DEPARTMENT OF
PRIMARY INDUSTRIES

Wyuna River Reserve Environmental Management Plan

September 2007

Department of Sustainability and Environment

Department of Primary Industries

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Cover photographs: Wyuna River Reserve (main photo)
Common Brushtail Possum (*Trichosurus vulpecula*) (top inset)
Tall Bluebells (*Wahlenbergia stricta*) (centre inset)
Tree Goanna (*Varanus varius*) (bottom inset)

MANAGING AUTHORITY

I the undersigned Manager for Parks Victoria acknowledge this document as being the operative Environmental Management Plan for Wyuna River Reserve and accept our responsibilities in partnership as recommended for its ecological sustainability.

.....

Jeff Carboon
Acting District Chief Ranger

Murray Central District
Parks Victoria

STAKEHOLDER AGREEMENT

Development and implementation of the Wyuna River Reserve Environmental Management Plan will be endorsed and supported by the following stakeholders.

.....

Peter Gibson
Chair
Shepparton Irrigation Region Implementation Committee
Goulburn Broken Catchment Management Authority

.....

Bruce Cumming
Leader
Sustainable Irrigated Landscapes – Goulburn Broken
Catchment and Agriculture Services
Department of Primary Industries

.....

Glen Thompson
President
Wyuna Landcare Group

.....

Earl Phillips
Resident and Wyuna Landcare Group

.....

Lee Joachim
Chairman
Yorta Yorta Nations

ACKNOWLEDGMENTS

Wyuna Landcare Group deserves special recognition for their dedication and commitment to Wyuna River Reserve. Earl and Jenny Phillips, Russell and Cathy Pell, Darrell Pell, Robert Lenne, Trevor Thompson and Geoff and Lyn Hallett are especially thanked for their involvement and input into this Environmental Management Plan.

Department of Primary Industry staff (previously Department of Natural Resources and Environment) past and present, including, Trudi Mullett, Melissa Walsh, David Harvey, Hayley Rokahr, Kane Travis, Rolf Weber, Keith Lyle and Kate Brunt have assisted with this Plan.

Information and interest provided by Paul Ryan (former Goulburn Broken Catchment Bushcare Facilitator), Natalie White (formerly Dookie College) and Paul Peake (Environmental Conservation Council) are also appreciated.

Finally we wish to acknowledge the support and funding provided by the Shepparton Irrigation Region Implementation Committee of the Goulburn Broken Catchment Management Authority, and in particular Ken Sampson for his patience and commitment to this project.

To all the people who provided comment on the draft plans, over the years, we are extremely grateful.

ACRONYMS

BAP	Biodiversity Action Planning, structured approach to native biodiversity conservation
DNRE	Department of Natural Resources and Environment, former government department that included the services provided by DPI and DSE
DPI	Department of Primary Industries
DSE	Department of Sustainability and Environment
ECC	Environment Conservation Council, replaced the Land Conservation Council (former government agency)

EMP	Environmental Management Program; working group within the Catchment and Agriculture Services division of Department of Primary Industries, Tatura
EVC	Ecological Vegetation Class, native vegetation classification described through a combination of floristics, life forms and ecological characteristics
FF	Flora and Fauna Branch of the Department of Sustainability and Environment
FM	Forest Management; division of the Department of Sustainability and Environment
GBCMA	Goulburn Broken Catchment Management Authority
LCC	Land Conservation Council (former government agency)
PPA	Pest Plant and Animals; part of the Flora and Fauna Branch within DSE
SIR	Shepparton Irrigation Region
SIRCS	Shepparton Irrigation Region Catchment Strategy
SIR IC	Shepparton Irrigation Region Implementation Committee of the Goulburn Broken Catchment Management Authority
WLG	Wyuna Landcare Group
VEAC	Victorian Environment Assessment Council, have taken on the responsibilities of the previous LCC and ECC.

FOREWORD

This Environmental Management Plan is the culmination of the effort of a number of dedicated people, over a number of years, who share the vision of seeing Wyuna River Reserve remain as a viable and productive woodland ecosystem. It is intended that the Plan will further foster the partnerships between the relevant stakeholders.

It identifies the key stakeholders, including government and non-government organisations who accept the management responsibilities assigned to them through the actions defined in this Environmental Management Plan.

This Plan has been developed as an adaptive Environmental Management Plan to enable management actions to be modified in response to the monitoring of the key biodiversity values.

Therefore all works and actions which may impact on the implementation of the Plan will only be carried out after consultation / approval from the identified key stakeholders to the Plan.

While implementation of the Plan is an adaptive process, the Plan will be formally reviewed when necessary to ensure that it remains a 'living' document. The review process will also be subject to consultation with, and sign-off by, the identified key stakeholders.

The Shepparton Irrigation Region Implementation Committee (SIRIC) looks forward to seeing the implementation of this Environmental Management Plan, which will be a prime model for partnerships in sustainable ecological management in the Goulburn Broken Catchment. SIRIC is happy with the works that have been implemented at Wyuna River Reserve while this Management Plan has been drafted and are confident that this excellent work will continue.

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1. SUMMARY

Wyuna River Reserve contributes significantly to the biodiversity estate of the Goulburn Broken Catchment. The 170 hectare reserve supports quality examples of two Ecological Vegetation Classes (EVC) that are recognised as depleted in the Victorian Riverina Bioregion (GBCMA, 2003).

Riverine Grassy Woodland (EVC 255) occurs along the riparian strip of the Goulburn River and associated drainage lines and topographic depressions. This vegetation type grades into an extensive patch of Plains Woodland (*syn. Riverina Plains Grassy Woodland)*(EVC 803). The dominant overstorey species is Grey Box (*Eucalyptus microcarpa*). On the slightly elevated rises Yellow Box (*Eucalyptus melliodora*) is present. The box woodland complex at Wyuna River Reserve has been identified as one of the most important patches of remnant vegetation left in the Victorian Riverina Bioregion due to its size and species composition (ECC, 1997).

The quality of the understorey vegetation varies throughout the Reserve. These patterns reflect variation in local topography, soils, vegetation characteristics and past management practices. Introduced grasses and herbs are prevalent, however good examples of Riverine Grassy Woodland and Plains Woodland vegetation remain in less disturbed areas.

Some recovery of native vegetation is evident since the cessation of grazing by domestic stock in 1994. Fallen timber, which provides habitat for a range of species and important micro-sites for germination and establishment of native plant species, is also accumulating as a result of minimal firewood collection.

Alteration of natural flooding and drainage regimes is persistent and threatens the ecological viability and sustainability of Wyuna River Reserve. River bank erosion and incremental loss of riparian vegetation is severe in places.

Fox numbers are regionally high and foxes are likely to impose pressure on vertebrate and invertebrate fauna and act as dispersal vectors for a range of agricultural and environmental weeds. On-going fox control is a management priority for Wyuna River Reserve and is being undertaken.

Recreational pressure is generally low, with peaks occurring in the Christmas, Easter and long weekend periods. Localised track damage, disturbance by trail bike riders, use of multiple fireplaces, sand-bar compaction, site disturbance and rubbish dumping are amongst the main impacts on the Reserve.

Fuel loads and fire risk is interlinked. Fuel loads at Wyuna River Reserve should be monitored following cessation of domestic stock grazing. Appropriate weed management is an important factor as introduced grass species contribute significantly to the fuel load at Wyuna River Reserve.

The Environment Conservation Council (ECC) released their final report of Box-Ironbark Forests and Woodlands Investigation in June 2001. This report reviewed the management status of Wyuna River Reserve and recommended that the Reserve should have the tenure of Bushland Reserve. The Victorian Government has accepted the ECC recommendations in principle. Parks Victoria is now recognised as the land manager for Wyuna River Reserve.

In June 2004, the Victorian Government and Yorta Yorta Nation Aboriginal Corporation signed a Co-operative Management Agreement for the Barmah region and Goulburn Valley. This

agreement formally recognises the input and contribution that indigenous people can make to the management of their traditional lands and waters. The area this agreement covers includes Wyuna River Reserve.

This Environmental Management Plan has been produced by the DPI, Environmental Management Program, on behalf of the Goulburn Broken Catchment Management Authority. The Plan has been produced in collaboration with Parks Victoria and the Wyuna Community. The purpose of the Plan is to provide direction for the on-going management, protection and enhancement of this important area.

2. INTRODUCTION

Wyuna River Reserve is one of the most significant vegetation remnants in the Victorian Riverina Bioregion. The 170 hectare Reserve supports quality examples of the Riverine Grassy Woodland and Plains Woodland Ecological Vegetation Class (EVC). Three endangered and one vulnerable fauna species as well as one rare and one vulnerable flora species have been recorded in the Reserve.

Wyuna River Reserve is extremely important in a landscape context. This extensive block of Box and River Red Gum grassy woodland supports many populations of species that require large continuous areas of habitat - a resource that is lacking in the surrounding landscape.

Wyuna River Reserve is used by a diverse array of resident, nomadic and migratory species. The diversity of habitats available within the Reserve enhances the nature conservation values of the Goulburn River corridor.

2.1 Purpose

The Environmental Management Program (EMP), Department of Primary Industries (DPI) Tatura, in consultation with Parks Victoria and former land managers Department of Sustainability and Environment as well as the Wyuna Landcare Group and Community, have produced this Plan on behalf of the Goulburn Broken Catchment Management Authority (GBCMA). The purpose of this Plan is to provide direction on the future management of Wyuna River Reserve. The main objectives of this Plan are the protection, restoration and enhancement of the conservation values of this important Reserve.

This Plan provides direction for Parks Victoria (the responsible management authority) Wyuna Landcare Group and the surrounding landholders that have taken an active interest in the future management of the Reserve.

2.2 Consultation Process

A list of agencies, groups and individuals involved in the planning process is provided in Appendix Two. Two public meetings were held in the early stages of the Plan's development. Relevant agencies, community groups and individuals were invited to comment on aspects of the Draft Plan in January 1999. A revised Draft Plan was completed in October 1999 and forwarded to the agencies and groups with identified management responsibilities for further comment. In January 2000 the Draft Environmental Management Plan was forwarded to the Forest Management (then the managing authority of Wyuna River Reserve), Wyuna Landcare Group and the Shepparton Irrigation Region Implementation Committee for endorsement.

The Plan did not progress for several months due to a change in staff. After the appointment of a new staff member, the Plan was updated and circulated to stakeholders in September 2002. Amendments to the Plan centred on recommendations made in the Environment Conservation Council's Box-Ironbark Forests Investigations released in June 2001.

Further staff changes delayed finalisation of the Plan in 2005, which was updated and circulated to the stakeholders. The update of the Plan reflects the changes of the managing authority to

Parks Victoria, the signing of the Yorta Yorta Co-operative Management Agreement and changes in departmental names and duties.

2.3 Plan period and review

The management prescriptions described in this Environmental Management Plan are suitable for Wyuna River Reserve's tenure of Natural Features Reserve (Bushland Reserve).

The Victorian Environmental Assessment Council (VEAC) has launched a study into Red Gum (*Eucalyptus camaldulensis*) forests on public land across Northern Victoria (from Albury to Mildura). The study area for Riverine Red Gum Forests Investigation includes Wyuna River Reserve.

During July 2007 VEAC released a Draft Proposal for public comment. The Draft Proposal recommends that Wyuna River Reserve become a National Park. This Proposal is yet to be considered by Government.

VEAC will review public submissions and submit its final report to the Minister for Water, Environment and Climate Change by 1 February 2008. The results of this study and the Government's response may require a review of this Plan.

2.4 Location, Access and Zoning

Wyuna River Reserve is located in the Shepparton Irrigation Region (SIR) of Northern Victoria, approximately 34km east of Echuca and 36km north-west of Shepparton, Victoria. Access to the Reserve is via Agnes Road and Waradgery Road, off the Murray Valley Highway east of Wyuna (Figure 1). The Goulburn River forms the northern boundary of the Reserve, while private land abuts the eastern, western and southern boundaries.

AGM Coordinates Zone 55, Easting 327 998, Northing 5 995 286 and Crown Land Parcel Numbers P162992, P162993 and P162994.

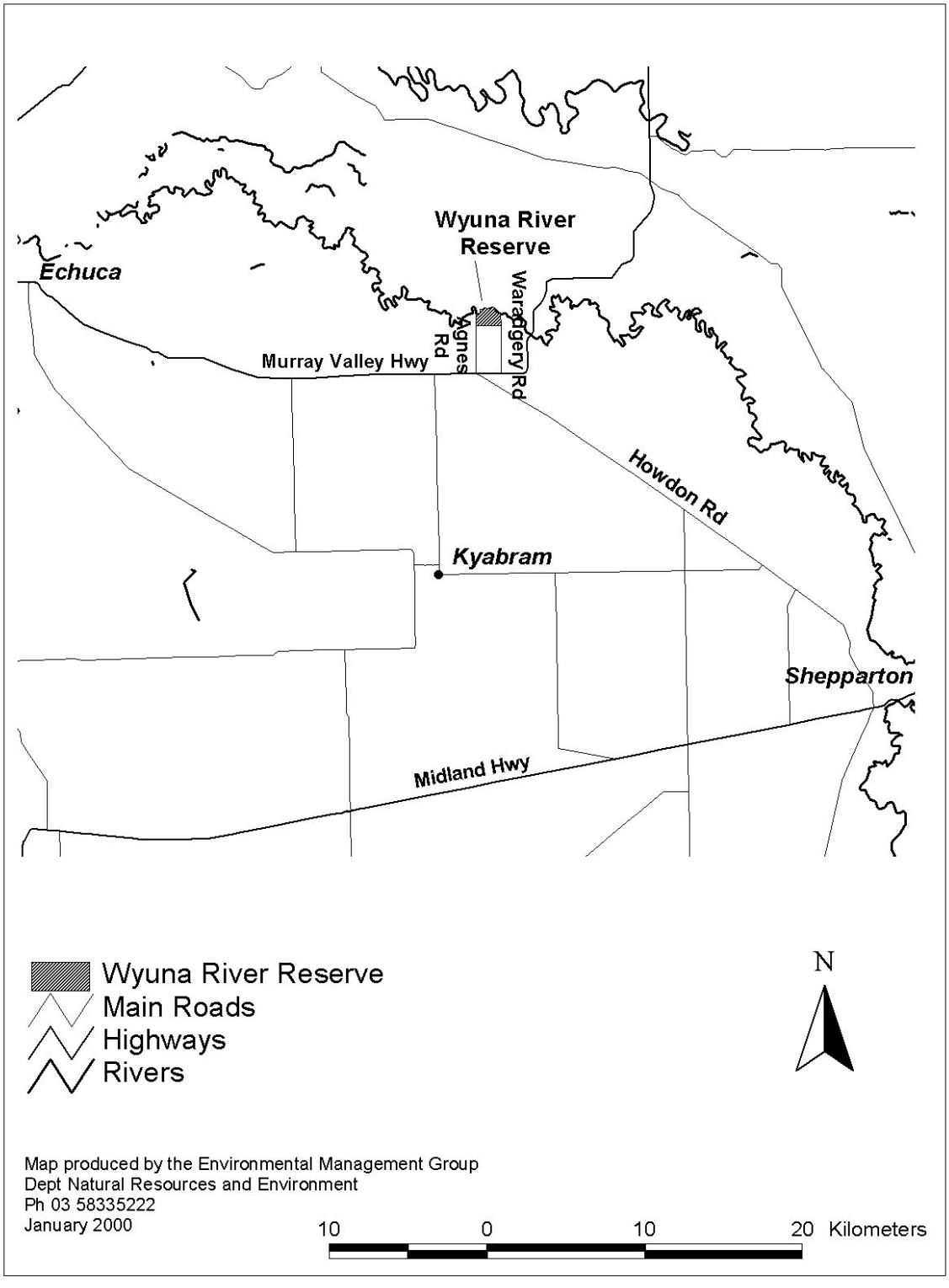

Figure 1. Location Map of Wyuna River Reserve

2.5 Reservation status and management authority

Parks Victoria is the current land manager of Wyuna River Reserve. The Reserve has an interesting history of management.

Wyuna River Reserve consists of three parcels of land, two of which P162992 and P162994 are reserved as Permanent Forest and the third parcel, P162993, is a 'Levee Reserve'. These parcels are shown on the following aerial (Figure 2).

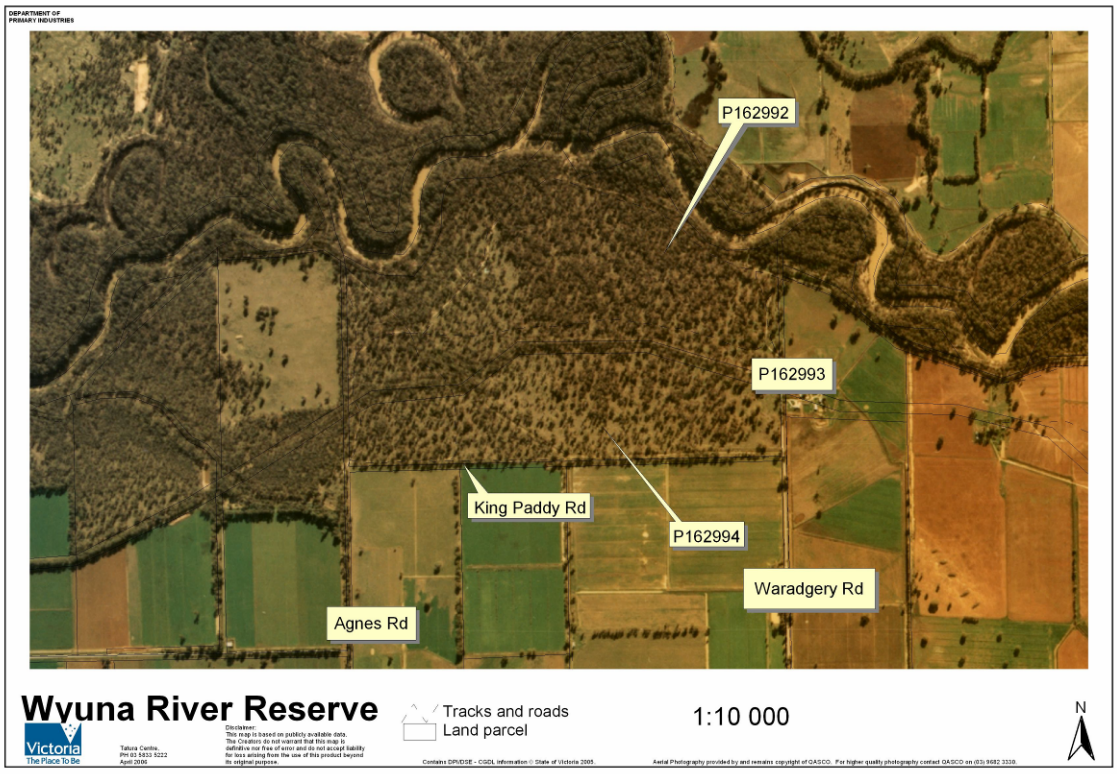

Figure 2. Aerial map of Wyuna River Reserve.

The tenure of Permanent Forest has meant Forest Management, DSE (and its former departmental names), previously managed the Reserve. The ECC's Box-Ironbark Investigations Report (1997) recommended tenure for the three parcels is Natural Features Reserve (Bushland Reserve). In recognition of the ECC's recommendations, Parks Victoria now manages the Reserve in accordance with the tenure of Natural Features Reserve (Bushland Reserve). Forest Management (DSE) acknowledges Parks Victoria as the managers in 'Forest Management Plan – Mid-Murray Forest Management Area' (DNRE, 2002).

'Forest Management Plan – Mid-Murray Management Area' (DNRE, 2002) identifies a small section of Special Protection Zone (SPZ), along the Goulburn River. The SPZ along the Goulburn River replaces the Public Purposes Reserve, which has a width of 30 metres from the riverbank. The SPZ restricts the activities that can occur within the area and is technically managed by Forest Management. Given that Parks Victoria manages the rest of the Reserve and the arrangements made at other reserves, Parks Victoria will oversee the practical management of the SPZ.

The Victorian State Government agreed, in principle, with all of the ECC's recommendations from the Box-Ironbark Investigations Report (1997). The tenure of Permanent Forest comes from the *Forests Act 1958*. Section 49 of this Act requires any excisions from reserved forest necessitate an Act of Parliament. Thus the tenure of Wyuna River Reserve will most likely remain as Permanent Forest and it will be managed in accordance with Permanent Forest tenure and Natural Features Reserve (Bushland Reserve)(dependent on VEAC process).

The Wyuna Landcare Group has also been involved in management activities at the Reserve. Their activities aim to restore and enhance the natural values of the Reserve. Some of these activities have included understorey planting, perimeter fencing, weed spraying, nest box installation and fox control.

2.6 Wyuna Landcare Group

Members of Wyuna Landcare Group have played an important, but unofficial, role in the management of Wyuna River Reserve for many years. The group has expressed keen interest in the on-going management of Wyuna River Reserve and the promotion of the importance of the Reserve and natural areas amongst the wider community.

Wyuna Landcare Group is doing a great job of promoting the values of the Reserve, through installation of signage at the Reserve for locals and visitors to the region as well as hosting tours for local school children and visitor groups to the region. The maintenance activities they conduct at the Reserve are important for protection and enhancement of the Reserve.

2.7 Legislation

A broad range of legislation, strategies and policies influence the management of Wyuna River Reserve. Only the most directly relevant legislation, strategies and policies are described.

Forests Act 1958

Wyuna River Reserve is managed under the *Forests Act* 1958. The *Forests Act* outlines the responsibilities and powers as it relates to the management, protection and utilisation of State Forest. The Forest Management Plan for the Mid-Murray Forest Management Area (DNRE, 2002), sets out specific management guidelines, including the management responsibility to Parks Victoria.

Flora and Fauna Guarantee Act 1988

The Act seeks to put in place preventative management mechanisms to ensure no biota or ecological communities become extinct and that the processes that threaten biodiversity are identified and addressed. The Act is far broader than 'endangered species' legislation, covering ecological communities, potentially threatening processes, community involvement in conservation and a strategic approach to biodiversity conservation and sustainable use.

Crown Lands (Reserves) Act 1978

The Act provides for the reservation and management of Crown Lands for certain purposes. This Act only has relevance to Wyuna River Reserve if the tenure changes in response to the ECC investigation to Bushland Reserve. The Forests Act 1958 overrides the Crown Land (Reserves)

Act 1978; thus it is unlikely that an Act of Parliament will occur to alter the tenure of Wyuna River Reserve based on the ECC recommendations.

Heritage Rivers Act 1992
This Act provides for the protection of public land along rivers and river catchments that have significant natural conservation, recreation, and scenic or cultural heritage values.

Parks Victoria Act 1998
This Act sets down the organisation and structure of Parks Victoria, operation procedures, regulations and guidelines.

Environmental Protection and Biodiversity Conservation (EPBC) Act 1999
This Commonwealth Act is to prevent further extinctions of Australian flora and fauna, and to restore endangered species and ecological communities to a secure status in the wild. A key objective of this Act is to promote the recovery of species that are considered nationally endangered and vulnerable. The Department of Environment and Heritage administer these programs.

Other relevant legislation:

STATE
Catchment and Land Protection Act 1994
Archaeological and Aboriginal Relics Preservation Act 1972
Commonwealth Aboriginal and Torres Strait Islander Heritage Protection Act 1984
Wildlife Act 1975
Vermin and Noxious Weeds Act 1958
Litter Act 1964
Environmental Protection Act 1970
Fences Act 1968
Country Fire Authority Act 1958
Local Government Act 1989
Water Act 1989
Lands Act 1958
Flora and Fauna Guarantee Regulations 2001

COMMONWEALTH
Aboriginal and Torres Strait Islander Heritage Protection Act 1984
Environmental Protection and Biodiversity Conservation (EPBC) Act 1999
National Environment Protection Council Act 1994

2.8 Strategies and policies

Victorian Biodiversity Strategy (1997)

The Victorian Biodiversity Strategy makes a commitment to the Conservation of Victoria's Biodiversity. The Strategy reports on the condition of each Bioregion and discusses the main pressures and threats. The Strategy recognises that "all natural ecosystems in the Victorian Riverina Bioregion have been depleted or highly modified, with only isolated vegetation patches remaining" (DNRE 1997, p. 70) and that "...all remaining areas are highly significant for biodiversity conservation" (DNRE 1997 p. 71).

Shepparton Irrigation Region Catchment Strategy (2002-2007)

This document is part of the Goulburn Broken Regional Catchment Strategy (2002-2007) and incorporates the Shepparton Irrigation Region Land and Water Management Plan (1989). The

Victorian Government established the Goulburn Broken Catchment Management Authority in 1997. It is a Statutory Authority responsible for the coordination of natural resource management programs within the region. Under the *Catchment and Land Protection Act 1994,* the Authority is required to prepare a five year Regional Catchment Strategy (RCS) that establishes the Framework for Action for Native Vegetation Management, Pest Management, Biodiversity and Salinity Management in the region.

The strategy does not describe in detail how the region intends to meet the range of obligations outlined in legislation. Rather, the Regional Catchment Strategy is an overarching document that takes a longer-term view of the challenges and opportunities facing the region. The Strategy recognises the fundamental role that partnerships between agencies and the catchment community play in achieving environmental goals as well as connecting the raft of sub-stratgeies.

Goulburn Broken Native Vegetation Management Strategy (August 2000)
This strategy documents the current condition of native vegetation by Bioregion and Broad Vegetation Type (now further defined as EVC). Priorities and procedures for achieving best management of remnant vegetation in the Goulburn Broken Catchment are described. Cost sharing, institutional agreements, targets and indicators to measure performance over time are also discussed. The Vegetation Strategy is the forerunner to the Catchment's Biodiversity Strategy. The draft of this Strategy has been adopted since 2000, along with Catchment Response (2000) to Draft Goulburn Broken Native Vegetation Management Strategy.

Forest Management Plan for the Mid-Murray Forest Management Area (2002)
The plan aims to provide for the balanced use of State Forest in accordance with the *National Forest Policy Statement.* State Forest areas are zoned to "facilitate the protection and management of the range of values and uses of State Forest". The plan identifies the area at Wyuna as part of the formal reserve system and in accordance with the State Government's in principle acceptance of land tenure changes recommended by the ECC Final Report (ECC 2001), Parks Victoria now manages the Reserve.

Box-Ironbark Forest and Woodland Investigation – Final Report (2001)
This report contains the Environment Conservation Council's final recommendations for the protection, use and management of Victoria's Box-Ironbark Forests and Woodlands. It marks the culmination of an investigation process beginning in 1995 by the then Land Conservation Council (LCC).

Biodiversity Action Planning, Action Planning for native biodiversity at multiple scale – catchment, bioregional, landscape, local (2002)
Biodiversity Action Planning (BAP) is a structured approach to identifying priorities and mapping significant areas for native biodiversity conservation at the landscape and Bioregional level. Bioregions are the broadscale mapping units for biodiversity planning in Victoria, capturing the patterns and ecological characteristics in the landscape. Wyuna River Reserve is part of the Murray Fans bioregion and intersects the Barmah Landscape Zone and the Western Goulburn Zone.

Our Water Our Future, Victorian Government White Paper Securing Our Water Future Together (June 2004)
This document is an 'action plan' to enable smarter water use and management across the State. The plan impacts on all water uses, from household to industrial to agriculture. There are also provisions to secure environmental water flows. Benefits delivered to the Goulburn River from this policy will assist the Reserve as well. Managing water use efficiency in the surrounding landscape will also provide benefits to the Reserve.

Other Relevant Strategies and Policies:

Local Government and Landcare Action Plan for Nature Conservation in the Goulburn Broken Catchment (1997) Trust for Nature, Melbourne.

Code of Forest Practices for Timber Production Revision No. 2 (1996) Department of Natural Resources and Environment, Victoria.

Code of Practice for Fire Management on Public Land (Revision 1) (2006) Department of Sustainability and Environment, Victoria.

Victoria's Biodiversity Strategy (1997) Department of Natural Resources and Environment, Victoria. This strategy includes the current Flora and Fauna Guarantee Strategy (1997).

Restoring Our Catchments – Victoria's Draft Native Vegetation Management Framework (2000) Department of Natural Resources and Environment, Victoria.

Revegetation Guide for the Goulburn Broken Catchment (2001) Department of Natural Resources and Environment, Victoria.

Restoring Our Catchments (2000) Department of Natural Resources and Environment, Victoria.

River Red Gum Forests Investigation – Draft Proposals Paper for Public Comment (2007) Victorian Environmental Assessment Council, Victoria.

Western Goulburn Landscape Zone Plan (2007) Department of Primary Industries, Victoria.

Barmah Landscape Zone Plan (2007) Department of Primary Industries, Victoria.

3. ECOLOGICAL VALUES

3.1 Significance of the Reserve in a regional context

Wyuna River Reserve contributes significantly to the biodiversity estate of the Goulburn Broken Catchment. Two Ecological Vegetation Classes (EVC) are present in the Reserve, Plains Woodland (EVC 803) and Riverine Grassy Woodland (EVC 255). It is one of the few Reserves in the local area where you can view the ecotone between the two EVCs.

Clark (1996) identified Wyuna River Reserve as one of the most significant Box Woodland remnants in the eastern Victorian Riverina Bioregion. River Red Gum (*Eucalyptus camaldulensis*) vegetation communities associated with River systems are considered to be of State botanical significance and are considered "...inadequately represented in legislated reserves" (DNRE 1998, p.5).

The Reserve satisfies all of the following "sites of significance" criteria listed by DNRE (unpub.);

- ecological integrity and viability - high degree of naturalness,
- richness and diversity of flora and fauna species,
- rarity including presence of rare and threatened species,
- representative of type; ie good example of vegetation type/habitat,
- scientific and education value.

Remaining natural areas in Victoria's Riverina Bioregion are considered "highly significant for biodiversity conservation" (DNRE, 1997, p. 71) given the extent of habitat depletion and fragmentation. Large remnants such as Wyuna River Reserve "... act as reservoirs for the conservation of plant and animal populations and for the maintenance of ecological processes within the overall system" (Bennett, unpub. p 7-8). The Reserve is large enough to support minor variation in topography that contributes to local variation in plant species composition and structure, capturing the variation across the vegetation type. This in turn creates variation in habitat opportunities for a range of species. Species such as Brown Treecreepers (*Climacteris picumnus*) and White-throated Treecreepers (*Cormabates leucophaeus*) for example, require about 10 hectares per pair. Both of these species occur in Wyuna River Reserve, but are absent from other smaller patches in the surrounding landscape (P. Ryan, pers. comm. 1998).

In addition to its large size, the Reserve forms part of the much larger Goulburn River floodplain and remnant vegetation corridor. The Goulburn River vegetation corridor provides important habitat connectivity for animals moving between the cooler highlands and the semi-arid woodlands of the northern plains, e.g. Squirrel Gliders (*Petaurus norfolcensis*).

3.2 Physical Aspects

3.2.1 Climate

Temperate climatic conditions characterise the Murray Fans Bioregion, with hot summers and mild winters (Figure 3). Winter-spring is the peak rainfall period, although the highest average monthly rainfalls have been recorded in May. Annual average rainfall recorded at Kyabram (the nearest site for which daily weather observations are taken by the Bureau of Meteorology) is 464.5mm (www.bom.gov.au, 2004). Frosts occur in the winter months and drought periods occur every five to ten years (Bennett *et al*. 1998).

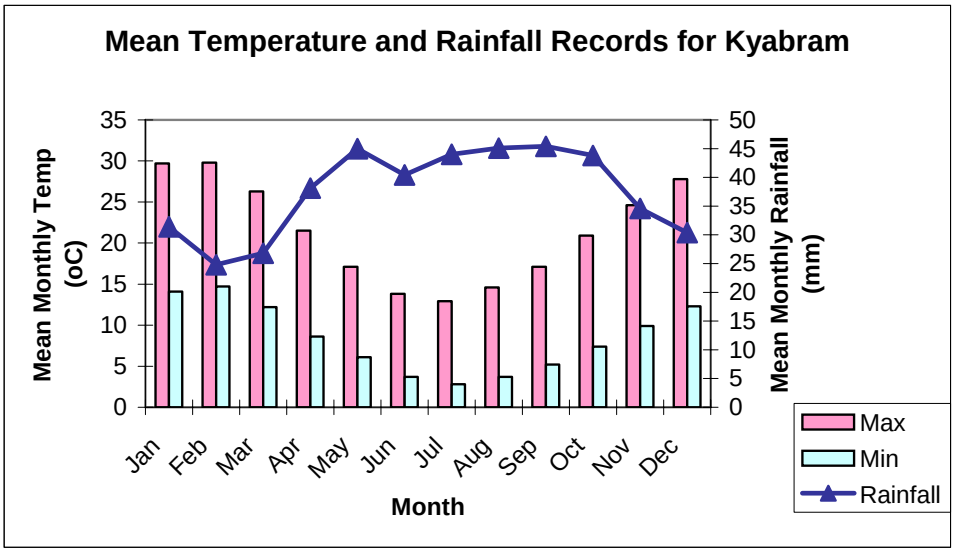

Figure 3. Mean temperature and rainfall records for Kyabram (nearest climate information station to Wyuna River Reserve). Source: www.bom.gov.au, 2007

3.2.2 Soil characteristics

The Riverine Plains of northern Victoria mainly consist of river alluvium. Minor sand dunes occur along sections of the main river courses. The southern section of the Reserve is clay loam (both Goulburn clay loam and Congupna clay loam) which extends into the neighbouring properties.

3.2.3 Flooding regimes and drainage characteristics

River Red Gum systems evolved with late winter-early spring floods that in most years lasted for about two or three months (Dexter *et al*. 1986). The natural flooding regime encompassing the seasonality, frequency and intensity of flooding dramatically altered with diversion and modification of flows for irrigation and other purposes (Figure 4a).

Figure 4a. The Goulburn River close to flood level (2005).

Changes in the natural flooding regime of River Red Gum forests "...have the potential to greatly alter the vitality and long term conservation of the River Red Gum system" (Dexter *et al.* 1986, p.19) and has contributed to river bank erosion and incremental loss of vegetation in places (Figure 4b).

Figure 4b.
River bank erosion and loss of riparian vegetation is severe in places.

Alteration to the natural flow regimes of rivers and streams is listed on Schedule 3 of the *Flora and Fauna Guarantee Act* 1988. This listing recognises the problems the alteration of natural flow regimes can cause. The alteration of natural flows impacts on the ability of River Red Gum (*E. camaldulensis*) to regenerate. Release and dispersal of the seed is timed to take advantage of flood dispersal opportunities and peak growth conditions in spring. Denial of natural flooding regimes results in reduced dispersal potential.

3.2.4 Ground Water

Given that the Reserve is located adjacent to the Goulburn River it is not considered to be at a high risk of salinity problems developing (SKM, 2002).

High Value Environmental Features in the Shepparton Irrigation Region is a project that was undertaken on behalf of the Subsurface Drainage Program (funded by Shepparton Irrigation Region Implementation Committee) during 2005. This project recorded 106 sites of high environmental value in the Shepparton Irrigation Region and rated their threat and risk of decline due to rising ground water and salinity problems. Wyuna River Reserve scored highly for its habitat value and recorded amongst the highest scores for the Region (note, the region excluded the natural features of Barmah as they are recognised through other processes). The project did note that the Reserve has a high EC reading (15 000 – 23 000 µS/cm) but the depth of the water table between 1 and 5 metres, but commonly recorded at 3.1m (SKM, 2002) combined with its potential discharge into the Goulburn River, reduces this risk.

3.3 Biological Aspects

3.3.1 Flora

Once the most extensive vegetation complex in temperate Australia, the grassy woodlands have been extensively depleted since European settlement (Robinson and Traill, 1996). Characterised

by grasslands interspersed with widely spaced trees and scattered shrubs, this floristically diverse vegetation type was rapidly converted for agricultural purposes.

Wyuna River Reserve is part of the Murray Fans bioregion. Bioregions reflect natural boundaries and relationships between biodiversity assets and natural resource based activities. Bioregions are promoted for regional-scale biodiversity planning because they are based on the patterns of ecological characteristics and underlying environmental features (www.dse.vic.gov.au, 2006).

Two Ecological Vegetation Classes (EVCs) are present at Wyuna River Reserve, Plains Woodland EVC and Riverine Grassy Woodland EVC.

3.3.1.1 Plains Woodland EVC (803)

Grey Box (*Eucalyptus microcarpa*) is the dominant overstorey species in the Riverina Plains Grassy Woodland EVC (Berwick unpub.). Yellow Box (*Eucalyptus melliodora*) is also an associated species while Gold-dust Wattle (*Acacia acinacea*) and Golden Wattle (*A. pycnantha*) are common in the shrub layer. This vegetation type was "postulated to have been of a shrubby nature prior to European settlement" (Berwick and Conway, unpub.).

More than 99% of Plains Woodland in the Goulburn Broken Catchment has been removed since European settlement, with more than 63% of the remaining forest found on private land (DSE, 2005a).

Wyuna River Reserve retains many of the shrub layer species expected in this vegetation type including Weeping Pittosporum (*Pittosporum phillyreoides*), Sweet Bursaria (*Bursaria spinosa*), Drooping Cassinia (*Cassinia arcuata*), Common Eutaxia (*Eutaxia microphylla*) and Mallee Wattle (*Acacia montanta*). The presence of these species is indicative of the quality of this patch compared to other Riverina Plains Grassy Woodland remnants on the lower Goulburn.

Figure 5.

Introduced species occupy inter-tussock spaces between native grasses, sedges and herbs and alter the structure of groundlayer habitat

The grassy, herb-rich ground layer includes many saltbush species (*Atriplex spp.* and *Maireana spp.*), New Holland Daisy (*Vittadinia gracilis*), Poa (*Poa spp.*) as well as Chocolate-lily (*Arthropodium strictum*) and Pale Vanilla-lily (*Arthropodium milleflorum*). Invasion of pasture grasses and other weed species (Figure 5) have altered the original tussocky, patchy nature of the ground layer. The implications of these changes to ground layer structure and floristic composition is difficult to determine, but an overall reduction in habitat values may have resulted. The more 'closed' nature of the ground layer, the more likely the reduction in micro-site availability for seed germination and establishment. Habitat opportunities for fauna may also be reduced.

3.3.1.2 Riverine Grassy Forest EVC (255)

River Red Gum (*Eucalyptus camaldulensis*) is the dominant overstorey species along the Goulburn River and associated drainage lines and depressions (Figure 6). The River Red Gum vegetation community at Wyuna River Reserve exhibits some characteristics of the Creekline Grassy Woodland EVC and the Riverine Sedgy Forest EVC. Silver Wattle (*Acacia dealbata*) is the dominant tall shrub/small tree and the ground layer is comprised of various native species and introduced grasses, herbs and sedges.

Figure 6.

River Red Gum (*Eucalyptus camaldulensis*) - Silver Wattle (*Acacia dealbata*) associations are common along the Goulburn River

River Red Gum (and Box) forests have been extensively harvested since early European settlement. Consequently the structure, as well as the floristic composition of the vegetation, has changed considerably. The construction of levee banks, alteration of natural flooding and grazing regimes have also contributed to changes in this vegetation community. Manipulation of the forest structure for ecological purposes may be required in the future if the proliferation of Red Gum regeneration is considered to have a detrimental impact on species diversity within the River Reserve.

An important legacy of past management practices at Wyuna River Reserve is the lack of age class diversity in *Eucalyptus* species. The situation at Wyuna River Reserve is characteristic of many vegetation remnants in the Victorian Riverina. The typical Eucalypt age structure comprises a few dead (ringbarked) trees, many mature hollow-bearing trees and a relatively high density of recent regeneration. The ultimate result, however, is a concerning ecological time lag in the availability of habitat resources. Essential resources such as hollows for example, take well over 100 years to form.

A list of vascular plants species recorded in Wyuna River Reserve in September 1998, by the Broken Creek Field Naturalists Club, is included in Appendix 3. In November 2004, two students from Bendigo Regional Institute of TAFE conducted a flora survey. The additional flora species sighted are listed in Appendix 4.

3.3.1.3 Significant species

One rare and one vulnerable plant species have been recorded at Wyuna River Reserve and these are briefly described below. It is possible that more rare or threatened plant species would be documented at Wyuna River Reserve with more detailed surveying, especially during Spring and early Summer.

Figure 7.

Smooth Minuria, *Minuria integerrima*

Smooth Minuria *Minuria integerrima* (r)
Perennial herb, up to 60cm tall. Flowers small with white or

mauve petals and yellow centre, 'daisy flowers' in June to October (refer to Figure 7 for picture). The shrub has fine foliage with the leaves oblanceolate (5cm x 9mm) arranged alternatively. Mainly occurs on grey clay soils usually in low-lying areas in which water ponds after rain.

Leafy Templetonia *Templetonia stenophylla* (v) Low shrub to 60cm. Prostrate habit, alternate narrow leaves, widely spaced along stems. Cream pea flowers with red-brown and green markings at the centre (refer to Figure 8 for picture), flowering September to October. Uncommon, occurs in dry well-drained woodlands.

Figure 8.
Leafy Templetonia, *Templetonia stenophylla.*

3.4 Fauna

Wyuna River Reserve provides an important refuge for native fauna in the SIR. The diverse range of habitats provided in the River Red Gum and Box Grassy Woodlands supports a range of woodland-dependent and other native fauna. The size of the Reserve and its position along the Goulburn River corridor enhance the conservation values of this site.

3.4.1 Mammals

The Environmental Management Group Tatura and Natalie White from Dookie College (White 1998) have recorded six mammal species, so far, within the Wyuna River Reserve. It is likely that more species are present, however they have yet to be officially recorded. It should be noted that an extensive fauna survey has not been conducted within the reserve. The species recorded to date include:

- Squirrel Glider (*Petaurus norfolcensis*), endangered in Victoria and listed as threatened under the Flora and Fauna Guarantee Act 1998.
- Eastern Grey Kangaroo (*Macropus giganteus*)
- Common Brushtail Possum (*Trichosurus vulpecula*)
- Common Ringtail Possum (*Pseudocheirus peregrinus*)
- House Mouse (*Mus Musculus*) - introduced

Figure 9.
Common Brushtail Possum (*Trichosurus vulpeca*) in River Red Gum (*Eucalyptus Camaldulensis*) at Wyuna River Reserve November 2004.

Two Bendigo Regional Institute of TAFE students, Garth and Smith (2004), surveyed Wyuna River Reserve in November 2004 and confirmed these species are still present.

In 2005 a Black Wallaby (*Wallabia bicolour*) was reported at the Reserve. Black Wallabies (*Wallabia bicolour*) are known in the area. It is unknown whether the Wallaby was visiting or has taken residence at the Reserve.

3.4.2 Birds

One hundred and two bird species have been recorded within the Wyuna River Reserve by Paul Ryan, while he conducted annual bird surveys, twice per year for three years (1997-1999). Of these, 42 species are classified as being woodland dependant (Ryan P, unpub.). Woodland dependant birds have been reported to be in a state of decline across temperate Australia (Robinson and Traill 1996). Large remnant areas such as the Wyuna River Reserve are extremely important for the survival of these species. The complete list of bird species recorded to date is in Appendix 5.

Neville Hunter of the local bird observers club visits the Reserve for bird observations two to three times a year. Appendix 6 displays the birds he has seen and grouped them into frequency of sightings.

3.4.3 Reptiles

An extensive reptile survey has not been conducted within the Wyuna River Reserve. However, the following reptile species have been recorded (White 1998) while conducting her student project:

- Tiger Snake (*Notechis scutatus*)
- Red-bellied Black Snake (*Pseudechis porphyriacus*)
- Tree Goanna (*Varanus varius*)

Figure 10.
A resident Tree Goanna (*Varanus varius*) of Wyuna River Reserve.

White (1998) noted the following amphibians at Wyuna River Reserve:

- Common Froglet (*Ranidella signifera*)
- Plains Froglet (*Ranidella parasignifera*)
- Spotted Marsh Frog (*Limnodynastes tasmaniensis*)
- Pobblebonk Frog (*Limnodynastes dumerilii).*

An extensive amphibian survey is yet to be conducted.

3.4.4 Significant species

Rare and threatened fauna recorded at the Wyuna River Reserve are listed and described below. In addition to these species, ecologists have recorded a disturbing trend in the decline of woodland bird species and other woodland-dependent species in the temperate grassy woodlands of south east Australia (Robinson & Traill 1996). Anecdotally bird numbers have declined due to the drought (E Phillips 2004 pers. comm.).

Classifications used to describe the conservation status of the following species are from the *Flora and Fauna Guarantee Act 1988*. The species conservation status in Victoria and in the Murray Fans Bioregion is included in parentheses.

Squirrel Glider (*Petaurus norfolcensis*)
(Endangered in Victoria; listed as Threatened under FFG Act 1998; Widespread and Uncommon in Victorian Riverina)

Wyuna River Reserve provides excellent habitat resources for Squirrel Gliders. These arboreal gliding marsupials require Grey Box (*Eucalyptus microcarpa)* and mixed box woodland habitats and River Red Gum (*Eucalyptus camaldulensis*) forests with a wattle (acacia) understorey. Squirrel Gliders use hollows in living and dead trees and have been recorded travelling up to 1km to forage. Linear strips of vegetation, such as those along road and river systems have been shown to be extremely important for Squirrel Gliders who may use these linkages to disperse, find mates or forage in other parts of the landscape.

Bush Stone-curlew (*Burhinus grallarius*)
(Endangered in Victoria; listed as Threatened under FFG Act 1988; Widespread and Uncommon in Victorian Riverina)

Two Bush Stone-curlew species have been recorded within the Wyuna River Reserve. These individuals have been known to be within the Reserve for the past 11 years (G Hallett 1998, pers. comm.). In 1998 two young were observed with the adult birds, this was the first time that the adults had been observed to successfully breed for the first time in 11 years (G Hallett 1998, pers. comm.). It is anticipated that the success of the breeding was due to the fox baiting that occurred within the Reserve that year.

Bush Stone-curlews have not been seen at the Reserve since 2001. They are still known in the greater area and it is hoped that a pair will establish at Wyuna Reserve in the future.

Figure 11.
Bush Stone-curlew **(*Burhinus grallarius*)**

This nocturnal bird nests and forages on the ground and consequently is vulnerable to predation, especially of eggs and nestlings. Domestic stock can also interfere with Bush Stone-curlews by trampling habitat, eggs and nestlings. Fallen timber provides important shelter and refuge for this species and this resource is often limited in bushland areas due to excessive firewood collection. Invasive pasture and other introduced grasses can also reduce the quality of habitat for this species.

Barking Owl (*Ninox connivens*)
(Endangered in Victoria, listed as Threatened under FFG Act 1988; Rare in the Victorian Riverina)

Barking Owls were recorded within Wyuna River Reserve by Paul Ryan between 1995 and 1998. It is estimated that the population of Barking Owls in Victoria is fewer than 50 pairs (ECC 1997). The ECC suggest that "it seems unlikely that such a small population can survive unless suitable protection is afforded to all remaining habitat" (p. 104). Current reports of Barking Owls at Wyuna River Reserve are unconfirmed; however the Reserve retains habitat resources essential to the Barking Owl. The Reserve may be a current, potential or transitory site of Barking Owls in the broader region.

Barking Owls are hollow dependent and have been recorded utilising hollows in Grey Box (*Eucalyptus macrocarpa*) and River Red Gum. Diet is varied but includes bats, birds, invertebrates and rabbits. Barking Owls generally occupy patches "on the edge of large forest blocks" or "wooded farmland close to forest patches" (ECC 1997, p. 104).

Tree Goanna (*Varanus varius*)
(Vulnerable in Victoria, Widespread and Uncommon in Victorian Riverina)

Two families of Tree Goanna (also referred to as a Lace Monitor) reside at Wyuna River Reserve. The Reserve provides suitable habitat of trees and fallen timber for the Goannas. Tree Goannas are considered generalist carnivorous predators and their diet consists of carrion, live mammalian kills and invertebrates as well as nestling birds, rabbits and bird and reptile eggs (Guarino, 2001). Tree Goannas range from the coast, ranges, slopes and adjacent plains of eastern and south-eastern Australia. The distribution and abundance of this species is likely to be in decline due to habitat fragmentation and lack of essential resources such as tree hollows.

3.5 Historic Land Use

3.5.1 Aboriginal history

The Kailtheban tribe of the Bangerang lived along the banks of the Goulburn River in the Wyuna area (Bossence 1963, cited in White 1998). "*Wyuna*" was adapted from "*Waioona*" meaning "clear water" - testimony to the condition of the Goulburn River at the time. The tribe fed on the fruits, yams and small animals gathered by the women while men hunted larger animals. The principle weapon was the spear, made from reeds, as the boomerang wasn't known in the area. The Kailtheban tribe also had tomahawks that they obtained through exchanges with the natives of Lancefield (Bossence 1963, cited in White 1998). They also enjoyed meals of fish from the Goulburn River, which were abundant during summer.

The tribe built canoes using bark removed from Grey Box (*Eucalyptus microcarpa*) and River Red Gum (*Eucalyptus camaldulensis*) trees. Several scar trees still remain in Wyuna River Reserve. Scar trees are protected under the *Archaeological Relics Preservation Act* 1972, and the *Commonwealth Aboriginal and Torres Strait Islander Heritage Protection Act* 1984, as are all artefacts.

3.5.2 European history

In the early days of European settlement, sheep farming was the main land use in this area. Squatters occupied huge runs on land considered to be ideal for this purpose. Edward Curr, one of the first squatters in the Goulburn-Murray area described the region as "...open, grassy, forest land, ...as yet undefiled by flock or herd, ... as green and fresh as Eden" (Curr 1883).

Attention turned to sleeper cutting in the 1860's and the River Red Gum (*Eucalyptus camaldulensis*) forests associated with the Goulburn and other Rivers were heavily exploited. Farming practices diversified and intensified over time with the expansion of irrigation. River frontage reserves such as Wyuna River Reserve were retained as navigating easements for the Goulburn River and as access points for stock and domestic water supplies. Some River Red Gum forests were also retained as an important timber source and are commonly grazed by cattle under lease arrangements (LCC 1983).

4. MANAGEMENT ISSUES

4.1 Reservation status and management authority

Wyuna River Reserve is reserved under the Forests Act 1958 with the tenure of 'Permanent Forest'. The ECC's Box-Ironbark Investigations Report (1997) recommended the whole Reserve be managed as a 'Natural Features Reserve' with the tenure of 'Bushland Reserve'. DSE recognise the change in management to Parks Victoria in their Forest Management Plan for the Mid-Murray Forest Management Area (DNRE, 2002).

4.2 Potential changes to reservation status and management authority

4.2.1 Investigation into Box-Ironbark Forests and Woodlands

The Environment Conservation Council (ECC) reviewed the reservation status of Wyuna River Reserve as part of the Box-Ironbark Forests and Woodlands Investigation. The purpose of this Investigation was to evaluate the extent, condition, values and uses of Box-Ironbark Forests and Woodlands in Victoria and to make recommendations to Government on the balanced use of these areas (Environment Conservation Council 1997).

The Victorian State Government agreed, in principle, with all of the ECC's recommendations from the Box-Ironbark Report (1997). As Wyuna River Reserve is reserved as Permanent Forest under the *Forests Act 1958*, an Act of Parliament is required to change this tenure. As the Reserve is being managed with the same techniques, rules and land manager as Bushland Reserve, it is not a priority that an Act of Parliament will be initiated and passed.

4.2.2 Native Title Application

Members of the Yorta Yorta community applied for a determination of Native Title relating to various parcels of Crown Land along the Murray, Goulburn and Ovens Rivers in 1995 (reference VG6001 of 1995). The Federal Court in December turned down this application. Members of the Yorta Yorta community appealed this decision and were dismissed by The High Court of Australia on 12 December 2002.

4.2.3 Yorta Yorta Corporation Co-operative Management Agreement

A 'Co-operative Management Agreement between Yorta Yorta Nation Aboriginal Corporation and The State of Victoria' was signed in June 2004. This agreement provides for the establishment of a committee, 'Yorta Yorta Joint Body' to advise the Minister responsible for the *Conservation, Forests and Lands Act 1987* (Vic). This agreement covers water and land management issues on public land in the Barmah Region and Goulburn Valley (refer to website www.dse.vic.gov.au for copy of a map and further details).

The objectives of this Agreement are to involve the Yorta Yorta people in decisions about the management of public land, integrating Yorta Yorta knowledge, internal decision making processes and perspective into management planning and works programming.

4.2.4 VEAC Riverine Red Gum Forests Investigation

During 2005, the Victorian Environmental Assessment Council was requested to carry out an investigation on River Red Gums of public land. The purpose of this investigation is to:

(a) Identify and evaluate the extent, condition, values, management, resources and use of riverine red gum forests and associated fauna, wetlands, floodplain ecosystems and vegetation communities; and

(b) Make recommendations relating to the conservation, protection and ecological sustainable use of public land as specified in Section 18 of the *Victorian Environmental Assessment Council Act 2001*.

During July VEAC released a Draft Proposal for public comment. The Draft Proposal recommends that Wyuna River Reserve become a National Park. This Proposal is yet to be considered by Government.

VEAC will review public submissions and submit its final report to the Minister for Water, Environment and Climate Change by 1 February 2008. The results of this study and the Government's response may require a review of this Plan. Any direct recommendations about Wyuna River Reserve will necessitate a review of this Plan.

4.3 Current Land Use

4.3.1 Recreation

No recreation-based facilities are provided at the Reserve. Camping along the Goulburn River peaks over summer and Easter with occasional camper use at other times. The main issues associated with camping include damage to sand bars adjacent to campgrounds (Figure 12) and inappropriate disposal of rubbish. Numerous informal fireplaces are evident at each campground. This contributes to site disturbance and encourages continual development of fireplaces at new sites.

The Reserve has become popular for motor bike riding, from both locals and visitors to the area. This activity is causing considerable damage in some areas of the Reserve, especially along the river frontage. After heavy rains in February 2005, some bank erosion has become evident. The riders have shown a preference for riding alongside the river and through the River Red Gum (*Eucalpytus camaldulensis*) area. Off road motor bike riding contributes to increased soil disturbance, vegetation removal and erosion. An increased presence of agency staff and signage would encourage motor bike riders to keep to designated tracks. Education also plays a key role and the Wyuna Landcare Group is actively participating in educating the community, in particular with school tours they conduct.

Figure 12.
Recreational usage has lead to damage of sensitive sandbars

Horse riding occurs at low densities, and may contribute to weed dispersal throughout the Reserve. Canoeing and fishing are popular along the Goulburn River and are not likely to impose a significant impact when conducted with care and in low numbers. A private company, River Country Adventours, conducts canoe tours along the Goulburn River and uses the Reserve for overnight stays. All use is conducted within the conditions of the permit issued by Parks

Victoria. River Country Adventours also notifies Wyuna Landcare Group and has helped them with activities at the Reserve.

4.3.1.1 Recreation facilities and opportunities

Low-impact education-based activities may serve to promote the natural values of Wyuna River Reserve throughout the community. The Wyuna Landcare Group has been proactive in organising education-based activities for the community. Annually they organise tours for local primary schools that promote the group's activities as well as Wyuna River Reserve and environmental messages. 'The Golden Oldies Day' is an annual event held by Wyuna Landcare Group to invite residents of local nursing homes to the Reserve. Events involving other community groups, such as the Broken Creek Field Naturalists guided walk (September 1988), should also be encouraged.

The current level of recreation facilities is appropriate for the Reserve and should be maintained.

4.3.1.2 Rehabilitation, community awareness and education activities

Wyuna Landcare Group has been proactive by instigating numerous enhancement and promotion activities within Wyuna River Reserve. Activities have included the installation of cattle grids, rubbish removal, fencing, weed spraying and erection of information boards. The Shepparton Irrigation Region Implementation Committee of the Goulburn Broken Catchment Management Authority has endorsed these activities and assisted by obtaining funds from the Natural Heritage Trust. Schools, community groups and interested members of the public, have attended these activities. Supervised workers from Dhurringile Prison have also been involved in revegetation activities under the "Landmate" scheme.

A highly successful community day was held in September 1997. Promotion of the Reserve and enhancement was the main focus of the day. Site enhancement activities included understorey planting, and the installation of nest boxes. Revegetation and enhancement activities on this scale foster many positive community, as well as environmental outcomes.

Figure 13.

Seven years of growth to the seedlings planted at Wyuna River Reserve, September 1997 by the Wyuna Landcare Group and community.

Five years after the community day of planting (September 2002), a local scout group conducted a survival survey for the success of the understorey species planted. The group recorded an average of 65% survival rate. This success rate can be seen visually when visiting the Reserve, especially during spring with the flowering wattles (*Acacia spp*.) Surveys undertaken in November 2002 indicate the nesting boxes have not been as successful. It appears only one box had been used.

4.3.1.3 Tracks and Access

Track quality and maintenance is an issue that will need to be addressed periodically. Upgrades are expensive and still require maintenance in the long term. Access through the Reserve is to be maintained on the current tracks. Minor maintenance will be undertaken as necessary, (eg. activities such as filling of potholes and grading). The installation of "dry weather only" signs at the entrance points to deter use of tracks in inappropriate conditions has been successful with evidence of reduced track destruction.

4.3.2 Timber extraction

The management of Wyuna River Reserve as a Bushland Reserve prohibits the extraction of timber. Prior management by NRE (as described in the Mid-Murray Forest Management Plan (NRE 2001)) prohibited timber extraction as the site was managed as a Special Protection Zone (SPZ).

Evidence of historical timber extraction is seen across the Reserve through the presence of stumps and dead stags. Historically trees that were selected to be of low timber value were ring-barked. Ring-barking was a common forestry practice to remove less productive trees to allow biomass to accumulate on the bigger trees. One benefit of this legacy is that the Reserve now has a good number of habitat trees.

4.3.2.1 Firewood collection

The removal of timber for firewood is not permitted within the Wyuna River Reserve and adjacent River Reserve. It is apparent that some firewood is collected for campfires, predominantly around the popular campsites within the Reserve. This activity results in the removal of logs and woody debris from the forest floor and the loss of habitat for a large number of ground dwelling species.

The endangered Bush Stone-curlew *(Burhinus grallarius*) is one species that relies on fallen timber for habitat and protection from predators. Signs have been erected at the entrance of the Reserve stating that firewood collection is prohibited. These signs appear to have reduced the amount of illegal firewood taken from the Reserve, as the forest floor is starting to accumulate woody debris. It is also recommended that the importance of fallen timber in natural areas be continually promoted amongst the community.

4.3.3 Apiculture

There is one apiculture licence issued for the Wyuna River Reserve. This apiculture site is usually present during summer and autumn and is located within the Grey Box (*Eucalyptus microcarpa*) and Yellow Box (*Eucalyptus melliodora*) vegetation community within the Reserve. According to the North Eastern Apiarists Association of Victoria, 85% of Victoria's honey is produced by Eucalypts. The three Eucalypt species present within Wyuna River Reserve, (ie Red Gum (*Eucalyptus camaldulensis*), Grey Box (*Eucalyptus microcarpa*) and Yellow Box), are the most valuable to the industry (E Papworth 1999, pers. com.). The presence of the apiarist site coincides with the flowering of the Eucalypt species.

There is concern that Apiculture can have a detrimental impact on ecological systems. Competition for nectar and pollen resources and disruption to natural plant-pollinator relationships may be the most significant disruptions (ECC, 1997). Honeybees can harvest up to 2km from their hives (Paton 1996, p. 46), so any ecological impacts of this nature are likely to be imposed in a large proportion of the Reserve. Feral hives can occupy tree hollows and "...there are documented accounts of feral honey bees displacing native fauna (including threatened species in some instances) from tree hollows and nest boxes" (ECC 1997, p. 214). There are no formal records of feral bees occupying artificial or natural hollows at Wyuna River Reserve. Some local landholders however, have reported several feral honeybee sites on or adjacent to their properties.

It is not anticipated that the present use of the Reserve as an apiarist site is a major management concern. However, it is recommended that the feral bee population is monitored in the future and management action taken if deemed necessary.

4.3.4 Drainage

Wyuna River Reserve forms part of the Wyuna Lower Goulburn Drain 1 sub-catchment. A private drain constructed prior to the development and implementation of the Shepparton Irrigation Region Land and Water Management Plan (SIR LWMP) enters the Reserve on the southern border. The drain is aligned on a northwest angle and enters the Goulburn River within the boundary of the Reserve. Localised erosion associated with this drain has occurred in some places and a great deal of native vegetation has grown along the drain banks. The Shepparton Irrigation Region Catchment Implementation Strategy Surface Water Management Program Five Year Review 2006/2007 Volume 3 - Maps (GBCMA, 2007) does not propose a Community Surface Drainage Scheme through the Reserve. The current drain is not heavily used by the surrounding properties. It is preferred that this minimal level of use is maintained.

Some minor erosion stabilisation works such as revegetation may be required in some locations along the existing drain.

4.3.5 Grazing

Wyuna River Reserve has been grazed by domestic stock for the most part of its recent European history. The intensity of grazing within the Reserve has varied greatly over this time. Landholders in the area remember the Reserve contained a large number of Wattles (*Acacia spp*) when they were young (R Pell 1998 pers. comm.). However during the 1980's, aerial photos indicate the Reserve was subject to intensive grazing pressure in addition to the drought conditions of the early 1980's which resulted in the loss of a large number of wattles and native ground cover. A change in licence holder in approximately 1987 resulted in a lighter grazing regime (G Hallett 1998 pers. comm.). This change in grazing regime and the 1993 flood resulted in the germination of a large number of native species including Grey Box (*Eucalyptus microcarpa*) and River Red Gum (*Eucalyptus camaldulensis*) .

In 1994 the grazing licence was cancelled by the Forest Service to allow Grey Box regeneration. The continued regeneration of native species has occurred since this reduction in grazing pressure. While domestic stock grazing may be conditionally permitted in all forest management zones, there is no current pressure to resume domestic stock grazing in Wyuna River Reserve (D Harvey 1998 pers. comm.).

In 1997 the Wyuna Landcare Group and the Forest Service of DNRE constructed cattle grids at each of the four access points into the Wyuna River Reserve. These cattle grids were installed to help prevent stray stock from entering the Reserve and to help keep stock inside the Reserve if they are re-introduced to graze for management purposes.

From 1994 through to 2007, there has been no domestic stock grazing. There has been limited grazing from visiting kangaroos.

Grazing can be a suitable management tool to reduce biomass or for weed control. Grazing is to be conducted with approval from Parks Victoria. The conditions of grazing will be determined by the required ecological management requirements. The period, frequency and intensity of grazing will be determined by the outcome and not restricted by the dry sheep equivalent (a measure of sheep when grazing in a paddock) ratings or other formal agricultural grazing categories.

Parks Victoria will determine whether grazing should be used at the Reserve and when. The timing of any grazing is important to ensure that:

- Soil is dry and not prone to pugging
- Grazing is not conducted during the flowering and seeding times of native grasses (generally between August and November)
- Targeted weeds are being removed
- There is suitable feed for the sheep/cattle as there should be no supplement feeding on the Reserve (due to risk of spreading weeds and soil damage)
- No grazing occurs during times of drought.

4.4 Vegetation management

4.4.1 Fire hazard management

Members of the Wyuna Landcare Group have expressed some level of concern about the accumulation of fire fuel loads in the absence of stock grazing within the Reserve. It is understood that the main area of concern is the spread of fire from the Reserve into neighbouring private land, particularly where there are nearby assets such as sheds and houses. It should be noted that fire is a natural process and many of the plants within the Reserve would benefit from the occasional fire.

The south-east edge of the Reserve is the most vulnerable with regard to fire management due to the proximity of houses and the large amount of spring germinated weeds in this area. It is recommended that this edge be actively managed to reduce the amount of spring germinated weeds. In the short term this may involve slashing the site and/or cool burning. In the long-term, approaches which will reduce the amount of spring weeds and promote the growth of native grasses in that area should be implemented.

The broad scale application of domestic stock grazing, within the Reserve, as a tool for managing fuel loads is problematic in many regards. The main issues relate to timing. In a fuel load management context, grazing would need to occur in spring (the peak-growing season of many of the introduced and native grasses). This may however, prove disadvantageous to many native species which flower and set seed in spring. Consequently grazing would be better early in spring, to reduce the new growth but not restrict the native seed distribution. Fuel loads and fire risk is highest in summer and autumn as the spring growth dries out. To utilise grazing as a tool to manage fire risk at this time would be pointless, as grasses in this condition would be

unpalatable to stock. In winter, grass growth is reduced and the moist soil would lead to soil pugging and compaction. Consequently grazing when the soil is wet is not an option.

There is no 'ideal' time to implement this tool across the entire Reserve for fuel reduction purposes. There are, however, small areas where introduced weeds are becoming particularly problematic. It is possible that crash grazing could be used as a tool to control and eventually eliminate these weeds. This technique will require the use of temporary fencing and will need to be implemented prior to the weeds setting seed, which corresponds with early spring. Care will need to be taken to ensure that the grazing does not cause further degradation of the site (e.g. soil pugging).

Control mosaic burning for the purpose of fuel reduction is a potential option, particularly if it can be conducted at a time of the year when it would ecologically benefit many of the native plant species. However, the timing and intensity of the burn is critical. As land managers, it will be the responsibility of Parks Victoria to conduct fuel reduction burns. Parks Victoria has well-established policies and procedures for fuel reduction burning and will use these to decide on timing and frequency of fuel reduction burns at Wyuna River Reserve.

4.4.2 Tree regeneration management

The combination of past timber harvesting practices, grazing management and seasonal weather conditions has resulted in the proliferation of River Red Gum (*Eucalyptus camaldulensis*) and Grey Box (*Eucalyptus microcarpa*) regeneration in some areas within the Reserve. In the absence of flood, fire and stock grazing, it is likely that the majority of the regeneration will survive, resulting in the vegetation structure changing from open woodland with high plant species diversity to a forest thicket with low plant diversity.

In 'natural situations' the next flood or fire would have thinned these thickets to a low number of trees. With a modified environment, thinning will not naturally occur. Some saplings will die (i.e. the weakest saplings) but most will survive. The resulting competition will cause the saplings to 'lock up'. The saplings will stay at this stage of growth until they can access more sunlight and/or water and/or nutrients. Thickets of saplings fighting for limited resources can kill surrounding older trees. It is important that the older trees around these thickets are monitored for signs of stress. Once older trees are showing signs of stress, it is important that some thinning occur on these saplings.

Figure 14.
An example of a patch of River Red Gum (*Eucalyptus camaldulensis*), at high density.

Selective thinning should only occur in consultation with Parks Victoria. Each thicket should be individually assessed, as some thicket will require thinning while others that are responding to natural stresses, such as drought, will sort themselves out.

4.4.3 Weed management

Invasion of remnant vegetation by weed species has been recognised as one of the most serious conservation issues in Australia (Carr *et al.* 1992). Weeds that invade bushland areas are termed 'environmental weeds', and may include native plants that are ecologically out-of-balance, as well as species introduced from other areas. Environmental weeds and agricultural weeds are not mutually exclusive; Blackberry (*Rubus fruticosis aggregate*), for example, can be extremely problematic in both agricultural and natural environments.

Once established in bushland areas, environmental weeds can quickly out-compete native plants and as a result, reduce the diversity of habitat resources available for native fauna. Environmental weed species, particularly those that germinate in spring and dry off quickly, also contribute to the fire hazard of an area.

Clark (1996) identified weed invasion as one of the biggest management issues in Box woodland remnants. Common weeds at Wyuna River Reserve include four regionally controlled noxious weeds. Property owners who do not eradicate or control the Regionally Controlled weeds on their land may be issued with a Land Management Notice (under the *Catchment and Land Protection Act 1994*). The noxious weeds recognised as Regionally Controlled at Wyuna River Reserve are:

- Sweet Briar (*Rosa rubiginosa*)
- Blackberry (*Rubus fruticosus aggregate*)
- Slender Thistle (*Carduus pycnocephalus*)
- Horehound (*Marrubium vulgare*)

Other common weeds at Wyuna River Reserve are:

- Phalaris (*Phalaris aquatica*)
- Wild Oats (*Avena fatua*)
- Barley Grass (*Critesion marianum*)
- Rye Grass (*Lolium* sp.)
- Great Brome (*Bromus diandrus*)
- Soft Brome (*Bromus hordeaceus*)
- Spear Thistle (*Cirsium vulgare*)

The disturbance associated with grazing by domestic stock such as seed introduction, increased soil fertility and soil compaction, is likely to have contributed to the current environmental weed problem in Wyuna River Reserve.

It is recommended that the four Regionally Controlled weeds (listed above) are the target of integrated weed control works within the Reserve. It is important that this work is conducted in a coordinated manner between Parks Victoria and the Wyuna Landcare Group.

Other weeds requiring particular attention include Phalaris and the spring germinated weeds (particularly in the south west and south east edges of the Reserve) which contribute to the fire hazard.

4.4.4 Revegetation

The Wyuna Landcare Group in association with the then Department of Natural Resources and Environment and the Goulburn Broken Catchment Management Authority have undertaken some

revegetation works within the Reserve. Most revegetation activities have occurred in disturbed areas of the Plains Woodland (previously recorded as Grey Box Grassy Woodland). The focus of the revegetation activities has been to supplement the shrub layer. Species planted include:

- Golden Wattle *(Acacia pycnantha)*
- Gold-dust Wattle *(Acacia acinacea)*
- Silver Wattle *(Acacia dealbata)*
- Sweet Bursaria *(Bursaria spinosa)*
- Weeping Pittosporum *(Pittosporum phillyreoides).*

As mentioned in Section 4.3.1.2, the success of these pl ıt Group and found to have a survival rate of 65% after fi om 2000 onwards, this is considered a great result.

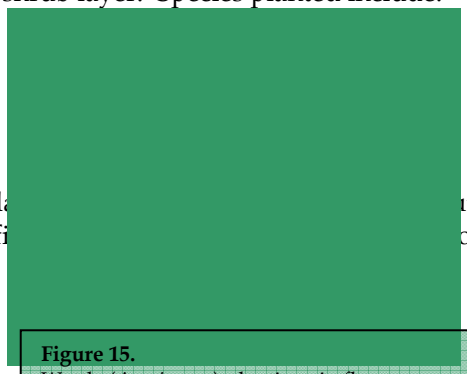

Figure 15.
Wattle (*Acacia spp.*) plantings in flower.

Natural regeneration is likely to be more effective in the absence of domestic stock grazing at Wyuna River Reserve. Since grazing has been removed from the Reserve, regeneration is occurring. New Holland Daisy (*Vittadenia spp)*, Ruby Saltbush (*Atriplex semibaccata*) and Goodenia (*Goodenia spp*) are just three of the groundcovers that are returning to the Reserve. Surveys conducted late in 2004 reveal a large number of native understorey species (Appendix Four).

Where scattered shrubs occur underneath an open Eucalypt canopy, revegetation may not be necessary - or even desirable. Plains Woodland is an EVC that is recognised for its grassy understorey. This type of forest is essential habitat for many bird species. Local bird watchers have reported a greater variety of birds present in the Plains Woodland area of Wyuna Bushland Reserve. Bush Stone-curlew (*Burhinus grallarius*) is one of the bird species that depend on Plains Woodland to nest and feed. The resident Tree Goannas (*Varanus varius*) can be found in the Plains Woodland area as well.

In 2007 there are limited areas that require revegetation. Future revegetation activities should target areas that are comparatively disturbed, (e.g. where there are little or no shrubs in areas where a scattered shrub layer would be expected). There are some areas alongside the river that could benefit from revegetation due to the disturbed nature of the site.

Any revegetation activities should use locally collected seeds. These indigenous species are best adapted to the local conditions and will avoid "genetic pollution" which can occur with the introduction of non-local seed sources.

4.4.5 Threatened flora management

The Broken Creek Field Naturalists undertook a flora survey in 1998. This survey (Appendix Three) found one rare species and one vulnerable species, Smooth Minuria (*Minuria integerrima*) and Leafy Templetonia (*Templetonia stenophylla*) respectively. It is possible that there are other threatened species present.

Periodic flora surveys should continue to be conducted to seek this information. It is recommended that universities and education institutions be encouraged to conduct monitoring and research within the Reserve as part of their curriculum.

Smooth Minuria (*Minuria integerrima*) and Leafy Templetonia (*Templetonia stenophylla*) share the same management principles as managing Riverine Grassy Woodland. Management of grazing is required to ensure that the plants are not overgrazed nor all seed eaten (thus removing regeneration capabilities). Weed maintenance around known populations is important to ensure

the current plants can survive and continue to spread. Avoiding disturbance by vehicles to prevent erosion and minimise weed invasion is recommended.

4.5 Wildlife Management

4.5.1 Feral animal management

A large number of introduced vertebrates, and an unknown number of invertebrate species have been introduced into the Murray Fans Bioregion. The ecological impact of these introduced species varies, by species, seasonal conditions and the characteristics of the invaded site.

Of the 'feral' animals recorded at the Wyuna River Reserve, the Fox (*Vulpes vulpes*) is probably the most problematic due to predation on native fauna and dispersal of weed species.

Since 1997 various fox-baiting programs have been undertaken. The fox-baiting program conducted by Parks Victoria in conjunction with NRE and local landowners during the autumns of 1997 and 1998 was very successful. This baiting program was terminated due to budget constraints, not a reflection of the results. Since 2000 Parks Victoria has coordinated an annual fox-baiting program at the Reserve. The fox-baiting program for June - July 2004 was a success with 42% of baits taken (B Wehner 2004 pers. comm.). Fox baiting was also conducted in 2005 and 2006. Kyabram Field and Game has supported the fox baiting program by undertaking Fox Hunts. Kyabram Field and Game have worked with the Wyuna Landcare Group and adjoining landholders for a number of years to assist with the removal of Foxes (*Vulpes vulpes*) and Hares (*Lepus capensis*). In August 2005 a weekend fox hunt removed 8 foxes (*Vulpes vulpes*) and 16 Hares (*Lepus capensis*) (E Phillips 2005 pers. comm.).

Local landowners and the Wyuna Landcare Group would like to organise an annual program that would see Parks Victoria bait in autumn and the Kyabram branch of Field and Game Australia to hold a shooting day in June. This type of annual program is encouraged, as it is a coordinated approach, including the areas of the Reserve, River Frontage and adjoining private land.

4.5.2 Artificial nest boxes

As a result of timber harvesting activity in the past, there is a potential lack of hollow bearing trees within the Wyuna River Reserve. The loss of hollow bearing trees has been listed as a threatening process under the *Flora and Fauna Guarantee Act* 1988, and is recognised as an important causal factor in the decline of many hollow-dependent species. Fifty artificial hollows were distributed throughout Wyuna River Reserve in late 1997 by members of the Wyuna Landcare Group for the purpose of increasing the number of available hollows in the Reserve (Figure 15). These hollows are of a similar construction but have different entrance dimensions, designed to target different hollow dependent species.

Figure 15.
Nearly 50 artificial hollows have been placed throughout Wyuna River Reserve.

Observation suggests that these artificial hollows are not being used as well as they could, and it is important that this situation is investigated. Artificial hollows need to be located strategically and match the ecological requirements of the target species. Consideration needs to be made about the relative location of other essential resources,

for example, foraging substrates and the current location(s) of hollows utilised by the target species.

Characteristics of home range requirements, movements of species in an area and the number of hollows used by each species within its home range (individual and population) would also be worth investigating. The size, shape and insulation characteristics of the artificial hollows may also be important as are factors such as aspect (direction the hollow entrance is facing), height off the ground and position on the tree. These factors will influence the suitability of hollows for particular species. Research and monitoring of these artificial hollows is currently beyond the resources of Parks Victoria and the Goulburn Broken Catchment Management Authority. It is highly recommended that universities and other educational institutions be encouraged to undertake such activities.

4.5.3 Threatened wildlife management

Three endangered and one rare fauna species have been recorded within the Wyuna River Reserve. It is possible that there are other species present that are also on the rare or threatened list. To date there has not been an extensive fauna survey of the Wyuna River Reserve and as a consequence we do not have any specific details regarding the species present, their population numbers, distribution or habitat requirements. These details are extremely important with regard to the long-term management of the Wyuna River Reserve. Unfortunately this type of research and information gathering is beyond the resources of Parks Victoria and the Goulburn Broken Catchment Management Authority. It is therefore recommended that universities and education institutions be encouraged to conduct research within the Wyuna River Reserve. The information obtained would then be required to further refine this Plan and the management actions.

4.6 Surrounding Land use

The main land use in the surrounding landscape is dairy farming, most of which is irrigated. Reasonable remnant tree cover exists on the surrounding private land adjacent to the Goulburn River. Remnant vegetation on surrounding private land serves to enhance the importance of Wyuna River Reserve as a biological refuge. Patches and strips of remnant vegetation in the vicinity of the Reserve are vital as 'stepping stones' for species moving in and out of the reserve and into surrounding areas.

Best management practices for remnant vegetation conservation are employed in the Reserve and should be employed in the surrounding landscape for optimum nature conservation outcomes to be achieved. Adjoining landowners are encouraged to implement habitat enhancement works on their properties. Since 1998 (with the initiation of the draft Environmental Management Plan), neighbours have increased the native vegetation on their properties with the addition of shelterbelts. The neighbour adjoining the western boundary has a large section of River Red Gum (*Eucalyptus camaldulensis*) regeneration resulting from the 1993 flood, linking the river frontage and Reserve with a forest remnant. The Wyuna Landcare Group continues to do a great job of encouraging and implementing shelterbelts across their district, both on private property and along roadside reserves.

Incentives may be available for the protection and enhancement of remnant vegetation and wetlands through the Environmental Management Program (DPI) and the Goulburn Broken

Catchment Management Authority. The incentive scheme does not use standard rates for payment of works, but relies on calculating a score based on criteria, including the amount of revegetation, width of corridors, and area of remnant vegetation to be protected and enhanced. This method ensures that landholders that are planting long, wide corridors, which have positive outcomes for the environment and consequently will score higher and receive a greater incentive payment for their efforts. Contact DPI Tatura for further information (03) 5833 5222.

4.7 Monitoring the effectiveness of management programs

Monitoring needs to be conducted throughout the life of this Environmental Management Plan, at which stage, patterns can be evaluated and management strategies reviewed. It is beyond the scope of this Plan to set specific criteria for such a monitoring program. These would need to be developed in conjunction with a regional monitoring program that investigates specific attributes of biodiversity performance. A monitoring program should:

- Define objectives,
- Select suitable methods (considering application and constraints),
- Develop monitoring design (including an 'in-built' mechanism to identify the threshold where management intervention should occur), and
- Manage data, interpret results and report findings.

In the interim, it is recommended that the following attributes are considered for inclusion in a monitoring program:

- Stream bank erosion,
- Weed invasion pattern and impacts,
- Weed control; effectiveness of strategies,
- Rare and threatened species; population status and distribution,
- Revegetation programs; success; spatial arrangement, provision of habitat, faunal use of revegetation, etc,
- Use of artificial hollows,
- Vegetation recovery after cessation of grazing,
- Local water table levels,
- Fuel loads and fuel reduction techniques.

Two small research projects have been conducted at Wyuna River Reserve. The first project collated historical information about the Reserve as well as conducting basic flora and fauna information (White 1998). The second project (Garth & Smith, 2004) expanded the flora survey. The flora survey was conducted on 200 metre gridlines. The species present and location of species types were recorded. They were also able to produce a map showing major weed infestation areas and weed type. A fauna survey was conducted in a much shorter time frame and not as scientifically rigorous in design.

These two projects have assisted in increasing the knowledge of flora in the Wyuna River Reserve. The flora survey was conducted 5 years after the initial flora survey, which assists in providing information on the Reserve within a time scale.

5. MANAGEMENT RECOMMENDATIONS

Management recommendations for Wyuna River Reserve are presented on the basis of priority. The intention of this Environmental Management Plan is to provide a tool for managers to identify new priorities and opportunities for the conservation and management of the values of Wyuna River Reserve, and to support application for funding to implement the Plan. It is understood that the issues identified in this Plan may not align with the regional priorities of individual organisations. It is acknowledged that the responsible organisation will address the individual actions as opportunities and funds become available.

A description of required management actions, estimated costs and the agency or group responsible for implementing each action are included. Where multiple groups are listed for responsibility, the first group listed is responsible with the other groups maintaining supporting roles and extra assistance as required. It is recognised that the implementation of works is directly related to the funds available to the relevant responsible body.

High	Actions of high priority should be implemented as soon as possible and certainly within the first year of the life of this Plan. These management actions may or may not require the most resources and commitment.
On-going	On-going actions to be implemented over the life of the Plan. Unless otherwise specified, on-going actions are to be considered the same priority as high priority actions.
Medium	Actions of medium priority should also be implemented as soon as possible, but focus should be turned to these actions after high priority actions have been addressed.
Low	Actions of low priority should be considered after high and medium priority actions have been addressed.
As needed	Management issues or opportunities that may need to be addressed on an infrequent occasion or when a situation or opportunity develops. To be determined by the appropriate management authority in consultation with other stakeholders, including Wyuna Landcare Group and surrounding Landholders.

This Environmental Management Plan will need to be revised and updated, as new information, techniques and/or funding become available.

5.1 Potential changes to reservation status and management authority

Management actions pertaining to current and future land use issues relate to varying degrees, on the outcome of the VEAC Red Gum Froests Investigation into the reservation status of the Reserve. Some land use issues may need to be reviewed over time, as further information becomes available.

5.1.1 Reserve status and responsible management authority

Action	Estimated cost based on 2006 prices	Responsibility	Priority
A submission was sent by the Wyuna LCG, FS and SIR IC to the Draft Mid-Murray Forest Management Plan committee requesting that the entire Wyuna River Reserve be determined a Special Protection Zone.	No capital cost involved	Forests Service, Wyuna Landcare Group, SIR IC	Completed January 2001.
Review the reservation status of the Reserve after the ministerial recommendations from the ECC Box-Ironbark investigation are finalised and the Native Title application has been determined.	No capital cost involved.	FS, WLG, SIR IC	Completed. Results of reservation status are discussed in 4.2.
Any changes to reservation status or management responsibility (e.g. VEAC recommendation) will require the responsible management authority to assess the management objectives and recommendations in this Plan and make appropriate changes in consultation with the relevant stakeholders listed in Appendix 2.	No capital cost involved.	To be determined.	As required.

5.2 Current land Use

5.2.1 Recreation

5.2.1.1 Recreation facilities and opportunities

Action	Estimated cost based on 2006 prices	Responsibility	Priority
The Wyuna Landcare Group is proactive in using the Reserve to promote and educate the wider community about the importance of biodiversity and natural areas. Activities to be encouraged include bush walks, spotlight tours, revegetation days and ethical seed collection activities.	$250/year	Wyuna Landcare Group in consultation with Parks Victoria.	On-going.
Education days specifically for the Wyuna Landcare Group are required to help members recognise key plant and animal species within the Reserve. The Group will then be able to confidently host community education activities within the Reserve.	No capital cost required	Wyuna Landcare Group, SIR IC	On-going
The Wyuna Landcare Group has organised funding for an annual education day for school children. The education days promote Wyuna River Reserve as well as exhibit Landcare projects in the area and the importance of the linkages.	Donation by Shire of Campaspe	Wyuna Landcare Group	High
Potential exists to promote low impact education based activities within the Reserve and along the Goulburn River. Information/education shelters should be erected at appropriate places within the Reserve and possibly at McCoys Bridge.	$2,000	Wyuna Landcare Group, SIR IC, in consultation with DPI.	Education activities are on-going; information shelters installed.
Camping is popular over summer and Easter holidays. Occasional patrols to promote good camping behaviour are beneficial. Camping facilities are to remain undeveloped.	Part of their operational budget.	Parks Victoria	On-going

5.2.1.2 Tracks and Access

Action	Estimated cost based on 2006 prices	Responsibility	Priority
Tracks should be maintained at existing levels to provide access for fire control, maintenance and recreation.	Varies according to amount of work required	Parks Victoria	On-going
If deemed necessary in the future place "dry weather only" signs at the four access points to discourage use of tracks in wet conditions.	$750	Parks Victoria	Completed

5.2.2 Timber extraction

5.2.2.1 Firewood collection

Action	Estimated cost based on 2006 prices	Responsibility	Priority
Signage deterring firewood collection to be installed at all access points.	$500	SIR IC	Completed
Increase community awareness programs about the importance of fallen timber for habitat.	No capital costs required	Parks Victoria Wyuna Landcare Group, SIR IC	On-going

5.2.3 Apiculture

Action	Estimated cost based on 2006 prices	Responsibility	Priority
The use of Wyuna River Reserve as an Apiary site may need to be reviewed if the reservation status of Wyuna River Reserve changes.	No capital costs required	Parks Victoria	As required

5.2.4 Drainage

Action	Estimated cost based on 2006 prices	Responsibility	Priority
Maintain low level use of existing drain through the Reserve.	No capital cost required	SIR IC	Medium
There are small sections where erosion is occurring as a result of the existing drain. Erosion control works such as revegetation is recommended.	$500	SIR IC, Wyuna Landcare Group, Parks Victoria	Medium (regeneration is occurring)

5.2.5 Grazing

Action	Estimated cost based on 2006 prices	Responsibility	Priority
The re-issue of an annual grazing licence for the Wyuna River Reserve is not recommended. However grazing can be permitted on a short term basis for ecological or fuel reduction purposes.	No capital costs required	Parks Victoria	As required
Fence off the remainder of King Paddy Rd to enable the movement of stock.	$4,000	SIR IC, WLG in consultation with the Forest Services.	Completed

5.3 Vegetation Management

5.3.1 Fire hazard management

Action	Estimated cost based on 2006 prices	Responsibility	Priority
It is recommended that fuel reduction techniques such as cool burns or weed eradication measures be adopted near the boundary of the Reserve in the south west and south east corners where private land assets such as houses and sheds are potentially in danger of fires escaping from the Reserve.	Part of annual works program	Parks Victoria	High
Fuel reduction techniques across the entire Reserve should only be used if deemed appropriate based on monitoring data. Cattle grazing should be excluded however short term seasonal grazing remains an option to manage fuel loads in exceptional circumstances.	Part of annual works program	Parks Victoria	Low
Alternative fuel management techniques, such as the	$0 -	Parks Victoria	High

spraying of pasture grasses should be investigated and used where appropriate.	$2000/year (varies)		

5.3.2 Tree regeneration management

Action	Estimated cost based on 2006 prices	Responsibility	Priority
The density of River Red Gum and Grey Box regeneration requires assessment and further monitoring. It is important that these thickets do not cause the death of mature trees nor reduce the biodiversity of the area. Fire management practices and grazing actions may assist with the management of tree regeneration.	Part of Parks Victoria management activities.	Parks Victoria	High and on-going
Pending the result of the assessment, active management of the regeneration may be required for ecological purposes. Selective poisoning of some regeneration maybe required to maintain the open woodland structure.	$1500	Parks Victoria	High

5.3.3 Weed Management

Action	Estimated cost based on 2006 prices	Responsibility	Priority
Noxious weeds (Regionally Controlled) within the reserve to be removed Blackberry *(Rubus fruticosus)*, Sweet Briar *(Rosa rubiginosa)*, Slender Thistle (*Carduus pycnocephalus*) and Horehound (*Marrubium vulgare*).	$500/year	Parks Victoria	High and on-going
Weeds requiring long-term management Phalaris (*Phalaris aquatica*), Wild Oats, (*Avena fatua*), Barley Grass (*Critesion marianum*), Rye Grass (*Lolium* sp.) Great Brome (*Bromus diandrus*), Soft Brome (*Bromus hordeaceus*) and Spear Thistle (*Cirsium vulgare*).	To be included in annual works program	Parks Victoria	Medium and on-going

5.3.4 Revegetation

Action	Estimated cost based on 2006 prices	Responsibility	Priority
Ethical seed collection for the purpose of revegetation within and immediately surrounding the Reserve is encouraged.	$200 per year includes labour and material costs	Parks Victoria, Wyuna Landcare Group (supported by SIR IC)	As required
Appropriate species should be planted in the appropriate locations. Soil disturbance must be minimised as an	Seedlings cost $2.50 ea	Wyuna Landcare	As required

essential component of revegetation activities.	plus costs of cartons $2 ea	Group (supported by SIR IC)	
The appropriateness of direct seeding should be investigated, especially around the Reserve perimeter and in the more disturbed areas.	2ha @ $800/ha Total $1600	Parks Victoria, supported by Wyuna Landcare Group, supported by SIR IC	As required

5.4 Wildlife Management

5.4.1 Feral Animal management

Action	**Estimated cost based on 2006 prices**	**Responsibility**	**Priority**
Apply for funding to undertake fox control programs on private land surrounding Wyuna River Reserve.	$500/year	Wyuna Landcare Group, DPI Pest Plant and Animal.	On-going
Continue to include Wyuna River Reserve in Parks Victoria's annual fox-baiting program.	Part of annual fox-baiting program	Parks Victoria	On-going
Apply for funding to control other pest species such as hares, rabbits if required.	$500/year	Parks Victoria, Wyuna Landcare Group	As required

5.5 Surrounding Land Use

Action	**Estimated cost based on 2006 prices**	**Responsibility**	**Priority**
Encourage habitat protection and improvement on private land in the vicinity of Wyuna River Reserve. Advice and financial assistance is available through the Environmental Management Program at DPI Tatura to eligible landholders.	Up to $5.00/metre fencing, $2.50 per seedling and $800/ ha direct seeding	Wyuna Landcare Group and EMP (DPI)	As required

5.6 Monitoring and research

Action	Estimated cost based on 2006 prices	Responsibility	Priority
Monitor the success of revegetation activities implemented within the reserve, using yearly photo points.	$30/year	Wyuna Landcare Group + EMP (DPI)	On-going
Monitor and assess fuel load characteristics.	Part of works program	Parks Victroia	On-going
Monitor populations of feral animals especially Foxes (*Vulpes vulpes*), Bees (*Apis mellifera*), Hares (*Lepus capensis*) and Rabbits (*Oryctolagus cuniculus*) and determine whether additional control programs are required.	Part of works program	Parks Victoria	On-going
Monitor population of Eastern Grey Kangaroo (*Macropus giganteus*) within the Wyuna River Reserve. Control programs may be required in the future.	Part of works program	Parks Victoria with support from Wyuna Landcare Group	On-going

5.6.1 Ecological research and surveys

To achieve best practice environmental management outcomes for the Wyuna River Reserve, an adequate understanding of the ecology and conservation status of resident, seasonal and nomadic species is required. The co-ordination or implementation of such programs however, is beyond the scope of Parks Victoria and the Wyuna Landcare Group. Many of the programs outlined below would make ideal research projects for university students of Natural Resource Management.

5.6.2 Co-ordination of Ecological Surveys and Research

Action	Responsibility	Priority
Send letters to all potential universities and TAFE Colleges informing them of the potential research opportunities that exist in the SIR.	EMP (DPI) with support from Wyuna Landcare Group and Parks Victoria	On-going. Some projects have been completed.

Studies on the fauna composition of Wyuna River Reserve

- Consolidate available data on the fauna of Wyuna River Reserve from Wyuna Landcare Group, local residents, community and interest groups, universities and government agencies.

Rare and threatened fauna management

- Determine distribution and abundance of rare and threatened fauna.
- Determine ecological requirements of rare and threatened fauna (will need to be assessed in association with rare and threatened plant species management).

Artificial hollows

- Location of hollows should be mapped and all hollows should be numbered.
- Investigate how well matched the location of artificial hollows is to other essential resources, e.g. hollows for Squirrel Gliders, have they been placed strategically in terms of the spatial

arrangement and distribution of other resources (e.g. feed trees), home range and territorial considerations.
- Investigate fauna use of artificial and natural hollows.
- Monitor use of hollows on a seasonal basis as part of a long-term monitoring program.

Vegetation description and mapping
- Determine the composition, character and distribution of ecological vegetation classes in Wyuna River Reserve.
- Map the distribution of Ecological Vegetation Classes in the Reserve.
- Rare and threatened plant species management.
- Determine the population status of rare and threatened plant taxa present at Wyuna River Reserve.
- Determine the ecological requirements of rare and threatened plant taxa and recommend appropriate management approaches.
- Ensure rare and threatened plant species management is consistent with habitat management objectives, especially for rare and threatened fauna.

Fine fuel load and fire risk management
- Long-term study of fuel load accumulation characteristics and fire risk assessment.

5.7 Summary of estimated funding requirements

Descriptions of the estimated funding requirements needed by the responsible body to successfully implement this Plan are summarised below. The summary includes all recommended, high, medium and low priorities and also indicates the expenditure required to achieve the recommendations. Prioritising expenditure based on the High, Medium, Low and on-going criteria will assist with the efficient use of funds.

5.7.1 Parks Victoria

CAPITAL COSTS	FUNDING OPPORTUNITIES	ESTIMATED $
Installation of "Dry weather only" signs		$750
Management of dense River Red Gum and Grey Box regeneration		$1500
Total Capital Costs		**$2 250**

ANNUAL MAINTENANCE COST	FUNDING OPPORTUNITIES	ESTIMATED $
Occasional patrols of campsites	Part of annual budget	1 workday a year.
Track maintenance	Provided for fire control, part of annual works program	Varies due to work required. Approx. 2 work days/ year.
Fuel reduction	Part of annual works program	2 work days a year
Weed Control	In-kind support from WLG	$1000/year
Feral Animal Management	Part of annual works program, support from Wyuna Landcare Group	$500/year
Fox Control	In-kind support from WLG	$3000/year
Total annual maintenance cost		**$4 500/year + 5 work days/year**

5.7.2 Wyuna Landcare Group

CAPITAL COSTS	FUNDING OPPORTUNITIES	ESTIMATED $ Spent
Installation of Information Shelter + 'No Firewood Collection' signage (completed)	Funding was obtained and these shelters have been installed.	$2000
Erosion control works – Revegetation	GB CMA.	$500
Thinning of regeneration	Support from DPI EMP	$500
Revegetation	GB CMA	$500
Direct Seeding	Volunteer Group Grants from Parks Victoria or Landcare Grants	$1700
Total Capital Cost		$3 200 ($2000)

ANNUAL MAINTENANCE COST	FUNDING OPPORTUNITIES	ESTIMATED $
Community education (including importance of biodiversity, revegetation days and ethical seed collection)	In-kind support from Parks Victoria, GB CMA and DPI.	$250/ year (including contribution of Wyuna Landcare Group efforts).
Education Day for local school children	Donation by Shire of Campaspe (through funding for Wyuna Landcare Group).	Donation by Shire of Campaspe (through funding for Wyuna Landcare Group).
Interpretive activities	In-kind support for EMP and Forest Services.	$500
Fox control on private land	Funding through the Good Neighbour program.	$500
Total Cost		$1 250 + Shire of Campaspe donation

5.7.3 Shepparton Irrigation Region Implementation Committee (GB CMA) and Environmental Management Program (DPI).

CAPITAL COSTS	FUNDING OPPORTUNITIES	ESTIMATED $ Spent
Fencing (Completed)		$4000
Drainage - SWMS		
Total cost		**$ $4000**

ANNUAL MAINTENANCE COST	FUNDING OPPORTUNITIES	ESTIMATED $
Annual Photo points		$30/year
Total cost		**$30/year**

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7. APPENDICES

7.1 Appendix One: Activities permitted in Forest Service (DNRE) Management Zones

(DNRE 1998, p.12)

Activity	**SPZ**	**SMZ**	**GMZ**
Sawlog and Sleeper production	No	Cond.	Yes
Firewood, posts, poles	No	Cond.	Yes
Regrowth thinning	No	Cond.	Yes
Stock grazing	Cond.	Cond.	Cond.
Apiculture	Cond.	Cond.	Yes
Extractive Industries	No	Cond.	Yes
Fuel reduction burning	Cond.	Cond.	Cond.
Recreation	Cond.	Yes	Yes
Road Construction	Cond.	Cond.	Yes

Key:

Yes Permitted under standard conditions

Cond. (Conditional) permitted with additional conditions, or to the extent that use does not conflict with identified values

No Not permitted.

Note: SPZ = Special Protection Zone
SMZ = Special Management Zone
GMZ = General Management Zone

7.2 Appendix Two: Community Consultation

List of agencies, groups and individuals invited to participate in the planning process for the Wyuna River Reserve Management Plan

- Wyuna Landcare Group
- Landholders with properties adjacent to Wyuna River Reserve
- Licensed bee keepers
- North-eastern Apiarists Association Victoria
- SIR Implementation Committee of the Goulburn Broken Catchment Management Authority
- Department of Natural Resources and Environment (now DPI and DSE):
  Forests Service
  Catchment and Agriculture Services
  Flora and Fauna
  Fire Management
- Dookie College
- Parks Victoria
- Goulburn Murray Landcare Network
- Goulburn Valley Environment Group
- Broken Creek Field Naturalists Club
- Lower Goulburn Waterways
- Goulburn Broken Catchment Management Authority
- Goulburn Broken Catchment Bushcare Facilitator
- Rumbulara Aboriginal Co-operative
- Environmental Conservation Council
- Grassy Ecosystems Project (Victorian National Parks Association)
- City of Greater Shepparton Shire
- Shire of Campaspe
- Yorta Yorta Nations

7.3 Appendix Three: List of Vascular Plant species in Wyuna River Reserve.

Compiled by the Broken Creek Field Naturalists Club (September, 1998).

The Broken Creek Field Naturalists Club compiled this list in September 1998. The information was collected over a short period and the list is therefore not intended to be exhaustive. Detailed floristic surveys are recommended as a potential project in the 'Ecological Surveys and Research' section of the Draft Plan. Species names have been updated due to name changes where possible.

* Denotes introduced species

MONOCOTYLEDONS

Cyperaceae		*Carex tereticaulis*	Poong'ort
Iridaceae	*	*Gynandriris setifolia*	Thread Iris
	*	*Romula rosea*	Onion-grass
Juncaceae		*Juncus spp.*	Rush
Lilliaceae		*Arthropodium minus*	Small Vanilla-lily
		Bulbine bulbosa	Bulbine Lily
		Dianella longifolia	Pale Flax-lily
		Dianella revoluta	Black-anther Flax-lily
Poaceae	*	*Avena fatua*	Wild Oats
	*	*Bromus diandrus*	Great Brome
	*	*Bromus hordeaceus*	Soft Brome
	*	*Critesion marianum*	Barley Grass
		Danthonia spp.	Wallaby Grass
		Elymus scaber	Common Wheat-grass
		Homopholis proluta	Rigid Panic
	*	*Lolium spp.*	Rye Grass
		Paspalidium jubiflorum	Warrego Summer-grass
	*	*Paspalum dilatatum*	Paspalum
	*	*Phalaris aquatica*	Toowoomba Canary-grass
		Poa fordeana	Forde Poa
		Poa labillardieri	Tussock Grass
		Poa sieberiana sieberiana	Tussock Grass
		Austrostipa elegantissima	Feather Spear-grass
		Austrostipa spp.	Spear-grass
		Themeda triandra	Kangaroo Grass

DICOTYLEDONS

Apiaceae		*Daucus glochidiatus*	Native Carrot
		Eryngium ovinum	Blue Devil
Asteraceae	*	*Arctotheca calendula*	Capeweed
	*	*Aster subulatus*	Aster-weed
		Brachyscome basaltica	Swamp Daisy
		Bracteantha viscosa	Sticky Everlasting
		Calotis anthemoides	Cut-leaf Burr-daisy
	*	*Carduus pycnocephalus*	Slender Thistle
		Cassinia arcuata	Drooping Cassinia
	*	*Cichorium intybus*	Chickory
	*	*Cirsium vulgare*	Spear Thistle
		Cotula australis	Common Cotula
	*	*Cotula bipinnata*	Ferny Cotula
		Eclipta platyglossa	Yellow Twin-heads
	*	*Erigeron karvinskianus*	Fleabane
		Euchiton sphaericus	Japanese Cudweed
Asteraceae	*	*Helminthotheca echioides*	Ox-tongue
	*	*Hypochoeris glabra*	Smooth Cat's-ear
	*	*Hypochoeris radicata*	Cat's-ear
		Ixolena sp.	Woolly Plover-daisy
	*	*Lactuca saligna*	Wild Lettuce
	*	*Lactuca serriola*	Prickly Lettuce
		Minuria integerrima	Smooth Minuria
	*	*Scorzonera laciniata*	Scorzonera
		Senecio quadridentatus	Cotton Fireweed
		Solenogyne dominii	Solenogyne
	*	*Sonchus oleraceus*	Sow Thistle
		Vittadinia cuneata	New Holland Daisy
		Vittadinia gracilis	Woolly New Holland Daisy
Brassicaceae	*	*Cardaria draba*	Hoary Cress
		Lepidium spp.	Peppercress
Callitrichaceae		*Callitriche sonderi*	Starwort
Campanulaceae		*Wahlenbergia fluminalis*	River Bluebell
		Wahlenbergia spp.	Sprawling Bluebell
Caryophyllaceae	*	*Spergularia rubra*	Red Sand Spurry
		Stellaria angustifolia	Swamp Starwort
	*	*Stellaria media*	Chickweed
Chenopodiaceae		*Atriplex semibaccata*	Berry Saltbush
		Einadia hastata	Saloop

		Einadia nutans	Climbing Saltbush
Convolvulaceae		*Convulvulus erubescens*	Australian Bindweed (narrow and broad leaf forms)
Euphorbiaceae		*Chamaescyce drummondii*	Caustic Weed
Fabaceae		*Dillwynia cinerascens*	Grey Parrot-pea
		Eutaxia microphylla	Common Eutaxia
		Glycine tabacina	Variable Glycine
		Lotus australis	Australian Trefoil
		Templetonia stenophylla	Leafy Templetonia
	*	*Trifolium angustifolium*	Narrow-leaf Clover
	*	*Trifolium arvense*	Hare's-foot Clover
	*	*Trifolium campestre*	Hop Clover
Geraniaceae	*	*Erodium cicutarium*	Common Heron's-bill
		Geranium retrorsum	Common Cranesbill
		Geranium solanderi	Australian Cranesbill
Goodeniaceae		*Goodenia gracilis*	Slender Goodenia
		Goodenia pinnatifida	Cut-leaf Goodenia
Haloragaceae		*Haloragis spp.*	Raspwort
Lamiaceae	*	*Marrubium vulgare*	Horehound
		Mentha spp.	Native Mint
		Teucrium racemosum	Grey Germander
Lobeliaceae		*Lobelia pratioides*	Poison Lobelia
		Pratia concolor	Poison Pratia
Malvaceae		*Sida corrugata*	Corrugated Sida
Mimosaceae		*Acacia acinacea*	Gold-dust Wattle
		Acacia dealbata	Silver Wattle
		Acacia montana	Mallee Wattle
		Acacia pycnantha	Golden Wattle
Myrtaceae		*Eucalyptus camaldulensis*	River Red Gum
		Eucalyptus melliodora	Yellow Box
		Eucalyptus mircocarpa	Grey Box
Onagraceae		*Epilobium billardierianum*	Willow-herb
Oxalidaceae		*Oxalis perennans*	Perennial Wood-sorrel

Pittosporaceae		*Pittosporum phylliraeoides*	Weeping Pittosporum
Plantaginaceae	*	*Plantago lanceolata*	Ribgrass
		Plantago varia	Variable Plantain
Polygonaceae		*Rumex brownii*	Slender Dock
Primulaceae	*	*Anagallis arvensis*	Pimpernal
Ranunculaceae		*Ranunculus inundatus*	River Buttercup
Rosaceae		*Acaena ovina*	Australian Sheeps-burr
	*	*Rosa rubiginosa*	Sweet Briar Rose
Rubiaceae		*Asperula conferta*	Common Woodruff
Santalaceae		*Exocarpos strictus*	Pale-fruit Ballart
Sapindaceae		*Dodonaea viscosa ssp cuneata*	Wedge-leaf Hopbush
Stackhousiaceae		*Stackhousia monogyna*	Creamy Candles
Thymelaeaceae		*Pimelia curviflora*	Curved Rice-flower
Violaceae		*Viola betonicifolia*	Showy Violet

7.4 Appendix Four: Additional Flora Species

Garth and Smith (2004) survey added the following flora species located at Wyuna River Reserve.

Common Name	Scientific Name
*White Clover	*Trifolium repens*
*Red Flowered Mellow	*Modiola caroliniana*
*Fennel	*Foeniculum vulgare*
*Curled Dock	*Rumex crispus*
*Panic Veldt Grass	*Ehrharta erecta*
*Prickly Pear	*Opuntia robusta*
Chinese scrub	*Cassinia arcuata*
Sweet bursaria	*Bursaria spinosa*
Tall Bluebells	*Wahlenbergia stricta*
Billy buttons or Drumsticks	*Pycnosorus globosus*
Box Mistletoe	*Amyema miquelii*
Ridge Sida	*Sida cunninghamii*
Lichen	*Cladia sullivani*
Moss	
Yellowish Bluebell	*Wahlenbergia lateola*
Clustered Everlasting	*Chrysocephalum semipapposum*
Cumbungi	*Typha spp*
Slender Monkey Flower	*Mimulus gracilis)*
Nodding Chocolate Lily	*Arthropodium fimbriatum)*
Jersey Cudweed	*Gnaphalium spicatum)*

* denotes introduced species.

7.5 Appendix Five: List of birds recorded at Wyuna River Reserve

This bird list was compiled from 5 transects in the Box grassy woodland and 1 transect in the River Red Gum forest at Wyuna River Reserve. Each transect was surveyed twice per season for a period of three years by Paul Ryan, Deakin University (1997 – 1999).
* denotes introduced species.

Common Name	Scientific name	Habitat preference	Conservation status
*House Sparrow	*Passer domesticus*	Generalist	
*European Goldfinch	*Carduelis carduelis*	Generalist	
*Common Blackbird	*Turdus merula*	Generalist	
*Common Starling	*Sturnus vulgaris*	Generalist	
*Skylark	*Alauda arvensis*	Generalist	
Pacific Black Duck	*Anas superciliosa*	Aquatic	
Grey Teal	*Anus gracilis*	Aquatic	
Australian White Ibis	*Threskiornis molucca*	Aquatic	
White-faced Heron	*Egretta novaehollandiae*	Aquatic	
White-necked Heron	*Ardea pacifica*	Aquatic	
Australian Wood Duck	*Chenonetta jubata*	Aquatic	
Willie Wagtail	*Rhipidura leucophrys*	Generalist	
Crested Pigeon	*Ocyphaps lophotes*	Generalist	
Welcome Swallow	*Hirundo neoxena*	Generalist	
Superb Fairy-Wren	*Malurus cyaneus*	Generalist	
White-backed Swallow	*Cheramoeca leucosternus*	Generalist	
Australia Raven	*Corvus coronoides*	Generalist	
Silvereye	*Zosterops lateralis*	Generalist	
Zebra Finch	*Taeniopygia guttata*	Open Country	
Little Grassbird	*Megalurus gramineus*	Open Country	
Golden-headed Cisticola	*Cisticola exilis*	Open Country	
White-fronted Chat	*Epthianura albifrons*	Open Country	
Singing Bushlark	*Mirafra javanica*	Open Country	
Masked Lapwing	*Vanellus miles*	Open Country	
Brown Songlark	*Cincloramphus cruralis*	Open Country	
Stubble Quail	*Coturnix pectoralis*	Open Country	
Restless Flycatcher	*Myiagra inquieta*	Remnant	
Rainbow Bee-eater	*Merops ornatus*	Remnant	
Rufous Songlark	*Cincloramphus mathewsi*	Remnant	
Noisy Miner	*Manorina melanocephala*	Remnant	
Australian Magpie	*Gymnorhina tibicen*	Remnant	
Galah	*Cacatua roseicapilla*	Remnant	
Laughing Kookaburra	*Dacelo novaeguineae*	Remnant	
Red-rumped Parrot	*Psephotus haematonotus*	Remnant	
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*	Remnant	
Brown Goshawk	*Accipiter fasciatus*	Remnant	
Magpie-lark	*Grallina cyanoleuca*	Remnant	
Eastern Rosella	*Platycercus eximius*	Remnant	
Black-faced Cuckoo-	*Coracina novaehollandiae*	Remnant	

shrike		
Red Wattlebird	*Anthochaera carunculata*	Remnant
Southern Boobook	*Ninox novaeseelandiae*	Remnant
Brown Falcon	*Falco berigora*	Remnant
Fairy Martin	*Hirundo ariel*	Remnant
Sulphur-crested Cockatoo	*Cacatua galerita*	Remnant
Pied Currawong	*Strepera graculina*	Remnant
Tawny Frogmouth	*Podargus strigoides*	Remnant
Tree Martin	*Hirundo nigricans*	Remnant
Flame Robin	*Petroica phoenicea*	Remnant
Little Corella	*Cacatua sanguinea*	Remnant
Black-shouldered Kite	*Elanus axillaris*	Remnant
Cockatiel	*Nymphicus hollandicus*	Remnant
Long-billed Corella	*Cacatua tenuirostris*	Remnant
Budgerigar	*Melopsittacus undulatus*	Remnant
Collared Sparrowhawk	*Accipiter cirrhocephalus*	Remnant
Australian Hobby	*Falco longipennis*	Remnant
White-plumed Honeyeater	*Lichenostomus penicillatus*	Woodland
Striated Pardalote	*Pardalotus striatus*	Woodland
Yellow Thornbill	*Acanthiza nana*	Woodland
Grey Fantail	*Rhipidura fuliginosa*	Woodland
Brown-headed Honeyeater	*Melithreptus brevirostris*	Woodland
Crimson Rosella	*Platycercus elegans*	Woodland
Pied Butcherbird	*Cracticus nigrogularis*	Woodland
White-winged Chough	*Corcorax melanorhamphos*	Woodland
Fuscous Honeyeater	*Lichenostomus fuscus*	Woodland
Little Lorikeet	*Glossopsitta pusilla*	Woodland
Musk Lorikeet	*Glossopsitta concinna*	Woodland
Crested Shrike-tit	*Falcunculus frontatus*	Woodland
Weebill	*Smicrornis brevirostris*	Woodland
Brown Treecreeper	*Climacteris picumnus*	Woodland
White-throated Treecreeper	*Cormabates leucophaeus*	Woodland
Mistletoebird	*Dicaeum hirundinaceum*	Woodland
Rufous Whistler	*Pachycephala rufiventris*	Woodland
Diamond Firetail	*Stagonopleura guttata*	Woodland
Black-chinned Honeyeater	*Melithreptus gularis*	Woodland
Striated Thornbill	*Acanthiza lineata*	Woodland
Golden Whistler	*Pachycephala pectoralis*	Woodland
Jacky Winter	*Microeca fascinans*	Woodland
Chestnut-rumped Thornbill	*Acanthiza uropygialis*	Woodland
Buff-rumped Thornbill	*Acanthiza reguloides*	Woodland
Scarlet Robin	*Petroica multicolor*	Woodland
Noisy Friarbird	*Philemon corniculatus*	Woodland
Brown Thornbill	*Acanthiza pusilla*	Woodland
Grey Shrike-thrush	*Colluricincla harmonica*	Woodland
Little Friarbird	*Philemon citreogularis*	Woodland
Varied Sittella	*Daphoenositta chrysoptera*	Woodland

Red-browed Finch	*Neochmia temporalis*	Woodland	
White-napped Honeyeater	*Melithreptus lunatus*	Woodland	
Red-capped Robin	*Petroica goodenovii*	Woodland	
Western Gerygone	*Gerygone fusca*	Woodland	
Sacred Kingfisher	*Todiramphus sanctus*	Woodland	
White-winged Triller	*Lalage sueurii*	Woodland	
Dusky Woodswallow	*Artamus cyanopterus*	Woodland	
Olive-backed Oriole	*Oriolus sagittatus*	Woodland	
Horsfield's Bronze-Cuckoo	*Chrysococcyx basalis*	Woodland	
Fan-tailed Cuckoo	*Cacomantis flabelliformis*	Woodland	
Bush Stone-curlew	*Burhinus grallarius*	Woodland	Endangered
Barking Owl	*Ninox connivens*	Woodland	Endangered

7.6 Appendix Six: Bird sightings and frequency to November 2003

Birds Sighted at (or nearby) Wyuna River Reserve 1998 - 2003

Common Sightings

White- faced Heron
Wood Duck
Pacific Black Duck
White Ibis
Straw- necked Ibis
Crested Pigeon
Galah
Sulphur-crested Cockatoo
Red- rumped Parrot
Eastern Rosella
Yellow Rosella
Laughing Kookaburra
White- throated Treecreeper
Brown Treecreeper
Superb Blue Wren
Striated Pardalote
Yellow-rumped Thornbill
Yellow Thornbill
White-plumed Honeyeater
Brown-headed Honeyeater
Red-capped Robin
Rufous Whistler
Grey Fantail
Grey Shrike-thrush
Black-faced Cuckoo-shrike
Willie Wagtail
Australian Magpie
Magpie Lark
White-winged Chough
Little Raven
Australian Raven
Welcome Swallow

Moderately Common Sightings

Little- pied Cormorant
Pied Cormorant
Great Cormorant
Pelican
Yellow-billed Spoonbill
White-necked Heron
Mountain Duck
Masked Plover
Brown Falcon
Whistling Kite
Common Bronzewing
Sacred Kingfisher
Varied Sitella

Little Friarbird

Moderately Common Sightings Continued

Spotted Pardalote
Brown Thornbill
Buff-rumped Thornbill
Weebill
Little Friarbird
Scarlet Robin
Golden Whistler
Jacky Winter
Pied Currawong
Red-browed Finch
Horsfield's Bronze-Cuckoo
Diamond Firetail
Corella species

Rare Sightings

Large Egret
Grey Teal
Chestnut Teal
Black-shouldered Kite
Peregrine Falcon
Black Falcon
Wedge-tailed Eagle
Little Eagle
Pallid Cuckoo
Dollarbird
Rainbow Bee-eater
Noisy Miner
White-winged Triller
Crested Shrike-tit
Pied Butcherbird
Golden – headed Cisticola
Rufous Songlark (75)

BIRDS SIGHTED FURTHER AWAY (but within 5 km)

House Sparrow
Common Starling
Common Blackbird
Common Myna

Neville Hunter, Kyabram Nov. 2003