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GOULBURN BROKEN CATCHMENT MANAGEMENT AUTHORITY

Parks VICTORIA

Yielima Bushland Reserve Environmental Management Plan

July 2002

Environmental Management Program

SIR Catchment Strategy

Department of Natural Resources and Environment, Tatura

Funded by the Department of Natural Resources and Environment, the Shepparton Irrigation Region Implementation Committee of the Goulburn Broken Catchment Management Authority through the Shepparton Irrigation Region Catchment Strategy.

ISBN 1 74106 269 1

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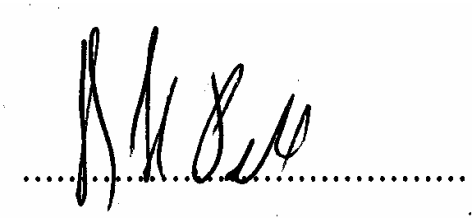
Management Agreement

We the undersigned stakeholder representatives acknowledge this document as being the operative Management Plan for the Yielima Bushland Reserve and accept our responsibilities in partnership as recommended for its ecological sustainability.



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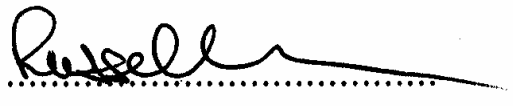

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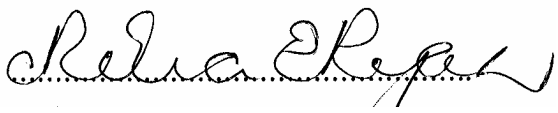

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Acknowledgments

This Plan could not have been developed without the help and assistance of numerous people. To all the members of the Nathalia Tree Group and the Superb Parrot Group thank you for your on-going dedication to the protection and enhancement of remnant vegetation in the region. For assisting with the protection of the Yielima Bushland Reserve and the development of this Plan the following people are gratefully acknowledged, Russell Terry, Joan Smith, Sue Logie, Bruce Morrison, Roger Muntz, David Gilbert, Graeme Frostick, Ross Smith, Jenny Miller, Mark Peterson and Lorraine McKenzie.

Departmental staff who have provided a great deal of support and input include, Leon Atkinson (Parks Victoria), John Kneebone (Parks Victoria), Rolf Weber (NRE), Bernard McLean (NRE) and Marion Howell (former NRE). In particular we wish to acknowledge the efforts of Trudi Mullett and Ann Roberts who have worked hard to put this Plan together.

Finally we wish to acknowledge the support and funding provided by the SIR Implementation Committee of the Goulburn Broken Catchment Management Authority.

To all the people who have commented on the Draft Plan we are extremely grateful.

Acronyms

NRE	Department of Natural Resources and Environment
EMP	Environmental Management Program; workgroup within NRE
GBCMA	Goulburn Broken Catchment Management Authority
GMLN	Goulburn Murray Landcare Network
NTG	Nathalia Tree Group
SIR	Shepparton Irrigation Region
PV	Parks Victoria

Foreword

This terrestrial Management Plan is the culmination of the effort of a number of dedicated people who share the vision of seeing Yielima Bushland 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 the Management Plan.

The Plan has been developed as an adaptive 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 and signatories to the Plan.

While implementation of the plan is an adaptive process the Plan will be formerly 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.

I look forward to seeing the implementation of this Management Plan, which will be a prime model for partnerships in sustainable ecological management in the Goulburn Broken Catchment.

Kate Brunt
Public Land Biodiversity Officer
Environmental Management Program
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1 SUMMARY

Yielima Bushland Reserve is a small isolated remnant of Plains Grassy Woodland located north of Nathalia in the Goulburn Broken Catchment's Shepparton Irrigation Region, Victoria. Despite its small size and relative isolation from other patches of remnant vegetation in the landscape, the botanical value of the reserve is high. Two rare, two regionally depleted and four regionally significant, plant species have been recorded in the Reserve to date.

Rising water tables and water leakage from channels and runoff adjacent to the Reserve, are the most important threats to the remnant vegetation at this site. Alteration of the natural drainage regimes has allowed local runoff to enter to the reserve and facilitated invasion by moisture-tolerant weed species. Introduced pasture grasses that respond extremely well to increased soil moisture and nutrient availability, are now present throughout the Reserve. These altered drainage conditions are likely to be a principal factor in the *Eucalyptus* dieback, evident in the Reserve. Early to advanced stages of dieback, are evident in Grey Box (*Eucalyptus microcarpa*), the dominant overstorey species at the site. Addressing these drainage issues should be the first priority for management.

Occasional stock grazing prior to the reserve being fenced, especially at inappropriate times, also reduced the conservation value of the site. Selective grazing, soil compaction, the addition of nutrients and the spread of weeds, are among the most damaging disturbance factors associated with stock grazing at this site.

The site is worth protecting because of its high botanic value. The site is likely to provide an important "stepping stone" for mobile vertebrates, especially birds, in a landscape where native vegetation cover is otherwise poor.

The Nathalia Tree Group has conducted two field days at the Reserve in recent years and has expressed interest in being involved in the future management of this important remnant.

2 INTRODUCTION

Yielima Bushland Reserve supports 4 hectares of Grey Box (*Eucalyptus microcarpa*) – Buloke (*Allocasuarina luehmannii*) grassy woodland. This vegetation type is extremely depleted in the Victorian Riverina Bioregion and has received a preliminary recommendation for listing as a threatened community under the *Flora and Fauna Guarantee Act 1988* (Scientific Advisory Committee 1997). The community has now also received a final recommendation for listing by the Scientific Advisory Committee. Two rare, four regionally significant and two depleted plant species, have been recorded at the site.

The main threats to the ecological viability of this site relate to its small size and relative isolation from other patches of remnant vegetation in the landscape. Regional water table levels are high and signs of *Eucalyptus* dieback are evident. The site has been used to graze and hold domestic stock, often at inappropriate times. The legacy of past stock management includes, severe soil compaction and pugging in some parts of the Reserve, weed dispersal and an unknown influence on the floristic composition and structure of the vegetation, through selective grazing of palatable species.

2.1 Purpose

The Environmental Management Program (EMP), Department of Natural Resources and Environment (NRE), Tatura, in consultation with Parks Victoria, and the Nathalia Tree Group, 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 environmental management of Yielima Bushland Reserve. The main objectives of this Plan being the protection, restoration, and enhancement of the conservation values of this important remnant.

This Plan provides direction for Parks Victoria (Nathalia), who are the responsible management authority. The Nathalia Tree Group has also expressed interest in being involved in the future management of this reserve.

2.2 Consultation Process

A list of agencies, groups, and individuals involved in the planning process is provided in Appendix Two. An informal meeting was held with the Nathalia Tree Group in November 1998 at which some issues associated with the reserve were identified. On the basis of this, a Draft Plan was produced.

In May 2000 a public consultation meeting was held at which relevant agencies, community groups and individuals were invited to identify any new issues and to discuss the issues identified so far.

A revised Draft Plan was produced in June 2000, which was forwarded to the agencies and groups with identified management responsibilities, for further comment.

In September 2000 the Draft Management Plan was forwarded to Parks Victoria, Nathalia Tree Group and the SIR Implementation Committee for endorsement.

The Plan was not progressed for several months due to a change in staff. After the appointment of a new staff member the plan was updated early in 2002. Amendments made to the plan centred around recommendations made in the Environmental Conservation Councils Investigations in June 2001. Other alterations made to the plan were simply updating the report to identify actions that had occurred between September 2000 and January 2002.

In February 2002 the Draft Management Plan was once again forwarded to Parks Victoria, Nathalia Tree Group and the SIR Implementation Committee for endorsement.

2.3 Plan Period and Review

The Reservation status and responsible management authority for Yielima Bushland Reserve may change within the next two to three years. The recommendations made in this Management Plan may require review following the outcome of the ECC Box-Ironbark Investigation and the Ministerial recommendations for Yielima Bushland

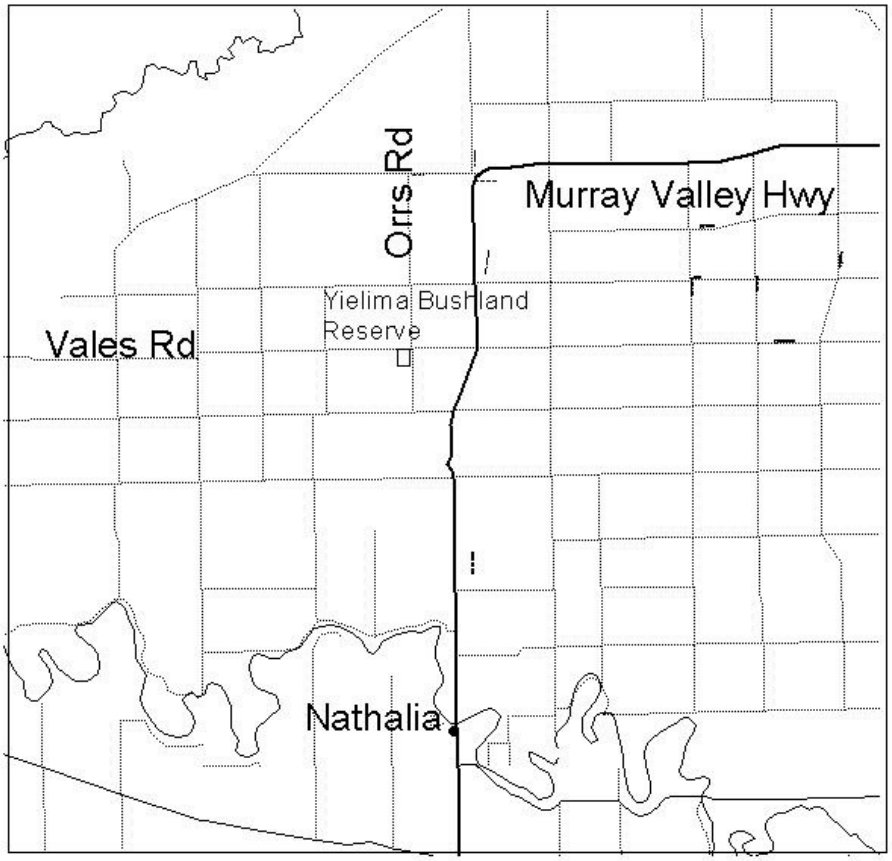
Reserve and the outcome of the Yorta Yorta Native Title determination. Some management prescriptions detailed in this report may need to be reviewed if the reservation status and management tenure change.

2.4 Location and Access

Yielima Bushland Reserve is located approximately 10 km north of Nathalia on the corner of Vale and Orrs Roads. Access to the Reserve is on the southern side from Orrs Road.

AGM Coordinates Zone 55, Easting 336,811, Northing 6,017,613 and Crown Land Parcel Number P160562.

Figure 1 Yielima Bushland Reserve Location Map



Legend

Major and minor roads
River/creek

N

This map was produced by the Environmental Management Group of the Department of Natural Resources and Environment Tatura.
June 2000.

2 0 2 4 6 8 10 12 14 16 18 20 Kilometers

2.5 Reservation Status and Management Authority

Yielima Bushland Reserve (H18) is gazetted as Unreserved Crown Land and is currently managed by Parks Victoria (Nathalia).

" The Land Conservation Council (LCC) was established by the *Land Conservation Act* 1970. As one of it's three functions it makes recommendations to the Minster for Conservation with respect to the use of public land, in order to provide for the balanced use of land in Victoria" (LCC, 1982).

The LCC recommended that the reserve be gazetted as a Bushland Reserve. A request has been made to Land Victoria in April 2002 to have the recommendations implemented.

Parks Victoria, NRE and the Nathalia Tree Group have been involved in various management activities aimed at restoring and enhancing the natural values of this site. Weed spraying, rubbish removal, botanical surveys, perimeter fencing, shrub planting to absorb moisture in the wetter areas and the installation of watertable watch bores, are among the activities undertaken to date.

2.6 Nathalia Tree Group

Members of Nathalia Tree Group have played an important, but unofficial, role in the management of Yielima Bushland Reserve for many years. The group has expressed a keen interest in the ongoing management of Yielima Bushland Reserve and the promotion of the importance of the reserve and natural areas amongst the wider community.

2.7 Legislation

A broad range of legislation, strategies and policies influence the management of Yielima Bushland Reserve.

***Crown Lands (Reserves) Act* 1978**

This Act provides for the reservation and management of Crown Lands for certain purposes and sets down provisions for the formulation of a Committee of Management.

***Parks Victoria Act* 1998**

Parks Victoria is the responsible management authority for Yielima Bushland Reserve. This Act sets down the organisation and structure of Parks Victoria, operational procedures, regulations and guidelines.

STATE
Catchment and Land Protection Act 1994
Archaeological and Aboriginal Relics Preservation Act 1972
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
Flora and Fauna Guarantee Act 1988

The main aim of the FFG Act is to ensure all of Victoria's native plants and animals can survive, flourish and maintain their potential for evolutionary development in the wild. The Act provides for the protection of threatened habitats and the identification of potentially threatening processes.

Other relevant legislation:

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

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" (NRE 1997, p. 70) and that "...all remaining areas are highly significant for biodiversity conservation" (NRE 1997 p. 71).

Shepparton Irrigation Regional Catchment Strategy (2002-2007)

This document is part of the Goulburn Broken Regional Catchment Strategy (2002-2007) 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 planning framework for land, water and biodiversity management in the region.

The Regional Catchment Strategy is an overarching document that takes a longer-term view of the challenges and opportunities facing the region. The Strategy does not describe in detail how the region intends to meet the range of obligations outlined in legislation. Priority issues and programs have been identified for the period 2002 and 2007. These priorities are described in the Regional Catchment Strategy but the detail of the programs to address these issues are found in accompanying sub-strategy documents.

Goulburn Broken Native Vegetation Plan (Draft)

This strategy documents the current condition of native vegetation by Bioregion and Broad Vegetation Type (BVT). 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. This vegetation strategy is the forerunner to the Catchment's Biodiversity Strategy.

Box –Ironbark Forests 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 began in 1995 by the then Land Conservation Council (LCC).

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 Practice for Fire Management on Public Land. (1995) Department of Conservation and Environment, Victoria.

Flora and Fauna Guarantee Strategy: Conservation of Victoria's Biodiversity; Draft prepared under the Flora and Fauna Guarantee Act 1988 (1992) Department of Conservation and Environment, Victoria.

Draft Conservation Program for Native Grasslands and Grassy Woodlands in Victoria (1992) Department of Conservation and Environment, Victoria.

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

Box-Ironbark Forests and Woodlands – Final report. (2001). Environment Conservation Council, Victoria

3 ECOLOGICAL VALUES

3.1 Significance of the Reserve in a Regional Context

The significance of the Reserve, lies in the Grey-Box - Buloke vegetation association and the range of regionally significant or depleted species that occur in the reserve. This site may also have value as a "stepping stone" for more mobile species such as birds and bats, in the landscape.

3.2 Physical Aspects

3.2.1 Climate

Temperate climatic conditions characterise the Victorian Riverina Bioregion, with hot summers and mild winters (Figure 1). Winter-spring is the peak rainfall period, although, on average, the highest monthly rainfalls have been recorded in June and October. Annual average rainfall recorded at Numurkah is 449.4 mm (Bureau of Meteorology web page). Frosts occur in the winter months and drought periods occur every five to ten years (Bennett e*t al*. 1998).

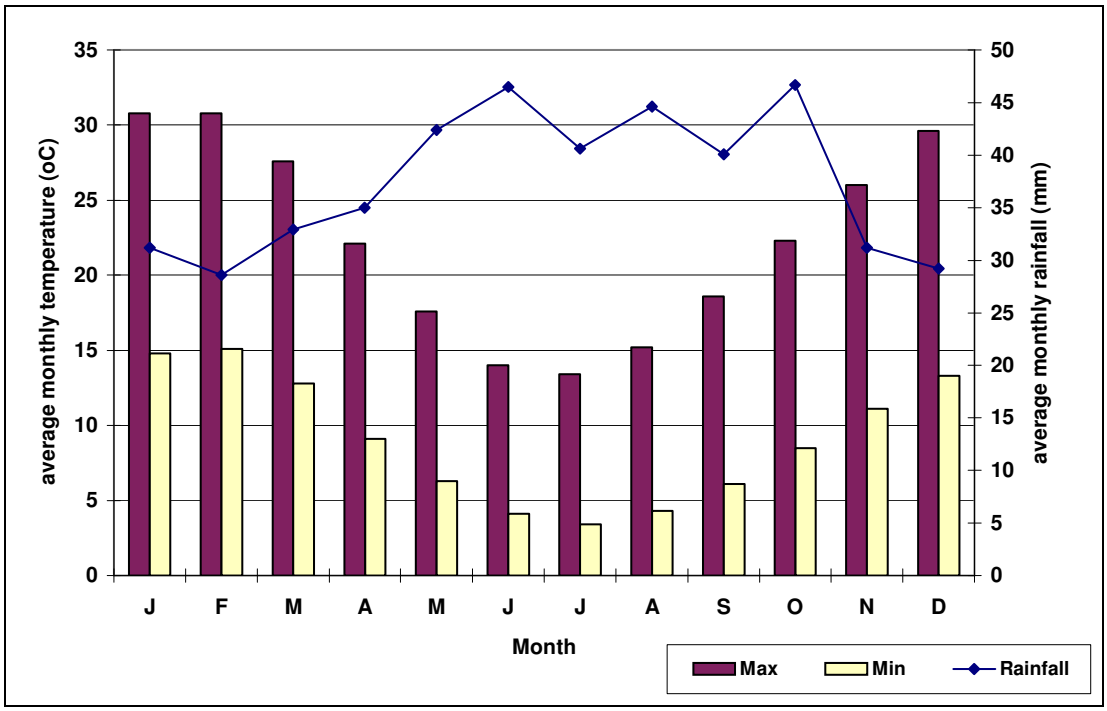


Figure 1 Mean temperature and rainfall records for Numurkah (nearest climate information station to Yielima Bushland reserve) Source Bureau of Meteorology Web Site 1998

3.2.2 Soil Characteristics

The soil type is reasonably uniform Cobram loam throughout the Reserve and immediately south and southeast of the site.

3.2.3 Flooding Regimes and Drainage Characteristics

Addressing inappropriate drainage into the Reserve is an important objective of this Plan. The Reserve is encompassed by intensively irrigated farmland and is subject to high regional watertables and occasional inundation.

Table drains along the north and eastern boundaries are choked with moisture-tolerant weeds such as Paspalum (*Paspalum dilatatum*) and Dock (*Rumex* sp.). Anecdotal evidence suggests channel leakage or overflow also contributes to water accumulation in the Reserve.

Four bores were installed in the Reserve in December 1998 to monitor watertable levels (Figure 2). Watertable levels were highest in the north and north-eastern sections of the Reserve; 2.9m and 1.7m respectively (M. Howell, pers. comm). Densities of moisture tolerant grassy weeds are consequently highest in this part of the Reserve.

Figure 2 Four bores have been installed in the Reserve to monitor water table levels

3.3 Biological Aspects

3.3.1 Flora

Approximately 3% of the original Plains Grassy Woodland Broad Vegetation Type (BVT) persists in the entire Victorian Riverina Bioregion. Many species reliant on this vegetation type have consequently declined in both distribution and abundance. Some associated species have become locally or completely extinct since European settlement such has been the extent of habitat loss and modification (Bennett *et al*. 1998). Other threats to this BVT are more incremental such as the effects of rising water tables and higher nutrient levels. Regeneration of indigenous species is further constrained by changes in grazing regimes and weed invasion.

The overstorey of the Reserve consists of Grey Box (*Eucalyptus microcarpa*), Buloke (*Allocauarina leuhmannii*) and White Cypress-Pine (*Callitris glaucophylla*)
The Grey Box overstorey is showing signs of stress and dieback is occurring from the tips of the branches. High watertable levels and inappropriate drainage regimes are identified as principal causes of Eucalypt dieback at this site. Insect attack,

imbalances in species composition, changed grazing and nutrient regimes compound the stress on individual trees, which is further exacerbated by the isolation of the site from other patches of native vegetation in the landscape.

Other species including the regionally depleted Buloke (*Allocasuarina leuhmannii*) are also exhibiting signs of prolonged environmental stress.

The scattered shrub layer includes, *Myoporum platycarpum* (Waterbush), *Acacia montana* (Mallee Wattle), *Dodonea viscosa ssp. cuneata* (Wedge-leaf Hop-bush) and *Senna artemisioides* (Desert Cassia). Introduced grasses dominate the field layer and are likely to remain competitive while promoted by high watertable and nutrient levels and soil disturbance. Despite the overall dominance of grassy weeds, the field layer contains a diverse array of native grasses, lilies, sedges and saltbushes.

3.3.1.1 Significant Species

The rare, regionally depleted and regionally significant plant species recorded in the Reserve are listed below. The Reserve also supports a number of species that are not classified as above, but have a limited distribution across the Victorian Riverina Bioregion.

- *Maireana humillima* (Dwarf Bluebush) (Rare)
- *Stipa gibbosa* (Spurred Spear-grass) (Rare)
- *Myoporum platycarpum* (Waterbush), (regionally significant)
- *Senna artemisioides* (Desert Cassia) (Regionally significant)
- *Acacia montana* (Mallee Wattle) (regionally significant)
- *Schoenoplectus validus* (River Club Sedge) (regionally significant)
- *Callitris glaucophylla* (White Cypress-pine) (depleted)
- *Allocasuarina luehmannii* (Buloke) (depleted)

3.4 Fauna

No formal fauna surveys have been conducted at Yielima Bushland Reserve. The Reserve may serve as a useful 'stepping stone' for mobile species such as birds and bats. Given the availability of hollows in the mature Grey Box trees, it would be interesting to conduct seasonal bird surveys and spotlighting to investigate aspects of the fauna of the Reserve.

Grey Box log and limb litter is starting to accumulate since the alleviation of grazing pressure and this may provide useful habitat resources for ground dwelling mammals and some reptile and frog species.

3.5 Historical Land Use

3.5.1 Aboriginal History

As far as can be established the area has not previously been surveyed for archaeological sites.

3.5.2 European History

The Reserve was formerly gazetted as a Cemetery Reserve in 1938. Two people are apparently buried in the south west corner of this site (Stan Brown, pers comm). It was reclassified as a Recreation Reserve in 1956 and in 1983 the Land Conservation Council (LCC) recommended the site be gazetted as a Bushland Reserve.

4 MANAGEMENT ISSUES

4.1 Reservation Status and Management Authority

Yielima Bushland Reserve was formerly gazetted as a Cemetery Reserve in 1938, before being reclassified as a Recreation Reserve in 1956. The Land Conservation Council (LCC) recommended the site be gazetted as a Bushland Reserve in 1983.

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) is currently reviewing the reservation status of Yielima Bushland Reserve as part of the Box-Ironbark Forests and Woodlands Investigation. The purpose of this investigation is 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 draft report was completed in June 2001, and is currently before parliament. The report recommended that the area should remain a Bushland Reserve however these areas will be known as Bushland Areas. Yielima Bushland Reserve will be subject to the general recommendations for a Natural Feature Reserve. The only potential changes to management is; grazing generally not be permitted, unless required for short periods by the land manager and commercial harvesting not be permitted.

In general the ECC recommendation will not alter the management or the Managing Authority for Yielima Bushland Reserve.
(See appendix 8.3 for General Recommendation for Natural Features Reserves)

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 1998 turned down this application. Members of the Yorta Yorta community appealed the Federal Court decision. Recently a Melbourne court upheld the right for the Yorta Yorta elders to appeal the 1998 Federal Court decision, paving the way to resume their court battle. The outcome of the appeal may also influence the future management of the Yielima Bushland Reserve.

4.3 Current Land Use

4.3.1 Recreation

Recreational usage of the Reserve is low and includes passive activities such as bird watching and nature studies.

4.3.1.1 Recreation facilities and opportunities

The construction of recreational facilities such as walking tracks and toilets, is not considered appropriate for this Reserve, due to its small size and environmental significance. There has been some interest in the placement of a picnic table in the more degraded area of the Reserve near the corner of Orrs and Vales Rd. If this proposal proceeds, then careful consideration will need to be given to the ongoing maintenance of the picnic table and associated issues such as rubbish collection.

4.3.1.2 Rehabilitation, community awareness and education activities

There is an opportunity to promote the natural and botanic values of the Reserve to the wider community. Possible activities include:

- the development of a brochure suitable for distribution to schools, universities, local community groups and government agencies,
- the organisation of community field days and native flower walks in spring.

4.3.1.3 Tracks and Access

A small track runs along the inside of the southern boundary of the Reserve and provides access to private land on the southwest border. There has been some interest in the construction of a small car park area next to the Reserve on the corner of Orrs and Vales Rd, further investigation of this proposal is required. The area proposed as a car park would accommodate a couple of cars making the area small in size and non-intrusive. The parking area may also be used to control the large amount of weeds found in the corner of the reserve. This area is highly degraded due to water run-off. Careful consideration will need to ensure that this activity does not result in further surface water drainage problems.

4.3.2 Timber extraction

The site has previously been harvested for timber and few mature trees remain. Firewood collection is prohibited at the Reserve.

4.3.3 Irrigation Runoff

During heavy rainfall events, water runoff from all adjoining properties tends to accumulate within the Reserve. It is considered that earthworks on the adjoining properties, have exacerbated the problem. It should be noted, that there is no catch drain between the Reserve and the property to the west. The paddock adjoining the Reserve is irrigated, and it appears that irrigation runoff water flows onto the reserve.

4.3.4 Grazing and Soil Disturbance

No grazing licenses are issued for Yielima Bushland Reserve however previously stock periodically strayed onto the site during movement between paddocks. Soil compaction caused by stock in the past is severe in some parts of the Reserve and this further influences the vegetation composition of the site usually in favour of introduced species.

4.4 Vegetation Management

4.4.1 Fire Hazard Management

Fire is not considered a major issue for this Reserve. The Reserve is bounded by roads on two sides, an irrigation channel on one side and an irrigated paddock on the other. Therefore, there is a low risk of a fire moving into and out of the Reserve.

4.4.2 Weed Management

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 overseas. Environmental weeds and agricultural weeds are not mutually exclusive, Blackberry (*Rubus fruticosis* spp. agg.) for example, can be extremely problematic in both agricultural and natural environments. Once established in bushland areas, environmental weeds can quickly outcompete native plants and by consequence, reduce the diversity of habitat resources available for fauna. Environmental weed species can also alter the rate of accumulation of fine fuels at an invaded site and in this way, alter the flammability of the vegetation.

Clark (1996) identified weed invasion as one of the biggest management issues in Box woodland remnants. Remnants with a high edge to area ratio such as Yielima Bushland Reserve are extremely prone to weed invasion.

Figure 3 Elms growing on G-MW channel 23/5 bank are spreading into Yielima Bushland Reserve.

Weed control is likely to be an ongoing battle at this Reserve. Well established populations of various weed taxa that need to be targeted for control include:

Carex appressa	Tall Sedge
Cyperuss eragrostis	Dirty Dora
Phalaris sp.	Phalaris sp.
Rumex sp.	Dock species
Paspalum dilatatum	Paspalum
Marrumbium vulgare	Horehound
Schinus molle	Peppercorn
Salix sp.	Willow species
Avena fatua	Wild Oats
Bromus sp.	Brome grass
Lolium sp.	Ryegrass
Critesion murinum	Barley grass
Trifolium angustifolium	Narrow-leaf Clover
Ulmus x hollandica	Dutch Elm tree
Aloe saponinaria	Aloe vera
Lycium ferocissimum	Box thorn

Control of the Elms, are the landholders responsibility on private land and G-MW responsibility along the channel easement (Figure 3).

Willows planted in the past to soak up water, are now deemed as inappropriate species. It is now recommended that indigenous species be planted, and that the willows be removed once the indigenous species have grown to a suitable stage.

4.4.3 Revegetation

Any revegetation activities should only use locally collected seeds. These indigenous species will not only grow better, but this will avoid potential "genetic pollution" which can occur with the importation of non-local seed sources—even if the same species are used.

Care should be taken in selecting appropriate species for use in plantings. Species used in the north eastern section of the Reserve would need to be adapted to high moisture and nutrient availability. There is a risk that species selected for their tolerance to these conditions may ultimately become competitive with indigenous species. The survival rate of various species planted in the last revegetation effort should be assessed, before further plantings are attempted.

4.4.4 Threatened Flora Species Management

The Nathalia Tree Group have conducted a number of walks through the Reserve and identified a significant number of the species present in the Reserve. Appendix 1 lists all the species identified to date. It is recommended, that in the future, further studies be undertaken to identify species and any significant management activities that may be required.

4.5 Cultural Heritage

Records at Aboriginal Affairs Victoria indicate that there are currently no registered Aboriginal archaeological sites within, or in the immediate vicinity, of the Yielima Bushland Reserve. However, as far as can be established, the area has not previously been surveyed for archaeological sites. It is therefore emphasised that the absence of recorded values within the reserve does not necessarily indicate that this area is devoid of Aboriginal heritage values.

Under the State *Archaeological and Aboriginal Relics Preservation Act 1972* and the Commonwealth *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*, all archaeological sites and relics are protected. Damage or disturbance, whether deliberate or inadvertent, without a permit, is prohibited.

4.6 Wildlife Management

Small patches of native vegetation, such as Yielima Bushland Reserve, may not provide abundant habitat resources for a range of species, however they make an important contribution to "regional systems of habitat" (Bennett *et al.* 1998, p. 69), across the landscape. The Reserve for example, may be an important "stepping stone" in the landscape for the more mobile species such as birds and bats.

Detailed fauna surveys have not been conducted at Yielima Bushland Reserve. See "Fragments for the Future" (Bennett *et al.* 1998) for a comprehensive discussion of Victorian Riverina wildlife; their ecological requirements and conservation issues.

4.6.1 Feral Animal Management

A large number of introduced vertebrates, and an unknown number of invertebrate species, have been introduced into the Victorian Riverina. Some of these species impose greater ecological impacts, than others, and impacts may vary in accordance with seasonal conditions and the characteristics of the invaded site. Of the 'feral' animals observed at Yielima Bushland Reserve, rabbits and foxes are probably the most problematic. Control of rabbits, would need to be undertaken by poisoning or gassing, not ripping due to the damage this would cause to native vegetation. Control of Foxes, could be achieved by using fox off baiting on both the Reserve and adjoining properties.

4.6.2 Threatened Wildlife Management

It is likely that there are species present within the Reserve, which are on the rare or threatened list. The endangered Superb Parrot (*Polytelis swainsonii*), has been observed in the Reserve, however, this species is probably an occasional visitor when food resources are available.

A study of Bats, was conducted in the Picola area in 1998, by Lindy Lumsden (Bennett *et al.* 1998). The study showed an extensive number of bats in the region using remnant vegetation. No extensive fauna survey has been conducted within the Yielima Bushland Reserve and as a consequence, no specific details are available 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 Yielima Bushland 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 Yielima Bushland Reserve. The information obtained would then be required to further refine this management plan and the management actions.

4.7 Salinity, Watertable and Drainage

The regional mapping indicates that the watertable at the Reserve is within two metres of the ground surface. The four bores installed in the reserve in 1998 confirm this.

4.8 Historic Issues

Two graves need to be identified within the Reserve. An investigation of historic records will be required to determine the location of the graves.

4.9 Surrounding Land Use

Native vegetation cover is very poor in the immediate landscape. Farms are intensively irrigated and watertable levels are very high (1-3m) in the area (GIS, NRE, 1998).

There is potential to link Yielima Bushland Reserve with other remnants along the Murray Valley Highway, through planting along roadsides and on private land. Revegetating around the Reserve to buffer the site against the primary edge effects of increased temperature, wind speed, solar radiation and input of weed seeds may help to conserve the natural values of the site.

Adjoining landholders should be encouraged to implement habitat enhancement works on their properties. Grants are available for the protection and enhancement of remnant vegetation and wetlands through the Shepparton Irrigation Region Land and Water Management Plan.

4.10 Monitoring the Effectiveness of Management Programs

Monitoring needs to be conducted over the life of the 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 concert with a regional monitoring program, that investigates specific attributes of biodiversity performance. Such attributes may be transferred from the Goulburn Broken Catchment Native Vegetation Strategy. In the interim, it is

recommended that the following attributes are considered for inclusion in a monitoring program:

- population status and distribution of rare and threatened plant species,
- weed invasion patterns and impacts,
- weed control; effectiveness of strategies,
- local water table levels, and
- drainage patterns and impacts.

To monitor management strategies effectively, it is essential to select the right (meaningful) indicators, and ensure these are measured in an appropriate manner, in the right place at the right time. Monitoring programs need to have a clear vision and objective. First, the "problem" or attribute to be monitored needs to be defined. Secondly, the information required to assess changes in the status of the particular attribute needs to be determined and the process for obtaining this information developed. Criteria need to be established at the onset of the program and the goals and objectives of management should be integrated with the goals and objectives of monitoring. Monitoring programs should also contain an "inbuilt" mechanism to identify the threshold when management intervention should occur.

5 MANAGEMENT RECOMMENDATIONS

Management recommendations for Yielima Bushland Reserve are presented on the basis of priority. A description of the required management actions and the agency or group responsible for implementing each action are included. It is recognised that the implementation of work is directly related to the funds available to the relevant responsible body.

PRIORITY	MANAGEMENT RECOMMENDATIONS
High	Actions of high priority should be implemented as soon as possible but 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	Ongoing actions to be implemented over the life of the Plan. Unless otherwise specified, ongoing 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 Nathalia Tree Group and surrounding Landholders

This 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

5.1.1 Reserve Status and Responsible Management Authority

Action	Estimated cost based on 2002 prices	Responsibility	Priority
After the issues of reservation status and management responsibility have been determined, (ECC recommendation and determination of Native Title), the responsible management authority needs to assess the management objectives and recommendations in this Plan and make appropriate changes as soon as possible in consultation with the relevant stakeholders listed in Appendix 2.	No capital cost	To be determined	As needed

5.2 Current Land Use

5.2.1 Recreation

5.2.1.1 Recreation Facilities and Opportunities

Action	Estimated cost based on 2002 prices	Responsibility	Priority
The Nathalia Tree Group has been encouraged to conduct regular visits to the reserve to promote and educate the wider community about the importance of biodiversity and natural areas. The Nathalia Tree Group has been active in removing rubbish from the reserve; tree planting and compiling a list of plant species within the reserve. Additional activities to be encouraged include, bush walks, spotlight tours, revegetation days and ethical seed collection activities.	No capital cost	Parks Victoria NTG	H
Due to the small size of the reserve and its conservation significance, the construction of facilities such as walking tracks and toilets are not recommended within the Reserve.	No Cost	Parks Victoria	L

Action	Estimated cost based on 2002 prices	Responsibility	Priority
Potential exists to promote low impact education based activities within the reserve through the production of an information brochure.	$2 000	NTG SIRIC	L

5.2.1.2 Tracks and Access

Action	Estimated cost based on 2002 prices	Responsibility	Priority
Investigate the potential to create a entrance to the reserve at the corner of Vales and Orrs Rd by laying gravel over the weed effected area, once the drainage issues at this site has been addressed Revegetation is not suitable at the corner of roads.	No Capital Cost	NRE	M
Track along the channel that provides access to private property should remain but should not be maintained.	No capital cost	Parks Victoria	M

5.2.2 Timber Extraction

Action	Estimated cost based on 2002 prices	Responsibility	Priority
Timber extraction to remain prohibited.		Parks Victoria	H
Increase community awareness regarding the importance of fallen timber for habitat.	No capital cost	NTG SIRIC	H

5.2.3 Irrigation Runoff

Action	Estimated cost based on 2002 prices	Responsibility	Priority
Investigate the drainage requirements of the area and the feasibility of the proposed Community Surface Water Management Scheme.	As per Community Surface Drainage Scheme Grant process	SIRIC	H
Surrounding landholders to be encouraged to develop whole farm plans for their properties to improve water management.	As per Community Surface Drainage Scheme Grant process	SIRIC	H

5.2.4 Salinity, Watertable and Drainage

Action	Estimated cost based on 2002 prices	Responsibility	Priority
Implement regular monitoring and reporting of ground water bores.	$100/month	NTG	H
If high water tables are found to be a major issue then investigation into the feasibility of installing a ground water pump to maintain or enhance native vegetation viability is essential.	As per grant process	SIRIC	As needed
Investigate the inclusion of monitoring bores in Goulburn Murray Landcare Network Watertable Watch program.	No capital cost	DNRE GMLN NTG	M

5.2.5 Grazing

Action	Estimated cost based on 2002 prices	Responsibility	Priority
Controlled grazing should be permitted to promote growth of native ground cover plants and control of weeds. Grazing should be restricted to times when ground cover plants are not flowering or seeding. It is recommended that sheep be used for this purpose.	No capital cost	Parks Victoria NTG	M
Install fencing around the perimeter of the reserve to control stock access to the reserve in order to prevent soil pugging and damage to native ground cover plants.	$2,000	Parks Victoria SIRIC NTG	H (Completed Sept. 2000.)

5.3 Vegetation Management

5.3.1 Fire Hazard Management

Action	Estimated cost based on 2002 prices	Responsibility	Priority
Not seen to be a major issue due to the small size of the reserve.	No capital cost.	Parks Victoria	L

5.3.2 Weed Management

Action	Estimated cost based on 2002 prices	Responsibility	Priority
Noxious weeds within the reserve to be controlled by Parks Victoria include; Pattersons curse (*Echium plantagineum*) African Box-thorn (*Lycium ferocissimum),* Willows *(salix spp).*	$ 300/yr	Parks Victoria	H

Action	Estimated cost based on 2002 prices	Responsibility	Priority
Plants requiring long term management Tall Sedge (*Carex appressa),* Drain flat-sedge *(Cypress eragrostis)*, Tussock grass *(Phalaris* sp.*),* Slender Dock *(Rumex* sp.), Paspalum (*Paspalum dilatum*,) Horehound (*Marrubium vulgare*) Wild oats (*Avena fatua*) Bromus (*Bromus* sp.) Ryegrass (*Lolium* sp.), Barley grass (*Critesion marianum)* Narrow-leaf clover (*Trifolium angustifolium)* Soil disturbance within the reserve should be minimised during weed control activities.	$100/yr	NTG Parks Victoria	M

5.3.3 Revegetation

Action	Estimated cost based on 2002 prices	Responsibility	Priority
Ethical seed collection for the purpose of revegetation within the reserve is encouraged. A seed collection permit is required from NRE and permission is required from Parks Victoria prior to collection.	No capital cost	NTG Parks Victoria	As needed
Revegetate area once the willows are removed.	$50	Parks Victoria SIRIC NTG	M

5.4 Wildlife Management

5.4.1 Feral Animal Management

Action	Estimated cost based on 2002 prices	Responsibility	Priority
Apply for funding to undertake rabbit and hare control programs within the reserve.	$200	Parks Victoria NTG	On-going
Actively encourage the control of rabbits and hares on surrounding properties. Funding may be available through NRE to assist	$200	Parks Victoria NTG	On-going

Action	Estimated cost based on 2002 prices	Responsibility	Priority
landholders.			
Apply for funding to undertake yearly fox off control program within the reserve.	$300	Parks Victoria	On-going
Actively encourage surrounding landholders to obtain fox off bait funding from NRE for control of foxes on adjacent properties.	$300	Parks Victoria NTG	On-going

5.5 Historic Issues

Action	Estimated cost based on 2002 prices	Responsibility	Priority
Identify information regarding the location of the graves within the Reserve.	No capital cost	Parks Victoria NTG	H

5.6 Cultural Heritage

Action	Estimated cost based on 2002 prices	Responsibility	Priority
Any potential sites of archaeological significance to be reported to Aboriginal Affairs Victoria.	No capital cost	Parks Victoria	H

5.7 Surrounding Land Use

Action	Estimated cost based on 2002 prices	Responsibility	Priority
Encourage habitat protection and improvement on private land in the vicinity of Yielima Bushland Reserve in order to link the remnant vegetation of the reserve with other remnants within the region through to the Murray Valley Highway. Advice and financial assistance is available through the SIR Catchment Strategy.	As per grants program	SIRIC NTG	H

5.8 Monitoring

Action	Estimated cost based on 2002 prices	Responsibility	Priority
Regularly check the populations of feral animals especially foxes, rabbits and hares and determine whether additional control programs are required.	$250/yr in kind contribution	Parks Victoria NTG	On-going
Monitor watertable bores and report data to GMLN Watertable Watch Co-ordinator.	No capital cost	NTG	On-going

5.9 Ecological Research and Surveys

To achieve best environmental management outcomes for Yielima Bushland 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 presently beyond the scope of Parks Victoria. Many of the programs outlined below would make ideal research projects for University Natural Resource Management students.

Co-ordination of Ecological Research and Surveys

Action	Responsibility	Priority
Send letters to all potential Universities and TAFE Colleges informing them of the potential research opportunities that exist in the SIR. The following topics relate to Yielima Bushland Reserve.	Parks Victoria SIRIC	H

Vegetation description and mapping

- Determine the population status and distribution of significant plant taxa.
- Determine the ecological requirements and appropriate management regime for rare plant taxa.
- Monitor the dieback in Grey Box (*Eucalyptus microcarpa*); especially if remedial measures such as groundwater pumping are undertaken.

Studies on the faunal composition of Yielima Bushland River Reserve

- Determine the population status and distribution of significant fauna within the Reserve.

5.10 Summary of Estimated Funding Requirements

A description of the estimated funding requirements needed by the responsible body to successfully implement this Plan are included.

5.10.1 Parks Victoria

CAPITAL COST	$
Revegetation	$50
Total Capital Costs	$50
ANNUAL MAINTENANCE COSTS	$
Weed Control	$400
Rabbit and Hare Control – On-site	$200
Fox Control – On-site	$200
Total Annual Maintenance Costs	$800

5.10.2 Nathalia Tree Group

ANNUAL MAINTENANCE COSTS	$
Monitoring and reporting of ground water bores	$1,200
Rabbit and Hare Control – Off-site	200
Fox Control – Off-site	200
Total Annual Maintenance Costs	$1,600

5.10.3 Shepparton Irrigation Region Implementation Committee

CAPITAL COST	$
Brochure	$2,000
Total Capital Costs	$2,000

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6 APPENDICIES

6.1 Appendix One. Vascular plant species recorded at Yielima Bushland Reserve by the Nathalia Tree Group.

This list is not intended to be exhaustive. Additional species may be recorded with further seasonal surveys.

Scientific name	Common Name
GYMNOSPERMS	
CUPPRESSACEAE	
Callitris glaucophylla	White Cypress Pine
MONOCOTYLEDONS	
CAMPANULACEAE	
Wahlenbergia sp.	Blue Bell
CYPERACEAE	
Carex appressa	Tall sedge
Carex inversa	Knob sedge
**Cyperus eragrostis*	Drain flat-sedge
Schoenoplectus validus	River club sedge
JUNCACEAE	
Juncus sp.	Rush
LILIACEAE	
Aloe saponaria	Aloe
POACEAE	
Agrostis avenacea	Blown grass
Aristida behriana	Brush wire grass
Austrodanthonia spp.	Wallaby Grass
**Avena fatua*	Wild Oats
**Bromus sp*	Bromus
Chloris sp.	Windmill grass
**Critesion marianum*	Barley Grass
Danthonia sp.	Wallaby grass
Elymas scabrus	Common wheat Grass
Enteropogan acicularis	Spider grass
Homopholis proluta	Rigid Panic
**Lolium sp.*	Ryegrass
**Paspalum dilatatum*	Paspalum
**Phalaris aquatica*	Toowoomba Canary Grass
Poa sp.	Tussock grass
Austrostipa elagantissima	Elegant Spear grass
Austrostipa gibbosa	Spurred spear grass
Austrosipa scabra	Rough spear-grass

Austrostipa nodosa	Knottyspear-grass
XANTHORRHOEACEAE	
Lomandra effusa	Scented Mat-Lily

DICOTYLEDONS

ANACARDIACEAE	
**Schinus molle*	Peppercorn
ASTERACEAE	
Vitadinia sp.	New Holland Daisy
Chrysocephalum apiculatum	Common everlasting
BORAGINACEAE	
**Echium plantagineum*	Paterson's Curse
CAESALPINIACEAE	
Senna artemisioides	Desert cassia
CASUARINACEAE	
Allocasuarina luehmannii	Buloke
CHENOPDOACEAE	
Atriplex semibaccata	Berry Saltbush
Chenopodium desertorum	Desert or Frosted goosefoot
Enchylaena tomentosa	Ruby Saltbush
Einada nutans	Nodding saltbush
Maireana decalvans	Black Cotton bush
Maireana enchylaenoides	Wingless Fissure Weed
Maireana humillima	Dwarf Blue bush
Scherolaean muricata	Five Spined Bassia
EUPHORBIACEAE	
Chamaesyce drummondii	Caustic weed
FABACEAE	
**Trifolium angustifolium*	Narrow-leaf clover
LAMIACEAE	
**Marrubium vulgare*	Horehound
MARSILEACEAE	
Marsilea sp.	Nardoo
MIMOSACEAE	
Acacia montana	Mallee Wattle
MYOPORACEAE	
Myoporum platycarpum	Sugar Wood
MYRTACEAE	
Eucalyptus microcarpa	Grey Box

NYCTAGINACEAE
Boerhavia diffusa Tar Vine

OXALIDACEAE
**Oxalis corniculata* Yellow Wood Sorrel

POLYGONACEAE
**Rumex brownii* Slender Dock

SALICAEAE
*Salix sp. Willow

SAPINDACEAE
Dodoneaea viscosa ssp. *cuneata* Wedge Leaf Hop bush

SOLANACEAE
**Lycium ferocissimum* African Box-thorn
**Solanum esuriale* Quena

ULMACEAE
**Ulmus x hollandica* Dutch Elm

6.2 Appendix Two: Community Consultation

List of Agencies, Groups and Individuals invited to comment on the Draft Management Plan for the Yielima Bushland Reserve.

- Nathalia Tree Group
- Landholders with properties adjacent to the Yielima Bush Reserve
- SIR Implementation Committee of the Goulburn Broken Catchment Management Authority
- Aboriginal Affairs Victoria (John Tunn)
- Natural Resources and Environment
- Flora and Fauna
- Parks Victoria
- Broken Creek Improvement Landcare Group
- Wildflower group
- Superb Parrot Project
- NADCO
- Goulburn-Murray Water
- Broken Creek Field Naturalists
- Moira Shire
- Bruce Morrison (Superb Parrot Group)
- David Gilbert (Superb Parrot Group)
- Graeme Frostick (Nathalia Tree Group)
- Joan Smith (Nathalia Tree Group)
- Ross Smith (Nathalia Tree Group)
- Russell Terry (Nathalia Tree Group)
- Janny Miller (Nathalia Tree Group)
- Mark Peterson (Nathalia Tree Group)
- Roger Muntz (Nathalia Tree Group)
- Leon Atkinson (Parks Victoria)
- John Kneebone (Parks Victoria)

6.3 Appendix Three: General Recommendations from the ECC for Natural Features Reserves

H Natural features reserves, according to their specific characteristics, be used to:

(a) protect natural features and values;

(b) provide opportunities for:

(i) education and passive recreation such as picnicking, walking and where relevant, fishing, and

(ii) more intensive recreation such as camping where specified;

(c) conserve indigenous flora and fauna;

(d) protect areas with remnant vegetation or habitat value;

(e) provide protection for historic and Aboriginal cultural values and sites;

(f) preserve features of geological or geomorphological interest;

(g) maintain scenic features and the character and quality of the local landscape;

and:

(h) commercial timber harvesting not be permitted;

(i) some firewood may be available from thinning for ecological management, subject to research and the approval of the land manager,

(j) exploration for minerals be permitted, and mining, subject to decisions on particular cases;

(k) prospecting and apiculture be generally permitted;

(l) grazing generally not be permitted, unless required for short periods by the land manager;

(m) unused road reserves adjoining natural feature reserves be added to those reserves where appropriate; and

(n) they be permanently reserved under the *Crown Land (Reserves) Act 1978*, and managed by the Department of Natural Resources.