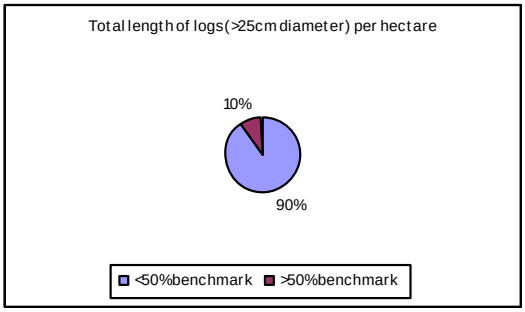


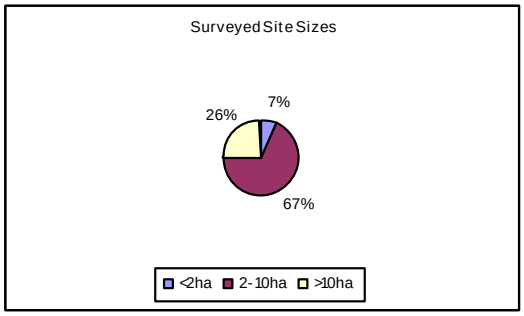












APPENDIX 10 – BIRD LIST

* List is an incomplete record of birds surveyed from some of the 93 site (20 minute) surveys. It does not represent the entire bird population in the Eildon Landscape Zone.

Common Name*	Scientific Name
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*
Black-faced Woodswallow	*Artamus cinereus*
Brown Thornbill	*Acanthiza pusilla*
Brown Treecreeper	*Climacteris picumnus*
Brown-headed Honeyeater	*Melithreptus brevirostris*
Buff-rumped thornbill	*Acanthiza reguloides*
Crested Pigeon	*Ocyphaps lophotes*
Crimson Rosella	*Platycerus elegans elegans*
Dusky Woodswallow	*Artamus cyanopterus*
Eastern Rosella	*Platycercus eximius*
Eastern Spinebill	*Acanthorhynchus tenuirostris*
Galah	*Cacatua roseicapilla*
Golden Whistler	*Pachycephala pectoralis*
Grey Currawong	*Strepera versicolor*
Grey Fantail	*Rhipidura fuliginosa*
Grey Shrike-thrush	*Colluricincla harmonica*
House Crow	*Corvus splendens*
Jacky Winter	*Microeca fascinans*
Laughing Kookaburra	*Dacelo novaeguineae*
Little Raven	*Corvus mellori*
Magpie	*Gymnorhina tibicen*
Magpie Lark	*Grallina cyanoleuca*
Masked Lapwing	*Vamellus miles*
New Holland Honeyeater	*Phylidonyris novaehollandiae*
Noisy Miner	*Manorina melanocephala*
Pied Currawong	*Strepera graculina*
Raven	*Corvus spp.*
Red Wattlebird	*Anthochaera carunculata*
Red-browed Finch	*Neochmia temporalis*
Rufous Whistler	*Pachycephala rufiventris*
Satin Flycatcher	*Myiagra cyanoleuca*
Scarlet Robin	*Petroica boodang*
Silvereye	*Zosterops lateralis*
Spotted Pardalote	*Pardalotus punctalis*
Striated Pardalote	*Pardalotus striatus*
Striated Thornbill	*Acanthiza lineata*
Sulphur-crested Cockatoo	*Cacatua galerita*
Superb Fairy-wren	*Malurus cyaneus*
Tree martin	*Hirundo nigricans*
Welcome Swallow	*Hirundo neoxena*
White-browed Scrubwren	*Sericornis frontalis*
White-faced Heron	*Egretta novaehollandiae*
White-naped Honeyeater	*Melithreptus lunatus*
White-plumed Honeyeater	*Lichenostomus penicilatus*
White-throated Treecreeper	*Cormobates leucophaeus*
White-winged Chough	*Cocorax melanorhamphos*
Willie Wagtail	*Rhipidura leucophrys*

Common Name	Scientific Name
Wonga Pigeon	*Leucosarcia melanoleuca*
Wood Duck	*Chenonetta jubata*
Yellow-faced Honeyeater	*Lichenostomus chrysops*
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*
Yellow-tailed Black-Cockatoo	*Calyptorhynchus funereus*
Yellow Thornbill	*Acanthiza nana*

APPENDIX 11 – PRIORTY SITE INFORMATION (MAPPING):

Mapping and accompanying information for each of the 'priority BAP sites' is now contained on the BAP CD (Version 1, January 2008) or on the GBCMA website (www.gbcma.vic.gov.au). This mapping data is designed to be used in conjunction with this Conservation Plan to assist users to obtain further information on priority sites.

HOW TO OBTAIN INFORMATION FROM THE BAP CD:

1. Locate the available mapping data by clicking on the 'BAP Mapping' hyperlink#.
2. Click on the hyperlink relating to the Zone of interest under the 'BAP Mapping' subheading' (e.g. 'Barmah').
3. This will lead to a map identifying priority BAP sites within the chosen Zone.
4. On this map, locate the area/site of interest by clicking on the area.
5. Zoom in or out to the areas/sites of interest, using the North, South, East, West arrows.
6. Click on a BAP site to view the Attribute Table information for that site.
7. Refer to the list of birds surveyed at each site (where available).
8. An explanation of the data provided in the Attribute Table, is provided in the 'Attribute Table Definition' document under the BAP Mapping Subheading
9. For further information to assist with the identification of opportunities to link the BAP sites, refer to 'BAP Mapping', 'Landscape Context Model Maps' and choose the relevant Zone name hyperlink(e.g. 'Barmah').
10. To access the data via the Geographical Information System (GIS) (where available) select 'BAP Mapping',
11. 'GIS data' then either 'BAP GIS layer' or 'LCM GIS layer'.

Note: Mapping data for each Landscape Zone can also be located by clicking on the 'BAP Zones' hyperlink and choosing the Landscape Zone of interest from the map of the Goulburn Broken Catchment.

* To obtain copies of the BAP CD (Version 1, January 2008), or for further information on BAP, please contact bap@gbcma.vic.gov.au OR the Biodiversity Action Planning Officer, Department of Sustainability and Environment (DSE) Benalla at Ph: (03) 57 611 611