



FINAL REPORT

JULY 2008

River Red Gum Forests Investigation

Victorian Environmental Assessment Council



What is the Victorian Environmental Assessment Council?

The Victorian Environmental Assessment Council (VEAC) was established in 2001 under the *Victorian Environmental Assessment Council Act 2001*. It replaced the Environment Conservation Council (ECC) as the body providing the State Government of Victoria with independent advice on protection and management of the environment and natural resources of public land. The five Council members are:

Mr Duncan Malcolm AM (Chairperson)—Mr Malcolm has a long career in natural resource management. He is currently Chairperson of the Gippsland Coastal Board, a member of the Victorian Coastal Council and former Chair of Lakes and Wilderness Tourism, Watermark Inc. and the Irrigation Association of Australia Ltd.

Associate Professor David Mercer—Associate Professor Mercer has been a VEAC member since 2002 and is currently with the School of Global Studies, Social Science and Planning at RMIT University. He has a background in natural resource management, recreation and tourism. The author of over 130 academic publications, Associate Professor Mercer is an elected Fellow of the Environment Institute of Australia and New Zealand and sits on the editorial board of the *Australasian Journal of Natural Resources Law and Policy*.

Professor Barry Hart—Professor Hart has expertise in environmental science, particularly in water quality management and ecological risk assessment. He has published extensively and received several awards for his work in the scientific underpinning of natural resource management. Professor Hart also has considerable experience in catchment management issues across Victoria, having served on the Victorian Catchment Management Council for almost 10 years. He has also served on the board of the Victorian Environment Protection Authority.

Ms Jan Macpherson—Ms Macpherson is a lawyer with expertise in resource, environmental and corporate law. She also has an extensive background in Indigenous heritage and land management having worked for several years in northern Australia and assisted in drafting native title legislation. Ms Macpherson has formal qualifications in corporate governance and is currently a board member of Greening Australia Ltd.

Ms Jill McFarlane—Ms McFarlane comes from a background in family farming enterprises in both western Victoria and South Australia and has also spent time as a social worker in rural areas of South Australia, NSW and Victoria. Ms McFarlane now lives in central Victoria. Having completed two terms on the board of the North Central Catchment Management Authority (CMA), she has experience in the complexities of natural resource management issues across public and private land. She has a strong focus on community engagement and involvement in natural resource management.

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18 July 2008

Gavin Jennings MLC
Minister for Environment
and Climate Change
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East Melbourne VIC 3002

Dear Minister

RIVER RED GUM FORESTS INVESTIGATION

In accordance with the requirements of Section 23 of the *Victorian Environmental Assessment Council Act 2001*, the Victorian Environmental Assessment Council is pleased to submit to you the Final Report for the River Red Gum Forests Investigation and copies of each submission received in relation to the investigation.

A handwritten signature in black ink, appearing to read 'Duncan Malcolm', with a stylized flourish at the end.

Duncan Malcolm
Chairperson

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Front cover: Top – Barmah Forest. Bottom – River Murray.
Photography by Mel Mitchell.

River Red Gum Forests Investigation

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Victorian Environmental
Assessment Council

ACKNOWLEDGMENT OF COUNTRY

The Victorian Environmental Assessment Council acknowledges Aboriginal Traditional Owners within the investigation area, their rich culture and their spiritual connection to Country. This includes the Bangerang, Bararapa, Dhudoroo, Dja Dja Wurrung, Jarra Jarra, Jupagulk, Latje Latje, Ntait, Nyeri Nyeri, Robinvale, Tati Tati, Taungurung, Wadi Wadi, Wamba Wamba, Way Wurru, Wergaia, Yorta Yorta and Yulupna peoples. We also recognise and acknowledge the contribution and interests of Aboriginal people and organisations in the management of land and natural resources. Finally, we acknowledge that past injustices and continuing inequalities experienced by Aboriginal people has limited, and continues to limit, their participation in land and natural resource management processes.

FOREWORD

The River Red Gum forests and their associated ecosystems are much loved and enjoyed by many people. This passion was clearly reflected during the course of the investigation. A broad range of aspirations including continued use and future protection were highlighted in thousands of thoughtful and often detailed submissions, and in comments and views put directly to Council members by the many hundreds of people who participated in community forums or other meetings. We greatly appreciate this contribution and it is clear that, although there were many differing approaches promoted during our consultations, all groups and individuals share a deep concern for the wellbeing of this region.

The unique natural assets of River Red Gum forests are highly valued ecologically, socially, culturally and economically. Given this nexus of values and uses, achieving a balance between conservation, recreation and ecologically sustainable use of public land is a difficult and complex task.

Council has heard strong arguments for multiple-use approaches to public land use and environmental management. Many people believe that current use and management is adequate. However, during the course of this investigation we have identified that past and current uses and management are seriously affecting the long-term viability of the River Red Gum forests and wetlands. The relatively small and fragmented remaining area of these ecosystems is a last refuge for many of the 350 threatened and near threatened plants and animals. Altered river flows in the River Murray and its Victorian tributaries fundamentally threatens the health of this ecosystem established by, and therefore dependent upon, flooding within an otherwise arid environment. New research continues to highlight the significant risk to water resources in future climate change scenarios.

All of these factors have led us to recommend a major shift in management priorities for public land in the investigation area, particularly for riparian, wetland and floodplain areas. We believe that our recommendations provide for multiple uses of public land whilst protecting the ecology of the region, particularly in light of increased competition for resources, most notably water. Many groups and individuals have told us that the increasing popularity of some recreational activities is threatening the natural values that have long attracted people to this region. A long-term and coordinated management framework is required to ensure that recreation can continue to be enjoyed and is sustainable for many years to come.

As a community, Australians have agreed to set aside representative areas of natural habitat and ecosystems for biodiversity conservation. This is our legacy for future generations. The process of selecting specific areas of public land for such high levels of protection is often controversial. Many community and industry groups have used—and gained economic benefit from—these public land forests and wetlands for generations. But the level of depletion leaves Council with little flexibility if the park and reserve system is to include representative examples of all ecosystems in accordance with nationally agreed reservation targets.



Council members. Front row left to right: Duncan Malcolm, Chairperson; Jill McFarlane; Jan Macpherson. Back row left to right: David Mercer; Barry Hart.

However, parks and reserves in themselves will not guarantee the long-term protection of natural values. The media attention given to the plight of the environment of the Murray Darling Basin means that most Australians are now aware that its long-term viability is ultimately dependent on adequate and appropriately timed water flows across these river and floodplain systems. We have made a start for the investigation area by assessing floodplain ecological water requirements, but ongoing research and adaptive approaches are required. Council's final recommendations seek to utilise an adaptive approach to floodplain inundation with properly resourced environmental water management directed by flood-dependent ecological values, rather than mostly relying on water that is available after all other allocations are met.

We recognise the strong association that Aboriginal Traditional Owners have with much of the investigation area, despite currently having limited opportunities for involvement in public land management and decision-making. Many of these groups would like greater involvement. We recommend mechanisms to substantially increase participation of Aboriginal people in public land management, whilst also acknowledging that adequate capacity and training is necessary for this to be successful.

Council has carefully considered the social and economic implications of its recommendations. We acknowledge that changes in categories of public land will adversely affect some people. On balance, however, we believe that the environmental outcomes for the entire community and for future generations will, in the medium to long term, be greater than the shorter-term economic costs. Where individuals or particular groups are adversely affected or disadvantaged, VEAC recommends that government develop and resource appropriate assistance strategies.

Completion of this Final Report marks the conclusion of Council's three year investigation.

Mr Duncan Malcolm
(Chairperson)

Associate Professor David Mercer

Professor Barry Hart

Ms Jan Macpherson

Jill McFarlane

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Executive summary

The River Red Gum forests and their associated ecosystems are valued by a wide section of the community for their natural, aesthetic, cultural and economic values and uses. However, these areas are under pressure. River Red Gum forests are severely stressed and without improved environmental flows onto the floodplains, many of these riverine forests and wetlands may be lost. Large areas of these ecosystems have been cleared, fragmented, degraded or depleted over the last two centuries. Public land in the River Red Gum Forests Investigation area comprises only about 22 percent of the extent of these ecosystems prior to European settlement.

There are many ecosystems in the investigation area that are poorly represented in the current conservation reserve system, and there are numerous threatened species reliant on these habitats for survival. The Victorian Environmental Assessment Council (VEAC) recommends a substantial increase in the size of the conservation reserve system in the investigation area to improve the protection of ecosystems and threatened species. In making these recommendations, VEAC took into account the potential impact of climate change and the need to maintain and enhance connectivity of ecosystems across the landscape. However, protection of these ecosystems in conservation land categories is not enough. Appropriate water management, and particularly the provision of adequate environmental water flows, is also vital to ensure the long term survival of riverine forests and wetlands.

Community interest in the River Red Gum Forests Investigation is very high, and VEAC received a large number of written submissions on its Draft Proposals Paper in 2007. These submissions have been carefully considered as part of the process of developing this Final Report, and many changes have been made to VEAC's draft proposals as a result of this input. The major issues arising from the submissions and VEAC's response are detailed in chapter 1, along with a summary of the changes made to draft proposals.

Scope of the investigation

The Victorian government asked VEAC to:

- identify and evaluate the extent, condition, values, management, resources and uses of riverine red gum forests and associated fauna, wetlands, floodplain ecosystems and vegetation communities; and
- make recommendations relating to the conservation, protection and ecological sustainable use of public land.

In addition, VEAC was requested to take a number of specific matters into consideration (see chapter 1 for details).

The investigation began in April 2005 and a Discussion Paper was released for public comment in October 2006. The Draft Proposals Paper was released in July 2007, and this Final Report submitted to the Minister for Environment and Climate Change in July 2008.

Social and economic assessment

An independent assessment of the social and economic implications of the final recommendations was commissioned and the report of the assessment is included at appendix 1. Chapter 4 includes a discussion of the socio-economic analyses (benefit–cost analysis and the regional input–output analysis) and the broad social, economic and environmental implications of the recommendations.

Consultation process

VEAC used three primary consultation methods to assist with developing its recommendations:

- **Advisory groups**—VEAC established a Community Reference Group, a Government Contact Group and an Indigenous Steering Committee to provide input and advice. Members of the Community Reference Group included people with backgrounds in recreational uses, industries (timber and grazing), rural communities, Aboriginal interests, local government authorities and other agencies. Members of the Indigenous Steering Committee provided advice on the Aboriginal consultation program.
- **Three formal public submission periods** were conducted during the investigation with almost 9000 written submissions received.
- **Direct consultation**—VEAC has met with hundreds of people in local communities, and with organisations such as local government, industry bodies, recreation and conservation groups, and government agencies.

The major issues arising from the consultation and VEAC's responses are provided in detail in chapter 1, along with a summary of the changes made to draft proposals.

Summary of major recommendations

The following major recommendations are included in this Final Report.

Major new or additional areas of national parks

- **Barmah National Park**—establishment of a large new national park from state park, state forest and River Murray Reserve in the largest River Red Gum forest along the River Murray.
- **Gunbower National Park**—establishment of a new national park from state forest and River Murray Reserve on the River Murray near Cohuna.
- **Lower Goulburn River National Park**—establishment of a new national park mostly from state forest extending from the River Murray, along the Goulburn River to north of Shepparton and including Kanyapella Basin.
- **Warby Range–Ovens River National Park**—addition of regional park and state forest along the Ovens River to the Warby Range State Park to establish a new national park.

- Leaghur–Koorangie National Park—establishment of a new national park in the Loddon and Avoca River floodplains west and south of Kerang, from a number of public land units, the largest of which include Leaghur State Park, Koorangie (The Marshes) Wildlife Reserve and Wandella Flora and Fauna Reserve.
- Murray–Sunset National Park—substantial increase in area through addition of state forest (including Wallpolla Island), Mullroo Creek Wildlife Area and River Murray Reserve to this existing national park.
- Terrick Terrick National Park—addition of several grassland nature conservation reserves and other public land units to this existing national park.

Major new or additional areas of regional or other parks

- Murray River Park—consolidation of the River Murray Reserve and incorporation of regional parks at Echuca, Tocumwal, Cobram, Yarrawonga and Wodonga.
- Four (three new) parks balancing recreation and conservation objectives along the River Murray
 - Kings Billabong Park incorporating Kings Billabong Wildlife Reserve and Bottle Bend;
 - Murray–Kulkyne Park incorporating the existing park, state forest and River Murray Reserve near Colignan;
 - Gadsen Bend Park incorporating state forest and River Murray Reserve south of Robinvale; and
 - Nyah–Vinifera Park incorporating Nyah State Forest and Vinifera forest (River Murray Reserve) downstream of Swan Hill.
- Two new regional parks close to regional centres
 - Kerang Regional Park incorporating Fosters, Back and Town Swamps and Cemetery Forest Wildlife Reserve; and
 - Shepparton Regional Park adjoining the new Lower Goulburn River National Park and incorporating part of the Lower Goulburn State Forest, Shepparton Flora and Fauna Reserve and Mooroopna Recreation Reserve.

Nature conservation reserves

There are 21 expanded or retained and 29 substantially new nature conservation reserves recommended in the investigation area to improve the protection of depleted and fragmented ecosystems.

State forests

- Gunbower State Forest—incorporates 61 percent of the area in the existing state forest and 71 percent of that which was previously available for timber harvesting.
- Benwell and Guttram State Forests (northwest of Koondrook)—remain unchanged.

Other areas

There are numerous other areas of public land in the investigation area. These include 111 natural features reserves including 23 new and existing state game reserves and many public land water frontages; three new or modified and 10 existing historic and cultural features reserves; seven new or modified community use areas and several other new and existing water production, service and utilities and earth resources extraction areas.

Major issues

Changes to land use categories alone are not sufficient to protect natural and cultural values on public land. VEAC has also recommended changes to public land management in four overarching themes: provision of sufficient environmental water, increased Indigenous involvement, management of sustainable recreation and tourism, and removal of domestic stock grazing.

The investigation area includes most of the pre-European extent of River Red Gum forests and associated ecosystems and consists of 1.2 million hectares of which 22 percent is public land (269,440 hectares) – see table 1 for details. The conservation reserve system (land in national parks, nature conservation reserves and some other areas), is recommended to increase from 26 percent of public land to 64 percent; or from 5.7 percent of the original extent of River Red Gum forests, wetlands and associated ecosystems to 14.2 percent. VEAC recommends a significant shift in uses and management of public land by excluding domestic stock grazing, reducing timber harvesting and involving Traditional Owners in shared management. Recreation and tourism remains a strong focus. VEAC has recommended a range of management strategies to ensure that these popular activities are sustained and enjoyed into the future. The most urgent and serious environmental problem in the investigation area is the need for delivery of sufficient environmental water to halt the imminent loss or degradation of large areas of flood-dependent riverine forests and wetlands.

Environmental water

The predominant environmental consideration for the River Red Gum Forests Investigation is the need to provide water to sustain the natural assets of the floodplains. VEAC has identified the approximate frequency and extent of flooding required to maintain—in an ecologically healthy condition—riverine forests and wetlands dependent on inundation, and recommends that this information be incorporated into decision-making on environmental watering through the relevant state and national water programs. VEAC has broadened the information base available to decision-makers by describing water requirements for all flood-dependent ecological vegetation classes and incorporating information on threatened flora and fauna, but an ongoing program is recommended to build upon this dataset and improve understanding of floodplain ecology.

Table 1. Summary of final recommendations for each public land use category

Land use category	Current area (ha)	Recommended area (ha)
National park	52,120	146,830
State park	9925	0
Other park (Schedule Three, <i>National Parks Act 1975</i>)	4000	11,130
Regional park (except Murray River Park)	3775	3925
Murray River Park	0	34,685
Nature conservation reserve	11,895	9900
Natural features reserve	48,665	27,160
Water production	2120	2105
Water supply regulation and drainage	10,545	10,610
Historic and cultural features reserve	705	865
Community use area	2690	2515
State forest	106,910	12,290
Plantation	175	175
Earth resources	125	225
Services and utility	5880	6160
Wildlife management co-operative area	2565	0
Uncategorised public land	7350	870
Total public land	269,445	269,445
Private land	950,650	950,650
Total extent of investigation area (including all freehold and other land)	1,220,095	1,220,095

Notes:

1. Additional areas of public land, particularly those where a freehold title is held by a public authority, have been identified since publication of the Draft Proposals Paper and account for the subsequent increase, from 268,715 ha to 269,445 ha, in the total extent of the public land in the investigation area.
2. Numbers are rounded to the nearest five hectares.
3. Barmah State Forest is subsumed by the recommended Barmah National Park.
4. Natural features reserve includes the River Murray Reserve which is currently 16,060 hectares and recommended to be incorporated in the Murray River Park and other public land use categories.

Indigenous involvement in public land management

Australian jurisdictions are increasingly adopting various forms of shared land management as a means of reconciling Aboriginal claims to land and, in some cases, addressing legal requirements to accommodate native title interests. Victoria has not so far taken the formal steps that most other states and territories have taken in providing for direct Aboriginal participation in land management.

There is a clear need for resourcing and capacity building to support increased involvement of Traditional Owner groups in public land management and decision-making. A range of approaches are recommended for increasing Traditional Owner engagement and decision-making within shared management arrangements, including co-management of the new Barmah National Park and the Nyah–Vinifera Park through Boards of Management with majority Aboriginal membership. Other arrangements for shared management include Aboriginal Advisory Committees. Amendments to legislation are recommended within five years to provide for a process to enable handback/leaseback of national parks in the future. Clarification of provisions for Aboriginal traditional cultural practice by Traditional Owners across public land is also recommended.

Recreation and tourism

The sustainable promotion and maintenance of recreation and tourism is an important factor for the River Red Gum Forests investigation area. After reviewing visitor data and following the changes below, VEAC considers implementation of its recommendations will result in increased recreation and tourism. VEAC recommends dispersed camping as the predominant form of camping across all land categories. Solid fuel fires and associated firewood collection on most public land are recommended to be retained except during the high fire danger period when fires would be banned. Camping with dogs is recommended to continue in regional parks including the Murray River Park. The development of a River Murray Strategy will provide a long term framework for sustainable recreation, tourism, commerce and similar uses along the length of the River Murray.

Domestic stock grazing

Significant changes are recommended for domestic stock grazing in the investigation area including the exclusion of broadacre domestic stock grazing across public land, other than unused roads, and a five year phase out of grazing on public land water frontages. While there will be an adjustment period, in many places infrastructure is currently in place to exclude stock. The critical function of riparian land and adjoining corridors for conservation of native flora and fauna and for river health is well known, and condition is currently declining due to grazing pressure. The benefits to waterways and water quality—particularly with climate change already affecting run off and stream inflows—are likely to be significant and of both environmental and economic benefit, especially in the lower catchment areas.

Summary of uses and implications

The independent social and economic assessment commissioned by VEAC found that VEAC's recommendations would result in a net increase in economic value to Victoria of \$37.3 million per year, or \$107 million per year (excluding water costs) if additional environmental water is provided. Most of the benefits result from the values people ascribe to environmental protection, some of which are dependent on adequate environmental water. Providing adequate environmental water for identified natural assets—in particular, flood-dependent vegetation and threatened species—is likely to have substantial costs, but is currently the subject of a number of rapidly developing national and state water programs. Accordingly it was beyond the scope of the consultants' benefit-cost analysis and regional impact analysis.

By their nature, environmental benefits are provided to the whole population and to future generations. The environmental benefits therefore would accrue mostly to people outside the investigation area, as they are calculated on a 'per household' basis, and their distribution largely corresponds to population. Accordingly large centres including Melbourne and regional cities inside and outside the investigation area receive major environmental benefits. The costs would be largely borne within the investigation area particularly in areas where public land timber harvesting and grazing are focussed. The smaller towns of Cohuna, Koondrook, Nathalia and Picola are likely to be most sensitive to these effects and VEAC is recommending that government provide assistance if required to address negative impacts.

Nature conservation

The investigation area largely follows the riverine corridors through an essentially semi-arid environment but also encompasses grasslands of the Victorian Riverina and fertile mountain valleys in the east. This corridor supports a diverse range of ecosystems and habitats, and many threatened plants and animals. In developing its recommendations, VEAC has used ecological vegetation classes (EVCs) as surrogates for ecosystems, and nationally agreed criteria for establishing a comprehensive, adequate and representative reserve system (also known as the 'JANIS criteria'). Protection of ecosystems in secure conservation reserves is a key element of this approach.

VEAC's recommendations more than double the total area in secure conservation reserves from 69,640 hectares to 173,240 hectares. These new reserves satisfy JANIS criteria for the majority of ecosystems and important threatened or depleted EVCs such as Riverine Grassy Woodland, Floodplain Riparian Woodland, Grassy Riverine Forest, Lignum Swampy Woodland, Plains Woodland, Plains Grassland, Semi-arid Chenopod Woodland, Chenopod Mallee, Woorinen Mallee and Riverine Chenopod Woodland.

The new conservation reserve system provides for many threatened species, including essential protection for the last Victorian breeding site of the threatened Superb Parrot (in the new Barmah National Park) and reduces threats to the endangered Mueller Daisy at two of the most important sites for this species in Victoria.

Consolidation of these areas into large and well connected reserves is an important component ensuring long term viability and allowing for species movement across the landscape. Strong habitat linkages also provide a buffer for the future effects of climate change. The north–south links in the Warby Range–Ovens River and Lower Goulburn River National Parks and the consolidated Murray River Park will be particularly important habitat corridors or links.

However, environmental flooding is the most critical requirement for biodiversity conservation in the investigation area. Without adequate water, public land use changes will reduce some threats but will not be sufficient for the long term sustainability of the River Red Gum forests flood-dependent ecosystems.

Environmental water

The most urgent and serious environmental problem in the investigation area is the imminent loss or degradation of large areas of wetlands and riverine forests as a result of greatly reduced frequency of flooding. This reduced frequency of flooding is already having substantial negative impacts on natural values (especially biodiversity), Aboriginal associations with the land, recreational values and the sustainability of timber harvesting, and these impacts are likely to become severe without prompt and significant action. Many tens of thousands of hectares of forests and wetlands habitats may be lost without adequate water in the near future.

Changes to public land use categories alone will not be sufficient to address this problem. As a result, VEAC's approach goes beyond such changes to identify the approximate frequency and extent of watering required to maintain riverine forests and wetlands in a healthy condition and highlights the need for such watering to be brought about.

Since the Draft Proposals Paper was published in July 2007 many aspects of environmental water management have changed significantly. For example, announcements have been made on new proposals to provide more environmental water, and new arrangements between the Commonwealth and the states for the Murray Darling Basin are in place. Over the same time period, new information has been published by CSIRO and DSE quantifying dramatic reductions in water yields under climate change scenarios. Such a dynamic setting emphasises the need for recommendations on environmental water that will remain relevant in the face of such changes in the future. To this end VEAC has directed its focus to the central issue: highlighting the natural values that depend on watering other than local rainfall for their existence.

VEAC has mapped areas of flood-dependent natural values and ascribed a watering requirement (minimum frequency and duration) for their maintenance in an ecologically healthy state. Expert scientific knowledge has been used to identify the water requirements of ecological vegetation classes (EVCs) as a surrogate for ecosystem diversity, and for threatened species. The resultant maps provide a comprehensive account of the required flood frequency across the entire floodplain. This approach is independent of delivery methods—artificial or natural. It establishes benchmarks across the entire floodplain enabling comparisons under different watering scenarios;

creates a consolidated baseline or reference set that can develop as new data are incorporated; and provides a basis for increasing community engagement in environmental water management.

This approach differs from that taken in the Draft Proposals Paper which focussed on achieving adequate overbank flooding and an estimated required volume (4000 gegalitres every five years; 800 gegalitres annualised). While overbank flooding is the optimal method of delivery for many ecosystems, if the current reduced water yields continue, targeted works may be the most feasible. While the approach has changed, the need for significant volumes of water to sustain the natural assets of the floodplain remains as the major environmental issue for the River Red Gum Forests Investigation area.

Other issues addressed in recommendations on environmental water include inappropriate summer flooding of Barmah forest and deteriorating levee banks.

Indigenous involvement

VEAC has recommended increased involvement of Aboriginal people and Traditional Owners in public land management. A number of recommendations have been made to increase Aboriginal community capacity and enhance involvement in management, including a program that will facilitate Traditional Owner identification, registration, and the establishment of internal decision-making processes and informed consent protocols.

A range of approaches are recommended for increasing Traditional Owner engagement and decision-making within shared management arrangements. The new Barmah National Park and Nyah–Vinifera Park are recommended to be co-managed through a new arrangement involving Boards of Management with a majority of members of the relevant Traditional Owner group or groups. Other arrangements are also recommended including Aboriginal Advisory Committees for the west Wallpolla Island area of the Murray–Sunset National Park, Hattah–Kulkyne National Park and Murray–Kulkyne Park, Bumbang Island Historic and Cultural Features Reserve and the new Gunbower National Park. A number of flexible arrangements acknowledge the different aspirations of different Traditional Owner groups at this time and provides for future changes in arrangements for particular areas.

Traditional cultural practice is viewed as one of the key ways that Aboriginal people may keep their culture alive and teach younger generations. VEAC has recommended changes to allow for traditional cultural practice by Traditional Owners across public land in the investigation area through a consent or permit system involving Traditional Owners in decision-making.

Recreation and tourism

Recreation and tourism are significant contributors to the economy of the investigation area, with around five million visitor days and \$868 million being spent each year in the region, based on 2005 and 2006 Tourism Victoria data for the Murray Region. This is the second highest Victorian regional total after the Great Ocean Road Region. Most people are drawn to the rivers and streams for recreation events and activities—notably along the Murray and Goulburn Rivers—particularly for low cost and relatively

unregulated camping holidays. Around 0.24 million people a year visit River Red Gum forests in the investigation area, with a strong trend towards increasing numbers. Designation of additional national parks and associated promotion has the potential to increase visitation by up to 20 percent.

The increasing popularity of camping in the investigation area has led VEAC to recommend dispersed camping (independent camping without facilities) as the predominant form of camping across all riverine parks and state forest areas, as well as recommending some areas be established for designated campsites and remote campsites. Camping with dogs is recommended as a permitted use for regional parks including the Murray River Park, which together cover some 75 percent of the frontage to the River Murray. To accommodate a range of visitor experiences whilst increasing the camping capacity in a sustainable manner, VEAC recommends land managers develop a recreation and camping strategy in consultation with the community. To help reduce the environmental impacts of camping, a ban on solid fuel fires and firewood collection is recommended for the designated high fire danger period on all public land in the investigation area. Campfires and associated firewood collection are recommended to continue for the remainder of the year in national parks, regional parks and state forest areas. Land managers will determine suitable sites for firewood collection that will minimise loss of habitat for ground dwelling animals.

VEAC's recommendations reduce the number and area of wetlands available for recreational duck hunting. A potential reduction in duck hunters visiting the investigation area is estimated to lead to a net economic cost of up to \$0.49 million and 15 (equivalent) jobs in the region, particularly in the Kerang area. This is largely due to reduced spending on fuel, accommodation and other retail services in the region. Recommended improvements to environmental water regimes will enhance many wetlands and therefore improve hunting opportunities for available areas, potentially reducing the estimated economic effects. The net economic gain for wetland protection is estimated at about \$0.66 million.

Integrated planning along the whole of the River Murray corridor is desirable and should take into account activities on the river itself and adjacent private land, as well as on public land. VEAC recommends that a co-ordinated River Murray Strategy be undertaken to provide a long term framework for sustainable recreation, tourism, commerce and other uses.

Timber industry

State forests in the investigation area are a major source of River Red Gum timber products, as well as supporting biodiversity and providing for a broad range of recreational activities. VEAC's recommendations significantly reduce the area of state forest—from 106,910 hectares to 12,290 hectares. Commercial timber harvesting in the investigation area is largely from Barmah, Gunbower and the Lower Goulburn forests. The area available for harvesting (not counting areas where harvesting is uneconomic, nonviable or prohibited) would reduce significantly under VEAC's recommendations. This will

greatly decrease the volume of wood produced and, consequently, the size of the River Red Gum timber industry.

Based on new predicted growth rates, estimates of sustainable yield show that with existing environmental water commitments delivered, no additional water and the current available area (the 'base case'), the sustainable sawlog harvest volume is likely to be reduced to 71 percent of the current sawlog allocation (based on 6070 m³/year). Countering this loss somewhat, improved environmental watering that increases forest flooding will increase current timber growth rates as River Red Gum forest health depends on water supplied by regular winter–spring flooding. However, the recommended reduction in state forest area and significantly greater floodplain inundation are estimated to result in a sustainable harvest equivalent to 22.5 percent of the current sawlog allocation but 32 percent of estimated 'base case' harvest volumes.

In financial terms, these changes would reduce the net economic contribution of the timber industry to the Victorian economy from \$1.83 million per annum currently to \$0.58 million per annum. The industry currently represents 0.08 percent of the regional economy. Employment in the industry would reduce by around 57 direct jobs (fulltime equivalents) in the investigation area with a flow on reduction of an additional 22 indirect jobs.

Domestic stock grazing

The critical ecological role and ecosystem services supplied by vegetated public land in this depleted and fragmented landscape, and particularly riparian land, cannot be underestimated. The uncertainty of climate change elevates the important role of waterways and adjoining corridors for conservation. VEAC has considered a range of information and opinions in forming the view that while domestic stock grazing can be an effective tool to address specific land management problems at particular locations and times, scientific evidence indicates that in general it adversely affects natural values especially biodiversity, water quality and soil condition. Accordingly, VEAC recommends that domestic stock grazing be generally excluded from public land in the investigation area with the exception of approximately 4600 hectares of licensed unused road reserves. The recommendations allow for grazing as a targeted management tool, to address particular environmental or management problems, such as controlling particular weed infestations or maintaining a specific grassy habitat structure.

These recommendations are a significant shift in public land management priorities and will see the cessation of some 1725 licences over an area of approximately 83,885 hectares. VEAC acknowledges that excluding stock grazing from riparian public land water frontages—comprising 1260 licences of about 8000 hectares extent—is likely to require considerable fencing and the installation of offstream water points. At current rates of riparian fencing reported by some catchment management authorities in the investigation area, stock exclusion from licensed frontages is achievable within only a few years, depending upon the resources allocated. The estimated cost to complete fencing along the Crown/freehold boundary and stock watering point installation is \$0.87 million for the entire investigation area. A phase-out period of five years is recommended for removal of grazing from public land water frontages.

Broadacre grazing and grazing outside unused roads and public land water frontages is recommended to cease immediately. This includes 29,600 hectares of Barmah forest, which provides an estimated economic contribution of \$140,000 and 1 fulltime equivalent job, across about 38 permit holders. Licensed domestic stock grazing on public land across the entire investigation area has an estimated economic contribution of approximately \$0.76 million and supports 4 to 5 fulltime equivalent jobs.

Cultivation and cropping on public land, both licensed and unauthorised, are also recommended to cease immediately.

Commercial and domestic firewood

The percentage reductions in timber availability resulting from VEAC's recommendations are likely to apply with reasonable reliability to firewood, especially waste timber following commercial sawlog harvesting activities and thinning operations. These reductions are included in the quantification of timber industry impacts summarised above.

Domestic firewood is largely obtained from harvested wood, and is largely constrained by accessibility. Local firewood strategies such as those implemented following acceptance of the ECC Box–Ironbark Forests and Woodlands Investigation recommendations may be appropriate in parts of the River Red Gum Forests Investigation area to guide the transition to new domestic firewood arrangements. To cater for areas with few affordable alternatives (especially reticulated gas) and where little state forest remains, zones for domestic firewood collection are recommended in the Murray River Park in the Mildura, Robinvale, Boundary Bend, Swan Hill, Barmah, Cobram and Rutherglen areas and parts of the Shepparton Regional Park. State forests at Gunbower, Benwell and Guttram will also remain available for domestic firewood collection.



A

Introduction



1 Introduction

The River Red Gum forests and wetlands of the River Murray are characterised by a diversity of natural values and attributes. These values include biodiversity, history, geology, cultural significance, scenery, as well as many other qualities. People also use the area for a range of activities, such as recreation, grazing, forestry and community education. These natural values and activities are described in detail in the Discussion Paper, the first report for the River Red Gum Forests Investigation, released in October 2006.

The Victorian government asked the Victorian Environmental Assessment Council (VEAC) to undertake an investigation into the River Red Gum Forests of the River Murray and its Victorian tributaries in 2005. A Draft Proposals Paper was released for public comment in July 2007. This Final Report, the third report of the investigation, outlines VEAC's final recommendations—including general recommendations, thematic recommendations and recommendations for public land categories. The report also includes Council's response to issues raised in submissions and during community consultation, as well as a section exploring the social, economic and environmental implications of the final recommendations.

Scope of the investigation

Legislation and Terms of Reference

VEAC conducts its investigations at the request of the Minister in accordance with the *Victorian Environmental Assessment Council Act 2001* (the VEAC Act) and the Terms of Reference provided by the Minister. Together these determine how VEAC conducts its investigations, including the reports that are required and public consultation timelines. The River Red Gum Forests Investigation began in April 2005.

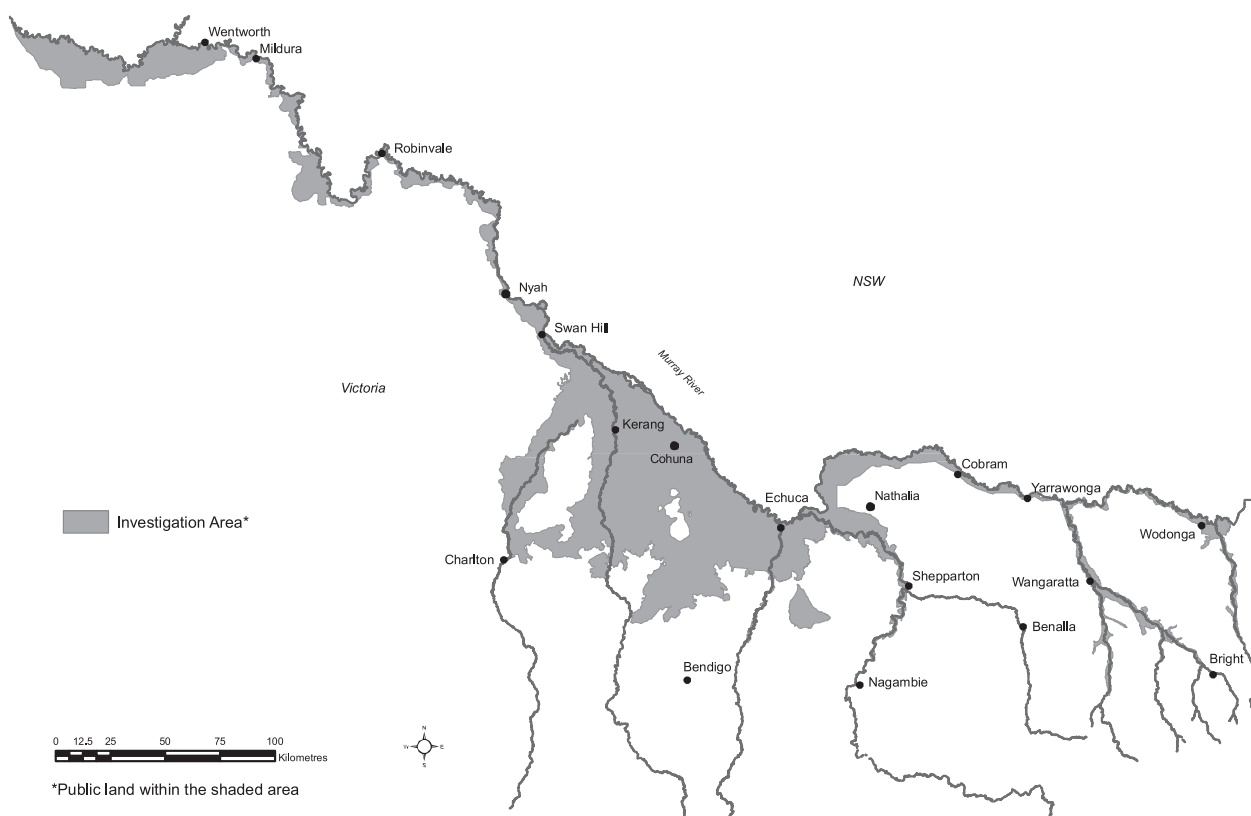
Investigation boundary

Public land comprises 269,444 hectares of the River Red Gum Forests Investigation area (within a total area of 1,220,095 hectares) extending from Lake Hume to the South Australian border. It also includes public land along a number of Victorian river tributaries. The investigation area, including boundaries and the distribution of public land in the area, is shown in map 1.

Timeframe for the investigation

This Final Report has been submitted to the Minister for Environment and Climate Change, and marks the conclusion of VEAC's role in the River Red Gum Forests Investigation. The Minister must make the report available to the public within seven days, and the Government is required to respond to the report within approximately six months. Appendix 4 contains the timeframe for the entire River Red Gum Forests Investigation.

Map 1: River Red Gum Forests Investigation Area



Requirements under the VEAC Act

Under Section 18 of the VEAC Act, the Council must have regard to the following considerations in carrying out an investigation and in making recommendations to the Minister:

- the principles of ecologically sustainable development
- the need to conserve and protect biological diversity
- the need to conserve and protect any areas which have ecological, natural, landscape or cultural interest or significance, recreational value or geological or geomorphological significance
- the need to provide for the creation and preservation of a comprehensive, adequate and representative system of parks and reserves within the State of Victoria
- the existence of any international treaty ratified by the Commonwealth of Australia which is relevant to the investigation
- any agreement at a national, interstate or local government level into which the Government of Victoria has entered, or under which the Government of Victoria has undertaken any obligation in conjunction with the Commonwealth, a State, Territory or municipal council, which relates to the subject matter of the investigation
- the potential environmental, social and economic consequences of implementing the proposed recommendations
- any existing or proposed use of the environment or natural resources.

Terms of Reference

The purposes of the Investigation as described in the Terms of Reference are to:

- (a) Identify and evaluate the extent, condition, values, management, resources and uses of riverine red gum forests and associated fauna, wetlands, floodplain ecosystems and vegetation communities¹; 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*.

In addition to the considerations specified in Section 18 of the VEAC Act, the Council must also take into consideration the following matters:

- Policies, programs and reports, as well as obligations, resulting from International, Commonwealth-State and Interstate agreements or arrangements, as they relate to the investigation
- Existing State Government policies, programs, strategies and Ministerial Statements, as they relate to the investigation
- Regional programs, strategies and plans, as they relate to the investigation
- Possible opportunities for indigenous management involvement
- The Yorta Yorta Co-operative Management Agreement
- Appropriate access for commercial opportunities (e.g. timber, grazing, apiaries, and other resource industries), for appropriate recreation activities, and for community values and uses
- Nationally agreed criteria for a comprehensive, adequate and representative reserve system, and
- Opportunities for a joint management regime with the New South Wales Government for the Murray River and public land on its floodplains.

The Council is required to release a Discussion Paper, a Draft Proposals Paper, and submit a Final Report on the results of its Investigation. The Final Report must be submitted by 31 July 2008².

1 This includes all Ecological Vegetation Classes (EVCs) occurring within the investigation area boundary

2 Originally 1 February 2008

Structure of the Final Report

This Final Report is divided into three main parts:

- Part A includes chapter 1 covering introductory material, a summary of the major changes to recommendations in the Draft Proposals Paper, and VEAC's response to the main issues or proposals raised in submissions to the Draft Proposals Paper
- Part B outlines the final recommendations including the general recommendations, thematic recommendations and recommendations for public land categories and includes chapters 2 and 3
- Part C includes chapter 4 and describes the social, economic and environmental implications of the recommendations outlined in part B.

More comprehensive and detailed information on the values and uses of public land in the investigation area can be found in the River Red Gum Forests Investigation Discussion Paper. Copies of the Discussion Paper and Draft Proposals Paper as well as this Final Report can be accessed through the VEAC website www.veac.vic.gov.au.

Information sources

In preparing this Final Report, VEAC has drawn on many sources including relevant existing studies, material from the Discussion Paper, submissions responding to the Discussion Paper and Draft Proposals Paper, information from the community, land and water managers, VEAC's own research and, where necessary, commissioned consultancies. All the reports prepared specifically for this investigation are available on VEAC's website.

In making its final recommendations, VEAC acknowledges that some users of public land may benefit whilst there may be social or economic burdens placed on others. To identify the distribution of costs and benefits, VEAC commissioned a social and economic assessment of its final recommendations and their implications. A discussion of this analysis is included in chapter 4 of this document, and the consultants' report is included at appendix 1.

Community and stakeholder consultation

Consultation plays a central role in VEAC investigations. Under its legislation VEAC is required to consult with the community. Three consultation methods have been used for this investigation: the use of advisory groups for the provision of information and advice; direct consultation with individuals, groups and organisations; and a formal submission process based on the release of documents for public comment. The major issues and themes arising from consultation are discussed later in this chapter, along with Council's response. Specific descriptions and discussion of community views are also incorporated into the discussion of the final recommendations for each land category, found in chapter 3 of the report.

Advisory groups

As required under Section 13 of the VEAC Act, the Council established a Community Reference Group for the investigation. The Community Reference Group was made up of representatives of a broad range of interests related to the investigation, and provides advice and input to VEAC on many issues.

The Council also established an Indigenous Steering Committee under section 12 of the VEAC Act, comprising representatives from across the investigation area to provide advice on consultation processes and methods for gaining Indigenous communities' views on involvement in public land management.

A Government Contact Group consisting of a range of representatives from government agencies provided technical advice to VEAC.

A list of members of the Community Reference Group and the Indigenous Steering Committee along with the Government contact agencies is provided at appendix 2.

Direct consultation

Since the release of the Discussion Paper and Draft Proposals Paper, VEAC has met with a range of individuals and groups to hear their views and to gain greater insights into their positions on public land use in the investigation area. VEAC also met with a diverse range of individuals at the six community forums which were held following the release of the Discussion Paper and the nine community forums following the Draft Proposals Paper. These forums provided an opportunity for people to learn about the investigation, discuss relevant issues and draft proposals and meet with Council members and staff in an informal setting. Approximately 900 people attended these events. The forums were accompanied by an extensive communications program including both print and radio media. Four briefing sessions were also held for government agency representatives following the release of the Discussion Paper and a further four following the release of the Draft Proposals Paper.

The Indigenous consultation process involved 17 workshops at 13 locations within and near the investigation area, with a total attendance of 117 people. Other people who could not attend made comments by telephone. Views gained from each of these workshops were considered as part of the process of developing recommendations for

Indigenous involvement in public land management. A copy of the consultant's report on the Indigenous consultation is included at appendix 3.

Formal submission process

Three formal submission periods have been completed, the first following the Notice of Investigation being advertised, the second following release of the Discussion Paper in October 2006, and the third following the release of the Draft Proposals Paper in July 2007. More than 580 submissions were received in the first stage, more than 1350 submissions were received in response to the Discussion Paper and a further 6800 submissions were received following the release of the Draft Proposals Paper. These submissions were from individuals, interest groups and organisations representing a broad cross-section of the community. There is a complete list of all those who made submissions for the three periods on the VEAC website: www.veac.vic.gov.au. Most of the submissions on the Draft Proposals Paper are also available on the VEAC website.

Response to major issues or proposals raised in submissions

Introduction

Almost 9000 written submissions were received during the course of the River Red Gum Forests Investigation, indicating a strong interest within northern Victoria and throughout the broader community. VEAC appreciates this high level of participation.

Submissions covered a very broad range of views and information. A number of submissions provided detailed information including technical reports and references to support various opinions or proposals, particularly during the two earlier submission periods. Some submissions provided information to correct what was seen as errors or omissions. Where new information or corrections to factual information was provided, it was incorporated into decision-making processes. Council members and staff have read every submission and analysed and considered relevant issues, comments and proposals during the development of the Discussion Paper, the Draft Proposals Paper and this Final Report.

This section outlines the main issues raised during the River Red Gum Forests Investigation. As well as an overall summary of issues, a summary of each of the major issues raised throughout the investigation is provided below together with VEAC's response.

Overview of issues

Draft proposals viewed as restricting access for recreational activities, such as camping, fishing, horse-riding, four-wheel driving and activities with dogs, caused the most concern. A very large number of submissions opposed any change to current recreational activities or access. In particular, a significant number of submissions disagreed with proposed changes to patterns of camping, campfire (solid fuel fire) bans, and other restrictions such as no camping overnight in national parks with dogs or horses. Other submissions expressed support for the proposed campfire changes, with many people supporting a modification of the draft proposals to align a summer

campfire ban with New South Wales regulations, rather than a complete exclusion in national parks. Many submitters requested that VEAC provide more detail on proposed camping management changes that may affect them, by describing the changes and specific locations. In general these submitters also opposed any change to public land use categories, and sought to retain access for traditional recreational pursuits.

Recreational hunters strongly opposed proposed changes to public land use which would lead to a reduction in the area available for duck hunting. Substantial economic loss was predicted with no hunting in the north-west portion of the investigation area and reduced opportunities in the popular Kerang lakes region. Comments related to recreational hunting are discussed in more detail below, but generally it is clear in submissions that the predicted impacts of the draft proposals on hunters were disputed, and the contribution of recreational hunters to management and purchase of wildlife areas (state game reserves) for duck hunting highlighted.

A significant number of submissions commented on the proposed increase in area of national parks and conservation reserves and the economic impact this would have on resource uses such as timber harvesting and domestic stock grazing on public land. Submitters viewed the proposed decrease in state forest area—and commensurate increase in conservation reserves—as significantly reducing timber industry jobs, in turn concentrating the social and economic impacts of the recommendations on small towns. A general view from submissions expressing concern about changes affecting timber availability was that VEAC had underestimated the economic importance of the timber industry to the regional economy in the investigation area. Many submitters put the view that multiple use—that is resource use, recreation and conservation—does not damage forests or biodiversity and that VEAC had not provided sufficient evidence to justify an increase in national park areas.

Improved management of biodiversity and other environmental values—by expanding protected areas such as national parks to meet nationally agreed criteria—was strongly supported by other submitters throughout the investigation. The need for protected areas such as national parks was important to many people, from both within and outside the investigation area. Many submissions called for an increase in national parks, particularly focussing on expansion of Gunbower National Park to include the entire area of Gunbower Island. Many of these submitters also promoted a reduction in resource use (timber and stock grazing) and greater involvement for Aboriginal people in public land management. An immediate phase-out of timber harvesting in proposed national and other parks was also suggested.

Many submitters called for domestic stock grazing to be retained; mostly these also opposed any changes to existing public land use categories and national parks. The proposed removal of stock grazing from most public land was seen as the loss of a long-standing right with cultural as well as economic impacts. Fencing costs and ongoing land management difficulties were given as reasons why stock should not be excluded from public land water frontages in particular. Some submitters claimed that VEAC had not put forward sufficient evidence that grazing

caused environmental damage. There was just as much support for excluding stock and recognising the importance of wetlands and waterway frontages as refuges for flora or fauna, and for absorbing nutrients, erosion control, protecting soil structure and other ecosystem services.

A substantial number of submitters expressed strong opposition to the predicted adverse regional economic effects. Many people considered that the cost of change to their industries or recreation interests were undervalued. Some submitters framed the economic and social effects as city versus country, with the costs incurred within the investigation area and the benefits enjoyed by residents of metropolitan Melbourne. The benefits of protected areas and biodiversity and the economic analysis supporting these results, were dismissed by some submitters as not ‘real money’. Adjustment to changes that would result from implementation of the draft proposals was beyond the ability of some communities already stressed by drought, according to some submissions.

The environmental water overbank flood draft proposal attracted a number of comments in submissions and at community forums. In general, those who saw a need for increases in conservation reserves and improved management, including many recreational users, were very supportive of the environmental water draft proposals. The proposal was seen as a necessary management tool if the natural values of the forests were to be retained for all to enjoy into the future. Some submitters disagreed with the need for environmental water, with many focussing on the difficulty of storing and delivering the volume of water proposed. The impacts of the environmental overbank flow on private property and infrastructure, particularly levees, were raised as reasons why the environmental water should not be delivered.

There was both support for, and opposition to, increased opportunities for Indigenous involvement in public land management and co-management of some parks. A significant number of people who also supported conservation or national park proposals, supported increased involvement by Aboriginal Traditional Owners in public land management and shared management. Many submissions promoted an increased role for specific areas and both the proposed Barmah National Park and Nyah-Vinifera Park were suggested as potential areas for “handback/leaseback” arrangements. Some people viewed the draft proposals as excluding other groups from having a role in management of public land. While some Aboriginal people supported the proposals for traditional cultural practice, there was some opposition from the wider community, particularly to hunting in protected areas.

The reduced availability of domestic firewood was raised in many submissions and there was clearly uncertainty about access to firewood under the draft proposals. Also there was confusion regarding the retention of coarse woody debris as habitat and to which public land use categories this applied. For many people, the availability of domestic firewood would be limited with no cheap fuel alternatives (such as reticulated gas) in many locations. Many submissions promoted the continuance of the timber industry as a means to supply firewood. Others proposed the establishment of plantations to provide the future supply of firewood.

A recurring theme throughout the investigation was both general and specific concerns related to management of public land, particularly for wildfire prevention and suppression, and adequate on-ground works. Parks Victoria was seen by many as a poor land manager because of a perceived lack of resources within the investigation area. It was assumed by some that the additional areas proposed as national and other parks would be managed with existing resources, leading to a decrease in fire suppression, weed and feral animal control and recreational access. State forests were seen as well managed by submitters supporting multiple uses of public land.

VEAC's investigation process and, in particular, community consultation received some criticism. The independence of VEAC and the transparency of the process were questioned in some submissions. The Indigenous community consultation process was also questioned and the role of the Indigenous Steering Committee raised. The role and responsibilities of the Community Reference Group in the investigation process attracted comments.

Recreational access and camping

Many submissions emphasised the importance of traditional camping along river frontages, with families and friends returning year after year to their favourite campsites. They emphasised that campfires, camping with dogs and associated activities such as boating and fishing are integral parts of the experience. Some submissions expressed the view that the draft proposals would prevent these activities from continuing and that many existing areas would not be accessible as tracks and boat launching sites would be closed and recreational uses banned.

VEAC's use of the term 'dispersed camping' was viewed as a method of moving people out of existing camping sites for 'dispersal' to other areas. Others interpreted the draft proposals as excluding the option of informal camping and thought they would be limited to designated camping grounds only. Many submissions wanted no changes to current practices in relation to campfires, dogs, fishing, boat launching, duck hunting, horseriding and track access. The main views relating to campfires and hunting are presented separately below.

Other submissions indicated that camping should be permitted along narrow frontages if consideration was given to access and hygiene issues. Others expressed concern about the lack of an effective rubbish collection service. A number of submissions indicated that access for duck hunting and horseriding had been reduced.

Response

Most recreational activities can continue in all land categories. Fishing, horseriding and camping are all permitted uses in national and other parks (refer to the relevant public land use category sections of the Final Report). Detailed planning for recreation and camping uses at specific sites is not the role of VEAC and will be undertaken by the land manager in close consultation with the community, user groups, tourism bodies and local government following government acceptance and implementation of specific recommendations.

Given the concerns relating to draft proposals for camping and management of the impacts of camping on the riverine environment in particular, VEAC has presented a clearer and detailed explanation of the terminology used in the final recommendations. To summarise, the term 'dispersed camping' means camping at sites that are self-selected, and generally have no facilities other than access tracks. The popular activity of dispersed camping with dogs is not permitted in national parks but is permitted in the other park categories, notably along the Murray frontage. This activity in particular has been accommodated with an increase in the area of Murray River Park (recommendation B3) and removal of the proposed camping ban for areas of river frontage that are less than 100 metres wide.

VEAC has changed and amended recommendations to provide a greater level of clarity about camping and recreation uses, as follows:

- dispersed camping is acknowledged as the predominant camping style and will continue across all park categories
- opportunities for designated campsites (campsites with basic facilities) and remote campsites will be investigated by the land manager in consultation with the community
- camping with dogs is permitted in the Murray River Park and regional parks and additions to these parks have been recommended to provide further dog camping areas
- traditional recreational uses such as four-wheel-driving, motorbike riding, horseriding on roads and tracks, fishing, and boat launching are allowable uses in parks and will continue
- areas for duck hunting have been expanded to include Reedy Swamp and McNab Bend near Koondrook
- detailed planning for recreation and camping uses is not the role of VEAC. This will be undertaken by the land manager in close consultation with the community, user groups, tourism bodies and local government
- camping is permitted on river frontages less than 100 metres wide where access and hygiene issues can be resolved.

Campfires

There were many written submissions and comments received about the proposed campfire (solid fuel fire) ban in national parks and nature conservation reserves, and the fire ban during the high fire danger period for other public land areas in the investigation area. Many submissions argued that campfires should be allowed all year round. People considered that there was little risk of campfire escape and the proposed target of retaining 50 tonnes per hectare coarse woody debris on the forest floor as habitat would be a major fire hazard.

Other submissions stated campfires should not be allowed during the high fire danger period in line with the restrictions on the New South Wales side of the River Murray. Many acknowledged the potential impact of firewood collection on ground habitat (coarse woody debris) and suggested that campers be encouraged to bring wood from home or purchase firewood or collect it from less sensitive areas.

Response

The final recommendations acknowledge the importance of campfires to recreational users, particularly campers, in River Red Gum forests but maintain that there is a need for a ban during the high fire danger period throughout all public land. Future climate change is likely to increase the risk of bushfires, and this recommendation aligns Victoria with similar bans in New South Wales and South Australia.

VEAC has changed and amended the recommendations to allow campfires in national parks except in the high fire danger period. The collection of firewood for campfires is permitted at the land manager's discretion where a mosaic of accumulated coarse woody debris can be retained for ground-dwelling fauna.

VEAC acknowledges that protection of visitors and forests from fire is a fundamental and ongoing responsibility of land managers. VEAC has indicated that the distribution of coarse woody debris should be based on appropriate research and be consistent with fire protection strategies.

Recreational hunting

Access for recreational shooting, especially duck hunting, drew a large number of submissions, the majority opposing any loss of access to hunting opportunities and protesting restrictions on family traditions. Opposition mainly focussed at a broad level and, in general, did not specify individual wetlands. Specifically mentioned hunting areas described as important included Johnsons Swamp, Goulburn River, Reedy Swamp, Loch Garry, Koorangle (The Marshes), Lake Bael Bael, Lake Elizabeth, Gunbower, Barmah forest, the River Murray and Kerang lakes more generally.

Submissions often mistakenly stated that 23 wildlife areas (including state game reserves) out of a total of 32 (181 statewide) were lost to hunting under the draft proposals. It was also suggested that many of these wetlands were purchased with game licence fees established in the 1950s and that such areas were supposed to be retained for duck hunting in perpetuity. Many submissions highlighted the role of hunting groups, and duck hunters generally, in lobbying for wetland protection and environmental water over many decades. The role of local hunting groups in on-ground management of wildlife areas, control of feral animals and public land more generally were also highlighted, and it was stated that the first environmental water initiatives in this region were established after lobbying by hunting organisations. Permanent reservation of state game reserves was taken to mean that no changes could be recommended to this public land use.

The socio-economic assessment in VEAC's draft proposals paper relating to the contribution of duck hunters to the regional economy was considered flawed and based on data from poor seasons or other states by some submissions. Both the number of hunters and the amount typically spent in the investigation area were disputed. In addition, the draft proposals were interpreted as being at odds with the Victorian Game Management Initiative (2007).

Some submitters claimed that no evidence was presented that duck hunting compromises biodiversity values or the environment and that in fact state game reserves are managed as national parks but with hunting permitted during a limited season. On the other hand, some submissions called for a permanent duck hunting ban citing cruelty with high wounding rates, an estimated 82 percent decline in waterbird numbers in south-eastern Australia and a dramatic reduction in licensed shooter numbers in the last 20 years, indicating a diminishing need for state game reserves. These submissions also noted bans on recreational shooting of waterbirds in Western Australia, New South Wales and Queensland. Other submissions noted the lack of strict protected areas for wetlands in the investigation area, particularly for the Kerang lakes and were either satisfied with the draft proposals or suggested increasing wetland reservation.

Response

VEAC acknowledges the role of hunting groups in the conservation and management of wetlands, and particularly state game reserves (wildlife areas). In this final report 23 wildlife areas are proposed to remain available for hunting, while 12 existing state game reserves are recommended to be added to conservation land use categories which exclude hunting. Two areas highlighted as important for duck hunting have been retained in the final recommendations, notably Reedy Swamp State Game Reserve near Shepparton and areas of state forest on Gunbower Creek (McNab Bend). Hunting opportunities remain on popular creeklines where recommended as public land water frontage reserves (such as much of Gunbower Creek), and on a number of water storage lakes and state forest. Adequate environmental water allocated to wetlands in areas such as the Kerang and Corop lakes will provide further hunting opportunities on wetlands which are currently dry.

Wetlands are currently under-represented in protected areas in the investigation area. VEAC is required under its Terms of Reference for this investigation and the VEAC Act to have regard for the need to provide for the creation and preservation of a comprehensive, adequate and representative system of parks and reserves. The inclusion of a number of wetlands in conservation reserves to meet this requirement was undertaken using a 'paired approach' to spread both the impact on, and opportunities for, recreational hunting and nature conservation across the investigation area.

The number of state game reserves and area purchased with game licence fees was often overstated in submissions. Some small areas were purchased for addition to Crown land, while others were existing Crown land reserves prior to reservation as state game reserves. For example, Johnsons Swamp (467 hectares) consists of 459 hectares of former timber and water reserve (reserved in 1882) and eight hectares of purchased freehold. This area was gazetted as a state game reserve in 1984.

Both the number of duck hunters and opportunities for hunting have significantly reduced in recent years in the investigation area. Ten out of the last 13 seasons have been modified in response to environmental conditions and included the cancellation of duck hunting seasons in 1995, 2003 and 2007. The economic value of this recreation activity to the investigation area has been re-examined in the economic assessment of the final recommendations. Updated and more comprehensive information of duck hunter numbers has been provided by DSE for the economic assessments presented in appendix 1 and chapter 4. Fundamentally, water is required to achieve a more reliable and sustainable level of duck hunting—something which is unlikely to happen naturally given climate change predictions for northern Victoria.

Nature conservation

A large number of submissions promoting biodiversity conservation in parks and reserves were received, particularly following release of the Discussion Paper. Connected corridors and habitat links (through contiguous parks and reserves) were promoted as methods for mitigating the impact of climate change on natural ecosystems.

Many submissions supported VEAC's draft proposals for new national parks and reserves. A number of submissions suggested that not enough land was recommended to be included in the parks and reserves system. Most of these submissions suggested that the whole of Gunbower forest should be made a national park, given its large size, Ramsar wetland values and importance for colonial nesting waterbirds. Others suggested further additions of wetlands to the Leaghur-Koorangie National Park near Kerang. Many submissions emphasised the need for adequate environmental water to ensure the survival of floodplain ecosystems and supported the removal of grazing from public land in the study area.

In contrast, a large number of submissions considered national parks and other reserves to place restrictions on their current use of public land. Many submitters felt the parks and reserves proposed were going to limit their access for camping, fishing, duck hunting, four-wheel driving, trailbike riding and firewood collecting. Some submissions suggested that biodiversity conservation could be achieved through existing public land use categories, particularly state forest, and there was no need to change them. Others suggested that parks and reserves would have a negative impact on biodiversity by increasing weeds, pests and the risk of wildfire.

Response

As part of the Terms of Reference for this investigation and under its legislation, VEAC is required to have regard for the need to provide for the creation of a comprehensive, adequate and representative (CAR) system of parks and reserves in line with nationally agreed criteria. These criteria, and the need for more robust and connected protected areas to mitigate the impacts of climate change, were important in determining the conservation reserve system proposed in the draft proposals. VEAC has sought to accommodate many of the issues raised in a large number of submissions by adjusting the boundaries of a number of national parks and reserves to provide for a wider range of recreational activities in popular river frontage areas while still seeking to meet the CAR criteria. A number of extractive activities which some submissions have suggested could coexist with protected area principles, do in fact place avoidable stress on biodiversity, and thus are not consistent with protected area objectives.

Although the Gunbower forest was considered to have values that could warrant national park status, VEAC wants to retain areas of state forest available for the timber industry, for firewood and for duck hunting. Known breeding sites for colonial nesting waterbirds in the proposed Gunbower State Forest will be protected by special management zones. Likewise, while a number of wetlands in the Kerang district have international significance, VEAC has sought to balance conservation and duck hunting opportunities in these areas.

Timber harvesting

Timber harvesting was frequently mentioned throughout the public consultation process. Commonly, comments in written submissions were made in the context of other activities on public land. For example, most conservation-oriented submissions proposed that several other activities, such as grazing, also cease or be better managed. Timber harvesting was seen as a threat to biodiversity and at odds with initiatives to conserve natural values (such as The Living Murray program)—costs which were seen as significantly outweighing the benefits of timber harvesting. Similarly, support for continued timber harvesting mostly came from people who saw it as one of many existing activities on public land that should continue much as at present. Typically timber harvesting was seen as an important tool in the “working forest” model, where active management is required to keep the forest healthy. Some also saw it as part of the status quo which has kept the forest healthy and should continue to do so. Submissions from the timber industry raised issues including the importance to local economies and small town viability, the availability of timber workers and machinery for fire fighting, the role of sawlog harvesting in generating domestic firewood as a by-product and the unique value of Red Gum timber products to many consumers—including consumers in Melbourne. Several people mentioned the long family histories of many timber workers in the industry. Some submitters questioned the figures used and the analysis of the effects of the draft proposals on long-term resource availability—in particular the exclusion of special management zones from calculations, and the use of recent slow tree growth rates.

Response

VEAC is very conscious of the consequences of its recommendations for the timber industry and dependent communities and families. At the same time, there are immense pressures on the natural values of the investigation area, and there is inadequate representation and protection of these riverine ecosystems in the current conservation reserve system. Adequate representation of ecosystems is a key element of the Terms of Reference given to VEAC for this investigation. Council has looked closely for opportunities to modify the draft proposals and satisfy both these concerns. However, no significant opportunities were found and there remains a substantial impact on the timber industry from the final recommendations. Boundary changes and other measures address the domestic firewood issue. A new recommendation to improve the implementation of approved recommendations is intended to provide certainty for affected workers and communities.

The analysis of the implications of the final recommendations takes on board several of the issues raised in relation to the analysis of the draft proposals, as well as updated timber resource information from DSE.

Domestic stock grazing

There were a substantial number of comments relating to the removal of stock grazing from public land in the investigation area. Many submitters agreed with the removal of all grazing on public land, especially in wetlands and riparian land, while many others expressed a range of other views such as continuing current practices to maintain forest values and prevent wildfire. There were a number of submissions from graziers who currently agist stock in Barmah forest and other forested areas, as well as from public water frontage licensees. Some graziers indicated that public land grazing was a significant part of their business and were very concerned about the impact that cessation of grazing would have on their viability. Many of the licensees said that they would like to retain grazing and management responsibilities, although some indicated that this was for land management purposes rather than for financial reasons. The desirability of maintaining a stewardship role for adjoining landowners was suggested. Many submissions incorporated comments on the exclusion of grazing from recommended additions to parks and conservation reserves, both supporting and opposing these recommendations.

In addition, some submitters specifically commented on removing grazing from public land water frontages and public riparian land and the perceived difficulties with ongoing management of extensive long and narrow areas. The estimated extent and cost of fencing and off-stream watering points was seen as an impediment to removal of stock grazing. Some submissions encouraged a progressive and incentive-based approach to phasing out grazing as a way of speeding up the phase out in priority areas. Focussing on areas with high values, diminishing assistance package over the phase-out period and increasing incentives for early stock removal were all presented as ways of prioritising sites.

Response

The critical function of riparian land in this investigation area cannot be overestimated. and a number of government initiatives support management practices such as the removal of stock grazing along riparian public land. Waterways and adjoining riparian vegetation are important for biodiversity conservation in providing corridors for movement of fauna, and habitat in their own right. The water in these creeklines is also, in many instances, important for the viability of adjoining farms. Riparian corridors will become increasingly important with the impacts of climate change.

VEAC notes that the cessation of grazing and fencing of water frontages is a successful program currently undertaken by the catchment management authorities, guided by the Victorian River Health Strategy and Commonwealth government programs. Although fencing and off-stream watering points will be required in some places, a substantial proportion of the required infrastructure already exists for much of the investigation area, particularly in areas proposed as parks. For national and other parks, grazing is recommended to cease immediately. However, VEAC believes that the removal of domestic stock grazing along public land water frontages and other narrow riparian strips will require a phase-out period of up to five years. During this time, a detailed implementation process will be required to prioritise fencing and establish new arrangements with the public land manager. VEAC's primary emphasis is on areas of highest environmental value, which are more directly threatened by grazing and which should be the first priority for the removal of grazing during the phase-out period.

For many licensees who currently participate in stock management and riparian conservation, the draft proposals were considered to offer a limited role in future management. Voluntary participation in implementing the recommendations and ongoing management by adjoining land owners can be encouraged. Accordingly, VEAC is recommending a licensing arrangement for public land water frontages that provides for a level of stewardship in the absence of grazing—a voluntary Riparian Conservation licence—and has objectives for conservation management.

Socio-economic impacts on local communities

Many people believed that the social and economic effects of the draft proposals would be worse than that suggested. Some felt that fewer recreational visitors would come to the area, resulting in a loss of tourism income. Others felt that the loss of timber industry jobs would have substantial and negative flow-on effects to the local and regional economies. The cost of purchasing and delivering environmental water was also a concern, as was the cost of fencing public land stream frontages and park boundaries to exclude domestic stock grazing.

Numerous submitters considered that the cost of changes to their industries or recreation interests was undervalued. Some submitters did not agree with the methodology used to measure the contribution of each element to the Victorian economy was flawed. Some submissions argued that the benefit-cost analysis flowed in one direction, with the costs impacting on the regional and local economies of the investigation area, and the benefits flowing only to residents of Melbourne. The methodology of the analysis was also criticised with the economic assessment of the benefits of protected areas and biodiversity dismissed as not 'real money'. The economic adjustment resulting from the draft proposals was seen as beyond the capacity of many communities already stressed by drought.

The values of forests to local people were considered to be under-estimated, and a bias was perceived towards the values to people outside the region, especially residents of Melbourne. Social disruption and impacts on quality of life or family traditions of many people in the investigation area were often raised, particularly with presumed changes to access for informal recreation activities such as dog walking, horseriding, camping (especially with dogs and horses), and reduction in hunting and access for fishing. These issues are also described above and greater clarification is provided throughout this final report in relation to recreation. Aspects of the regional assessment relating to possible long-term social impacts were criticised, with some submitters stating that the impacts were at odds with the Victorian government policy "A Fairer Victoria".

Response

The economic studies, conducted for VEAC by independent consultants for both the draft proposals and final recommendations, consist of a benefit-cost analysis and a regional assessment. The benefit-cost analysis gauges the net benefit to the Victorian economy that would result from VEAC's proposals, if implemented. It is necessarily partial, as full costing of environmental water is beyond the scope of this Victorian investigation, requiring the involvement of the Commonwealth and three other states.

The regional assessment appraised the impacts of the recommendations within the investigation area, in particular on specific small communities. The purpose of the regional assessment was to identify affected industries and locations, so as to inform government about communities that may require specific adjustment programs. To highlight this potential need, the consultants mentioned the long-term difficulties that could hypothetically face small, very isolated communities in extreme circumstances. This was not included in the report as a statement of what would happen as a result of the proposals, but what might potentially happen in the worst case if impacts were not addressed. VEAC also understands that many regional communities are currently experiencing hardship and stress related to the drought. These matters reinforce the need for appropriate government adjustment programs that include adequate resources, community engagement and education.

The perception that some uses were under-valued requires some explanation of the methodology. Benefit-cost analysis does not use 'total economic value' methods and, to enable valid comparisons, all uses must be valued at the same level. For both reasons, flow-ons are generally excluded.

The final report's economic studies incorporate the effects of changes to both general recommendations and the areas recommended in each public land use category, and revisit the approach to tourism and recreation. VEAC and the consultants have reviewed data sources and revised assumptions and estimates where appropriate to better characterise benefits, costs and regional effects. The 2006 Census results have also been included in the assessment of the final recommendations.

In relation to the geographic distribution of benefits, the net benefits accrue to all Victorians, but the distribution of benefits relates to population density, so that Mildura, Swan Hill, Echuca, Shepparton, Wangaratta, Wodonga and other regional towns all benefit, as well as Melbourne. Regarding the benefits of protected areas and biodiversity and the economic analysis supporting these results, although they are valued by the community, these environmental values are not priced by normal markets. The choice modelling method used is an established, respected way to estimate prices for such non-market features.

Environmental water

The provision of adequate water for the environment, and especially floodplain forests and wetlands, was given prominence in the Draft Proposals Paper. However, although a large number of submissions mentioned environmental water, there were several issues that received more attention in public consultations.

Most people who commented on environmental water broadly supported the draft proposals. Some proposed measures additional to those proposed by VEAC, such as larger volumes and smaller, more frequent flows, as well as the large extensive overbank flows emphasised by the draft proposals. Several argued for factoring in climate change predictions of significantly reduced overall water availability into VEAC's model for the water needs of the floodplain.

The most common concerns expressed about the draft proposals for water were related to:

- *The social and economic implications and how they are calculated.* Most people raised this issue on the basis that the estimated volume of water required (4000 gigalitres every 5 years) was in addition to existing environmental commitments (ie. all 'new' water for the environment). They believed it would all be sourced from Victoria's consumptive allocation (very largely from Victorian irrigators), and/or be required every year, rather than every five years. None of these fears are the case, although this may not have been made sufficiently clear in the draft proposals paper—see below for further details. Others maintained however that any loss of water from irrigation would have an unacceptable impact on the regional economy and communities, that the water market would be distorted by government purchase of water for the environment, and/or that obtaining the water from efficiency or infrastructure improvements would be a waste of government money and may not provide sufficient water.
- *The practicalities and administrative issues of implementation.* Many stakeholders questioned whether other states and the Commonwealth would agree to the proposals and whether such a large volume of water (4000 gigalitres) could be obtained, held in storages and delivered to the floodplain as proposed given current physical, operational and administrative constraints—including current rules for the allocation of water to the environment and consumptive users. Some questioned the basis, precision and reliability of the 4000 gigalitres estimate. Others were concerned about the potential liability associated with planned releases of water (particularly inundation of private land by artificially generated floods), aspects of the social and economic assessment and the potential use of environmental water for consumptive use. Some submitters believe that engineering solutions (rather than just non-engineering solutions) may make a useful contribution to reducing summer flooding in Barmah forest and maximising the ecological benefits of environmental watering.
- *The benefits of the proposals and how they would be measured, given the significant costs.* While the social and economic assessment quantified the environmental benefits that would result from adequate watering for comparison with the costs, many stakeholders did not link that approach to on-ground environmental health.

Many saw the benefits going to Melbourne residents at the expense of residents of northern Victoria in the middle of a drought.

Response

Clearly there is a need for greater clarity from VEAC about its environmental water recommendations. While specifying overbank flooding and an estimated required water volume in the Draft Proposals Paper was helpful in framing the discussion, it also raised many associated questions outside VEAC's scope. Council's response is detailed in chapter 2. In summary, VEAC has focussed its attention on comprehensively specifying the natural values (or ecological assets such as flood-dependent ecosystems) to be maintained by watering. This approach highlights key assets and clarifies the gains and losses that would occur under a range of water regimes.

Although VEAC's focus has shifted from the volumes of water required for adequate overbank flows, some explanation is required regarding the earlier 4000 gigalitres/5 years estimate. Firstly, a large proportion of that water could be met under existing commitments either from the jurisdictions involved in the Murray Darling Basin or from the Victorian government. The Living Murray First Step Decision committed to 500 gigalitres per year; there are existing environmental water reserves of 100 gigalitres per year for Barmah–Millewa and 27.6 gigalitres per year for other Victorian wetlands. Stage one of the Foodbowl Modernisation Project is predicted to provide 75 gigalitres per year of environmental water for northern Victoria. These existing commitments amount to an annual total of around 700 gigalitres compared to 800 gigalitres which is the annualised conversion of 4000 gigalitres every five years. Secondly, this figure does not include the Commonwealth's recently announced \$3 billion program *Restoring the Balance in the Murray Darling Basin* to purchase water for the environment over the next 10 years. Nor does it include potential contributions from New South Wales or from Stage two of Victoria's Foodbowl Modernisation Project (estimated at 100 gigalitres per year). Finally any shortfall between existing commitments and the estimated volume would not necessarily be met at the expense of existing consumptive uses, given that there could be further infrastructure and efficiency improvements.

In addition to the recently announced programs and projects already mentioned, there have been other recent developments pertinent to the environmental water recommendations. In particular, Victoria's Northern Region Sustainable Water Strategy Discussion Paper and the CSIRO Sustainable Yields project reports, released in early 2008, have highlighted the likelihood of significant reductions of water availability under climate change.

These projected and actual changes highlight the dynamic nature of the environmental water debate at present. They illustrate the rationale for VEAC's current approach which focuses on the location and requirements of floodplain assets to be protected—parameters that remain largely unchanged regardless of the amount of water available and how it is delivered. Nor is this focus changed by the physical, operational and administrative issues associated with watering events. The goals remain the same, no matter how far or close we are to achieving them.

Indigenous involvement

Indigenous land issues were raised in a significant proportion of submissions throughout the entire investigation period. Those that supported increased involvement of Indigenous people, also generally supported the draft proposals. In addition, handback/leaseback and joint management for those areas identified for co-management in the draft proposals was raised—notably for the new Barmah National Park and Nyah–Vinifera Park. Land management options for Aboriginal people, especially the Yorta Yorta, was an important issue raised largely by stakeholders who also proposed biodiversity conservation through larger national parks and cessation of timber harvesting. Existing arrangements between Traditional Owners and public land managers were also highlighted. Some proposals were less specific, suggesting broadly that Traditional Owners be more engaged in decision-making. Some submitters were concerned that the hand-back lease-back proposals had no timeframe or specific areas for implementation. For other submitters, there was a perception that the draft proposals downgraded current levels of Indigenous involvement at some locations such as west Wallpolla Island. There was also a perception that VEAC had supported specific Aboriginal groups above others.

A relatively small number of written submissions were received from people and organisations identifying as Traditional Owners. Some Aboriginal people and others called for a greater role than that provided for in the draft proposals. Indigenous capacity and increased involvement proposals were considered too detailed and prescriptive by some. To supplement the Indigenous views received through the formal consultation process, VEAC employed a consultant to undertake workshops within Aboriginal communities across the investigation area to specifically seek people's views on future public land use and management. The consultant's report is available on VEAC's website and in appendix 3.

Although not unanimous, there was widespread support for the draft proposals from Indigenous community workshop participants. In particular, the need for funding and other resources was supported to assist Traditional Owner groups and other Indigenous stakeholders to be more actively involved in the proposed co-management and advisory board structures. At the same time, more employment and training opportunities for local Indigenous people in public land management tasks and activities as was seen as a positive and direct way of engaging and involving Indigenous people.

Some opposition was expressed to Aboriginal people having a special role in public land management over other community or user groups. There was an overall desire for greater clarification of Aboriginal traditional cultural practice. A number of people supported the general principle of traditional cultural practice, provided this did not include modern technology such as firearms, exclusive access to areas or involve hunting in protected areas. A number of submissions raised a perceived inconsistency in allowing Indigenous hunting and campfires while banning non-Indigenous hunting and campfires for the same area.

Response

VEAC has included additional advisory committees in the final recommendations, reflecting the aspirations of some Traditional Owner groups to have a greater role in management of public land. A timeframe of five years from government acceptance has been included in the final recommendation for establishment of legislation establishing joint management provisions. Shared management models have been broadened to include other parks under the *National Parks Act 1975* in the final recommendations.

Clarification of traditional cultural practice has been included in the relevant recommendation notes to address some of the community concerns raised. These relate to licensing for use of firearms, the exclusive use of areas as a temporary measure, and the use of fire. VEAC believes that traditional cultural practice is extremely important to many Aboriginal people and is not simply a form of recreation. Details of any future arrangements between public land managers and Traditional Owners relating to specific traditional cultural practices is outside VEAC's role and investigation timeframes but Council notes that protocols and agreements have been successfully negotiated for the management and sustainable cultural use of natural resources in many places throughout Australia and internationally.

Domestic firewood

Many submitters felt that the draft proposals would reduce their access to firewood for heating and cooking, and this would particularly affect residents and pensioners in small towns that are not connected to natural gas. Others identified an impact on other users such as the Echuca paddlesteamer fleet and households with supplementary wood heating. A concern was expressed that illegal firewood collection could escalate and that there would be a reduction in firewood from commercial timber harvesting areas. Some submissions offered suggestions about alternative sources of firewood that could be supplied from public land, such as silvicultural thinning or ecological thinning and from plantations dedicated to the production of firewood.

Response

VEAC has provided for continuity of supply to local communities, by identifying additional firewood areas within the Murray River Park. It has recommended that land managers investigate alternative firewood sources such as access to currently unthinned state forest areas at Benwell and Guttram forests and update firewood licensing and management systems. It has also recommended further investigation of future plantation firewood supplies.

Fire protection and suppression

Some submissions expressed concern that a build up of fuel on the ground as a result of retaining a target of 50 tonnes/hectare of coarse woody debris for habitat purposes would create a fire risk, and that tracks used for firefighting would be closed as a result of changes to public land use categories. Others were concerned that fuel will build up following the cessation of timber harvesting and grazing, causing a significant fire hazard for adjacent populations. Fire protection agencies were supportive of recommended restrictions on the use of campfires during the high fire danger period.

Response

The Department of Sustainability and Environment manages fire on Victoria's public land, including the forests of the investigation area. This management includes reducing the risk of fire, containing outbreaks and managing environmental effects. The department works closely with the Department of Primary Industries and Parks Victoria during fire suppression and prevention practices on public land, with the Country Fire Authority on the rural/urban interface, and with all municipalities. Fire Protection Plans and Fire Operations Plans are prepared for all fire districts including the investigation area and incorporate a public consultation phase. These plans specify fuel reduction operations, such as where strategic fuel reduction burns are to take place, and specific visitor protection strategies, such as mowing around campsites. These responsibilities are unchanged by the recommendations.

VEAC considers that land managers will address any fire risks associated with the new parks and increased visitor use, as part of fire protection planning, and ensure the continuance of a track network suitable for fire protection and suppression. VEAC's recommendations do not specify that any tracks should be closed. The additional volume of coarse woody debris to be retained as habitat in riverine parks and state forest areas will be made up of larger sized timber. This is not the same as the build up of fine fuels that are periodically removed by fire protection burns. VEAC's expectation is that all fire risks will be evaluated and managed within the above arrangements.

Public land management

Some stakeholders, with many years of experience working in River Red Gum forests, offered their experience and views on public land management. Others suggested that Traditional Owners would be better land managers than the current government agencies. Perceived under-resourcing of public land management attracted a significant number of comments in submissions. In particular, management of weeds and fire on public land drew much comment and criticism. For some people, the economic impact of any increase in pest plants and animals, or any increase in the incidence of wildfire on neighbouring public land was important.

Response

VEAC recognises the wealth of land and natural resources management experience and knowledge within the investigation area and wider community. It is important that the community is involved and engaged in the planning and decision-making of public land management agencies. VEAC is recommending that government allocates additional resources to address current and future public land management requirements, particularly in the areas of fire protection, pests plant and animal control, track maintenance, on-ground staff presence and recreation facilities.

VEAC process and independence

The consultation and investigation process undertaken by VEAC was raised by some groups and individuals. Some people considered that the consultation process and submission timeframes were inadequate for the community to consider the information and particularly the draft proposals in detail. A few stakeholders indicated that they had not been notified or sufficiently made aware of the investigation.

Some members of the Community Reference Group and other stakeholders considered that VEAC's approach was out of step with rural communities, and that there was a lack of meaningful consultation. In particular the socio-economic analysis presented in the Draft Proposals Paper, it was felt, failed to give proper consideration to the effects of the proposed changes on regional communities. This was framed within declining regional economic circumstances due to prolonged drought throughout much of the investigation area.

Some people expressed their view that the investigation outcomes were pre-determined and that the Council was not independent. It was also argued in some submissions that there was a lack of scientific evidence supporting the draft proposals.

The role and responsibilities of the Indigenous Steering Committee and the representation of specific Aboriginal groups in consultation were raised as issues. A few people considered that too much emphasis was given to the opinions of Aboriginal people or specific Aboriginal groups.

Response

VEAC investigations are structured processes initiated when the Victorian government formally provides terms of reference. The Council is requested to provide independent strategic advice in response to the terms of reference and in accordance with the VEAC Act. The legislation provides very specific roles for the Minister and the Council during the conduct of an investigation, and for the Minister following the submission of VEAC's final report.

Formal written submission periods established under the VEAC Act are for a minimum of 60 days. The submission period following release of the draft proposals paper was extended to 81 days in response to requests for more time by many individuals and organisations. In addition VEAC staff and Council members attended a number of community meetings during the consultation period and published information material outlining the draft proposals for specific locations and activities. During the consultation period following release of the Draft Proposals Paper, Council members and staff met directly with more than 700 people across the investigation area.

Both the Community Reference Group and Indigenous Steering Committee were invited to comment and help formulate the consultation schedule during major community consultation stages of the investigation (membership of these groups is listed in appendix 2). VEAC accepted advice for the location and number of community forums or workshops as well as ways to raise awareness of the investigation within the community and seek comments. For the most part, community participation was high, with well attended forums and workshops. The large number of submissions is also indicative of the high level of awareness of the investigation process.

The role of the Community Reference Group is to provide advice to VEAC on issues associated with the investigation and, where possible, to assist with resolution of issues in an atmosphere that appreciates and respects the interests and viewpoints of all stakeholders. In establishing the reference group, VEAC strives to achieve a balance between broad community representation without creating an unworkably large group. Although the reference group makes an important contribution to the investigation, it is not a decision-making group. VEAC is grateful for the involvement of the Community Reference Group members and for their expertise and insights.

The role of the Indigenous Steering Committee established part way through the investigation was specifically to provide advice on matters relating to VEAC's Indigenous consultation program. VEAC appreciates the assistance provided by members of the Indigenous Steering Committee.

Locality-specific comments or proposals

Relatively few comments or concerns were raised about specific sites or detailed boundary issues. Some submitters proposed that specific locations outside the investigation area be included in the investigation, or a new public land use category be erected.

A number of submissions, during the earlier consultation periods predominantly, provided detailed information including technical reports and references to support specific proposals or points of view. This information was utilised and included in Council's deliberations. It should be noted that some submissions provided information that was viewed as correcting errors or omissions, mostly in response to the Discussion Paper.

Response

Any detailed comments have been considered during the process of developing the final report, and VEAC has made changes where appropriate to accommodate concerns or comments (see the next section: Changes to the Draft Proposals). Where appropriate, new information or corrections to factual information have been taken into account in the process of preparing the final report.

Changes to the Draft Proposals

Following public consultation on the Draft Proposals Paper, VEAC has made some significant changes to its recommendations as well as a number of smaller changes. The major changes are summarised in the text below, followed by a full list of changes in table 2. Many of the changes and the reasons for them are covered in more detail in the relevant sections of the report.

Implementation

VEAC is recommending the Victorian government establish a project team to implement approved recommendations. As an important part of that process, consultation with local government, relevant industries, stakeholder groups and communities should be undertaken.

Nature conservation

Compared to the draft proposals, there has been a net decrease in the area of public land recommended as part of the conservation reserve system (from 178,923 hectares to 173,379 hectares). This primarily results from a reduction in the areas of Murray-Sunset, Gunbower, Lower Goulburn River and Barmah National Parks to allow for increased recreational opportunities along major river frontages, specifically camping with dogs, and to provide additional zones in four of the above five parks for domestic firewood collection. The areas removed from these proposed national parks generally receive higher intensity use or are close to regional population centres.

The area of two national parks has increased slightly compared to the draft proposals:

- Terrick Terrick National Park incorporates a grassland reserve recently purchased by the Victorian Government.
- Warby Range-Ovens River National Park incorporates water authority land (not previously identified as public land) near the junction of the Murray and Ovens Rivers.

Environmental water

A key overall theme from public consultation was a lack of clarity on a number of aspects relating to environmental water—particularly the sourcing and delivery of the estimated 4000 gigalitres every five years for overbank flooding, and the explanation of benefits in the context of the potential significant costs associated with the draft proposals. Since release of the Draft Proposals Paper, there has been significant new information published about the likely impact of climate change on water availability.

In response, VEAC has refocused its approach to include documenting and mapping of flood-dependent natural assets to be protected on public land along with their flooding requirements. This approach covers the whole system—not only “icon sites”—and enables a clear and comprehensive evaluation of assets that would be maintained under a variety of environmental watering scenarios covering whatever delivery mechanisms, environmental conditions and administrative arrangements are appropriate or feasible.

VEAC has also clarified that a large proportion of the estimated environmental water requirements can be met from existing environmental water commitments from

the Murray Darling Basin Commission’s “Living Murray” program and a number of Victorian government programs.

Indigenous involvement

Recommendations designed to increase Indigenous community capacity and engagement in public land management have been simplified to allow for greater flexibility in delivery. VEAC has also recommended additional advisory committees for Hattah-Kulkyne National Park and Murray-Kulkyne Park, and the new Gunbower National Park. In addition areas recommended for co-management have been broadened to include other parks under the *National Parks Act 1975* and provisions to enable joint management in the future are recommended to be established within five years from Government acceptance. Aboriginal traditional cultural practice recommendations have been clarified to address concerns raised about traditional cultural practice and native title rights and interests.

Recreational access

The proposed ban on winter campfires in national parks that was outlined in the Draft Proposals Paper has been removed in response to strong community representations. Campfires are now recommended to be allowed in the winter period on public land but not in the high fire danger period. Restrictions on the use of campfires during the high fire danger period will assist with fire protection strategies.

More areas along the Murray and Goulburn Rivers have been made available for camping with dogs. These additional stretches total some 80 kilometres and occur in popular camping areas in the large forest blocks, including parts of eastern Wallpolla Island, McNab Bend and Torrumbarry in the Gunbower forest, Barmah Island, and in the Goulburn River forests around Shepparton. These areas were previously recommended as national park in the Draft Proposals Paper, and are now recommended as Murray River Park, Shepparton Regional Park or state forest.

The proposed recommendation to ban camping on narrow river frontages has been removed. Instead it is recommended that land managers review the capacity of narrow stretches of public land along the Murray, Ovens and Goulburn Rivers which are less than 100 metres wide from the top of the bank and determine whether camping is an appropriate use.

Clarification of VEAC’s recommendations relating to dispersed camping is provided. Dispersed camping is acknowledged as the predominant camping style and will continue across all park categories.

Recreational hunting

VEAC has sought to balance opportunities for duck hunting with the conservation of waterfowl and other wetland fauna across the investigation area by adding significant areas to the national parks and nature conservation reserves. The final report has been changed from the Draft Proposals Paper so that Reedy Swamp near Shepparton and the Gunbower Creek around McNab Bend remain available for duck hunting. A further change is that wildlife areas are recommended to be reserved as state game reserves under the *Wildlife Act 1975*. Some 23 wildlife areas (state game reserves) are now proposed, with 12 former wildlife areas added to the parks and reserves system.

Timber harvesting

A minor net increase has been made to the area recommended to remain available for timber harvesting. However, while the land base remains essentially unchanged, further analysis of the timber resource by DSE has reduced estimates of timber availability to 22.5 percent of the current yield (compared to 36 percent in the Draft Proposals Paper). This is due to reduced forest flooding leading to slower tree growth rates.

Domestic stock grazing

A new recommendation has been introduced for the establishment of a new type of water frontage licence – the Riparian Conservation Licence. The licences could be granted to those licensees who agree to manage a public land water frontage in accordance with the recommendations for those public land categories, and thereby maintain a stewardship role in relation to the licence area.

Domestic firewood

New domestic firewood zones within the Murray River Park (to be identified by the land manager and the community) are recommended near Boundary Bend, Swan Hill, Barmah, Cobram and Rutherglen. This is in addition to areas near Mildura and Robinvale previously recommended in the draft proposals paper. In particular, the removal of Barmah Island from the proposed Barmah National Park, and a stretch of east Wallpolla Island from the Murray-Sunset National Park, increases access to domestic firewood. Zones within the expanded Shepparton Regional Park (as identified by the land manager and the community) may also provide domestic firewood for Shepparton and district.

A strategic and coordinated approach to delivery of regional firewood requirements, including the establishment of a regional committee consisting of the land managers, catchment management authorities, local government, industry and the community, has run successfully in northeast Victoria. A similar model is proposed for delivery of firewood requirements in the River Red Gum Forests Investigation area.

Socio-economic impacts

The implications of VEAC's draft proposals were assessed by independent consultants, who prepared a benefit–cost analysis and a regional assessment. The benefit–cost analysis gauged the net benefit to the Victorian economy that would result from VEAC's proposals if implemented. It was necessarily partial, because full costing of environmental water was beyond the scope of this investigation and would require co-operation with the Commonwealth and three other states. The regional assessment appraised effects of the draft proposals within the investigation area, in particular in specific small communities.

While the approach and methodology for the final report remain the same as that for the Draft Proposals Paper, there have been numerous changes that have resulted in changes to specific valuations, as a consequence of reviewing and refining the data and responding to issues raised in submissions. For the final report the consultants have:

- revised the benefit–cost analysis scenarios which compare current conditions with VEAC's recommendations, with and without adequate environmental water. These now reflect VEAC's focus on the flooding requirements of ecosystems and threatened species, and climate change
- revisited the previous assumption there would be no net benefit from recreation and tourism. Clarification of the recommendations affecting camping, boundary and other changes regarding campfires and traditional camping, and more detailed analysis of visitor data, will result in no reduction in existing camper numbers, and more visitors bringing a net tourism benefit to the region
- incorporated more comprehensive data provided by DSE on duck hunting locations and numbers, and refined the analysis of wetland benefits
- reviewed the timber data, with new resource data for Gunbower forest, new growth rate data, and inclusion of special management zones
- added a new, accurate estimate of the length and hence cost of licensed public land water frontage requiring fencing
- included a new assessment of the value of protecting riparian areas
- added a new cost reflecting society's willingness to pay to maintain rural communities
- incorporated recently released data from the 2006 Census, revised industry and recreation data in the regional assessment "input-output model", and re-run this model.

Other changes

There are a large number of detailed area-specific changes, many of which are summarised in the following table. Other changes are detailed in relevant sections of the report. Some changes have resulted in notes added to recommendations throughout the report for large and small parcels of land.

There is a new appendix outlining the process for identifying flood-dependent natural assets along the Murray, Goulburn and Ovens Rivers (appendix 11).

Table 2. Changes since the Draft Proposals Paper

GENERAL RECOMMENDATIONS		
Final Report recommendations	Change	Reason
Implementation	New recommendation for the establishment of a project team to implement approved recommendations.	Provides certainty to community about steps that follow government response to the recommendations.
Nature conservation	New recommendation for ongoing scientific research into terrestrial floodplain ecology.	Improves knowledge of floodplain ecology and provide a basis for adaptive management of floodplain watering.
	New recommendation to review the conservation status of flood-dependent Ecological Vegetation Classes and flora and fauna.	Review required in light of threats posed by insufficient floodplain watering.
Environmental water	Shifted emphasis from required water volumes for overbank flows to specifying flood-dependent natural values. This approach highlights key assets and clarifies gains and losses that would occur under a range of water regimes.	Ensures recommendations on environmental water remain relevant and workable in the face of changing climate and water management in the future. Ensures focus on the core issue – protection of values, rather than volumes, delivery methods and administrative issues. Maximises effectiveness of environmental watering.
Indigenous involvement	Additional Indigenous advisory committees recommended for A2 Hattah-Kulkyne National Park and B5 Murray-Kulkyne Park, and A4 Gunbower National Park.	Responds to Indigenous community aspirations and values raised in submissions and workshops.
	Simplification of detail in capacity building and engagement recommendations R21 and R22.	Clarification of recommendations.
	Clarification of traditional hunting provisions.	Addresses concerns raised in submissions and at Indigenous community workshops.
Recreation	New recommendation to clarify dispersed camping as predominant camping style in riverine parks and forests.	Responds to concerns raised in submissions and addresses misinformation, particularly related to ‘dispersed camping’ and access.
	Allow campfires in national parks outside high fire danger period (formerly all year ban).	Recognises the importance of campfires to the camping experience.
	Allow firewood collection for the purpose of campfires in national parks outside the high fire danger period where targets for coarse woody debris retention can be met and at the land manager’s discretion.	Accepting suggestions that campfire wood can be provided in ways that retain woody debris in riverine parks and state forest areas.
	Additional areas of the Murray and Goulburn River frontages available for camping with dogs in parts of Wallpolla, Gunbower, Barmah and Lower Goulburn forests (now recommended as B3 Murray River Park and B2 Shepparton Regional Park).	Responds to stakeholder concerns about exclusion of camping with dogs in parts of large forest blocks.

Final Report recommendations	Change	Reason
Recreation (continued)	Additional areas available for duck hunting at Reedy Swamp near Shepparton and McNab Bend in Gunbower Forest.	Reduces impacts on duck hunters.
	New recommendation includes reservation as state game reserve under the <i>Wildlife Act 1975</i> .	Responds to comments from stakeholders about confusion regarding the wildlife area classification
	Removing the ban on camping on narrow river frontages.	Responds to issues raised in public consultation.
	Additional areas for camping (without dogs) in the large Lambert Island and Murrumbidgee Junction Nature Conservation Reserves (D1 and D4). Camping and campfires will be allowed at these reserves at the land manager's discretion.	Provides for existing camping to continue at the land manager's discretion.
Domestic stock grazing	Additional recommendation to establish Riparian Conservation Licences along public land water frontages.	Allows adjoining landholders to maintain a stewardship role and assist in ongoing management for nature conservation.
	Clarification that grazing phase out includes public land water frontages and public land stream beds and banks. A phase-out incentive scheme is recommended.	Removes ambiguity and improves implementation.
Domestic firewood	New zones to be identified in the Murray River Park at Boundary Bend, Swan Hill, Barmah, Cobram and Rutherglen. Some areas previously recommended as national park (Wallpolla Island, Barmah, Lower Goulburn River) are now Murray River Park or regional park to accommodate this use.	Provides additional domestic firewood for communities reliant on it for heating and cooking.
	Recommendation for a coordinated approach and specific regional actions to manage firewood demand and supply.	Maximises the effectiveness of firewood supply in the context of declining availability.

AREA RECOMMENDATIONS

Final Report recommendations

Change

Reason

National parks

A1 Murray-Sunset National Park	Removal of 543 ha (now B3 Murray River Park and Community Use Area near Lake Cullulleraine).	Provides additional opportunities for camping with dogs and horses in West Wallpolla Island and provides additional area for firewood in Mildura area. Boundary change near Lake Cullulleraine to include land in community use area.
A4 Gunbower National Park	Removal of 682 ha (now C3 Gunbower State Forest and B3 Murray River Park) near McNab Bend and Torrumbarry.	Provides for greater recreational opportunities including duck hunting, camping with dogs and horses.
A5 Terrick Terrick National Park	Addition of 130 ha of the recently purchased Roslynmead East Nature Conservation Reserve and formerly proposed Bickford Rd Grassland Bushland Area.	Protects a new parcel of land recently purchased by the government for the conservation of native grasslands and small adjoining block of public land.
A6 Lower Goulburn River National Park	Exclusion of 2564 ha (now B2 Shepparton Regional Park, G103 Reedy Swamp Wildlife Area and I7 Moira Park Community Use Area).	Provide for greater recreational opportunities, including duck hunting at Reedy Swamp and camping with dogs in the Goulburn River forests upstream of Shepparton. Also provides for continued use of Moira Park as a scout camp and for dog sled racing.
A7 Barmah National Park	Removal of 1421 ha (now B3 Murray River Park).	Provide additional opportunities for camping with dogs and horses. Responds to concerns raised about domestic firewood availability in the Nathalia and Barmah areas.
A8 Warby Range-Ovens River National Park	Addition of 144 ha (not previously identified as public land).	Incorporates small vegetated and river parcels adjoining or within the Park not previously mapped as public land.
A2, A3, A9	No change	

Regional and other parks

B3 Murray River Park	Addition of 2567 ha (formerly parts of A1, A4 and A7)	Responds to concerns raised about domestic firewood availability and/or reduced opportunities for camping with dogs and horses.
B2 Shepparton Regional Park	Addition of 2813 ha (formerly A6 Lower Goulburn River National Park and public land water frontage)	Provides additional opportunities for domestic firewood collection and camping with dogs and horses near Shepparton.
B7 Nyah-Vinifera Park	Removal of 16 ha (Nyah Golf Course)	Golf course inadvertently included in this park in draft proposals.

State forest

C1-C3 State forests	Minor change in state forest area (12,205 ha to 12,292 ha). Reduced volumes of timber availability.	Reappraisal of growth rates and stand quality by DSE (from 2249 to 1366).
C3 Gunbower State Forest	Addition of 147 ha (former A4 Gunbower National Park) along Gunbower Creek and McNab Bend.	Allows increased opportunities for hunting and camping with dogs and horses.

Final Report recommendations	Change	Reason
Nature conservation reserves		
D1-45, D47-D50	No change.	
D46 Gemmill Swamp Nature Conservation Reserve	Reverts to existing reserve (formerly A6 Lower Goulburn River National Park).	Retains high-level of protection for this wetland and allows for continuation of dog walking on leads on formed tracks. Adjoining public land is now Shepparton Regional Park (B2) and not Lower Goulburn River National Park (A6).
Historic and cultural features reserves		
E, E1-E13	No change.	
Reference areas and heritage river areas		
F, F1-F2	No change.	
Natural features reserves		
G, G1-G81, G105-G107, G109-G112	No change.	
G82-G104	New recommendation includes reservation as state game reserve under the <i>Wildlife Act 1975</i> .	Responds to comments from stakeholders about confusion regarding wildlife area classification.
G103 Reedy Swamp Wildlife Area	Reverts to existing reserve (formerly A6 Lower Goulburn River National Park).	Reduces impacts on duck hunters.
G108 Goulburn River Reserve	New recommendation includes renaming of public land water frontage along the Goulburn River as 'Goulburn River Reserve'.	Responds to comments in submissions and reflects values.
G113	Public land stream beds and banks, which were not mapped as part of the draft proposals, have now been mapped and classified as public land water frontages.	Increases clarity as to where recommendations for this land use apply.
Former G33 Bickford Rd Grassland Bushland Area	Now included within A5 Terrick Terrick National Park.	Adjoins recently purchased land to be added to Terrick Terrick National Park
Water production, distribution and drainage areas		
H2 Lake Hawthorn	Addition of 214 ha (not previously identified as public land).	Addresses comments made in submissions and new information.
Community use areas		
I1	31 ha becomes part of Lake Cullulleraine community use area (formerly A1 Murray-Sunset National Park).	Corrects an inaccuracy in mapping and includes additional land in the community use area adjacent to Lake Cullulleraine township.
I7 Moir Park Community Use Area	5.8 ha reverts to community use area (formerly A6 Lower Goulburn National Park).	Responds to new information on existing uses of this area.



B

Recommendations



2 General recommendations

The River Red Gum Forests Investigation area is a much loved and popular place. Both visitors and residents enjoy its many aesthetic, cultural and economic values and uses. However many of these values are under serious threat from both changing and ongoing patterns of water and land use. Indeed, some economic uses of the River Red Gum forests, such as grazing and forestry, are already being affected particularly in the face of climate change.

Public land occupies some 269,000 hectares of the total investigation area (1,220,000 hectares) and comprises some 22 percent of the former extent of River Red Gum forests and related ecosystems. As these ecosystems are poorly represented on public land and under significant threat, VEAC recommends that a substantial area be protected within the conservation reserve system. The enhanced conservation reserve system will protect threatened ecosystems, flora and fauna in accordance with many national and state biodiversity goals. At the same time recreation and tourism uses will continue and have the potential to form the basis for renewed economic prosperity in the region.

VEAC's public land use recommendations are underpinned by a series of environmental water recommendations. The evidence is strong that, without environmental water flows to the River Red Gum floodplains, the forests will be lost over time. The Murray-Darling Basin river systems are under extreme stress during the current extended drought, and if flows are not restored to forest and wetland systems, they will suffer irreparable damage and will be permanently lost for future generations.

The recommended conservation reserve system consolidates and improves public land connections between habitats. Public land use categories have been simplified; notably the existing River Murray Reserve which has been incorporated into adjoining categories, reducing potential boundary management issues. The River Murray corridor is identified as a critical environmental element of this floodplain forest system and the majority of public land in this zone is recommended to be protected in a series of national parks and regional parks, particularly the proposed Murray River Park (recommendation B3).

In some places visitor use needs to be managed and coordinated in a more effective manner, especially along the rivers and during the peak periods of long weekends and school holidays. If some activities continue in their current pattern and visitor numbers continue to grow, natural values will inevitably decline with diminished appeal for visitors. Dispersed camping, horseriding, four-wheel driving and other popular activities will still be available throughout all major land use categories in the investigation area. Management planning will be undertaken by the land managers in consultation with the community to provide for biodiversity protection and sustainable recreation activities.

In Victoria, Indigenous involvement in public land management is minimal compared to other Australian states and territories. In the past, there have been few mechanisms for Traditional Owners to engage with public land planning and management. Involvement in decision making is almost non-existent. VEAC recommends a range of mechanisms to increase the involvement of Traditional Owners in public land use planning and management. Such increased involvement benefits both land managers and Indigenous people and is a significant practical mechanism towards the reconciliation of traditional Indigenous cultural values and practices with the needs and interests of the wider Australian community.

Implementation of the recommendations

VEAC acknowledges that its recommendations for the investigation area raise a series of complex implementation issues that will need to be addressed. While implementation of approved recommendations falls outside VEAC's role, Council notes that the wide range of implementation issues in the River Red Gum Forests Investigation are similar to the types of issues raised during the Box-Ironbark Forests and Woodlands Investigation conducted by the Environment Conservation Council and presented to the Government in 2001.

To facilitate implementation of approved recommendations, VEAC recommends that Government establish an implementation team to engage with industry, local government, stakeholder groups, licence-holders and communities. This team could be modelled on the project team established by the former Department of Natural Resources and Environment to help implement the approved Box-Ironbark recommendations. The Box-Ironbark project team addressed implementation issues, communicated recommendations, advised on implementation processes, and generally responded rapidly to community and individual concerns (within the scope of the recommendations and Government decisions). The project team also managed a timber industry adjustment process, and worked with the community to identify detailed firewood access plans and recreation plans.

The key implementation issues for the River Red Gum Forests Investigation area are:

- adjustment for the timber industry in keeping with similar adjustments made elsewhere in Victoria
- establishment of new parks, including legislation, staffing and resourcing
- planning of domestic firewood access and streamlined licence processes that provide for firewood supply, particularly at the local level
- prioritising and managing the phase-out of grazing on public land water frontages
- developing processes for Indigenous co-management of national and other parks and enhanced roles for Indigenous people in the management of parks including legislation and resourcing

- detailed management planning for parks (including a recreation and camping strategy) to provide clarity around biodiversity protection and recreation uses and sites, and ensuring continued access for dispersed camping
- development of statutory procedures and consultations for seasonal bans on solid fuel fires
- determining the process or processes for addressing identified environmental water requirements
- initiating the River Murray Strategy
- enhancing small business capacity and developing associated tourism opportunities
- reservation and management of small reserves.

Some of the above issues should be initiated quickly after the government responds to VEAC's recommendations, to provide certainty for communities and users; for example, planning for domestic firewood access. Other issues will take a longer time to resolve, but are no less urgent, such as adjustment for the timber industry and processes for addressing environmental water requirements.

VEAC recognises that the recommendations will not suit all users. It acknowledges that many people have had long associations with the land, through family connections, ongoing camping trips, long-term occupancy under licence and economic dependency. Some of the recommendations will impact directly on these people and for others there will be minimal effect. VEAC believes that as part of the implementation of approved recommendations, it is the responsibility of the State government to address the impacts and make provision for financial relief, where this is warranted, and other forms of assistance appropriate to individual cases. VEAC also believes that adequate new funding should be made available to land managers to manage the lands at a level equivalent to national benchmarks for park and reserve management.

Throughout the report, when referring to the management of public land, VEAC has used the term 'land manager' or the Department of Sustainability and Environment. In practice there is a broad range of land managers. The Department of Sustainability and Environment is the government's primary steward for the management of public land and the relevant minister or the department assigns most of the public land to other managers (although it retains direct management control of state forest in the investigation area). Examples of assigned or delegated land managers include: Parks Victoria as the manager for national parks and other parks and conservation reserves; and committees of management comprising local government or elected community members for management of many local reserves. For example, the Port of Echuca Public Purposes Reserve is managed by a local council committee focussing on its tourism and heritage businesses. VEAC's recommendations do not impact on local committee roles unless this is specifically mentioned.

GENERAL RECOMMENDATIONS

Implementation

- R1** Government establishes a project team to implement the approved recommendations and coordinate associated planning and, as part of that process, consult with local government, relevant industries, stakeholder groups and communities.

Implementation resources

- R2** Government allocates adequate financial and staff resources for implementation of these recommendations and ensure that the objectives of the report and recommendations are achieved.

Resources for ongoing land management

- R3** Government allocates additional resources in parity with national benchmarks, to address the current and future public land management needs across the region, with priority given to fire protection, pest plant and animal control, track maintenance, on-ground staff presence, and the provision and servicing of recreation and tourist facilities.

Assistance

- R4** Where individuals or local communities are adversely affected as a result of the implementation of recommendations in this report, government establishes a process to evaluate and implement mechanisms and levels of assistance required to minimise those effects.

Interim management and minor boundary adjustments

- R5** Upon government approval of VEAC recommendations that:
- (a) relevant land be managed in accordance with those recommendations and be consistent with national and international conventions where appropriate; and
 - (b) subsequent implementation of recommendations allow flexibility for minor boundary adjustments.

Knowledge and information

- R6** Land managers base their management on adaptive management practices and address current and future information and knowledge gaps, particularly in relation to climate change trends.

Community engagement and awareness

- R7** Government supports measures to increase awareness, appreciation, education and interpretation of River Red Gum forests and associated ecosystems throughout the investigation area, Victoria and nationally.
- R8** Government supports community participation through adequate resources for planning processes associated with changes in land use categories and future management arrangements.

Nature conservation

A recent survey of residents, visitors and tour operators in the Murray River region found that the community valued the 'wilderness, biological, learning and life sustaining' values of existing national parks as well as the 'wilderness and biological' values of Gunbower and Barmah forests, which are currently classified as state forest. The natural beauty and integrity of the River Murray landscape and ecosystems are clearly important features for a broad cross section of the community.

Many ecosystems in the investigation area have been substantially reduced by clearing for agriculture. The riverine forests and woodlands that remain are under significant stress due to reduced and altered flooding regimes. This stress is likely to be exacerbated as climate change reduces rainfall and runoff. All Australian governments (federal, state and territory) have agreed to protect substantial examples of remaining ecosystems and endangered species in parks and reserves with no commercial exploitation. VEAC seeks to implement these policies and statutes for the ecosystems in the investigation area, which are underrepresented in the reserve system. VEAC also seeks to reduce the impact of a number of processes that place further pressure on an already stressed landscape. The Council has consequently recommended nine new or expanded national parks, and 135 new or expanded conservation reserves.

A recent CSIRO assessment reported that protecting habitat is one of the best ways to conserve species under climate change. While the species and ecosystems in any one area will change over time, the greater the total area of habitat available and the more diverse that habitat, the greater the number of ecosystems and species that will be able to survive.

One of VEAC's key responses to the threats facing biodiversity in the River Red Gum Forests investigation area is the establishment of a comprehensive, adequate and representative system of protected areas, as defined under the nationally agreed CAR criteria. Establishing such a reserve system is an important part of VEAC's Terms of Reference for this investigation and a requirement under the *Victorian Environmental Assessment Council Act 2001*. In summary, protected areas should contain examples of all types of ecosystems found in the area (comprehensive). For each ecosystem, the reserved areas should be of sufficient size and configuration to maintain the integrity of their biodiversity (adequate). Each ecosystem should also be represented within each bioregion to cover the range of biological variation (representative). VEAC, in line with recent national and international conservation science, has also placed an increased emphasis on the robustness and connectedness of the reserve system.

VEAC's recommended national parks and other protected areas meet nationally agreed criteria for a comprehensive, adequate and representative reserve system, by protecting high quality examples of the region's diverse range of ecosystems (defined in terms of ecological vegetation classes or EVCs). These protected areas are complemented by recommendations for regional parks, the Murray River Park and various natural features reserves which seek to ensure native vegetation is maintained in a relatively

natural state while encouraging a range of recreational and other activities. For a number of ecosystems, reservation targets could not be met because they now mainly occur on private, rather than public, land. On the Northern Plains in particular, where private land predominates and public land is often small and fragmented, Conservation Management Networks are recommended to coordinate and integrate the management of public and private conservation lands across the landscape. A Conservation Management Network (CMN) is a network of vegetation remnants, the people who manage those remnants and other interested parties. CMNs have been established in a number of fragmented landscapes in southeastern Australia to facilitate the coordination of remnant vegetation conservation and management across public and private land. Landholders and other interested individuals are an integral part of CMNs.

In relation to wetlands, VEAC has sought to balance opportunities for duck hunting on many popular wetlands, with refuges for waterfowl in nearby wetlands by adding the refuges to national parks and nature conservation reserves.

These recommendations will protect both the habitat of threatened species and other outstanding natural values. New protected areas will expand the area currently within the reserve system from 69,641 hectares to a recommended area of some 173,379 hectares. The substantial change reflects the shifting priorities for public land use since the last systematic assessments in the investigation area, the majority of which were carried out more than 20 years ago. These recommended changes are designed to provide a resilient reserve system that represents and protects the different ecosystems and natural values from the potential effects of climate change. In choosing areas as national parks and other reserves, VEAC has emphasised the need for improved connectivity and habitat links across bioregions. Strengthening the links along the vegetated corridors of major waterways in the investigation area was a key consideration, particularly given that the River Murray forms an important biolink traversing a range of inland environments across south-eastern Australia. In such areas where the public land is narrow or discontinuous, private protected areas may be established to achieve similar objectives.

Nature conservation is not only restricted to parks and reserves. A range of recommendations seeks to ensure that natural resources are more sustainably managed across *all* public land in the investigation area. These recommendations include the removal of grazing from most public land, the need to establish more appropriate flow and flooding regimes to maintain the health of riverine forests, and the re-establishment of crucial habitat such as coarse woody debris for woodland-dependent fauna. Within state forests, key sites for colonially nesting waterbirds, such as endangered egrets, will be managed to maintain habitat and avoid disturbance. These recommendations are outlined in greater detail later in this chapter.

Although our ecological understanding of aquatic and terrestrial ecosystems is relatively well-researched, many aspects of floodplain ecology, particularly terrestrial floodplain ecology, are poorly understood. This ultimately

impacts on how ecosystems and species are managed. Key aspects requiring urgent research include:

- refining and improving our knowledge of the water requirements of ecological vegetation classes (EVCs) and threatened species, including frequency, duration, drying intervals
- identifying the factors affecting the recovery of threatened species such as basin-wide and landscape-scale aspects (habitat continuity), habitat condition, climate change, species richness, and
- establishing a basis for prioritising different values for environmental watering.

There is a particular need to review the conservation status of species and EVCs in light of the ongoing and increasing threat posed by altered flow regimes. Although reduced watering is the greatest threat to the natural values of the floodplain, and is predicted to worsen, it has largely not been incorporated into current assessments of conservation status. It is important that this research be publicly available.

Another important focus of VEAC's nature conservation considerations is coarse woody debris—sticks, logs and wood on the ground. This material provides essential habitat for many ground-dwelling animals. The estimated current level of coarse woody debris in River Red Gum forests is approximately 20 tonnes per hectare on average, reduced from a pre-European average of about 125 tonnes per hectare. The main cause of this reduction is firewood collection. Some animals dependent on coarse woody debris such as the Yellow-footed Antechinus only occur at sites with more than 45 tonnes per hectare. Accordingly, VEAC believes that it is important to re-establish ground layer habitats and proposes that land managers seek to retain mosaics of coarse woody debris accumulations across riverine forests and parks, with a target of at least 50 tonnes per hectare on average.

RECOMMENDATIONS

Nature conservation

Several recommendations to improve nature conservation in the River Red Gum forests and associated ecosystems apply to specific public land use categories and are formally documented later in this report as follows:

- The reserve system itself is recommended as a series of national parks (recommendations A1–A9), some regional parks (recommendations B4–B7), nature conservation reserves (recommendations D1–D50), reference areas (recommendation F1) and some natural features reserves (recommendations G1–G81).
- Removal of domestic stock grazing from most public land in the investigation area (recommendation R38)
- Development of an adaptive management approach based on clearly defined, transparent and scientifically supported ecological objectives (e.g. ecological burning to promote certain fire-dependent ecosystems, ecological thinning and short-term grazing for ecological or management purposes such as targeted weed control (recommendations A(d) and B(d))
- Re-establish habitat crucial to a number of species of woodland fauna; a target of retaining an average of at least 50 tonnes per hectare of coarse woody debris in riverine parks and state forests is proposed (recommendation R36)
- Planning for provision of environmental flows that maintain and improve the health and long-term viability of floodplain-dependent ecosystems (recommendations R13–R14)

Specific recommendations for nature conservation not detailed elsewhere are:

- R9** That ongoing scientific research be conducted into terrestrial floodplain ecology to provide a basis for adaptive management of floodplain watering.
- R10** That the conservation status of ecological vegetation classes and flora and fauna be reviewed in light of threats posed by insufficient floodplain watering.
- R11** That government protect and restore River Red Gum forests and other vegetation communities on private land, using incentives and market-based mechanisms, particularly where these areas adjoin or link public land blocks and (where opportunities exist) acquire areas in order to consolidate vegetation or wildlife corridors.
- R12** That voluntary Conservation Management Networks be established by the relevant catchment management authority, in partnership with private landholders, public land managers and other interested parties, at suitable locations.

Examples of suitable locations include the Avoca Plains, Lower Goulburn floodplain, areas between the Warby Range and Ovens River forests, Loddon floodplain between Leaghur and Wandella forests and north of Kerang.

Environmental water

The River Red Gum Forests Investigation Discussion Paper (2006) highlighted the long term environmental impact of insufficient flooding on the survival of wetlands and riverine forests in the investigation area. Since then, this impact has been exacerbated by continuing drought, and the potentially devastating impact of climate change has become more apparent. The Murray Darling Basin Commission recently released its first audit on river ecosystem health for each of the 23 valleys in the Basin. All 11 river valleys in the investigation area were found to be in very poor or poor condition. Since the Draft Proposals Paper was released, many aspects of the management of environmental water have changed significantly, with new proposals to provide more environmental water and new arrangements between the Commonwealth and the states for the Murray Darling Basin. Such a dynamic setting emphasises the need for recommendations on environmental water that will remain relevant and workable in the face of such changes in the future.

The approach VEAC has adopted in this final report is different to that taken in the draft proposals paper which focussed on overbank flooding and an estimated volume required to achieve adequate flooding (in the order of 4000 gegalitres every five years). Where possible, overbank flooding is still the optimal method of environmental water delivery for many ecosystems. It is the mode of inundation to which the native biota has adapted, and does most to maintain ecological connectivity along and across the floodplain—including between the rivers and their floodplains. However, overbank flows may not be feasible, and in these cases a comprehensive description of assets and their water requirements is a necessary tool for decision-making. When overbank flows are not feasible, VEAC supports targeted works to provide water to protect natural values on the floodplain.

To this end VEAC has directed its focus to the natural values that depend on watering other than local rainfall for their existence. The location and water requirements of these values are independent of the physical, political and administrative means by which water may be delivered. VEAC has mapped and documented the flood-dependent natural values of the investigation area in detail and ascribed a watering requirement (minimum frequency and duration) for each area. The project is described in appendix 11 and more fully on VEAC's website (www.veac.vic.gov.au). Two sets of values have been mapped: ecological vegetations classes (EVCs) as a surrogate for ecosystem diversity, and threatened species. In addition, expert scientific knowledge has been used to identify the water requirements of each EVC and threatened species. These water requirements have been condensed into two variables: the minimum flood frequency and the duration required to maintain the relevant value in a healthy state. The resultant maps provide a comprehensive account of the required flood frequency (every second year, every fifth year, and so on) across the entire floodplain (see maps D and E). Additional parameters describing water regimes, such as flood duration, have been incorporated by DSE as part of the process of developing the Northern Region Sustainable Water Strategy.

Comprehensive coverage of the flood-dependent natural values across the floodplain improves the data available for decision-making on environmental watering and allows options to be compared in the assessment of trade-offs in environmental watering programs. VEAC's mapping can be used in conjunction with floodplain inundation models to predict which natural assets would be adequately inundated under various scenarios.

This approach has several advantages. By focussing on the assets to be maintained, it provides a single, relatively simple yardstick against which decisions can be evaluated. The approach remains useful as an input to decision-making, regardless of whether that water is delivered artificially or naturally, by overbank flows or other means, from purchased entitlements or water savings projects. The mechanisms by which water is delivered can thus be treated as a separate issue for discussion and decision-making. The approach also provides a good basis for increasing community engagement in environmental water management.

Mapping the flood-dependent natural values in a single consolidated data set also establishes a baseline that can improve as a result of regular reviews and new data. VEAC's work to date provides the basis for an ongoing, continually improving and publicly transparent undertaking. Scientific peer review should be incorporated into an ongoing program. VEAC's project was limited to the Murray, Goulburn, King and Ovens floodplains, to EVCs and threatened species, and to state-significant terrestrial vertebrates and vascular plants. To ensure the comprehensiveness of the inventory of assets, future work should cover all flood-dependent natural assets in northern Victoria (notably the Kerang and Corop Lakes, and the Kiewa, Campaspe, Loddon and Avoca floodplains), and value sets (such as species richness, habitat condition, other plant and animal groups, regionally significant values). The role of groundwater is complex, and fell outside the scope of VEAC's work.

Key areas for further work include clarifying the interaction of surface and groundwater hydrology with watering, and the relationship between watering (particularly frequency and duration) and the health of the targeted assets. As with the other additional work mentioned above, monitoring and feedback of results will be important elements for the adaptive management of these flood-dependent environments.

Climate change

While VEAC's focus has shifted, the need for water to sustain the natural assets of the floodplain remains the primary environmental concern of the River Red Gum Forests Investigation. The large volumes of water that are required present a very significant challenge for land and water managers. Newly published information about water yields under climate change makes it clear that the challenge is greater than previously thought. For example, as shown in the 2008 Discussion Paper for the Northern Region Sustainable Water Strategy, unless there are changes to the rules under which water is allocated to environmental as opposed to consumptive uses, the average amount of water for environmental flows in the Murray system could be reduced by as much as 44 percent, based on a continuation of the low inflows of the past ten years.

The comparable figure for consumptive uses is approximately ten percent. Even under less severe climate change scenarios—for example, CSIRO's "medium" climate change scenario—the water available for environmental flows in the Murray system will be reduced by 33 percent (six percent for consumptive uses).

In terms of the impacts on the natural values of the floodplain, the predictions are even more severe. Work carried out for DSE as part of the development of the Northern Region Sustainable Water Strategy shows that without remedial action the frequency of medium-level floods in Gunbower forest (reaching approximately 50 percent of River Red Gum dominated ecological vegetation classes) will decrease by 85 percent, from 39 in 107 years (based on the last 107 years) to only 6 in 107 years.

These figures are based on the 'worst case' scenario of future water availability described in the Discussion Paper for Northern Region Sustainable Water Strategy—a continuation of the low inflows of the past ten years. In the last ten years, the natural ecosystems on the floodplain have been watered only artificially. If this continues, large areas supporting flood-dependent values that are currently highly stressed will be lost. Some 190,000 hectares or 70 percent of public land in the investigation area supports flood-dependent natural values. While perhaps in the order of a fifth of this area is reasonably easily watered (especially areas that are part of or close to waterways used in the management of irrigation and drainage water), the extent to which the rest can be sustained will depend on future environmental watering. Some values, such as the 30,000 hectares of Black Box-dominated Riverine Chenopod Woodland, are likely to be difficult to water and under extreme threat in the long term. The outcome in Victoria is likely to mirror that in other states—overall, many hundreds of thousands of hectares of one of the most ecologically significant systems in Australia could be lost, including places such as the Ramsar sites which Australia has committed to protect under international agreements.

There is currently little integration of environmental flows on public land along the length of the River Murray, including its Victorian tributaries and associated wetlands. In part this reflects the site-specific nature of current programming required around timing and availability of water for environmental flows, as well as the focus on "icons" rather than the system as a whole. The current programming of environmental flows, while successful in recognising and responding to short-term imperatives, is not well suited to meet the requirement for a long-term comprehensive approach. A long-term approach is essential in the face of climate change and reduced water availability that confronts governments in their aim to reverse the decline of rivers and floodplain ecosystems in the Murray Darling Basin.

Site-specific issues

In addition to determining the most appropriate flow regime for the River Murray there are four specific operational and ecological issues warranting particular comment.

Wetland management

The first specific issue relates to the various wetland systems such as Kerang Lakes, Corop Wetlands, Boort Wetlands and Kanyapella Basin scattered throughout the investigation area. Many of these lake systems, like the River Red Gum forests, are under stress and unless an appropriate environmental flow regime is determined, secured and implemented over the long term there is a real risk that the biodiversity, aesthetic and recreational values of these ecosystems may be lost in the future. Compared to the floodplains, total volumes of water may be a less important issue for these wetlands than the unnatural flow regimes in parts of the lake systems that deliver water for nearby irrigators and downstream users. In cases where environmental water is delivered to wetlands which have existing water diversion licences, utilisation of these licences should not be at the expense of the water requirements of the wetland.

Barmah forest flooding

The second issue relates to summer flooding in Barmah forest and its detrimental effects on the ecology of the forests and wetlands. These floods occur as a result of irrigation water being released into the river system but then rejected by irrigators because of summer rain. Irrigation water in the river system then reaches the Barmah choke (the restricted section of the River Murray) where it is forced out onto the floodplain and wetlands, resulting in unseasonal floods. These floods degrade the ecology of the floodplains, and the Moira Grass plains have retreated through the encroachment of Giant Rush and River Red Gums. VEAC believes this encroachment is a major concern and will irreversibly change vegetation communities and ecology of the forests if left unmanaged. This issue should be addressed through a range of policy and management tools, rather than relying solely on engineering solutions such as proposals which will allow some irrigation flows to by-pass the physical constraint of the Barmah choke.

Levee banks

The third issue is levee banks for flood mitigation. Throughout the investigation area there are numerous levee banks used to manage or mitigate flooding, mostly on private land but some also located on public land. Many, including both those located on private and public land, are in need of major maintenance or upgrade. Many of these levee banks (such as along the Old Mail Road in the Lindsay–Wallpolla area and in the lower Goulburn River area) either impede water movement across the floodplain or are in disrepair. Where levees are in disrepair, there should be an assessment of whether the structures are still required or in fact could be removed or constructed in an alternative manner, thereby achieving greater spatial coverage during flooding events. Management of flooding at the boundaries of private and public land could be done without levees and facilitate the greater floodplain connectivity through the use of special area

plans under the *Catchment and Land Protection Act 1994* and environmental overlays under the *Planning and Environment Act 1987*.

Salt accumulation on the floodplains

The final issue is salt accumulation in the floodplain soils where the groundwater is shallow. This salt accumulation has increased as a result of shallower groundwater levels from irrigation and native vegetation clearing. Salt levels were kept in check naturally by flooding and rainfall but with a decline in both the rate of salt accumulation in the Lindsay-Wallpolla area has led to significant areas of degraded vegetation. Salt accumulation coupled with lack of flooding and drought conditions is showing visible signs progressively up the River Murray.

RECOMMENDATIONS

Environmental water

- R13** That environmental watering of the floodplains, conducted through the relevant existing or new national and state water programs, include:
- (a) identifying appropriate allocations of water to maintain flood-dependent natural assets;
 - (b) distributing that water in a way that maximises the maintenance of the flood-dependent natural assets, through overbank flows if feasible, otherwise using targeted works;
 - (c) monitoring so that the sites, requirements and prioritisation of natural values and selection of watering regimes are regularly refined and updated; and
 - (d) developing a greater public understanding of the natural values, and monitoring and publicly reporting on the delivery of water to sites.
- R14** That, more broadly than in recommendation R13 above, an environmental flow strategy be developed with the objective of achieving an integrated and consistent approach to environmental flows across the River Murray area, its Victorian tributaries and the key wetlands of Kerang Lakes, Corop Wetlands, Boort Wetlands and Kanyapella Basin.
- R15** That, more broadly than in recommendation R13 above, the improvement of the knowledge base of the forests and wetlands floodplain, hydrology, the river as a system, and in particular the use of models to integrate this information, be given a high priority and be readily available to the community.
- R16** That sufficient resources be allocated as a matter of highest priority for the development of a detailed long-term environmental water accounting system across the entire investigation area.
- R17** That land and water managers consider non-engineering options to mitigate the causes of summer flooding in Barmah forest.
- R18** That the relevant agencies conduct an audit of existing levee banks and where appropriate remove those levees in disrepair or seek alternative structures to facilitate greater dispersal of flood waters across floodplains; and where this is deemed necessary land and water management agencies undertake an extensive consultation process with private land holders and relevant public land managers.
- R19** That where changes to water supply infrastructure occur in the future environmental flows should not be adversely affected and additional costs associated with the provision of environmental flows be borne by the whole community.
- R20** That where opportunities exist, special area plans and the statutory planning processes be applied to more effectively manage environmental flows for ecological outcomes at the interface between public and private land.

Indigenous involvement

Aboriginal people have a connection with the River Red Gum Forests Investigation area that has endured and evolved over some 50,000 years. The relationship between Aboriginal people and the land, as well as the current extent of Aboriginal involvement in land management, was discussed in detail in the Discussion Paper. Information was also presented on public land management options and generalised models of Indigenous involvement in land management.

In carrying out its investigation VEAC is specifically required to take into consideration possible opportunities for Indigenous management involvement and the existing Yorta Yorta Co-operative Management Agreement.

To facilitate the participation of Aboriginal people in the investigation, VEAC commissioned consultants to seek the views of Aboriginal people and communities in the investigation area, through a series of workshops. An Indigenous Steering Committee was established to advise on consultation processes. The consultants' full report on workshops after release of the Draft Proposals Paper is provided in appendix 3. Despite being committed to consultation with Aboriginal people throughout the investigation, VEAC recognises that consultation is limited by the finite timeframe of the investigation and the competing demands on the time and resources of Aboriginal people, particularly Traditional Owners. The consultation conducted during this investigation is therefore considered to be the preliminary development stage of an ongoing relationship between public land management agencies and Indigenous people in the investigation area.

Australian jurisdictions are increasingly adopting various forms of shared land management as a means of reconciling Indigenous land claims and, in some cases, the legal requirements of native title interests. Victoria has not taken the steps that most other states and territories have taken to provide for direct participation in land management. A flexible framework for the direct involvement of Aboriginal people and Traditional Owners is needed for the management of public land in the investigation area.

There is a broad range of community aspirations for Aboriginal involvement in public land management across the investigation area. The recommendations presented below provide for greater levels of involvement of Aboriginal people, but acknowledge the need for flexibility to accommodate the differing capacity and aspirations of different communities. The recommendations also provide for greater access to public land for traditional cultural practice.

During all of VEAC's formal submission periods, many stakeholders expressed their wish to see greater involvement in public land management for Aboriginal people. Groups who identified as Traditional Owners described aspirations ranging from the handback of Barmah forest, through to increased consultation and sustainable harvest of native species for traditional cultural practice and use. In some submissions, joint management was proposed as a mechanism to improve social outcomes and economic development for Aboriginal people. These improvements include increased tourism revenue and employment in land

management. A relatively small number of submissions opposed greater Aboriginal involvement in public land management, with some specifically opposing any handback arrangements.

Many Aboriginal communities have expressed the desire to participate in public land management but are constrained in various ways including through their limited access to resources (see appendix 3). Native Title Services Victoria (NTSV) and the new Registered Aboriginal Parties (RAP) cultural heritage processes undertake registration and identification processes for Aboriginal people. However, resources for groups to establish or conduct internal consensus/agreement or informed consent processes are not provided unless specifically related to core functions.

In other states and territories, Aboriginal representative bodies perform a mediator function on behalf of Aboriginal landowners and Aboriginal people living on the land. These functions are established as a legal obligation using agreed informed consent or group consensus/agreement processes. Traditional Owner identification, registration, internal informed consent processes or protocols are necessary if a greater level of involvement in public land management decision-making—both strategic and practical—is to be achieved.

In more general terms, Traditional Owners are regularly consulted by public land managers and government agencies on matters related to land or natural resource management without clearly structured decision-making processes or resources for Aboriginal communities to undertake such processes. Aboriginal communities and individuals typically do not receive remuneration for provision or use of their knowledge, but under some Federal accreditation processes for state and local natural resource management agencies (e.g. National Action Plan for Salinity and Water Quality funding), Aboriginal community consultation must be demonstrated.

Traditional Owner groups have identified the following as major impediments to their participation in management and decision-making processes associated with public land:

- lack of administrative infrastructure to manage or coordinate activities
- lack of payment for time and expertise provided to government agencies when consulted about specific areas of public land or related management issues
- lack of funding to enable Traditional Owner groups to establish and undertake ongoing informed consent and internal group decision-making processes or protocols.

VEAC believes a properly resourced program is required to facilitate greater involvement of Aboriginal people in management and decision-making processes for public land. The program needs to include a brokering and advisory capacity to assist Traditional Owner groups to undertake processes that achieve agreement on identification of traditional Country, registration and effective internal processes and decision-making. Achieving these things may lead to improved outcomes (including resourcing and capacity building) through more structured and strategic engagement between public land and natural resource management agencies and Traditional Owners.

Agreements established by processes such as the Murray Darling Basin Commission's Murray Lower Darling Rivers Indigenous Nations (MLDRIN) Living Murray Initiative and Native Title registration may be used as a basis to formally identify and register Traditional Owner groups.

RECOMMENDATIONS

Increasing Indigenous community capacity

R21

That government provides relevant Aboriginal Traditional Owner Groups with assistance to participate in public land management by establishing a properly resourced program to assist with:

- (a) a mediated process to facilitate Aboriginal Traditional Owner identification and registration, identification of Country, group internal decision-making and procedures, and engagement with public land managers;
- (b) administrative support;
- (c) coordination of consultation requests from government agencies, and preferential selection of appropriately qualified Traditional Owner groups or organisations for contract services for public land and natural resource management projects;
- (d) targeted training and capacity building exercises;
- (e) initiatives aimed at retaining traditional knowledge and integrating this knowledge in public land management projects and partnerships on Country;
- (f) support for relevant Aboriginal Traditional Owner groups wanting to develop a permit regime as described in recommendations R29 and R30 for the traditional hunting, gathering and ceremonial use of Country.

Notes:

1. Aboriginal Traditional Owners are defined as those people who are the direct descendants of specific Indigenous groups present prior to European settlement.
2. Indigenous people refer to land and natural resources of an area over which they have a profound cultural and spiritual relationship as their traditional Country.

Current management of public land in Victoria does not generally provide for meaningful participation of Indigenous people in decision-making, although there are some examples of positive relationships and effective consultative arrangements. At the same time, many Indigenous communities have reflected a general aspiration for increased involvement in public land management, particularly on their traditional Country.

The Discussion Paper for this investigation provided detailed examples of various models of Aboriginal involvement. Involving Traditional Owners in the management of national parks and other protected areas is common in Australian states and territories. This approach has not been adopted to date in Victoria, although VEAC notes the Gunditjmarra agreement which includes a form of co-management of Mount Eccles National Park in western Victoria.

Indigenous communities in the River Red Gum Forests Investigation area have clearly expressed a desire for increased involvement in public land management generally and also for specific areas of public land. The recommendations below provide for varying levels of Aboriginal involvement in public land management (recommendations R22-R28). In some cases, specific areas have been designated for particular shared management regimes. It is important that legislative provision is made for additional areas to be added in the future as Traditional Owners decide on the level of management involvement they wish to seek for particular areas of public land.

RECOMMENDATIONS

Enhancing Aboriginal involvement

R22 That:

- (a) public land planning and management processes and policy acknowledge the unique relationship of Aboriginal people with Country and be based on recognition and respect for the traditional and contemporary relationship of Aboriginal people with the land;
- (b) prior to implementing VEAC's recommendations for parks and reserves, and changes in public land management, government consult with each relevant Traditional Owner or Aboriginal group regarding their native title rights and interests;
- (c) government, in consultation with each relevant Traditional Owner Group, establish mechanisms to improve and resource Indigenous participation in public land and water management;
- (d) opportunities for increased employment and training for local Aboriginal people be resourced and provided in the implementation of parks and reserves in the River Red Gum Forests Investigation area; and
- (e) cross-cultural awareness training continue to be available for agency staff involved in the implementation of recommendations R21-R30.

Joint management and co-management

Shared management in its various forms has the potential to be a partnership between Traditional Owners, the broader community and government working together within a framework of shared decision-making and management responsibility. One of the key social attributes of such management arrangements is that they recognise Traditional Owners and reaffirm their ties with their Country. The exercise of traditional practices of caring for Country through a management structure gives Indigenous people a stronger and active role in land management. Traditional Owners see this as a means of valuing and respecting their knowledge of land and wildlife, along with mainstream scientific approaches, to achieve better land management and conservation outcomes.

Employment opportunities can be created for Aboriginal people in a range of roles under shared management structures. It is expected that, through training and participation, Aboriginal people will develop skills and gain employment as rangers and in other park-related services and enterprises.

Typically, for a momentum to be established that will lead to meaningful Indigenous involvement in public land management, processes and arrangements must be underpinned or initiated by specific legislation. Without specific legislation, progress towards shared management can be very slow or stall completely. VEAC therefore proposes that changes be made to the *National Parks Act 1975* to provide for the increased involvement of Traditional Owners in the management of parks, and specifically for shared management arrangements. It is also recommended that legislative provision be made within five years to enable the transfer of national and other park land to Traditional Owners in the future, and for processes to be established for nominating parks for that schedule. Changes are also required to the *National Park Act 1975* for parks scheduled under that Act to be co-managed by a management board with a majority of Traditional Owners. These management board provisions are essentially the same whether the parks remain in public ownership (referred to here as co-management), or transferred to Traditional Owners (referred to here as joint management). See Glossary for more detailed definitions. The following recommendations outline the legislative changes that VEAC considers are required to facilitate future Aboriginal joint management and co-management.

RECOMMENDATIONS

Joint management provisions for national and other parks

R23

That the *National Parks Act 1975* be amended within five years of acceptance of this recommendation to make provision for a new schedule to be established and for a process where areas on that schedule may be transferred to Aboriginal Traditional Owners as National or other Park Aboriginal Land (inalienable freehold), and

- (a) that transfer be subject to agreement to enter into a lease for use of the land as a national or other park;
- (b) for each such park a board of management be established with a majority of members from the relevant Aboriginal Traditional Owner group or groups; and
- (c) a process be established for nomination and addition of areas to the schedule.

Co-management provisions for parks and reserves

R24

That the *National Parks Act 1975* be amended to make provision for co-management of specific parks with which an Aboriginal group or groups have a traditional association by establishing co-management agreements, and

- (a) the co-management agreements will be between relevant Aboriginal Traditional Owner groups and government, and
- (b) the park or reserve be managed by a co-management board consisting of a majority of members from the relevant Aboriginal Traditional Owner group or groups;
- (c) the co-management board provide for (amongst other obligations):
 - (i) protection of flora and fauna, and other natural values
 - (ii) preservation and protection of Aboriginal sites, features, objects and structures of spiritual or cultural significance within the area
 - (iii) continued enjoyment of the area by the relevant Aboriginal groups for cultural, spiritual and traditional uses
 - (iv) continued enjoyment of the area by members of the public in a manner consistent with the designated public land use category
- (d) the co-management board prepare a management plan for the park, and
- (e) the co-management board manage the park on the 'business as usual' basis until the first co-management plan comes into operation.

R25

That the *National Parks Act 1975*, and other relevant legislation such as the *Crown Land (Reserves) Act 1978* be amended to provide for:

- (a) a process for additional areas with which an Aboriginal group or groups have a traditional association to be added to the areas over which the co-management arrangements outlined in recommendation R24 may apply (including parts of a park or reserve), and
- (b) other co-management arrangements not necessarily involving a board of management or a board of management with majority Aboriginal Traditional Owners.

Specific areas for co-management

Areas with a high level of Aboriginal cultural heritage and groups with a willingness to engage in management issues are suitable for co-management arrangements. VEAC recommends that co-management agreements be initially developed for the following parks.

Nyah–Vinifera Park co-management

Nyah and Vinifera forests have an outstanding range and concentration of Aboriginal cultural heritage sites.

Keeping the culture, including caring for Country, was expressed as the most important thing to Aboriginal people from this area. Co-management with the relevant Aboriginal Traditional Owner group or groups for the recommended Nyah–Vinifera Park (recommendation B7) will provide an opportunity for culture and tradition to be supported, practised and shared. There may also be opportunities for both nature and culture based tourism business development in Nyah–Vinifera Park. This park is recommended as an addition to Schedule Three of the *National Parks Act 1975*.

Barmah National Park co-management

Many Traditional Owners of the Barmah forest have expressed a desire to join in partnership with the government in the ongoing operation and management of this area of their traditional lands as a national park. This progresses the existing advisory role of the Yorta Yorta Co-operative Management Agreement in which the State of Victoria acknowledges the cultural connection Aboriginal people have with areas under the agreement, including Barmah forest.

There is widespread support from environment and other community groups for such a partnership, which is viewed as an opportunity to link the skills and knowledge of Aboriginal people with those of the government agency park managers. This partnership has the potential to achieve the most desirable and effective conservation and cultural heritage outcomes, while ensuring public access for visitors and providing a richer visitor experience. VEAC acknowledges a substantial spiritual and cultural connection for Traditional Owners of the recommended Barmah National Park (A7).

RECOMMENDATIONS

Co-management of specific parks

R26

That a co-management agreement be entered into between the government and the relevant Traditional Owner group or groups and that the following areas be managed by a co-management board consisting of a majority of Traditional Owner group representatives in accordance with recommendation R24:

- (a) Nyah–Vinifera Park (recommendation B7)
- (b) Barmah National Park (recommendation A7).

Note:

1. The establishment of this co-management arrangement for the proposed Barmah National Park is not intended to affect the existing agreements for other areas of public land under the Yorta Yorta Cooperative Management Agreement.

Advisory bodies

Consultative or advisory roles also provide for Aboriginal Traditional Owners or Aboriginal people more generally to participate in public land management. Although this structure does not provide for decision-making responsibilities, it provides a more flexible means of engaging Aboriginal people in public land management, without imposing onerous or under-resourced management responsibilities.

RECOMMENDATIONS

Aboriginal advisory committees

R27

That provision be made for involvement of Aboriginal people in management of designated areas of public land by:

- (a) establishing advisory committees (under existing legislation) consisting of Aboriginal Traditional Owner representatives, to provide the land manager with advice on one or more aspects of land management,
- (b) adequately funding advisory committees to perform their functions and that, if required, legislation be amended to provide for allowances and expenses, and
- (c) reviewing and changing the specific role of the advisory committees by agreement of the parties.

VEAC has identified four areas for the initial establishment of Aboriginal advisory committees.

West Wallpolla Island Aboriginal Advisory Committee

West Wallpolla Island State Forest is currently managed by a committee of management established under the *Forests Act 1958*. Members of the committee represent the land manager, grazing licensee, cultural heritage group representing the Latje Latje Traditional Owners and other government land management agencies. This committee was based on relationships developed over several years of negotiations for protection of Aboriginal cultural heritage sites.

Recommendation R28(a) provides for the Traditional Owners to remain involved in management of west Wallpolla Island and cultural heritage sites in particular, after it is added to the expanded Murray-Sunset National Park (recommendation A1). This advisory committee can be established under existing provisions of the *National Parks Act 1975*. The level of involvement may be re-negotiated at some later time to cover other locations and matters other than cultural heritage protection. As outlined in the general recommendations for advisory committees above, resources are required to support the advisory committee and provide appropriate payments for service. These recommendations ensure a resourced and ongoing role for Aboriginal people in management of this area. VEAC does not believe this recommendation will diminish the current level of

engagement Aboriginal people have with public land managers in this area, and has the potential to be expanded to include other areas such as Mulcra and Lindsay Islands in the future. However, future amendments to the *National Parks Act 1975* should consider extending co-management provisions to part of a park (see recommendation R25(a)).

Hattah-Kulkyne National Park and Murray-Kulkyne Park Aboriginal Advisory Committee

VEAC has recommended only small changes to the existing Hattah-Kulkyne National Park (A2) and Murray-Kulkyne Park (B5). The new recommendation for an Aboriginal advisory committee over this area (R28(b)) reflect the expressed desire of Aboriginal people in this area to participate in public land management. There are existing relationships between Aboriginal people and park managers for management of cultural heritage sites within Hattah-Kulkyne National Park. Establishment of an Aboriginal advisory committee will provide an opportunity for Traditional Owners to enhance their current level of engagement and facilitate resourcing for consultation.

Bumbang Island Aboriginal Advisory Committee

Currently Bumbang Island Historic and Cultural Features Reserve, comprising some 570 hectares near Robinvale, protects one of the most significant clusters of scarred trees in the investigation area (see also recommendation E2). Many other Aboriginal sites and places also occur in this area. In recognition of the ongoing management and planning required for protection of these sites, VEAC recommends that an Aboriginal advisory committee be established to work with the land manager (recommendation R28(c)). This will, in some respects, formalise existing relationships but also provide for a clear allocation of resources to the Aboriginal advisory committee.

Gunbower National Park Aboriginal Advisory Committee

Gunbower National Park (recommendation A4) comprises 8892 hectares of Gunbower Island, the remainder comprising Gunbower State Forest (recommendation C3). Whilst acknowledging that cultural heritage and spiritual connections to Country exist across the entire Island, VEAC believes that an Aboriginal advisory committee should be initially established for the national park portion only (recommendation R28(d)) as a capacity-building program. At a later time, a form of shared management may be considered over the entire Gunbower Island area.

RECOMMENDATIONS

Specific Aboriginal advisory committees

R28

That an Aboriginal advisory committee be established as described in recommendation R27 for:

- (a) west Wallpolla Island area of Murray-Sunset National Park (A1)
- (b) Hattah-Kulkyne National Park (A2) and Murray-Kulkyne Park (B5)
- (c) Bumbang Island Historic and Cultural Features Reserve (E2)
- (d) Gunbower National Park (A4).

Aboriginal traditional cultural practice

During consultation with Aboriginal people, the right and ability to practice traditional cultural activities on Country was raised. Although provisions exist under various pieces of legislation (*Wildlife Act 1975*; *Fisheries Act 1995*; *Commonwealth Native Title Act 1993*) allowing for some activities (e.g. hunting for Aboriginal cultural purposes) there is no broad understanding about how to obtain such permissions, nor is the role of Traditional Owners in the process clear. Changes to legislation are required to provide for an appropriate role for Traditional Owner groups in the issue of permits to undertake cultural practice involving hunting or gathering on their traditional Country. In order to facilitate this process, authority must be devolved to Aboriginal people to develop their own internal decision-making processes around such matters. Traditional Owner groups need to be identified and supported by public land managers to perform such tasks.

VEAC recommends that provision be made for hunting, food gathering and ceremonial practice across public land in the investigation area. Traditional cultural practice may be restricted by the identified Aboriginal Traditional Owners of the Country, through a permit system established in consultation with the land manager.

There are many examples throughout Australia and internationally of permit regimes that accommodate traditional cultural practice, including protocols for matters such as the protection of threatened species. In addition, other jurisdictions acknowledge that evolution and modification of traditional cultural practice has occurred over time allowing for modern forms of hunting with firearms or other weapons and is not restricted to practices undertaken before European colonisation.

RECOMMENDATIONS

Aboriginal traditional cultural practice

R29

That policies and legislative restrictions inhibiting traditional cultural practice on specified areas of public lands and waters be amended to provide for Aboriginal Traditional Owners to undertake the following activities for personal, domestic and non-commercial communal use on Country:

- (a) hunting (including using licensed firearms), gathering, collecting, fishing and collecting earth materials,
- (b) conducting a cultural or spiritual ceremony, including (if required) having exclusive use of specified areas for a specified time, and
- (c) use of fire as related to (a) and (b) above.

R30

That Aboriginal traditional cultural practice may be governed by a permit regime and protocols established by the relevant Aboriginal Traditional Owners for the specific area in partnership with the public land manager.

Notes:

1. The use of firearms is subject to specific licensing and legal requirements.
2. The exclusive use of an area for traditional cultural practice is not to be used as a permanent exclusion zone.
3. The use of fire is subject to regulations and restrictions relating to declared total fire ban days as a matter of public safety and is not intended to include broad scale or 'fire-stick' farming.
4. The above recommendations are not intended to contravene the Commonwealth *Native Title Act 1993* where this applies.

Recreation and tourism

Popular recreational activities in the investigation area include camping (and associated activities), dogwalking, boating (including waterskiing, wakeboarding and canoeing), fishing, horseriding and camping with horses, four-wheel drive and general car touring, trailbike riding, hunting, bushwalking, birdwatching and other nature study. The tourism industry relies on the River Murray and its environs and offers a wide variety of built accommodations and activities such as paddleboat tours, houseboat hire, golfing holidays, visiting food and wine outlets and cultural heritage sites; horse-riding and canoeing tours.

Tourism Victoria's Nature-based Tourism Strategy 2007-2011 depends on the healthy and sustainable use of the River Murray and associated public land. The Strategy will encourage additional public and private sector investment in higher yielding tourism experiences that focus on high quality visitor facilities and access to a range of recreation opportunities associated with parks. This will be serviced by a range of accommodation types, including camping in parks, and nature retreats and eco-lodges adjacent to parks.

Camping

Camping on public land is an extremely popular activity along all major river frontages in the investigation area and provides for low-cost holidays. The most favoured activity is 'dispersed camping'. This is generally defined as camping along the river frontage accessible by vehicle, at a site of one's choosing, and where there are generally no toilets, drinking water, or fireplaces. It includes the ability to have an open fire and obtain firewood.

Many submissions place a high value on the relatively unregulated experience of dispersed camping along the River Murray and other major rivers in the investigation area. VEAC has provided for this use to continue in all riverine national parks, the Murray River Park, regional parks and state forests, and intends that dispersed camping will remain the dominant form of camping in these areas.

Some visitors seek a more remote camping experience, where campsites are located away from tracks and the noise of vehicles and require users to arrive on foot or by boat. There are limited remote campsites in the investigation area.

Other visitors wish to camp in designated camping areas that include facilities such as bush toilets, tables, water supply and fireplaces. Designated campsites are currently located at Wills Bend, Wharparilla North, Hattah Lakes and Barmah Lakes. In addition, there are a number of formal camping and caravan parks on public land (and private land). These areas are not affected by the recommendations.

Given the range of camping experiences sought by visitors to the River Murray, VEAC recommends that a recreation and camping strategy across all public land categories provide for the full range of experiences sought by campers and other users, and acknowledges the preference for dispersed camping.

The strategy will need to take into account the impacts of camping and other recreation uses. For example, there can be significant impacts on the environment such as removal of coarse woody debris for firewood, development of large cleared areas, inappropriate disposal of human waste and rubbish accumulation, especially in peak periods when visitor numbers are very high. Additionally, high density camping may lead to disputes between campers over sites and noise and may reduce the quality of the experience—especially if people are primarily camping in these areas for peace and quiet. At peak periods it can be difficult for day visitors to access popular stretches of the major rivers if all available sites are occupied by campers. Land managers need to plan for these different camping experiences and minimise negative impacts, by addressing rubbish removal and facilitating environmental recovery by resting of certain sites.

The support and cooperation of campers will be required for this strategy to be successful. The recreation and camping strategy should be prepared by the land managers in close consultation with the community, user groups, local government, tourism bodies and campers. Education programs may help encourage the responsible and sustainable use of the public land.

Many visitors like to camp with their dogs. Camping with dogs is permitted in the recommended Murray River Park, the regional parks and state forests. VEAC has enlarged the area available for camping with dogs in these final recommendations by extending the Murray River Park north of Barmah township, and near Torrumbarry Weir, and on Wallpolla Island near Wentworth. The Shepparton Regional Park has also been extended to allow for camping with dogs. These changes have meant a corresponding reduction in the area of national park. Camping with dogs is not permitted in recommended national parks and nature conservation reserves in the investigation area.

Within the regional parks (including the Murray River Park), the land manager should define any sensitive areas where dogs may need to be excluded either to protect particular natural values of a site, where dogs are incompatible with other recreational uses, or where it may be necessary to allow dogs only on leashes. These small and localised exclusion areas would be defined in management plans, in consultation with the community.

In some areas, public land between the River Murray (and the other major rivers) and adjoining private land is too narrow to accommodate temporary campers' toilets at a distance of 100 metres from the river edge (as required by camping regulations). As a result, land managers have prohibited camping at these sites. This is particularly the case around some towns such as Echuca. However, these narrow stretches of public land may provide important points of access to the river for day visitor use, fishing or launching of boats, and in some cases may be suitable for camping. It may be beneficial for land manager to review these areas, in consultation with the community, and determine whether day visitor use or camping is the most appropriate use. If camping is suitable, it should be a requirement either that an appropriate style of chemical toilet is used by campers or the land manager may need to provide suitable toilets. This may require an amendment to the camping regulations.

The River Murray frontage is approximately 1600 kilometres in length between the South Australian border and Wodonga, and dispersed camping is a permitted use over most of this area. For those wishing to camp with dogs, the recommended Murray River Park, extending over approximately 75 percent of the River Murray frontage, is available for this use. National parks and conservation reserves where camping with dogs is not permitted extends over 23 percent of the frontage.

Fishing

Recreational fishing is an increasingly popular activity and many fishers access the Murray and Goulburn Rivers by boat in pursuit of their sport. Land managers need to consult with recreational fishers and ensure a range of boat launching facilities are available, including the existing sites capable of launching a boat off the bank and more formal boat ramps in certain locations.

Four wheel driving

Four wheel driving is a popular recreation activity in the investigation area, often associated with other outdoor pursuits such as fishing and dispersed vehicle-based camping. The extensive road and track network provides diverse opportunities both for short trips and extended touring. VEAC is aware of the constructive relationship four wheel drive clubs and associations have with DSE and Parks Victoria across Victoria, especially in relation to track identification and signage, developing routes, seasonal access and environmental management.

Because of the extensive network of river frontage tracks in the investigation area, VEAC believes there is considerable scope for sharing of information and co-operative ventures between land managers and four wheel drive groups.

RECOMMENDATIONS

Recreation use

R31

That public lands in the River Red Gum Forests Investigation area be available for a range of recreation activities for community enjoyment and appreciation appropriate to the land use category.

Dispersed camping and camping with dogs

R32 That:

- (a) dispersed camping be provided for in riverine national parks, the Murray River Park, regional parks and state forests as the predominant form of camping (see also general recommendations for these land use categories), and
- (b) camping with dogs be permitted in the Murray River Park, regional parks and state forests.

Recreation and camping strategy

R33 That:

(a) a recreation and camping strategy be coordinated, as part of management planning processes for all parks across the investigation area, to show where and how each of the major popular recreational activities can be enjoyed so that overall, there is an appropriate mix of experiences (where permitted in the specific public land use category), including in particular:

- (i) dispersed camping
- (ii) camping areas with facilities such as toilets and fireplaces
- (iii) camping areas with dogs, or areas with dogs on leash only
- (iv) camping areas with horses
- (v) camping areas without noise from generators, pump houses or utilities either fixed or temporary
- (vi) day visitor areas

(b) camping be managed to minimise impacts, which may include temporary restriction on some uses in areas of high conservation values,

(c) the strategy be coordinated with tourism destination planning, and tourism development and management, undertaken by the tourism bodies,

(d) the strategy address waste management in consultation with local government, tourism authorities, tourism providers and user groups.

Camping on narrow river frontages

R34

That the land manager should review the capacity for a range of recreation uses along the Murray, Ovens and Goulburn Rivers where the public land frontage is less than 100 metres wide from the top of the bank and determine whether camping is an appropriate use, and that

- (a) the review be conducted in consultation with the community as part of the planning for camping specified in recommendation R33, and
- (b) if camping is permitted, the land manager specify whether portable chemical toilets are required.

Campfires

For many visitors, campfires are an important part of the experience of camping. However, many people and organisations have raised concerns about campfire safety over summer. Additionally, many stakeholders expressed concern about the environmental impact of firewood collection by campers. Coarse woody debris (sticks, logs and wood on the ground) is essential habitat for many ground-dwelling animals.

Escaped campfires are a major cause of wildfires in River Red Gum environments over summer. For example over 60 percent of wildfires in the Barmah forest of known source from 1983 to 2004 were started from escaped campfires. In New South Wales and South Australia there is a seasonal solid fuel fire ban over the high fire danger period on public land along the River Murray.

VEAC recommends that campfires should continue to be a permitted use in parks across the investigation area except in the high fire danger period. VEAC is also recommending a seasonal ban to reduce the fire hazard over the summer months and align Victoria with the seasonal fire ban regimes operating in New South Wales and South Australia.

In order to minimise impacts on the levels of coarse woody debris being utilised for campfires in the vicinity of campsites, land managers should consider directing campers to alternative sources of wood elsewhere on public land, which may become available as a result of safety works, road clearing, fire protection works or ecological thinning. Land managers should explore alternatives as adopted elsewhere in Victoria where, for example, firewood is available for purchase at certain park camp sites and in other instances campers are encouraged to bring wood from home.

RECOMMENDATIONS

Solid fuel fire bans and firewood strategy for campers

R35 That:

(a) solid fuel fires and collection of firewood for campfires not be permitted on public land adjoining the Murray, Ovens and Goulburn Rivers within the investigation area during the officially declared high fire danger period, and

(b) solid fuel fires and collection of firewood for campfires be generally permitted outside the high fire danger period in parks and state forest areas adjoining the Murray, Ovens and Goulburn Rivers.

R36

That the Department of Sustainability and Environment develop (in the context of management planning) a firewood strategy for campers (outside the solid fuel fire ban period):

(a) with a target of retaining at least 50 tonnes per hectare of coarse woody debris across each frontage block, and

(b) specifying where wood can be obtained elsewhere on forested public land, as a result of safety works, road clearing, fire protection works or ecological thinning.

Note: Campers could also be encouraged to bring wood from home or purchase it from local suppliers prior to entering the park.

River Murray Strategy

Many aspects of camping and associated recreational activities on public land along the River Murray are similar to the Victorian coast. In both locations public land often occurs in narrow strips with multiple access points across and to public land. These strips of public land provide an opportunity for safe, affordable family holidays and many families repeatedly camp at the same location over many years, developing a sense of ownership of the area. Although a major appeal of these camping destinations is the perception of being close to nature, some popular areas (particularly those closest to Melbourne) are in danger of being 'loved to death'. Their popularity, particularly during peak periods, may lead to environmental degradation, with pressure also being increased by the development of adjoining private land.

The complexity and differences across public land along the coast has been recognised by successive governments in the Victorian Coastal Strategy, which was developed to take an integrated approach to coastal planning and management. VEAC proposes that a River Murray Strategy, similar to the Victorian Coastal Strategy, be developed to bring together multiple stakeholders and agencies with responsibility for managing different parts of the River Murray, its anabranches, wetlands, catchments, and adjoining public and private land. The strategy aims to improve outcomes for conservation and recreation, as well as ensure appropriate and sustainable development (including on adjacent private land) through long-term strategic planning.

Long term strategic planning is particularly important along the River Murray given the added level of complexity associated with defining the border and with cross border issues. For example, some recreational activities along the River Murray will take place in both Victoria and New South Wales, and be subject to the two different regulatory regimes. Like the Victorian Coastal Strategy, such a strategy is not intended to replace or duplicate the detailed management plans for specific parks and reserves on public land, but is intended to articulate a long-term vision for use and development of the River Murray corridor, and to pick up longer-term planning issues, particularly those relating to pressures from outside the public land estate such as adjacent private land and activities on the River Murray itself.

RECOMMENDATIONS

River Murray Strategy

R37

That a River Murray Strategy be developed within three years of government acceptance of these recommendations, in consultation with relevant Victorian and New South Wales government agencies and relevant planning bodies to provide a long term framework for the co-operative use of the River Murray and environs on a sustainable basis for recreation, conservation, tourism, commerce and similar uses.

Domestic stock grazing

Domestic stock grazing on public land was highlighted as a significant issue in the Discussion Paper, and attracted considerable comment in public consultations following release of the Draft Proposals Paper. VEAC has considered this feedback and other inputs in forming the view that while domestic stock grazing may be an effective management tool to address specific problems at particular locations and times, scientific evidence indicates that stock grazing in general adversely affects natural values, especially biodiversity, water quality and soil condition. Accordingly, VEAC recommends that domestic stock grazing be generally excluded from public land in the investigation area, with some limited exceptions (recommendation R38).

This recommendation is consistent with recommendations for other relevant public land categories (notably national parks, the Murray River Park, nature conservation reserves and state forests) which specifically exclude domestic stock grazing.

The recommendation to largely exclude grazing on public land is a significant change in emphasis from existing management of domestic stock grazing on public land. As documented in the Discussion Paper, domestic stock grazing is currently common on public land water frontages (a sub-category of natural features reserves), unused roads ('services and utilities—transport (roads)' that are not in use), state forests, regional parks and some other public land use categories. In most of these areas public land grazing continues largely on the basis that it is permitted unless it is demonstrated to be not ecologically sustainable or causing environmental damage. Stock grazing usually has significant impacts on ecological communities which have not evolved under such grazing regimes. Nevertheless, demonstrating specific environmental damage (or sustainability) at individual locations is costly, time-consuming and is consequently rarely done.

VEAC's recommendations on stock grazing in this investigation differ from the intent of earlier government-approved recommendations of the Land Conservation Council. LCC investigations have recommended that grazing be allowed to continue along public land water frontages provided it does not contribute to environmental damage. For example, the LCC (1991) Rivers and Streams Investigation recommended that grazing

continue on stream frontages where it does not conflict with several other uses, notably conservation of native flora and fauna, and restoration of native vegetation. The LCC recommendations are reflected in the Victorian River Health Strategy (2002) which states that 'the Government has a vision for the rivers of Victoria which is based on ecological sustainability'.

This past approach, however, does not appear to have been entirely successful at preventing environmental damage through stock grazing. Although the LCC recommendations and Victorian River Health Strategy has provided some impetus for the removal of grazing as part of frontage protection programs undertaken by catchment management authorities and DSE, it has had little if any effect on grazing elsewhere even where it seems likely that damage is occurring. This is why VEAC is explicitly recommending in this investigation area grazing generally not be permitted other than to address a particular environmental or management problem, such as controlling particular weed infestations or maintaining a specific grassy habitat structure.

Grazing for ecological management purposes is unlikely to be required very often and when it is, the framework under which it is managed would be different from the current general approach. That is, domestic stock grazing should only occur to address a specific, explicitly-stated problem and with grazing-specific management planning and research, and control of stock numbers residing with the land manager. This is currently the case in Terrick Terrick National Park where, for example, sheep grazing is closely monitored and administered through short-term contracts rather than under licence or agistment permits. It should be noted that VEAC does not see broad-scale fuel reduction for fire protection as a specific problem for which domestic stock grazing is an appropriate management tool—the scientific evidence concerning the effects of grazing on broad-scale fire protection in the vegetation types of the investigation area is equivocal at best.

VEAC recommends two other limited exceptions to the immediate removal of grazing. Because of the large number (approximately 2000) and long boundaries (often unfenced) of grazing licences along public land water frontages ('stream frontages'), VEAC is recommending a five year phase-out of stream frontage licences, to allow time for the administration of the change and for fencing and, where required, alternative water sources to be established. This phase-out of grazing needs to be completed as a matter of priority, and any incentives offered to adjoining land-owners need to be scaled to prioritise the most vulnerable and sensitive areas. Implementation costs are considered as part of resourcing and assistance in recommendations R1 to R4 above.

There are also a large number of unused road licences, most of which are not completely fenced, if at all. Because it would currently be impractical to manage these areas separately from the agricultural land in which they are embedded, VEAC is recommending that grazing continue to be permitted in these areas.

In addition to the large number of grazing licences, there are a small number of current licences for cultivation or cropping in the investigation area. Consistent with the removal of grazing elsewhere VEAC is also recommending

the removal of cultivation from these areas. There may also be areas of unlicensed cultivation or cropping in the investigation area which should be removed immediately. All areas from which cultivation is removed should be revegetated.

Although a general decline in natural values has been identified due to grazing pressure, VEAC acknowledges the appropriate management practices of many licensees and adjoining land-owners. This is particularly the case for adjoining owners involved with catchment management authority projects to fence and re-vegetate stream frontages. A new Riparian Conservation Licence is recommended to encourage adjoining landowners to maintain their connection with public stream frontages and waterway by managing the land for environmental objectives (recommendation R39).

Catchment management authorities are well placed to be effective on-ground managers, engaging communities and adjoining land-owners about the new licence category. Implementation of the recommendations will require a dedicated change management program and community engagement (as described in recommendations R7-R8). The cost of such processes is outweighed by the significant gains that will be achieved through retaining native vegetation, strengthening habitat corridors, improving water quality and river ecology and reducing water pollution. Adjoining land-owners will also see benefits with reduced erosion, improved soil structure and ecosystem services. The benefits to waterways and water quality—particularly with climate change affecting run-off and stream inflows—are likely to be significant and of both environmental and economic benefit, especially in the lower catchment areas.

RECOMMENDATIONS

Domestic stock grazing

R38

That cultivation, cropping and domestic stock grazing not be permitted on public land in the investigation area, except:

(a) in areas proposed to remain as public land water frontages (G105-G112) and stream beds and banks (G113) grazing may continue for a phase-out period to be completed within five years of government accepting this recommendation; and

(b) in areas proposed to remain as unused roads (services and utilities—transport (roads) where an unused road licence is current).

R39 That:

(a) for public land water frontages, a Riparian Conservation Licence be established where appropriate for adjoining landowners and be subject to agreement to manage these areas as described for natural features reserves general recommendation G and public land water frontages recommendations G105-G112, and

(b) the Riparian Conservation Licence be managed by the relevant catchment management authority in consultation with the Department of Sustainability and Environment, and

(c) the relevant catchment management authority in consultation with other appropriate government agencies establish management plans with individual licensees to achieve the objectives outlined in (a).

Notes:

1. Land managers may utilise domestic stock grazing on public land under contract for ecological or management purposes such as targeted weed control.
2. That the phase-out of grazing on recommended public land water frontages and stream beds and banks be prioritised with incentives to licensees scaled to benefit those participants who install fencing and off-stream water points early in the phase-out period.
3. In general, unused roads should remain in public ownership.

Domestic firewood collection

Domestic firewood is obtained from public land in the investigation area mainly from thinning of state forests to provide future sawlogs, but also from a range of other sources such as windthrow, and drought-killed trees. Across the state, it is estimated that some 11 percent of firewood demand is provided from public land, the remainder is from private land and other sources. This firewood is used for domestic purposes, particularly as an affordable option for residents of small settlements that are not connected to natural gas. A large proportion of commercial firewood is used to supply markets in Melbourne, regional centres and other consumers such as the Echuca paddlesteamer fleet.

Harvesting of forest products (including sawlogs, posts and firewood) is not consistent with national park objectives and will not be continued where they currently exist in recommended national parks. VEAC acknowledges that the cessation of timber harvesting in certain state forests, for example as a result of the creation of the Barmah National Park, will have an impact on the supply of firewood for domestic and commercial use. To supply firewood to local users, VEAC has identified additional zones within the Murray River Park and has designated additions to the Murray River Park near Barmah and Wallpolla Island within which firewood may be obtained (see recommendation B3). Firewood collection zones in the Murray River Park will need to be carefully managed to ensure sustainable cutting and minimise biodiversity impacts. The Department of Sustainability and Environment should continue to have the overall responsibility for management of firewood across public land, in consultation with the manager of the Murray River Park. VEAC's intention is to utilise the existing systems of site identification, environmental analysis, public consultation and licensing for domestic firewood collection.

A strategic approach to managing the supply and demand for firewood should be coordinated at the statewide level and implemented regionally. Much work has been commenced in this area. For example in the Bendigo area, five year firewood plans have been developed to ensure a sustainable flow of wood and to provide certainty to local communities. Licensing systems have been upgraded to ensure wood is preferentially available to local users and concession card holders. The collection season has been reduced to minimise illegal firewood collection and a maximum firewood volume has been set for firewood collection licences. In certain instances, additional volumes of firewood have been made available from increased thinning operations in state forest and from ecological thinning in parks. Additional emphasis has been placed on advising residents of the government rebate system that provides an allowance for those wishing to convert to energy efficient gas appliances, solar hot water and home insulation. The North East Firewood Strategy Implementation Committee which consists of members from relevant departments, local government and the North East Catchment Management Authority has played a lead role in identifying additional firewood sources, setting up local woodlots and galvanising local support.

Plantations provide a potential future firewood resource. Five hundred hectares of firewood plantations were recently established on private land in northeast Victoria, under a cooperative project led by the Catchment Management Authorities and government departments. A study undertaken by the Goulburn Broken Catchment Management Authority shows that the establishment of firewood plantations at the rate of 100 hectares per year for 15 years would provide 15,000 tonnes of firewood per year from 2020. If managed on a sustainable basis, such plantations may play an important part in the providing carbon credits. These approaches should be further evaluated and extended into the investigation area.

RECOMMENDATIONS

Firewood collection zones in the Murray River Park and Shepparton Regional Park

R40 That:

(a) domestic firewood collection not be permitted in the Murray River Park, other than in zones to be identified by the land manager and the community in consultation with the Department of Sustainability and Environment, near Mildura, Robinvale, Boundary Bend, Swan Hill, Barmah, Cobram and Rutherglen

(b) domestic firewood collection not be permitted in the Shepparton Regional Park, other than in zones to be identified by the land manager and the community in consultation with the Department of Sustainability and Environment, and

(c) firewood may only be cut and removed where this action will promote growth of large old trees, improve flora and fauna habitat and assist fire protection strategies.

Improved planning, licensing and monitoring systems for domestic firewood

R41

That land managers implement a planning, licensing and monitoring system that will ensure domestic firewood is made available on a sustainable basis to local communities and in particular to concession card holders who rely on wood for cooking, heating and hot water.

Notes:

1. The Department of Sustainability and Environment oversees the planning, public consultation and monitoring of firewood demand and supply from state forest at a statewide and regional level. Domestic firewood collection is licensed under provisions of the *Forests Act 1968*. It is intended that the collection of firewood in the Murray River Park continue to be part of this system, in consultation with the land manager.
2. Domestic firewood collection should be subject to appropriate controls and management systems to ensure protection of biodiversity and reduce theft of wood.

Silvicultural thinning of state forest

R42

That land managers give consideration to increasing the area subject to silvicultural thinning programs in Gunbower State Forest (recommendation C3) to enhance the development of sawlogs and produce additional volumes of domestic firewood, and to extend the silvicultural program to additional River Red Gum state forest areas at Benwell and Guttram (see recommendations C1 and C2).

Plantations and other sources of firewood and incentives

R43 That:

(a) the government encourage the establishment of firewood plantations and woodlots on suitable cleared areas on public land and private land and that incentive funding be provided to assist in their development.

Note: Where areas of cleared public land become available for alternative uses, government could give consideration to establishment of firewood plantations. Areas in this category that could be considered include Beveridge Island, Pental Island and other sites near Robinvale.

(b) That energy authorities in conjunction with local authorities promote the availability of energy subsidies for gas appliances, solar heating and home insulation and encourage the uptake of alternative energy sources.

(c) That subject to the results of appropriate research and monitoring, ecological thinning of River Red Gum forests in parks and reserves be applied where required; for example to promote the survival and growth of retained trees, the protection of Moira Grass plains in Barmah National Park, and swamps.

Note: Production of firewood is not an objective. Where ecological thinning is approved, the operation will produce wood as a by-product which may be used as firewood where this does not conflict with ecological objectives, including the retention of coarse woody debris on the forest floor.

Firewood strategy implementation

R44

That government develop a strategic and coordinated approach to delivery of regional firewood requirements, at both a state and regional level, including establishment of a regional committee consisting of the land managers, catchment management authorities, local government, industry and the community, modelled on the successful North East Firewood Strategy Implementation Committee.

3 Public land use recommendations

A National parks

Victoria's national and state parks are the cornerstone of the state's protected area system. Parks currently comprise approximately 62,000 hectares or about 23 percent of public land in the investigation area. These areas are set aside primarily to protect natural values whilst also allowing a range of visitor experiences. Visitors enjoy the sense of rejuvenation and inspiration provided by these natural environments. Environmental education often occurs jointly with recreational pursuits in these areas. For many years, national parks in the investigation area have been popular with tourists for visits ranging from day trips to extended camping holidays. The River Murray and its tributaries are a major focus for recreation and tourism but other natural environments away from the river also offer their own range of different visitor experiences.

National parks are generally, although not always, larger than state parks but the two categories of parks are otherwise established and managed for the same objectives under provisions of the *National Parks Act 1975*. For the River Red Gum Forests Investigation area no new state parks are recommended and existing state parks are recommended to become part of larger consolidated national parks. Although national and state parks have the same management intent and level of protection, the objectives of national parks are generally better understood by the general public and the park visitor. VEAC has therefore adopted the national park category for these areas.

VEAC has recommended a number of new national parks and nature conservation reserves in line with nationally agreed criteria for a comprehensive, adequate and representative reserve system (as explained in the 'Nature Conservation' section of Chapter 2). These recommendations will protect threatened species habitat and other outstanding natural values. New park boundaries will expand the area currently within national and state parks from about 62,000 hectares to around 146,830 hectares. This substantial change reflects the new approaches and data on ecosystems and flora and fauna since the last systematic assessments in the investigation area, the majority of which were carried out more than 20 years ago. In recommending this change, VEAC has endeavoured to design a robust national park system that represents and protects the different ecosystems and natural values from the potential effects of climate change and other threatening processes. In recommending areas as national parks, VEAC has emphasised the need for improved habitat links across bioregions. Strengthening the links along the vegetated corridors of major waterways in the investigation area was a key consideration, particularly given that the River Murray forms an important biolink across a range of inland environments across south-eastern Australia. In areas where public land is narrow or discontinuous, private protected areas and conservation management networks (see recommendations R11–R12) may be established to achieve similar objectives.

There is a danger that increasing visitor numbers to the investigation area will, over time, reduce the natural values that initially attracted people to the area. This is particularly the case for peak periods around long weekends, Easter and Christmas/New Year. A recreation and camping strategy is recommended that will identify the distribution of camping sites and amenities, while protecting natural values, and encouraging year-round use of the area. A ban on solid fuel campfires is recommended during the high fire danger period. Harvesting of forest products (including sawlogs, posts and firewood), and hunting and grazing by domestic stock are not consistent with national park objectives and will cease in those parts of recommended national parks where they currently occur. Mineral exploration licences may continue, be renewed (if they do not lapse), and proceed to a mining licence and work authority, with appropriate consent, but no other new exploration or mining licences can be granted once the recommended national parks are established.

Altered flooding regimes and other management practices have changed the condition of some ecosystems and these changes are likely to continue under current regimes. For example, Giant Rush and River Red Gums are invading the Moira Grass plains in Barmah Forest as a result of summer flooding. In such instances, park managers need the flexibility to undertake adaptive management to restore ecosystems or to return them to a condition more closely resembling their natural condition. Such management should be based on clearly defined, transparent and scientifically supported ecological objectives. Examples of adaptive management include ecological burning to promote certain ecosystems that are responsive to fire, ecological thinning and short term grazing for ecological or management purposes such as targeted weed control.

Following the analysis of submissions on the draft proposals, VEAC has decided to retain the national park proposals, with some variations. VEAC believes this is a sound long term decision that meets the requirement to protect the biodiversity attributes of the land, achieves nationally agreed targets for a conservation reserve system, particularly in a time of climate change, and allows most users of the land to continue their favoured activities.

As well as the general national park recommendations below, which apply to all new or expanded national parks, specific recommendations may apply to individual parks or areas within parks. A detailed description of the location, values, uses and implications of recommended public land use changes for each recommended new or expanded national park is provided on the following pages. An overview of public submissions for each park and VEAC's deliberations on submissions is also provided.

RECOMMENDATIONS

General recommendations for national parks

A That national parks shown on Map A (numbered A1 to A9) and described below:

(a) be used to:

- (i) conserve and protect biodiversity, natural landscapes and natural processes
- (ii) protect significant cultural and historic sites and places, including Aboriginal cultural sites and places
- (iii) provide opportunities for recreation and education associated with the enjoyment and understanding of natural environments and cultural heritage;

and that:

(b) the following activities generally be permitted:

- (i) bushwalking, nature observation, heritage appreciation, picnicking,
- (ii) camping (in particular dispersed camping) in accordance with recommendations R32–R33
- (iii) campfires and collection of wood for campfires, outside the high fire danger period in accordance with recommendations R35–R36
- (iv) car touring, including four wheel driving, on formed roads and tracks
- (v) mountain bike and trailbike riding on formed roads and tracks
- (vi) horseriding on formed roads and tracks
- (vii) fishing
- (viii) apiculture at existing licensed sites, subject to the outcome of research into the ecological impacts of this industry, and park management requirements
- (ix) research, subject to permit;

and that:

(c) the following activities not be permitted:

- (i) harvesting of forest products
- (ii) grazing by domestic stock (see note 2 below)
- (iii) hunting and use of firearms (see note 3 below)
- (iv) exploration and mining, other than continuation of operations within existing permits and licences, as approved
- (v) dogwalking and camping with dogs
- (vi) overnight camping with horses;

(d) subject to clearly defined, transparent and scientifically supported ecological objectives, park managers may undertake adaptive management to restore ecosystems or to return them to a condition more closely resembling their natural condition (see notes 1, 2 and 3 below);

(e) unused road reserves be added to adjoining parks where appropriate; and

(f) the parks be reserved under Schedule Two to the *National Parks Act 1975*.

Notes:

1. Ecological thinning may be permitted where required for ecological or management purposes.
2. Short-term grazing may be contracted for ecological or management purposes such as targeted weed control.
3. Hunting and use of firearms may be authorised as part of a pest animal control program and/or for traditional Aboriginal cultural purposes in accordance with recommendations R29–R30.
4. Practical access should continue to be provided to existing private land holdings surrounded by the national parks.
5. Implementation of recommendations and land management should allow flexibility for minor boundary adjustments.

A1 Murray–Sunset National Park

Murray–Sunset National Park was originally established to protect a broad range of environments from the South Australian border and the River Murray in the west and north, across the Sunset Country to adjoin Hattah–Kulkyne National Park in the east. This national park is the second largest in Victoria comprising some 633,000 hectares of which 96 percent is within the Murray Mallee and Lowan Mallee bioregions. The remaining four percent in the Murray Scroll Belt bioregion comprises nearly all of the park's extent in the River Red Gum Forests Investigation area.

The recommended Murray–Sunset National Park (57,172 hectares in the investigation area) enhances features and attributes relating to the Murray River floodplain and strengthens the existing natural vegetated corridor along this important biogeographic link. The expanded park complements the existing Neds Corner Station, a Private Protected Area established by the Trust for Nature (Victoria). The national park extends east from the South Australian state border, providing a continuous protected frontage to the River Murray for nearly 200 kilometres along its many bends and meanders, through the arid mallee country to a point east of the Great Darling anabranch junction.

A large, generally consolidated block, the expanded park incorporates the existing Murray–Sunset National Park (26,340 hectares in the investigation area) and the existing Mullroo Creek Wildlife Area (1140 hectares), as well as state forest (27,980 hectares), natural features reserves and River Murray Reserve (940 hectares), Lock Nine Historic Area Reserve (0.01 hectares) and areas of uncategorised public land (770 hectares).

Consolidating this national park improves the representation of ecological vegetation classes (EVCs) in reserves and protects threatened species, significant geomorphological features and habitat links as well as providing a buffer for future climate change. The expanded Murray–Sunset National Park represents a large proportion of the Murray Scroll Belt bioregion and includes the vulnerable EVCs Shallow Freshwater Marsh and Alluvial Plains Semi-arid Grassland. The area hosts five endangered and 15 vulnerable flora species, including chenopods (saltbush), wattles, swainson-peas, lilies, emu-bush and daisies. Within Victoria, many of these species are limited to the far northwest of the state. This area, notably Wallpolla Island, is also particularly important for threatened reptiles such as the critically endangered Beaked Gecko, the endangered Inland Carpet Python and the vulnerable Curl Snake, Red-naped Snake, De Vis' Banded Snake and Tree Goanna.

Three geological and geomorphological sites of international and state significance lie within the expanded Murray–Sunset National Park including the nationally significant Lindsay Island floodplains comprising scroll plains, anabranch and channels. The sites of state significance are Olney Bore Eocene to Miocene type section and Wallpolla Island and Creek anabranch and floodplain.

The ecological and recreational values associated with the creation of a national park are heavily dependent on adequate environmental water flows. These are outlined further in chapter 2 under recommendations R13–R20.

In some areas engineering works may be required to deliver water across existing structures such as the Mail Route Road that currently acts as a levee limiting the extent of medium sized floods in the Lindsay Island area.

The River Murray is a drawcard for a number of visitor activities and experiences, but education and management strategies are required to strike a balance between sustainable tourism and protection of conservation values. It is estimated that visitor numbers range from 11,000 to 15,000 per annum in the two main areas of public land recommended as national park additions—Mulcra Island and Wallpolla Island. Visitor levels are similar at Lindsay Island in the existing national park. Some restrictions to recreational use such as no campfires and firewood collection during the high fire danger period and no camping with dogs will occur in the recommended Murray–Sunset National Park.

Commercial harvesting of sawlogs has not occurred in the recommended national park additions for several years. VEAC acknowledges that the recommendations may have some impact on local domestic firewood collection and, since the Draft Proposal Paper, has reduced the size of the national park at the eastern end of Wallpolla Island. This change will provide an additional source of domestic firewood for local users, and for camping with dogs. Existing apiculture sites will continue to be permitted in the recommended additions to the national park.

Commercial grazing over around 22,000 hectares of state forest and public land water frontages will be excluded in the recommended national park additions. Adjoining land owners may need to control stock access to the abutting national park by fencing property boundaries. Trust for Nature has reported significant improvements in biodiversity values such as vegetation condition and increases in reptile populations since grazing was removed from Neds Corner Station in 2003.

The recommended park has a significant number of Aboriginal cultural heritage sites and places of spiritual importance for Traditional Owners, including burial sites. VEAC recommends that the joint DSE and Aboriginal community committee of management established for west Wallpolla Island State Forest under the *Forests Act 1958* be replaced by a new Aboriginal advisory committee under the *National Parks Act 1975*, to provide advice and information to the park manager on cultural heritage management over the west Wallpolla Island area and land management more generally (recommendations R27–R28).

Community views

As previously discussed in Chapter 1, many submissions expressed concern about changes to the use of land recommended for this national park. Many people argued against any changes to existing recreational uses, including camping and hunting and forest uses such as grazing and firewood collection. Submissions were received from neighbouring property owners concerned about the loss of grazing on public land and the impact this would have on their farming enterprise, and from Traditional Owners concerned about management of their heritage. The general issues raised, and VEAC's response to them, are discussed in more detail in Chapter 1.

Other submissions supported the additions to the national park because of its high biodiversity values and protection for the Chowilla Floodplain Living Murray Icon site. Community views highlighted the importance of the connectivity along the River Murray and the role that this area performs as a drought refuge and zone for species movement, both seasonally and under the effects of climate change.

Response

VEAC has retained the proposal for an expanded national park and has varied the draft proposals to provide for campfires outside the high fire danger period. VEAC has also emphasised that dispersed camping will continue to be the predominant form of camping in the park. The proposed national park has been reduced in size in an area along the River Murray at the eastern end of Wallpolla Island. This area has been included in the Murray River Park to provide additional areas for camping with dogs, and to provide an additional source of firewood for Mildura and adjacent townships. Since the draft proposals, a small area has been excluded from the recommended park adjacent to Lake Cullulleraine township (recommendation I1).

VEAC acknowledges that land managers may undertake adaptive management to restore ecosystems or to return them to a condition more closely resembling their natural condition, such as short term grazing for ecological or management purposes or targeted weed control. VEAC also acknowledges the concerns of Traditional Owners and believes that these can be addressed in the establishment and operation of the recommended advisory committee. In developing legislation for shared management arrangements in national and other parks, VEAC's recommendations allow for circumstances where Traditional Owners have an interest in part of a park, such as west Wallpolla Island (see recommendation R25).

RECOMMENDATIONS

Murray–Sunset National Park

A1 That:

- (a) the area of 57,172 hectares shown on Map A be used in accordance with the general recommendations for national parks
- (b) an appropriate environmental water regime be established for this national park as outlined in recommendation R13
- (c) camping (in particular dispersed camping) continue in accordance with recommendation R32–R34
- (d) campfires and collection of wood for campfires, continue outside the high fire danger period in accordance with recommendations R35–R36
- (e) acknowledgment of the spiritual importance and cultural heritage values of this park, and in particular west Wallpolla Island, for Traditional Owners be reflected in the management and visitor interpretation of values of this area, and
- (f) an Aboriginal advisory committee be established in accordance with recommendation R28(a) to facilitate greater Aboriginal community involvement and provide expert advice to the park manager on cultural heritage site management specifically for west Wallpolla Island, and also more generally in land management, planning and works throughout the national park.

Notes:

1. The area of the park within the investigation area encompasses two existing reference areas (see recommendation F1). Reference areas are managed in accordance with the *Reference Areas Act 1978*.
2. Subject to assessment of existing values and uses, areas of Lindsay Point State Forest immediately adjacent to the recommended national park that are outside the investigation area, are suggested as logical additions to the recommended national park.
3. Engineering solutions be adopted to facilitate medium sized floods across Mail Route Road maintaining Lindsay Island floodplain system linkage to the River Murray and other waterways.

A2 Hattah–Kulkyne National Park

The Hattah lakes area, located some 70 kilometres south of Mildura, has long been identified as an area of outstanding natural values. Hattah Lakes National Park (7200 hectares) was reserved in 1960 and additional areas of state forest were added to the park in 1980 to form Hattah–Kulkyne National Park. The park consists of riverine and floodplain vegetation close to the Murray River and a lake system as well as rolling sand dunes and distinctive mallee extending inland from the river and lakes. The River Red Gum Forests Investigation area encompasses about 48 percent (24,428 hectares) of the existing Hattah–Kulkyne National Park, entirely within the Robinvale Plains bioregion. The national park abuts Murray–Kulkyne Park (see Recommendation B5) for a significant proportion of the Murray River frontage. The recommendations presented here are a minor expansion of the current national park with the addition of Brockie Bushland Reserve (5.2 hectares).

Two hundred and forty-five native fauna species, including 47 threatened and near threatened species, have been recorded from the portion of Hattah–Kulkyne National Park in the River Red Gum Forests Investigation area. These include five species considered critically endangered in Victoria: Intermediate Egret, Australian Painted Snipe, Plains-wanderer, Murray Hardyhead and Silver Perch. Hattah–Kulkyne National Park also provides habitat for Greater Long-eared Bat, Mallee Emu-wren and Regent Parrot—all considered vulnerable Australia wide. Four hundred and sixty-four native plants including 92 rare and threatened species have also been recorded. These include Winged Peppergrass which is endangered in Victoria and Australia. The area also includes the most secure Victorian populations of endangered Dwarf Swainson-pea and vulnerable Spreading Scurf-pea, which is almost entirely restricted in Victoria to the national park.

The portion of Hattah–Kulkyne in the investigation area contributes significantly to the representation of the vulnerable Semi-arid Woodland, depleted Riverine Chenopod Woodland and Riverine Grassy Woodland Ecological Vegetation Classes (EVCs). The addition of Brockie Bushland Reserve south of Lake Kramen contributes vulnerable Woorinen Mallee and Semi-arid Woodland EVCs to the recommended national park.

The Hattah lakes are the River Murray's largest overflow lake system and of national geomorphological significance. This area is different from the floodplain inundation areas that constitute most of the Murray's geomorphology. The system of anabranch lakes and associated channels takes overflow from the Murray River along Chalka Creek returning only a small amount of flow to the Murray with the majority retained in ponded terminal lakes. Red sand dunes have migrated into the area from the desert to the west providing a unique geomorphological system in this region. Other overflow lake systems occur on tributaries to the Murray (e.g. the Willandra Lakes on the Darling River) but not on the River Murray.

The lakes in Hattah–Kulkyne National Park are attractive habitat for waterfowl and have been identified as wetlands of international significance under the Ramsar convention and JAMBA, CAMBA and RoKAMBA migratory bird agreements.

Two Ramsar inland wetland types are recognised: permanent freshwater lakes and seasonal intermittent freshwater lakes including floodplain lakes. Two wetland types are also recognised under the Victorian classification of wetlands: Deep Freshwater Meadow and Permanent Open Freshwater. The lakes and wetlands are currently managed to protect these values.

VEAC received a number of public submissions arguing that the Hattah Lakes area should receive adequate environmental flows. The Council recognises that the ecological and recreational values associated with the Hattah–Kulkyne National Park are heavily dependent on adequate environmental flows. This is outlined further in chapter two in the discussion of environmental water.

There are a significant number of Aboriginal cultural heritage sites and places in the national park, including burial sites and a large number of scarred trees near the lakes system. Shell middens occur around the margins of current lakes or stream and also palaeolakes that encompassed a much larger area during periods of higher rainfall in the past.

Recreation is an important activity in Hattah–Kulkyne National Park. Camping is provided for at Lake Mournpall and Lake Hattah campgrounds where toilets, picnic tables and fireplaces are located. Camping on the River Murray within the park is restricted to Firemans, K1 and Jinkers Bends. Camping with dogs is not permitted within the national park, but dogs are permitted in the adjoining Murray–Kulkyne Park. Campers enjoy Hattah–Kulkyne National Park for its natural setting and the feeling of remoteness. The park is popular with birdwatchers as the diverse range of habitats and access to water provide for many bird species.

Community views

Submissions supported the small addition to Hattah–Kulkyne National Park and the environmental flow requirements. A number of submissions suggested the adjoining Murray–Kulkyne Park should be added to the national park.

Response

VEAC has retained the two park categories to ensure camping with dogs can continue at the popular sites along the River Murray frontage within Murray–Kulkyne Park.

RECOMMENDATIONS

Hattah–Kulkyne National Park

A2 That:

(a) the area of 24,428 hectares shown on Map A be used in accordance with the general recommendations for national parks, and

(b) an appropriate environmental water regime be established for this national park as outlined in recommendation R13.

A3 Leaghur–Koorangie National Park

The Leaghur–Koorangie National Park (7790 hectares) incorporates a number of public land units in the Loddon and Avoca River Floodplains, to the south and west of Kerang as listed below.

• Leaghur State Park	1556 hectares
• Lake Leaghur water supply reserve	83 hectares
• Leaghur Wildlife Reserve	176 hectares
• Appin State Forest (Special Protection Zone)	290 hectares
• Appin Recreation Reserve	4 hectares
• Lake Meran (Meering) Lake Reserve	205 hectares
• Wandella Flora and Fauna Reserve	981 hectares
• Lake Wandella Wildlife Reserve	62 hectares
• Pelican Lake Wildlife Reserve	38 hectares
• Lake Elizabeth Wildlife Reserve	121 hectares
• Koorangie (The Marshes) Wildlife Reserve	3255 hectares
• Yassom Swamp Flora and Fauna Reserve	362 hectares
• Mystic Park Bushland Reserve	646 hectares

The creation of Leaghur–Koorangie National Park contributes significantly to the representation of the threatened Ecological Vegetation Classes (EVCs) including the endangered Chenopod Grassland, the vulnerable Riverine Chenopod Woodland, Lignum Swampy Woodland, Lignum Swamp, Freshwater Lake Aggregate and Red Gum Wetland and the depleted Lake Bed Herbland and Intermittent Swampy Woodland.

The Avoca Marshes are part of the internationally significant Kerang Wetlands Ramsar site and are of state geomorphological significance. The Avoca Marshes are especially important for waterbirds. In particular, Third Marsh is of statewide importance for species such as Eurasian Coot, Grey Teal and Hardhead, and also supports the endangered Freckled Duck and Blue-billed Duck. First Marsh has been an important breeding area for a variety of cormorant species, as has Second Marsh for the Australasian Darter. In most years, Lake Bael Bael has supported the endangered Freckled Duck and Australian Little Bittern as well as providing habitat for the Australian Painted Snipe. The Black Box woodlands of the Leaghur, Appin and Wandella blocks are important habitat for the endangered Grey-crowned Babbler and a number of other declining woodland bird species. The native grasslands surrounding Yassom Swamp support critically endangered Plains-wanderers. Lake Elizabeth provides habitat for Freckled Duck and Blue-billed Duck, and for the critically endangered fish species, the Murray Hardyhead.

A number of sites of Indigenous cultural significance have been identified in various sections of the recommended national park, including scarred trees at Leaghur, Appin and Wandella forests and cooking mounds, burial sites and shell deposits at the Avoca Marshes. The national park should be managed to protect these values.

The Leaghur–Koorangie National Park offers a variety of recreational opportunities. Bushwalking and horseriding occurs in the Leaghur, Appin and Wandella Forests while birdwatching is popular at the Avoca Marshes. Waterskiing and picnicking occur at Lake Meran (Meering). These activities will be able to continue in the national park, although horseriding would be restricted to formed roads and tracks.

Hunting is currently permitted within the Koorangie (The Marshes), Lake Wandella, Lake Elizabeth and Lake Leaghur sections of the recommended Leaghur–Koorangie National Park but would not be permitted in the new national park. No timber harvesting currently occurs in the recommended park. Only a small part of the recommended Leaghur–Koorangie National Park is grazed under licence. Grazing would be discontinued in the new park. There are no apiary sites in the recommended Leaghur–Koorangie National Park. There are currently three exploration licences over parts of the recommended Leaghur–Koorangie National Park and these may continue, be renewed (if they do not lapse) and proceed to a mining licence and work authority, with appropriate consent. No new exploration or mining licences can be granted once the national park is established.

Due to the changes in the hydrology of the landscape, the wetlands and woodlands of the Leaghur–Koorangie National Park will require environmental water allocations to maintain the health of these ecosystems.

Community views

Hunters oppose the creation of this park on the basis that waterfowl hunting and camping with dogs will not be permitted. Adjacent landowners, the water authority and the Catchment Management Authority have identified the environmental and water supply roles of some of the wetlands. Many submissions support the park and consider it should be extended to cover additional wetland areas, and that adjacent areas could be protected as part of conservation management networks.

Response

VEAC has retained the recommendation for the national park. Because the objectives of the park are to protect biodiversity values, recreational hunting is not permitted. The draft proposals have been varied to provide for campfires outside the high fire danger period. VEAC has also emphasised that dispersed camping will continue to be the predominant form of camping in the park. Council acknowledges that water is supplied from the park to adjacent properties, and this should be able to continue where no other sources of water are available, as part of a plan to ensure achievement of environmental flows. Many nearby areas outside the national park remain available for traditional recreational pursuits including hunting, notably Hird Swamp and Cullens Lake.

RECOMMENDATIONS

Leaghur–Koorangie National Park

A3 That:

- (a) the area of 7790 hectares shown on Map A be used in accordance with the general recommendations for national parks
- (b) an appropriate environmental water regime be implemented as outlined in recommendation R13
- (c) speed boating and fishing within parts of Lake Meran (Meering) be permitted, by arrangement with the land manager, and
- (d) existing water diversion licences be allowed to continue from particular wetlands where no other sources of water are available to adjoining landowners providing the environmental water requirements for these wetlands can be achieved.

Note:

1. Certain public land areas now managed by Goulburn–Murray Water are to be incorporated in the park under these recommendations. Goulburn–Murray Water has an ongoing role to operate, maintain and monitor flood retardation and drainage systems within the park.

A4 Gunbower National Park

Gunbower forest is the second largest River Red Gum forest in Victoria and includes wetlands and billabongs as well as extensive Black Box and saltbush woodlands to the south. This wetland area is listed under both the Ramsar Convention and the Directory of Important Wetlands in Australia.

The recommended Gunbower National Park (8892 hectares) encompasses 8265 hectares of the Gunbower State Forest (much of which is existing special protection zone) as well as 430 hectares of River Murray Reserve upstream of and including McClure Bend. Smaller areas included are part of Spence Bridge Education Area (35 hectares) and part of Gunbower Creek Public Land Water Frontage (149 hectares). The boundary for the recommended national park has been chosen to protect a diversity of vegetation types, including endangered and under-represented Ecological Vegetation Classes (EVCs), important flora and fauna habitat, whilst also providing a diversity of recreational opportunities and retaining timber harvesting activities in the adjoining Gunbower State Forest (recommendation C3).

The creation of Gunbower National Park contributes significantly to the representation of threatened EVCs such as the endangered Riverine Chenopod Woodland and Plains Woodland, the vulnerable Riverine Grassy Woodland and Spike-sedge Wetland, as well as smaller areas of Sedgy Riverine Forest, Riverine Swamp Forest and Tall Marsh.

One hundred and ninety-five species of native fauna have been recorded in the recommended Gunbower National Park, including 30 threatened species such as endangered

Inland Carpet Python, Silver Perch, Giant Bullfrog, Broad-shelled Turtle and Squirrel Glider. A number of egret and other colonially nesting waterbird breeding sites exist within Gunbower forest but there have been very few breeding events in the last 30 years due to insufficient flooding. The most recent event was in 2005/06 when egrets bred along Little Gunbower Creek (recommended to remain part of the Gunbower State Forest) after environmental water flooded parts of the forest. Within the recommended Gunbower National Park, egrets bred at Charcoal Swamp in the early 2000s. Although this area is protected in the Gunbower National Park it will require environmental water allocations to ensure the habitat is suitable for the breeding of these threatened species. This is outlined further in chapter 2 in the discussion of environmental water.

The floodplain forests, wetlands and drier Black Box woodlands provide habitat for 242 native plant species including 14 rare and threatened species. The threatened species include Western Water-starwort, a semi-aquatic plant that is threatened by altered flooding regimes, and Winged Peppergrass, with rare saltbushes and daisies also present.

Recreation is a major use of Gunbower forest. The river bends are particularly popular for dispersed camping in a natural setting and facilities at the existing Spence Bridge Education Area also provide a focus for recreational activities. Horseriding, trailbike riding and four wheel driving are popular in the forest and are recommended to be permitted to continue on existing trails and roads. Hunting, previously permitted within state forest, is not consistent with national park objectives and will not be permitted in the new park.

Commercial timber harvesting is currently a major use of Gunbower forest. For example, DSE's 2006/07 Wood Utilisation Plan allocated 7485 cubic metres from Gunbower State Forest. However, as no timber is currently harvested from the special protection zones or the Murray River Reserve, recommended for inclusion in the national park, the recommended Gunbower National Park does not impact greatly on the volumes of timber available for harvesting in this area. A number of historic sites, mostly representing early timber harvesting practices, have been identified in Gunbower forest and the national park should be managed to protect these values.

Cattle grazing in Gunbower forest was primarily by agistment in the past but stock have not been agisted in the forest for several years. The 12 current grazing licences in the Black Box woodland in the south of the park cover a total of 1481 hectares. Grazing will not be continued in the recommended national park.

There are currently 21 apiculture sites in the recommended Gunbower National Park and these will continue to be permitted. There are two mineral exploration licences over the recommended Gunbower National Park and these may continue, be renewed (if they do not lapse) and proceed to a mining licence and work authority, with appropriate consent. No other new exploration or mining licences can be granted once the recommended national park is established.

Community views

Those submissions opposed to the national park cited loss of recreational activities such as fishing, camping with dogs, campfires, hunting and the impact on local communities as a result of reduced timber availability, and loss of revenue to adjacent towns from visitors. Other submissions suggested the entire forest be made national park due to its size, Ramsar wetland status and importance for colonially nesting waterbirds.

Response

VEAC has largely retained the proposal for the Gunbower National Park and has varied the draft proposals to provide for campfires outside the high fire danger period. VEAC has also emphasised that dispersed camping will continue to be the predominant form of camping in the park. The national park has been reduced in size in an area along the River Murray from Brereton Road upstream to Horseshoe Bend north of Torrumbarry township. This area has been included in the Murray River Park. It provides for camping associated with the popular waterskiing area near Torrumbarry Weir and additional areas for camping with dogs. Another area near McNab Bend, along Gunbower Creek at the western end of the recommended park, is now recommended to remain as state forest, further reducing the size of the recommended park. This change is in response to the views of people who hunt and camp in this area with dogs.

RECOMMENDATIONS

Gunbower National Park

A4 That:

- (a) the area of 8892 hectares shown on Map A be used in accordance with the general recommendations for national parks
- (b) camping (in particular dispersed camping) continue in accordance with recommendations R32–R34
- (c) campfires and collection of wood for campfires continue outside the high fire danger period in accordance with recommendations R35–R36, and
- (d) an appropriate environmental water regime be implemented as outlined in recommendation R13.

Note:

1. Goulburn-Murray Water has an ongoing role to operate, maintain and monitor outfall systems within the park.

A5 Terrick Terrick National Park

The expanded Terrick Terrick National Park (3483 hectares within the investigation area, 5882 hectares in total) incorporates the existing Terrick Terrick National Park, the Terrick Terrick East, Roslynmead, Roslynmead East, Kotta, Tomara Gilgais, Pine Grove, and Wanurp Nature Conservation Reserves, The Meadows Wildlife Reserve, uncategorised public land known as 'Canegrass Swamp' and parts of the Bendigo Creek water frontage reserve. The additions to the national park are centred on an area known as the Patho Plains, between Echuca and Mitiamo.

This expanded national park more than doubles the extent of endangered Northern Plains Grassland Ecological Vegetation Class (EVC) already protected in the existing Terrick Terrick National Park. With the majority of this recommended park already part of the conservation reserve system in a variety of categories, consolidation in a single national park will simplify management. Although the recommended park appears to be fragmented, areas of native grasslands on private land provide ecological connections for the expanded park. The Northern Plains Conservation Management Network which is currently operates over the Patho Plains, seeks to coordinate the management of native grasslands over public and private land.

Besides the size and quality of the Northern Plains Grasslands themselves, the area is the most important in the state for the critically endangered Plains-wanderer, a small quail-like bird endemic to Australia. As many of the grasslands have not previously been cultivated, they provide habitat for significant reptile species such as Curl Snake and Hooded Scaly-foot. The shallow ephemeral wetlands within the grasslands provide habitat for Brolgas. The grasslands are also renowned for their flora, with the area being a stronghold for a number of threatened species including the nationally vulnerable Red Swainson-pea and Slender Darling-pea. The Bendigo (Mount Hope) Creek provides habitat for a number of threatened woodland fauna species, including Grey-crowned Babbler, Tree Goanna and Bush Stone-curlew.

The expansion of the Terrick Terrick National Park complements significant investment in conservation efforts on public and private land in this area, ranging from land purchase, conservation covenants, fencing and ecological grazing regimes. Sites of Aboriginal cultural significance have also been identified in sections of the Bendigo (Mt Hope) Creek. The national park should be managed to protect these values.

Recreational opportunities are mainly restricted to the woodland section of the national park (outside of the investigation area) and have not been widely encouraged in the grasslands section of the existing Terrick Terrick National Park nor in the nature conservation reserves. Hunting was previously permitted within The Meadows and Bendigo Creek Water Frontage Reserve sections of the recommended Terrick Terrick National Park but would not be permitted in the new park. No commercial timber harvesting currently occurs in the recommended national park area.

There are currently four apiculture sites in the Terrick Terrick National Park, in the woodland section outside of the investigation area and these will continue to be permitted. There are four mineral exploration licences over the expanded Terrick Terrick National Park and these may continue, be renewed (if they do not lapse) and proceed to a mining licence and work authority, with appropriate consent. No other new exploration or mining licences can be granted once the recommended national park is established.

The grasslands section of Terrick Terrick National Park and the existing nature conservation reserves are currently grazed by sheep at times of the year to provide desirable structure for Plains-wanderer and other flora and fauna. This grazing is for ecological purposes, in accordance with the respective management plans, and is not under licence. The timing and stocking rate is strictly controlled by Parks Victoria. In the short term at least, it would be desirable to retain this management regime. The current licensed grazing of Bendigo (Mt Hope) Creek would not continue in the recommended national park. The restoration of fencing along parts of the creek would be required to exclude stock.

Community views

A small number of submissions called for the addition of various grassland reserves on the Patho Plains to the Terrick Terrick National Park. A number of submissions supported the expanded Terrick Terrick National Park.

RECOMMENDATIONS

Terrick Terrick National Park

A5 That:

- (a) the area of 3483 hectares shown on Map A be used in accordance with the general recommendations for national parks
- (b) existing water diversion licences be allowed to continue where no other sources of water are available to adjoining landowners, and
- (c) low intensity sheep grazing under contract, where necessary for biodiversity conservation, be permitted at the land manager's discretion.

Notes:

1. Some small areas along Bendigo (Mt Hope) Creek have been cropped (legally and illegally) and require restoration to enhance their grassland and woodland ecosystems. Fencing to align with cadastral boundaries is required to prevent further loss of values along this creek.
2. There is currently an agricultural licence over an area of Crown land adjoining Bendigo (Mt Hope) Creek (Parcel number P129443) and this area has been cropped for a number of years. However considering its proximity to native grassland areas (both on public and private land), and a population of the endangered Striated Sun-moth, restoration of a native grassland community on this site is considered desirable. The agricultural licence should be discontinued and no further cropping should occur.
3. Improved fencing for parts of Bendigo (Mt Hope) Creek is required.

4. VEAC is aware that the government has recently reached agreement to purchase approximately 220 hectares of private land in the Parish of Patho for addition to the reserve system. This land, which contains high quality native grasslands, would be an appropriate addition to the Terrick Terrick National Park once transferred to the Crown.
5. The reach of Bendigo (Mt Hope) Creek between parcels P129443 and P129444 has not been parcelised but is public land in the stream beds and banks public land use category and should be included in the recommended national park.

A6 Lower Goulburn River National Park

The Lower Goulburn River National Park (12,154 hectares) incorporates much of the Lower Goulburn and Murray River State Forests as well as the Little Gilmartin and Big Gilmartin State Forests. It also includes the Wyuna Bushland Reserve, Yambuna Bridge Streamside Reserve, Loch Garry and Kanyapella Basin Wildlife Management Cooperative Areas, and sections of water reserves along Yambuna and Warrigal Creeks.

The Lower Goulburn River corridor has strong ecological integrity and is a recognised biolink through the landscape. In recognition of its unique natural, recreational, scenic and cultural values, the Goulburn Heritage River was declared in 1992. Kanyapella Basin and the Lower Goulburn River Floodplain are both listed under the Directory of Important Wetlands in Australia. The Lower Goulburn River National Park makes significant contributions to improving the representation of a number of Ecological Vegetation Classes (EVCs) in the Murray Fans bioregion, including Riverine Grassy Woodland, Sedgy Riverine Forest and Floodplain Riparian Woodland, as well as protecting areas of endangered Plains Woodland and Riverine Chenopod Woodland along the River Murray.

The Lower Goulburn forests are particularly important habitat for a number of significant fauna species, including the Squirrel Glider, Brush-tailed Phascogale and Barking Owl. Kanyapella Basin provides habitat for a number of threatened bird species, including the critically endangered Australian Painted Snipe, the endangered Bush Stone-curlew and the vulnerable Royal Spoonbill, Diamond Firetail and Musk Duck. Flora species of note include the endangered Grey Billy-buttons, Small Scurf-pea and Jericho Wiregrass. The recommended Lower Goulburn River National Park contains a number of known sites of Aboriginal cultural heritage including scarred trees and artefacts along the riverine forests, and cooking mounds at Loch Garry and Kanyapella Basin. The national park should be managed to protect these values.

The Goulburn River forests are popular for camping, fishing, canoeing, bushwalking and a variety of other recreational activities, particularly close to Shepparton and where the Goulburn and Murray Rivers meet. Camping with dogs will not be permitted within the recommended park but dogs will be permitted in the adjoining recommended Murray River Park (recommendation B3) where the Goulburn River and Murray River meet, and in the recommended Shepparton Regional Park (recommendation B2). Onlead dog walking will also be permitted in Gemmill Swamp Nature Conservation Reserve (recommendation D46).

Hunting is currently permitted within the state forest portion of the recommended Lower Goulburn River National Park and in Kanyapella Basin, but would not be permitted in the new national park.

The state forests in the Lower Goulburn contribute six percent of total sawlog production in the Murray Fans bioregion (which includes Barmah and Gunbower forests). Domestic firewood collection also occurs.

Grazing licences occupy approximately 60 percent of public land along the Lower Goulburn forests, although it is unlikely that this proportion is grazed at any one time. Firewood collection and grazing would be discontinued in the national park. Small areas of Kanyapella Basin have been cleared for agriculture and cropped, an activity not consistent with national park objectives and which would not continue. Such areas will require restoration.

There are currently five apiculture sites in the recommended Lower Goulburn River National Park and these will continue to be permitted.

Due to the changes in flow regimes down the Goulburn River and into Kanyapella Basin, the wetlands and woodlands of the Lower Goulburn River National Park will require manipulated watering to maintain health of the floodplain and associated ecosystems. This is outlined further in chapter two in the discussion of environmental water.

Community views

Submissions supporting the park highlighted the value of its riverine forests and associated woodlands for wildlife and as a biodiversity corridor. Submissions that opposed the park cited a desire for continued access to the river with dogs, for hunting and fishing, for grazing and for firewood collection.

Response

VEAC has retained the proposal for the Lower Goulburn National Park but has varied the draft proposals to provide for campfires outside the high fire danger period. VEAC has also emphasised that dispersed camping will continue to be the main form of camping in the park. The national park has been reduced in size to provide for additional uses around Shepparton. Reedy Swamp has been returned to its former category as a wildlife reserve to allow waterfowl hunting to continue and Gemmill Swamp has been returned to its former category as a nature conservation reserve (dog walking on lead will be permitted). Other areas to the north and south of Shepparton have been included in the Shepparton Regional Park to provide for camping and sledding with dogs and some areas for firewood collection. An area used by the Scouts Association has been recommended as a Community Use Area.

RECOMMENDATIONS

Lower Goulburn River National Park

A6 That:

- (a) the area of 12,154 hectares shown on Map A be used in accordance with the general recommendations for national parks
- (b) camping (in particular dispersed camping) continue in accordance with recommendations R32–R34
- (c) campfires and collection of wood for campfires continue outside the high fire danger period in accordance with recommendations R35–R36
- (d) an appropriate environmental water regime be implemented as outlined in recommendation R13, and
- (e) existing water diversion licences be allowed to continue where no other sources of water are available to adjoining landowners.

Notes:

1. Certain public land areas now managed by Goulburn–Murray Water are to be incorporated in the park under these recommendations. Goulburn–Murray Water should continue to manage channels and regulators within the Kanyapella Basin section of the park for the purpose of flood mitigation and water transfer and the outfalls and drainage services in other sections of the park.
2. Sections of Kanyapella Basin have been cleared for agricultural purposes. Restoration of these areas using indigenous species matching benchmarks for Ecological Vegetation Classes should be undertaken.
3. The water requirements for Kanyapella Basin and options for achieving an improved water regime in this area are outlined in the Kanyapella Basin Environmental Management Plan.

A7 Barmah National Park

With the adjoining Millewa forest in New South Wales, Barmah forest forms the largest River Red Gum forest in the world. It is also the pre-eminent site in the investigation area in terms of natural values—many of which are threatened. Accordingly, VEAC is recommending the creation of Barmah National Park (28,521 hectares) encompassing most of the existing Barmah State Forest (19,853 hectares), Barmah State Park (8366 hectares in two blocks) and River Murray Reserve (220 hectares). Additionally public land water frontage along Broken Creek (63 hectares) and Ulupna Creek (eight hectares) as well as six hectares of road reserve and three hectares of uncategorised public land would be included. Two reference areas in the existing Barmah State Park are recommended to be retained in the new national park (recommendation F1).

Not included in the park is an area of 22 hectares around the Dharnya centre buildings and nearby muster yards. This envelope (currently partly state forest and state park) is recommended as community use area (recommendation I6) to provide greater flexibility for potential development and use of this 'gateway to the park'. Barmah Island, just north of Barmah township, is not included in the national park, and forms part of the recommended Murray River Park.

The Barmah–Millewa forest is recognised internationally as a wetland of significance under the Ramsar Convention. It supports approximately 224 native fauna and 370 native flora species with some 39 threatened or near-threatened fauna species, including breeding sites for the Superb Parrot (the only remaining site in Victoria) and colonially breeding water birds such as Eastern Great, Intermediate and Little Egrets. The recommended national park will protect habitat for 38 rare or threatened plants including the endangered Mueller Daisy, Slender Love-grass, Spiny-fruit Saltbush, and Winged Peppercress. Creation of the park will also significantly improve the reserve system protection of a large number of endangered, vulnerable, or depleted ecological vegetation classes. The EVCs include the endangered Plains Woodland and vulnerable Riverine Swampy Woodland and Riverine Grassy Woodland.

The Barmah–Millewa forest exists because of the limited flow capacity of the main river channel and presents a range of geomorphological features of national importance. The forest ecology has formed as a result of the interaction between tectonic movements of the earth and the River Murray's changing hydrology. The Murray in this region has been strongly influenced by local, relatively recent tectonic movements on the roughly north–south oriented Cadell Fault, and the changing sequence of channels across the floodplain. The region is also characterised by a severely constricted reach, known as the Barmah Choke, in which the river channel capacity significantly decreases, thereby forcing the river's flow into the Edward River in New South Wales and out onto the broader floodplain, including its network of channels and anabranches. The floodplain is characterised by its width and swampy nature—shallow but widespread floods are common.

Barmah forest has a significant number of Aboriginal cultural heritage sites and places including scarred trees, mounds, stone artefact scatters, middens and burial sites.

Traditional Owners have articulated a strong affinity with the Barmah forest and continue to assert their claims of ownership of this area as their traditional Country. VEAC acknowledges the cultural importance of this area for Traditional Owners and recommends that a shared management structure be established for the recommended Barmah National Park. The management board or committee would consist of a majority of Traditional Owner representatives as outlined in general recommendation R24.

Currently, Barmah forest is used extensively for recreational activities, including camping along the river and creeks, horseriding, fishing, waterskiing, swimming and canoeing. The forests, sandy river beaches, creeks and lakes provide an ideal setting for low cost family holidays, particularly over Easter, Christmas and the Melbourne Cup long weekend. In addition, many visitors stay in adjacent caravan and camping parks and make use of the forest for similar recreation activities. A number of commercial tour operators provide horse riding, canoeing and bike riding tours of Barmah forest. VEAC strongly supports the continued use of the recommended Barmah National Park for these recreation activities.

VEAC is recommending that dispersed camping continue as the main form of camping in Barmah forest—as elsewhere in the investigation area—and, along with the designated camping area at Barmah Lake be managed in accordance with recommendations R32 and R33. Land managers will need to pay particular attention to the protection of conservation values and take steps to minimise conflicts between different user groups in times of peak visitation, during holidays and long weekends.

Campfires and collection of wood for campfires will be permitted in the recommended Barmah National Park, except during the high fire danger period. This recommendation is consistent with concerns about escaped campfires. Particular attention will need to be given to managing the collection of wood for campfires to minimise the negative impacts on the biodiversity values of the area. The use of public land areas for camping with dogs and undertaking day visits with dogs is important for many people. Dogs will not be permitted in the recommended national park for Barmah, but will be allowed in the adjoining recommended Murray River Park.

Historically, hunting in Barmah State Forest focused on feral animals, notably pigs and deer, with waterfowl taken occasionally. Under the recommended national park, hunting will not be a permitted recreational use. However, as a result, the removal of introduced animals by land managers, in association with organised hunting groups, is supported.

Comparatively frequent flooding has allowed Barmah forest to supply over half the timber resource (including commercial firewood) harvested in the investigation area in recent years. However, timber harvesting is not permitted in national parks and will not be permitted in the recommended Barmah National Park. Most of Gunbower State Forest and forests near Koondrook will remain available for commercial timber production.

Similarly, domestic firewood collection under permit—which currently occurs in Barmah State Forest—will not be allowed in the recommended national park. VEAC is recommending

that a zone for domestic firewood collection be established in Barmah Island block of the recommended Murray River Park (recommendation B3) near Barmah in order to provide firewood for local residents, many of whom have few viable alternative heating sources.

Domestic stock grazing has occurred in Barmah forest for several generations. The average of 2000 (summer) and 800 (winter) head of cattle agisted in the forest has been reduced in response to recent drought conditions, culminating in the destocking of the forest from the start of the 2007 winter term. There are also seven current grazing licences covering a total of 78 hectares and with a total carrying capacity of 112 Dry Sheep Equivalent that would be excluded from the recommended national park. Grazing with domestic stock is incompatible with national park status and will not be permitted in the recommended park. As well as domestic stock, Barmah forest is also grazed by feral horses and deer which, together with feral pigs, should be controlled in the recommended national park to protect its highly significant natural values.

Apiculture is currently permitted in Barmah forest other than in and within two kilometres of the two reference areas. This will continue to be the case in the recommended Barmah National Park.

Community views

A large number of submissions mentioned the Barmah forest, highlighting its special significance to a wide range of people, including Traditional Owners. Submissions were received from neighbouring property owners and residents of adjacent townships, recreation groups, tour operators, licensees, clubs and individuals. Significant themes represented include those seeking no change to existing recreational uses, particularly dispersed camping and forest uses such as timber harvesting, grazing and firewood collection. There were a large number of submissions supporting the creation of the national park. The environmental values of the forest and the need for environmental water were acknowledged by many, but many also questioned how environmental water will be obtained and at what cost.

Response

VEAC has retained the proposal for a Barmah National Park but has varied the draft proposals to provide for campfires outside the high fire danger period. VEAC has also emphasised that dispersed camping will continue to be the main form of camping in the park. The proposed national park has been reduced in size in the area north of Barmah township to The Gap. This area (Barmah Island block) has been included in the Murray River Park to provide additional areas for people to go camping with their dogs and to provide a source of firewood for adjacent townships including Barmah and Nathalia.

RECOMMENDATIONS

Barmah National Park

A7 That:

- (a) the area of 28,521 hectares shown on Map A be used in accordance with the general recommendations for national parks
- (b) camping (in particular dispersed camping) continue in accordance with recommendation R32–R34
- (c) campfires and collection of wood for campfires continue outside the high fire danger period in accordance with recommendations R35–R36
- (d) an appropriate environmental water regime be established for this national park as outlined in recommendation R13, and
- (e) an Indigenous co-management board be established for the national park in accordance with recommendation R26 (b).

Notes:

1. Over time the course of the River Murray has altered since the state border was determined. A 43 hectare area of NSW known as 'Native Dog Flora Reserve' (part of Thornley State Forest) is effectively an inlier and contiguous with the Ulupna Island section of Barmah National Park. An agreement should be sought with the NSW Department of Primary Industries to enable DSE or a designated agency to manage Native Dog Flora Reserve as part of the Barmah National Park under existing provisions of Section 19D of the *National Parks Act 1975*.
2. The park encompasses two existing reference areas (see recommendation F1). Reference areas must be managed in accordance with the *Reference Areas Act 1978*.
3. VEAC notes that feral horses and pigs have been present in the Barmah forest for several decades. The land manager has responsibility for eliminating and controlling pest plants and animals, and should make a concerted effort to control these animals in the recommended national park.
4. Goulburn–Murray Water has an ongoing role to operate, maintain and monitor outfall and drainage systems within the park.

A8 Warby Range–Ovens River National Park

The recommended Warby Range–Ovens River National Park (total area 15,889 hectares) links the existing Warby Range State Park (11,460 hectares outside the River Red Gum Forests Investigation area) with 4367 hectares of public land along the Lower Ovens River near the confluence of the Ovens and Murray Rivers. Within the investigation area, the recommended national park consists of the existing Lower Ovens State Forest (2591 hectares), Lower Ovens Regional Park (1223 hectares), Peechelba Flora Reserve (220 hectares), water authority land (130 hectares) and approximately 20 hectares of public land water frontage. A further 62 hectares of public land water frontage reserve and bushland reserve along Chinaman and Irishtown Creeks linking the Killawarra and Lower Ovens Forests are also included in the national park.

The Ovens River—a Heritage River—remains the only substantial, essentially unregulated Victorian tributary of the Murray River, with only two tributaries (the Buffalo and King Rivers) having a small storage each. The resultant near natural flow regime partly explains the high biodiversity values and moderate–good condition stream condition of the Lower Ovens. The flooding pattern also generates floods further downstream along the River Murray and its floodplains. Maintaining the Ovens River as an unregulated system is essential to protect the natural values along the river.

The Warby Range–Ovens River National Park will protect wetlands and streams that provide habitat for many threatened bird and frog species including egrets, spoonbills, White-bellied Sea-Eagle and the Growling Grass Frog. Significant aquatic species include the Murray and Trout Cod, Golden Perch, Flat-headed Galaxias, Unspecked Hardyhead and Murray Spiny Cray. The forests have particular importance for the near threatened Southern Myotis, usually a cave dwelling bat, which roosts in River Red Gums in this area. More than 185 native animal species have been recorded in the Lower Ovens forests including 30 threatened species.

Two hundred and one native plant species (including nine rare or threatened species) have been recorded in the area. The region is extremely important for the endangered Mueller Daisy. This species occurs in only about four populations across northern Victoria (as well as a small area in NSW) and is threatened by overgrazing. A regionally significant localised shrubland of Rough-barked Honey-myrtle is located in the recommended park near Peechelba.

Creating the Warby Range–Ovens River National Park will substantially increase reserve system representation for the threatened ecological vegetation classes Sedgy Riverine Forest, Floodplain Riparian Woodland, Riverine Swampy Woodland and Billabong Wetland Aggregate.

The Lower Ovens forests provide an important north–south vegetated link between the River Murray and the Warby Ranges that will increase in importance with climate change. Consolidating the Lower Ovens forests with the Warby Range State Park in one park will lead to a more integrated conservation management approach and ultimately more effective onground connections between

the areas to achieve conservation objectives. The creation of a larger national park, whilst occurring in two discrete units, is supported by native vegetation corridors on private land between the two areas.

The forests and wetlands of the Lower Ovens River provide a tranquil setting and are popular for recreational activities including camping and fishing. Convenient access from the Murray Valley Highway and the ability to reach the nearby town of Bundalong by boat add to the camping experience. Camping peaks (beyond capacity) over Easter, Christmas and Melbourne Cup weekend and is most popular at Parolas Bend (15,000 annual camper nights and up to 2000 individuals at Easter). Such large numbers of campers create high demand for firewood and remove habitat for ground dwelling fauna. The use of pit toilets is also a problem in the narrow band of less than 100 metres between the river and the adjacent wetlands. VEAC recognises the need to better manage human waste disposal close to waterways and recommends that all campers at Parolas Bend be required to provide and use a chemical toilet. In riverine areas, dispersed camping will continue in the Warby Range–Ovens River National Park and campfires will be permitted outside the high fire danger period.

No sawlog or commercial firewood harvesting activities have occurred recently in the Ovens forests and departmental thinning activities have been carried out in the last five years to provide firewood. A number of grazing licences (including broadacre, water frontage, and unused road reserve) cover approximately 70 percent of the recommended national park within the investigation area. These activities are inconsistent with the objectives of a national park and will be discontinued.

There are currently five apiculture sites in the Lower Ovens forests and these will continue to be permitted in the recommended national park. A base mineral exploration licence is current over most of the Lower Ovens forests and this may continue, be renewed (if it does not lapse) and proceed to a mining licence and work authority, with appropriate consent. However, no other new exploration or mining licences can be granted once the recommended national park is established.

Community views

Many submissions were received from local and regional residents and local authorities. Many opposed the park based on concerns about cessation of grazing and its perceived impacts such as fire risk, weed management, fencing costs and loss of income, and loss of access for traditional camping uses. Local fire authorities voiced concern regarding any loss of access for fire protection and suppression. Some submissions raised concern about the cessation of domestic firewood collection. Many others supported the park because of its biodiversity values, high quality condition of the forests and unregulated nature of the Ovens River.

Response

VEAC has retained the proposal for the Warby Range–Ovens River National Park because of its high biodiversity values. The draft proposals have been varied to provide for campfires and collection of firewood for campfires outside the high fire danger period in riverine sections.

VEAC has also emphasised that dispersed camping will continue to be the predominant form of camping in the park. In keeping with national park status, grazing is to cease. However, land managers may utilise domestic stock grazing on public land under contract for ecological management purposes such as targeted weed control. Access for domestic firewood is to cease, and VEAC recommends that land managers develop strategies to ensure wood is available to local communities from other sources (see R40–R44). Fire protection plans will need to be reviewed to ensure protection and suppression strategies are updated as required in consultation with local communities, but the recommendations should not result in any reduction in access for these purposes.

RECOMMENDATIONS

Warby Range–Ovens River National Park

A8 That:

- (a) the area of 15,889 hectares (4367 hectares inside the investigation area and 11,522 outside of the investigation area) shown on Map A as the Warby Range–Ovens River National Park be used in accordance with the general recommendations for national parks
- (b) camping (in particular dispersed camping) continue in accordance with recommendations R32–R34
- (c) campfires and collection of wood for campfires continue outside the high fire danger period in accordance with recommendations R35–R36
- (d) an appropriate environmental water regime be implemented as outlined in R13, and
- (e) existing water diversion licences be allowed to continue where no other water sources are available to adjoining landholders.

Notes:

1. All campers at Parolas Bend must have a chemical toilet which must be emptied at an approved disposal point such as a caravan park.
2. Car rallying will continue to be permitted in Killawarra forest (currently part of Warby Range State Park), by arrangement with the land manager.
3. VEAC notes that certain areas of public land managed by Goulburn–Murray Water are included in the park.

A9 Mount Buffalo National Park

A small area (9.6 hectares) of public land water frontage reserve and unused road reserve along the Buckland River and stone reserve at Nug Nug is recommended to be added to the Mount Buffalo National Park. This area contains Herb-rich Foothill Forest Ecological Vegetation Class and the addition of this area consolidates the boundary of the park which is outside the investigation area.

RECOMMENDATIONS

Mount Buffalo National Park

A9

That the area of 22.1 hectares shown on Map A be used in accordance with the general recommendations for national parks.

B Regional parks and other parks

A regional park is an area of public land set aside primarily to provide informal recreation for large numbers of people in natural or semi-natural surroundings. Such parks provide an area of natural vegetation often close to towns and visitors enjoy a wide range of recreational activities.

The parks generally give recreation objectives priority over conservation objectives. Regional parks are usually readily accessible from urban centres or major tourist routes.

Typically, they provide an environment where residents can walk their dog and visitors can stop for a picnic in a natural bush setting.

The more intensively developed recreation areas on public land, such as sportsgrounds, are generally categorised as community use areas and are described later in this chapter. VEAC is recommending two new regional parks: Kerang Regional Park and Shepparton Regional Park.

There are many contiguous areas of public land along the River Murray with similar levels of recreational intensity and activity to regional parks and which are generally accessible from major towns and tourist routes. This regional park area, which extends from Wodonga to beyond Mildura, is recommended to be known simply as the Murray River Park.

There are other places in the investigation area that currently have a comparable intensity of recreational use and similar activities (e.g. dog walking) to a regional park, in combination with a high level of natural values. In such cases, conservation objectives require a higher priority than apportioned in regional parks. These four recommended parks—Murray–Kulkyne, Kings Billabong, Gadsen Bend, and Nyah–Vinifera—will be included on Schedule Three of the *National Parks Act 1975* and are described below. Schedule Three currently includes similar categories of parks (e.g. coastal parks) where both conservation and recreation are considered a high priority. Establishing these parks in this way means that they are considered protected areas and contribute towards achieving a comprehensive, adequate and representative reserve system, while at the same time allowing for a broader range of uses and activities such as dogwalking and camping with dogs, that are not usually allowed in national, state and wilderness parks.

Regional parks have high levels of visitor use, and it is important for land managers to have effective tools to manage and regulate visitor activities. Development of appropriate regulations is a high priority. For areas abutting the New South Wales border on the River Murray, it is also important to ensure a seamless regulatory regime across the border, which is difficult to define on the ground.

RECOMMENDATIONS

General recommendations for regional parks and other parks

B That:

- (a) regional parks and other parks shown on Map A (numbered B1 to B7) and described below be used to:
 - (i) provide for informal recreation associated with enjoyment of natural surroundings by large numbers of people
 - (ii) conserve and protect natural landscapes and scenic values
 - (iii) conserve and protect biodiversity to the extent that is consistent with (i) above, and
 - (iv) protect significant cultural and historic sites and places, including Aboriginal cultural sites and places;
- (b) the following activities generally be permitted:
 - (i) bushwalking, nature observation, heritage appreciation, picnicking, recreational fishing
 - (ii) camping including dispersed camping in accordance with recommendation R32–R34
 - (iii) dogwalking and camping with dogs (see notes below)
 - (iv) car touring, including four wheel driving, on formed roads and tracks
 - (v) mountain bike and trailbike riding on formed roads and tracks
 - (vi) horseriding on formed roads and tracks and overnight camping with horses
 - (vii) apiculture
 - (viii) metal detecting, prospecting, and
 - (ix) research, subject to permit;
- (c) the following activities not be permitted:
 - (i) harvesting of forest products, except where domestic firewood collection zones are specifically identified (see recommendations B2, B3 and R40)
 - (ii) grazing by domestic stock
 - (iii) hunting and use of firearms, and
 - (iv) burning solid fuel fires during the high fire danger period;
- (d) subject to clearly defined, transparent and scientifically supported ecological objectives, park managers may undertake adaptive management to restore ecosystems or to return them to a condition more closely resembling their natural condition (refer chapter two – see also notes 3 and 4 below);
- (e) unused road reserves be added to adjoining parks where appropriate; and
- (f) a management plan be prepared for each park in partnership with key user groups, local authorities and the community.

Notes:

1. Dogs must be on a leash in some areas as zoned in management plans.
2. Collection of firewood for campfires is permitted outside the designated high fire danger period.
3. Ecological thinning may be permitted where required for ecological management purposes.
4. Short term grazing may be contracted for ecological or management purposes such as targeted weed control.
5. Hunting and use of firearms may be allowed as part of a pest animal control program.
6. Implementation of recommendations and land management should allow flexibility for minor boundary adjustments.

B1 Kerang Regional Park

The recommended Kerang Regional Park (1138 hectares) encompasses a variety of public land parcels containing riverine and wetland environments encircling the township of Kerang. This land includes Town and Back Swamps, Cemetery Forest Wildlife Reserve (and adjoining uncategorised Crown land), Fosters Swamp and areas of public land water frontage along the Loddon River and Pyramid Creek which link these swamps.

The majority of the recommended park is part of the Kerang Wetlands Ramsar Site, which is of international significance because of the types of wetlands represented and the ecological and genetic diversity they support, particularly for waterbirds. The wetlands within the recommended Kerang Regional Park support habitat for a range of significant fauna species, including Intermediate Egret, Royal Spoonbill and Golden Perch and flora species such as Swamp Buttercup, Umbrella Wattle, Twin-leaf Bedstraw, Spreading Emu-bush and Waterbush. Lignum Swampy Woodland and Lignum Swamp are the dominant ecological vegetation classes (EVCs) and the sections of the Loddon River and Pyramid Creek contain River Red Gum and Black Box riparian woodlands. Fosters Swamp, in particular, has high waterbird carrying capacity and species diversity. The Brick Kilns (Tragedy) Bridge, constructed in 1927, on Lower Loddon Road over Pyramid Creek, is of state historical significance.

Fosters Swamp is currently used by Lower Murray Water for directing tertiary sewage outfall and drainage water for evaporation, and it can continue to be used for this purpose, as required, in consultation with the land manager. Access to the western section of the swamp (where the ponds are located) may need to be restricted. The sewage lagoon system and associated infrastructure is not included in the recommended regional park.

Town and Back Swamps are currently used for passive recreation such as dogwalking. Parts of Cemetery Swamp are currently designated as a Wildlife Reserve available for hunting, and hunting is also permitted in the other wetlands surrounding Kerang. Due to the proximity to the township of Kerang and the objective to encourage use of these areas for a range of recreational activities, hunting would not be permitted in the recommended regional park.

The grazing licences on parts of the recommended regional park would not be continued.

Community views

A relatively small number of submissions were received and these were mostly in support of the park proposal. Some called for the establishment of a Kerang Lakes State Park, while others sought better protection of individual wetlands as new nature conservation reserves. Some other submissions opposed the creation of the park because hunting would not be allowed.

Response

VEAC has retained the proposal for the Kerang Regional Park. Because of its proximity to Kerang, hunting is considered not to be appropriate. The recommended Kerang Regional Park would unify and enhance the management of these important wetlands, both for their recreation and biodiversity values.

RECOMMENDATIONS

Kerang Regional Park

B1 That:

(a) the area of 1138 hectares shown on Map A as the Kerang Regional Park be used in accordance with general recommendations B for regional parks and other parks

(b) the use of Fosters Swamp as an outfall for tertiary sewage and drainage be permitted in consultation with the land manager, and

(c) the area be reserved under section 4 of the *Crown Land (Reserves) Act 1978*.

B2 Shepparton Regional Park

The Shepparton Regional Park (2786 hectares) is centred on the River Red Gum forests of the Goulburn River between Shepparton and Mooroopna. It incorporates part of the Lower Goulburn State Forest, the Shepparton Flora and Fauna Reserve, Mooroopna Recreation Reserve and public land water frontage. This area continues upstream from the recommended Lower Goulburn River National Park to the north and offers a number of recreational activities including walking, fishing, canoeing, bikeriding, horseriding, trailbike riding and nature observation. The recommended Shepparton Regional Park provides increased opportunities for recreation activities that would not be available in the recommended Lower Goulburn River National Park, such as dogwalking, camping with dogs and (in designated zones) domestic firewood collection.

The natural values of this park are similar to those of the adjoining recommended Lower Goulburn River National Park, with Sedgy Riverine Forest, Riverine Grassy Woodland and Riverine Swamp Forest EVCs which provide habitat for significant species such as the endangered Squirrel Glider.

Community views

Many submissions supported the park, highlighting its importance for residents and visitors. Submissions that opposed the park expressed a desire to retain access to traditional pursuits such as access for camping with dogs, hunting and fishing, and firewood collection.

Response

VEAC has retained the recommendation for the park and increased its size to provide for additional areas for traditional uses close to Shepparton, including walking dogs, and reduced the size of the proposed Lower Goulburn River National Park. The enlarged regional park provides for camping with dogs and collection of domestic firewood in defined zones. The adjacent Reedy Swamp has been returned to its former category as a wildlife reserve to allow waterfowl hunting to continue and Gemmill Swamp has been returned to its former category as a nature conservation reserve with dog walking on lead. An area used by the Scouts Association has been categorised as a Community Use Area. Fishing is not affected under previous or current proposals.

RECOMMENDATIONS

Shepparton Regional Park

B2 That:

(a) the area of 2786 hectares shown on Map A as the Shepparton Regional Park be used in accordance with general recommendations B for regional parks and other parks

(b) domestic firewood collection generally not be permitted, other than in zones to be designated in accordance with recommendation R40, and

(c) the area be reserved under section 4 of the *Crown Land (Reserves) Act 1978*.

B3 Murray River Park

The Murray River Park is the major land use category along the River Murray in the investigation area, and extends from Wodonga to west of Mildura. It builds on the Land Conservation Council's 1985 approved recommendations for the River Murray Reserve. This park will help conserve and protect the many values and uses of public land along the Murray River and maintain a continuous vegetated corridor along the river. The Murray River Park (34,685 hectares) incorporates most of the existing River Murray Reserve, adjoining areas of state forest, existing regional parks at Wodonga, Yarrawonga, Cobram, Tocumwal and Echuca, public land water frontages, and small areas of land in various other public land use categories.

As outlined by the Land Conservation Council in 1985, these lands in association with the river, provide a significant natural attraction for people wishing to engage in river-based recreation in an essentially natural environment and provide an outstanding scenic landscape. Many recreational activities are pursued along the river. Camping on or near the sandy beaches of the Yarrawonga–Ulupna Island reach is very popular, as is fishing, walking, nature study or just relaxing by the river. Swimming, houseboating, canoeing, rafting, and waterskiing are also popular pastimes. The Southern 80 water ski race is a very well-attended event that takes place on the River Murray between Echuca and Torrumbarry, with much of the land-based activity taking place in the recommended Murray River Park.

The enjoyment derived from various activities depends in large measure on maintaining and protecting the river and treescape adjacent to it. In addition, the river's heritage values need to be protected, including old sawmill sites, punt landings, and localities associated with the riverboat era. Archaeological sites of significance—such as Aboriginal fish weirs, middens, and canoe trees—also need to be protected.

Management of the Murray River Park should be directed toward enhancing the scenic, recreation, and nature conservation values, protecting historical and archaeological features and providing opportunities for a diversity of informal recreation activities in an essentially natural riverine

environment. Consolidating the various land use categories that comprise the recommended Murray River Park will integrate management of these riverlands, enhancing and broadening recreational opportunities and emphasising connectivity. Developing a strategy for dispersed camping (and associated firewood collection in accordance with recommendations R33 and R36) in consultation with users will ensure the riverine environment is maintained even with increasing numbers of campers along the River Murray.

Due to the importance of fallen timber for fauna in the riverine forests, commercial and domestic firewood collection would not be permitted in the Murray River Park, other than in zones to be designated by the land manager in consultation with the community for domestic firewood collection around Mildura, Robinvale, Boundary Bend, Swan Hill, Barmah, Cobram and Rutherglen. As a general rule, an average of 50 tonnes per hectare of coarse woody debris across each frontage block should be maintained. Due to fire risk, solid fuel fires will be prohibited during the high fire danger period (as determined by the Department of Sustainability and Environment in conjunction with the Country Fire Authority) on all public land adjoining the River Murray (see recommendations R35–R36) consistent with comparable areas in New South Wales and South Australia.

Given that there are high level natural and scenic values and intense recreation pressures, some activities previously permitted in the former land use categories will be incompatible with the objectives and direction sought through the Murray River Park. For example, due to the numerous campers using areas in the recommended Murray River Park, hunting and grazing are not appropriate.

A number of licensed pump sites, pumpline sites, and regulators associated with water management and use occur within the recommended park and the use of these facilities would continue. A number of large new installations consisting of pumpsites, pipelines and power supplies have been approved in recent years and it is clear that these have had an impact on the environmental, cultural, scenic and recreation values of the River Murray frontage. The process to determine new applications is complex, as approvals are required under many pieces of legislation, such as the *Water Act 1989*, *Crown Land (Reserves) Act 1978*, and *National Parks Act 1975*, and involve a number of separate agencies. This can result not only in delays, but in lack of clarity as to which legislation and agency has primary responsibility. A new streamlined approach is required on applications for new installations that also meets the governance requirements of the respective legislation. As a result of VEAC's recommendations for new parks, amendment to existing processes, and approvals and some legislation will be required. The approach needs to:

- develop a revised approval process that meets the legislated objectives of the new land categories and adopts a whole of government approach to dealing with applications
- develop guidelines to minimise the impact on the environmental, cultural, scenic and recreation values of the River Murray frontage and on the overall appearance of these structures, particularly at pump sites

- direct the location of structures to private land where possible or, failing that, consolidate frontage sites.

The land in New South Wales abutting the River Murray shares similar characteristics, values and uses with the recommended Murray River Park. Compatible management of at least the public land component of the New South Wales river frontage with the Murray River Park is highly desirable. As the Victorian–New South Wales border is the top of the southern bank of the River Murray, activities occurring on the River Murray itself or on sandbanks on the southern side of the River Murray are within the jurisdiction of New South Wales. Nonetheless a number of activities that occur on the river or the sandbars have a direct impact on areas within the recommended Murray River Park, including watersports, the construction of jetties connected to the Victorian side of the river and activities associated with camping on sandbars. A coordinated management approach with New South Wales authorities, preferably including a seamless regulatory regime, would resolve a number of these anomalies and provide a more integrated approach to planning along the River Murray (see recommendation R37).

Community views

Many submissions were received from local and regional residents and local organisations regarding the Murray River Park. Submissions supporting the park highlighted the importance of a habitat corridor along the length of the river. Submissions that opposed the park expressed a desire for continued access to traditional pursuits such as access for camping with dogs, hunting and fishing, and firewood collection. Some opposition to the park was based on fears that the cessation of grazing would increase fire risk, weeds and fencing costs and also reduce income for licensees. Some submissions raised concerns about the cessation of domestic firewood collection.

Response

VEAC has retained the proposal for the Murray River Park as it can accommodate most of the existing recreation uses while protecting its biodiversity and habitat connectivity values. The draft proposals have been varied to provide for campfires and collection of firewood for campfires outside the high fire danger period. VEAC has also emphasised that dispersed camping will continue to be the predominant form of camping in the park and camping with dogs is permitted. Domestic firewood collection is permitted around Mildura, Robinvale, Boundary Bend, Swan Hill, Barmah, Cobram and Rutherglen. VEAC has added to the Murray River Park in three areas totalling some 2680 hectares to provide for camping with dogs. These additions are along the eastern part of Wallpolla Island near Mildura; from Brereton Road upstream to Horseshoe Bend north of Torrumbarry township; and the area between Barmah township to The Gap. While domestic stock grazing is to cease, VEAC has noted that land managers may utilise domestic stock grazing on public land under contract for ecological or management purposes such as targeted weed control. Fishing is not affected under these proposals.

RECOMMENDATIONS

Murray River Park

B3 That:

- (a) the area of 34,685 hectares shown on Map A as the Murray River Park be used in accordance with general recommendations B for regional parks and other parks
- (b) a management plan for the Murray River Park be developed in consultation with the community within three years of the acceptance of this recommendation
- (c) an appropriate environmental water regime be established for this park as outlined in recommendation R13
- (d) use of existing and licensed pump and pumpline sites be permitted to continue
- (e) a streamlined multi-agency approach be developed for dealing with applications for new pump and pumpline sites that provides protection for the environmental, cultural, scenic and recreation values of the River Murray frontage whilst recognising rights of diverters, and locates structures on private land where possible or, failing that, on consolidated frontage sites
- (f) domestic firewood collection generally not be permitted, other than in zones to be designated by the land manager in consultation with the community around Mildura, Robinvale, Boundary Bend, Swan Hill, Barmah, Cobram and Rutherglen in accordance with recommendation R40
- (g) broadly, other existing uses in the area of the recommended Murray River Park be permitted at the discretion of the land manager and subject to the management plan
- (h) the recommended Murray River Park be considered "restricted" Crown land under the *Mineral Resources (Sustainable Development) Act 1990*
- (i) the park be zoned in order to provide for the range of uses outlined above and be permanently reserved under section 4 of the *Crown Land (Reserves) Act 1978*
- (j) regulations be developed to be in place as soon as practicable after the park is established, and
- (k) a coordinated approach to management across the border with New South Wales be developed, including a co-ordinated regulatory regime.

Notes:

1. A firewood strategy for campers should be developed in accordance with recommendation R36.
2. Goulburn-Murray Water has an ongoing role to operate, maintain and monitor outfall and drainage systems within the park.
3. Parklands Albury Wodonga manages part of the park near Wodonga.

B4 Kings Billabong Park

The recommended Kings Billabong Park incorporates the existing Kings Billabong Wildlife Reserve, Karadoc State Forest, Red Cliffs Scenic Reserve, water supply and drainage basin, Mildura Bushland Reserve and linking areas of River Murray Reserve. Kings Billabong Wildlife Reserve (where hunting is not currently permitted) is a 2135 hectare nature conservation reserve 8 kilometres southeast of Mildura within the Robinvale Plains bioregion.

A 17 hectare recreation reserve at Bruces Bend, containing a houseboat marina, occurs to north of Kings Billabong and is not part of the recommended Kings Billabong Park.

A total of 393 species of native flora and 179 species of native fauna have been recorded in the recommended Kings Billabong Park, including 82 significant flora and 31 significant fauna species. The fauna includes the nationally vulnerable Regent Parrot and Growling Grass Frog. Many of the threatened plant species have very restricted distributions in Victoria, such as the Curly Flat-sedge which is known from only three sites between Boundary Bend and Mildura.

There are 22 Ecological Vegetation Classes mapped within Kings Billabong and Bottle Bend, including Lignum Shrubland, Lignum Swampy Woodland, Intermittent Swampy Woodland, Riverine Chenopod Woodland and Spike-sedge Wetland. Areas of Semi-arid Woodland, Chenopod Mallee, Woorinen Mallee with Woorinen Sands Mallee occur elsewhere in the recommended park. The wetlands in Kings Billabong were ephemeral prior to European settlement but have since been used as a water storage basin from which water is pumped for irrigation. Permanent inundation has resulted in the death of many River Red Gums.

The Kings Billabong Wildlife Reserve has high river health and biodiversity values, and is identified as a high value section of river by the Mallee River Health Strategy. The Kings Billabong wetlands are listed on the Directory of Important Wetlands, however parts of the southern section of Kings Billabong are affected by secondary salination caused by rising groundwater and disposal of irrigation drainage. This has caused the death of vegetation and changed the understorey composition.

Many sites in Kings Billabong are important for Aboriginal cultural heritage. Kings Billabong and the adjacent Psyche Bend Pumps Historic and Cultural Features Reserve (Recommendation E1) are an important part of the irrigated horticulture heritage of the region. The Psyche Bend Pumps area should be managed in conjunction with the Kings Billabong Park to protect the historic values of the site.

There are five apiary sites in the recommended Kings Billabong Park while Bottle Bend (currently River Murray Reserve) and the existing Karadoc State Forest are crossed by a small number of water supply licences. These licensed activities will continue to be permitted. A 290 hectare grazing licence covers the eastern section of Karadoc State Forest and a 75 hectare licence covers part of the western area. Grazing will not be permitted in the park.

Kings Billabong and Bottle Bend provide highly accessible, low cost camping destinations in a bush setting close to Mildura and Red Cliffs. These areas are particularly popular as vantage points for the Mildura water ski race

held annually at Easter. Annual visitor numbers in Kings Billabong have been estimated to be in the vicinity of 75,000–100,000, with highest visitation occurring during Easter and on public holidays. Kings Billabong and Bottle Bend provide opportunities for many recreational activities including dogwalking, camping, horseriding, fishing, walking, bicycle riding, canoeing, birdwatching, waterskiing (not on the Billabong), sightseeing and picnicking.

Community views

A small number of submissions were received regarding Kings Billabong Park, both in support and opposition to the park.

Response

VEAC has retained the proposed park. The draft proposals have been varied to provide for campfires and collection of firewood for campfires outside the high fire danger period. VEAC has also emphasised that dispersed camping will continue to be the main form of camping in the park and camping with dogs is permitted.

RECOMMENDATIONS

Kings Billabong Park

B4 That:

(a) the area of 3535 hectares shown on Map A as the Kings Billabong Park be used in accordance with general recommendations B for regional parks and other parks, and

(b) the park be established under Schedule Three to the *National Parks Act 1975*.

B5 Murray–Kulkyne Park

This enlarged park includes the existing Murray–Kulkyne Park (3999 hectares) which occurs in two distinct blocks on the River Murray either side of the Hattah–Kulkyne National Park, as well as the Tarpaulin Island Reference Area (436 hectares) and a narrow section of River Murray Reserve (165 hectares), between the existing northern boundary of the park and Colignan. The existing Murray–Kulkyne Park is currently reserved under Schedule Three of the *National Parks Act 1975*.

The existing Murray–Kulkyne Park contains large areas of depleted ecological vegetation classes including Grassy Riverine Forest and Riverine Grassy Woodland in the northern section and Lignum Swampy Woodland in the southern section, and smaller areas of other threatened EVCs. One hundred and eleven species of native fauna including 14 threatened species have been recorded in the northern section and 124 species of native fauna including 12 threatened species have been recorded in the southern sections of Murray–Kulkyne Park. The threatened species include Bush Stone-curlew, Regent Parrot, Painted Honeyeater and Curl Snake. Ninety-two species of native flora including 11 threatened species have been recorded in the northern section and 81 species of native flora including eight threatened species have been recorded in the southern part of Murray–Kulkyne Park.

The narrow section of the existing River Murray Reserve, between the existing northern boundary of the existing Murray–Kulkyne Park and the Colignan township has many natural values, including threatened flora species such as Woolly Scurf-pea, Silky Glycine, Desert Lantern, Tall Kerosene Grass, Silky Umbrella-grass and Sand Sida. The predominant EVCs in the area are Shrubby Riverine Woodland, Grassy Riverine Forest, Floodway Pond Herbland and Intermittent Swampy Woodland in the tight bends with smaller areas of Shallow Freshwater Marsh, Riverine Chenopod Woodland and Riverine Grassy Woodland.

The primary use of the recommended Murray–Kulkyne Park is recreation and conservation. The park's location on the River Murray and its reservation status allows a different recreational opportunity from the experience in the adjoining Hattah–Kulkyne National Park. For example, campers can bring their dogs in Murray–Kulkyne Park.

There are a small number of licences in the area recommended for addition to the Murray–Kulkyne Park, including three apiary licences. These licences will be allowed to continue.

Community views

A small number of submissions were received regarding the park, both in support and opposition to the park. Some suggested it be added to Hattah–Kulkyne National Park and that the forests around Nangiloc and Colignan be added to the conservation reserve system.

Response

VEAC has retained the small additions to the existing park. Adding the area near Colignan to the existing Murray–Kulkyne Park will give the area a higher profile with both land managers and the public and lead to better conservation outcomes as recreational pressure increases in the future. The Tarpaulin Island Reference Area will continue to be managed under the *Reference Areas Act 1978* but, as it is separated from the rest of the park by the River Murray, it will require fencing to prevent access by domestic stock from New South Wales (see recommendation F1(c)). The draft proposals have been varied to provide for campfires and collection of firewood for campfires outside the high fire danger period. VEAC has also emphasised that dispersed camping will continue to be the main form of camping in the park and camping with dogs is permitted.

RECOMMENDATIONS

Murray–Kulkyne Park

B5 That:

(a) the area of 4604 hectares shown on Map A as the Murray–Kulkyne Park be used in accordance with general recommendation B for regional parks and other parks

(b) fencing be undertaken of the Tarpaulin Island Reference Area to prohibit wandering stock from New South Wales entering the site, and

(c) the park be established under Schedule Three to the *National Parks Act 1975*.

B6 Gadsen Bend Park

The recommended Gadsen Bend Park (1618 hectares) incorporates the Gadsen Bend State Forest and River Murray Reserve upstream of the existing Murray–Kulkyne Park near Robinvale. The varying ecological vegetation classes (EVCs) found here contribute to reserve system representation of the Robinvale Plains bioregion. The southern section contains the vulnerable Semi-arid Chenopod Woodland and Semi-arid Parilla Woodland while the northern section has larger areas of more riverine vegetation such as Lignum Swampy Woodland, Lignum Shrubland and Riverine Grassy Woodland. Shrubby Riverine Woodland and Intermittent Swampy Woodland EVCs which occupy the insides of the river bends.

Significant fauna species known to occur in the recommended Gadsen Bend Park include the endangered Inland Carpet Python and vulnerable Regent Parrot. One hundred and nine species of native flora have been recorded including 16 threatened or near-threatened species. Of particular importance are the endangered Silver Tails (the only known site in Victoria) and Woolly Scurf-pea (the only populations in Victoria are between Boundary Bend and Mildura).

Grazing of stock is not permitted in the recommended park. Grazing on the main area of forest was removed many years ago. There are seven grazing licences (mostly less than 10 hectares) on blocks on the boundary of the forest. The vegetation on these blocks is currently in poor condition and requires restoration. There are four apiary licences in the northern section of the forest, and a licence for a rifle range over most of the downstream section (~140 hectares). The apiary licences will continue to be permitted. The rifle range itself is not part of the recommended park, but is recommended as a separate community use area (recommendation I2), where the licence can continue. Most of the existing buffers around the shooting ranges are recommended to be included in the park, with existing restrictions on access maintained by zoning. Other recreational activities are similar to other parts of the River Murray and include camping, fishing and four wheel driving but visitation is not as high as in areas that are closer to major population centres.

Community views

A small number of submissions were received both in favour and opposed to this park proposal. No specific issues were raised.

Response

VEAC has retained the proposed park. The draft proposals have been varied to provide for campfires and collection of firewood for campfires outside the high fire danger period. VEAC has also emphasised that dispersed camping will continue to be the main form of camping in the park and camping with dogs is permitted.

RECOMMENDATIONS

Gadsen Bend Park

B6 That:

(a) the area of 1618 hectares shown on Map A as the Gadsen Bend Park be used in accordance with general recommendations B for regional parks and other parks, and

(b) the park be established under Schedule Three to the *National Parks Act 1975*.

B7 Nyah–Vinifera Park

The recommended Nyah–Vinifera Park (1375 hectares) incorporates the Nyah State Forest (808 hectares) and the Vinifera forest section of the River Murray Reserve (547 hectares) at Nyah, between Swan Hill and Piangil.

There are 19 ecological vegetation classes (EVCs) in the Nyah and Vinifera forests including large areas of Riverine Swamp Forest and Sedgy Riverine Forest and smaller areas of threatened EVCs such as Riverine Grassy Woodland, Spike-sedge Wetland and Riverine Chenopod Woodland.

Riverine habitat is essential for Inland Carpet Pythons and they have recently been recorded in Nyah State Forest and near Vinifera forest. In riverine environments, thick ground cover and hollow-bearing trees and logs are essential for Inland Carpet Pythons. The endangered Grey-crowned Babbler occurs at the Wood Wood end of the Nyah State Forest. Other threatened fauna species recorded in Nyah State Forest and Vinifera forest include the Australian Shoveler, Intermediate Egret, Hardhead, Musk Duck, Royal Spoonbill and Diamond Firetail. Two significant flora species, Riverina Bitter-cress and Native Couch are recorded in these forests.

Nyah and Vinifera forests are important cultural sites for the Wadi Wadi Aboriginal people and there are numerous burial sites, middens, and scarred trees. Some of the mounds created by burial sites attract trail bike riders who use the sites as jumps. The earthen ovens and middens are listed under the Register of the National Estate. European heritage reflects the pioneering history of the area. The Takasuka Bank (levee) shows an early example of water diversion to grow rice.

In recent years, Wood Utilisation Plans have allocated a firewood coupe in Nyah State Forest; however due to community opposition no coupe has been cut and domestic firewood has been sourced from elsewhere. Cattle grazing (agistment) was previously removed from Nyah and Vinifera State Forests because the cattle were damaging Aboriginal cultural sites. Domestic firewood collection and grazing are not permitted uses in the recommended park. There is an apiary site in each of Nyah and Vinifera forests that can be continued.

An earthen weir across the Parnee Malloo Creek ponds water along almost the full length of the creek. The Nyah District Golf Club pumps water out of the Creek to irrigate its greens and fairways during wet years and during dry years pumps directly from the River Murray. Drains from adjoining freehold land enter the southern end of Nyah State Forest.

The region is popular for dispersed camping, fishing, boating, four wheel driving, trailbike riding and walking and these uses will continue in the park. Vinifera forest is popular for duck hunting when the creek is running but this activity will not continue in the recommended Nyah–Vinifera Park. The Nyah District Pony Club is currently licensed to use 13 hectares of Vinifera forest for equestrian activities and this activity will be allowed to continue.

Community views

A large number of submissions were received in support of this park. A consistent theme was the support for Aboriginal involvement in park management, particularly in the form of handback. Others opposed the park based on concerns that camping and campfires would not be permitted and that the forest was a significant fire risk.

Response

VEAC has retained its proposal for the park and the co-management arrangements between the government and the Traditional Owner group. The draft proposals have been varied to provide for campfires and collection of firewood for campfires outside the high fire danger period. VEAC has also emphasised that dispersed camping will continue to be the main form of camping in the park and camping with dogs is permitted. Fire protection and suppression will remain a key priority for fire management agencies.

RECOMMENDATIONS

Nyah–Vinifera Park

B7 That:

(a) the area of 1354 hectares shown on Map A as the Nyah–Vinifera Park be used in accordance with general recommendations B for regional parks and other parks

(b) Indigenous co-management arrangements be established in accordance with recommendation R26(a)

(c) the area currently licensed for equestrian activities be zoned for this purpose in management planning, and

(d) the park be established under Schedule Three to the *National Parks Act 1975*.

C State forests

The River Red Gum forests of the Murray Valley have been a major source of durable timbers and firewood in southeastern Australia since the early days of European settlement. State forests are a major source of timber products on public land, as well as supporting biodiversity and providing for a broad range of recreational activities including camping, horseriding, four wheel driving and car touring, hunting and fishing. These forests are also used for a variety of other purposes such as earth resource extraction and apiculture.

State forests in the investigation area contain sites of great cultural and spiritual importance to Aboriginal people. Many sites provide opportunities for the continuation of traditional practices on Country. State forests also contain areas of European cultural significance. With careful management, especially adequate flooding, the state forests of the investigation area can continue to produce timber whilst also catering for a wide range of other uses and values into the future, albeit in the reduced area recommended here.

Timber

Seasoned River Red Gum timber is relatively hard and moderately dense and often used for structural timber. Its vibrant red colour and decorative grain when polished give it great appeal for furniture and appearance products such as flooring. It is also durable and resistant to white ants and borers, making it well suited for use as railway sleepers and wharf timber. Its density also makes it sought after for firewood.

The net gain to the economy from the timber industry is approximately \$2.6 million per annum. The industry employs approximately 74 people (full time equivalents) directly and another 28 people indirectly in or near the investigation area (see appendix 1 for details).

The recommendations in this report significantly reduce the area of state forest—from 106,910 hectares to 12,292 hectares. However, only a small proportion of the current total state forest area is actually available for timber harvesting because some state forests do not contain River Red Gums, timber harvesting is not economically viable in other forests, timber harvesting is prohibited in special protection zones, and the Code of Forest Practices also places limits on harvesting. Most of the current commercial timber harvesting is from Barmah, Gunbower and the Lower Goulburn forests.

In the three major commercial forests the area available for harvesting from General Management Zone and Special Management Zone would reduce from 37,391 hectares to 9884 hectares, or 26 percent of the current available area, under VEAC's recommendations. All of the remaining available area would be in Gunbower forest and the nearby Benwell and Guttrum forests. See Chapter 4 for a discussion of the implications of these recommendations on the River Red Gum timber industry.

Estimating the long term sustainable harvest volumes available from these areas, and thus the size of the industry, is particularly difficult because growth rates vary with site quality and flood regime. Because rainfall in the investigation area is insufficient to sustain River Red

Gum forests, the health, growth and indeed existence of these forests is dependent on water supplied by regular winter–spring flooding from the River Murray and its tributaries. River regulation and increased extraction of water for agriculture and urban use coupled with the ongoing drought has severely reduced the extent of this flooding and altered its timing. These changed flood regimes have reduced tree growth rates substantially and placed large areas of River Red Gum forest under severe stress. For example, Continuous Forest Inventory (CFI) plot measurements in Barmah and Gunbower forests, obtained from DSE, indicate that growth rates between 1998 and 2005 were only 60 percent of rates recorded in previous periods. This decrease is almost certainly due to the recent drought and lack of flooding over the last ten years.

Estimates of sustainable yield have been made using the areas from the current recommendations, CFI data to predict growth and DSE's methods for calculating timber growth in uneven aged forests. A summary of the results is provided in appendix 6.

Appendix 6 shows that with frequent flooding and the current available area, an average of 5462 cubic metres of sawlogs could be harvested sustainably each year. The volumes in appendix 6 differ from the estimates in VEAC's Draft Proposals Paper because they include new Continuous Forest Inventory data from DSE for Gunbower, Benwell and Guttrum Forests, and special management zones (SMZs) as well as general management zones (GMZs). The estimates also include revised DSE data for the Lower Goulburn and reductions to account for code of forest practices and other exclusions in GMZs, and also harvest difficulties in SMZs. With the present reduced tree growth rates, an estimated 3497 cubic metres could be harvested sustainably from the currently available forests.

VEAC's recommendations for a reduced state forest area with adequate environmental flows are estimated to result in a sustainable harvest equivalent to 25 percent of the yield (5462 cubic metres) from the current area with adequate environmental watering (see recommendation R13 on environmental water). Failure to deliver flooding will reduce this to 15 percent. Some timber businesses are unlikely to be viable with such volumes. Without VEAC's recommendations (without any reductions in area), the sustainable harvest is likely to drop to 64 percent of 5462 cubic metres if nothing is done to increase environmental watering (appendix 6).

An additional factor is that while DSE's timber resource estimates indicate the sustainable volume available from the remaining area of state forest, Gunbower Forest has extensive areas of relatively young River Red Gum trees not yet at commercial size, which will not provide harvestable timber for several years.

Commercial and domestic firewood

The implementation of the Environment Conservation Council (ECC) Box–Ironbark Forests and Woodland Investigation recommendations (2002) has increased pressure on other forests to supply firewood. Much of this pressure has been on the River Red Gum forests because of their accessibility, availability and the suitability for firewood. The effects of changes in available forest and flooding regimes on sustainable firewood volumes are even more

poorly known than the corresponding effects on timber volumes. However, firewood and timber volumes are both primarily a function of forest productivity. Therefore, the percentage reductions in timber availability resulting from VEAC's recommendations for public land categories and environmental water (see appendix 6) are likely to apply with reasonable reliability to firewood, especially waste timber following commercial sawlog harvesting activities and thinning operations.

The supply of domestic firewood needs to be planned and carefully managed, particularly to cater for neighbouring regional centres with few affordable alternatives (especially reticulated gas). Domestic firewood will continue to be available from Gunbower State Forest and VEAC has recommended that land managers consider extending forest thinning programs into Benwell and Guttram State Forests thereby generating additional firewood (see recommendation R42). Where little state forest remains, zones for domestic firewood collection are recommended in the Murray River Park: in the Mildura, Robinvale, Boundary Bend, Swan Hill, Barmah, Cobram and Rutherglen areas and parts of the Shepparton Regional Park (recommendation R40). As part of the implementation of the ECC Box–Ironbark recommendations, local firewood strategies were developed to guide the transition to the new arrangements for firewood for particularly affected areas. VEAC is recommending that similar strategies be adopted in the River Red Gum Forests Investigation area (recommendations R41, R43–R44).

Other uses and values

The issues associated with key thematic recommendations in Chapter 2 such as environmental water, Aboriginal involvement, recreation and tourism, domestic stock grazing and nature conservation, are applicable in state forests as they are in other larger public land use categories. Notably:

- for adequate floodplain watering and other aspects of environmental water management (recommendations R13–R20)
- for increased Aboriginal involvement in public land management and continuation of traditional practices (recommendations R21–R30)
- for improved management of recreation in riverine forests, including controls on campfires and collection of wood for campfires (recommendations R31–R36)
- to remove domestic stock grazing (recommendation R38)
- for protection of biodiversity values, including important vegetation communities, wetlands listed under the Ramsar Convention, coarse woody debris and threatened species.

Community views

State forests were mentioned generally in many submissions; issues raised were typically focussed on recreation access and timber harvesting in specific state forest areas (Gunbower, Barmah, Lower Goulburn, Wallpolla Island state forests). Often people who favoured the status quo promoted 'working forests' and the need for active management practices to retain forest health. Industry access was critical for many submitters, particularly the economic contributions to small towns from the timber

industry. The need for domestic firewood supplies within the investigation area and the pressure associated with reduced opportunities for commercial timber harvesting were also highlighted. Timber industry comments largely debated at a broad level sustainable yield, growth rates and extent of resource calculations utilised by VEAC and the economic impacts on businesses and communities. The likelihood of recommended floodplain flooding and restoration of tree growth rates to previous levels was also questioned.

For many people, particularly those living near areas of state forest, the feeling of relatively unrestricted recreation access to natural forest was seen as essential for their quality of life. Continuation of family traditions in state forests—be it timber harvesting or recreation pursuits—were also important to some people. Many submissions opposed expansion of national parks at the expense of state forest because of (perceived and actual) changes to recreational use. Many others proposed that state forests be changed to national or other parks, particularly Barmah and Gunbower State Forests, in order to protect threatened species.

Good land management such as fire protection and pest plant or animal control, and resource use were promoted as reasons for retaining the status quo. Others argued that current state forest activities such as timber harvesting and domestic stock grazing present an ongoing danger to biodiversity values, particularly threatened species. Plantations were proposed as a way of providing future firewood and timber needs. The ecological value of forested corridors along major rivers was important to many people.

Response

VEAC is aware of the likely consequences of its recommendations on the timber industry (see chapter 4 — Social, economic and environmental implications). Nevertheless, inadequate representation of riverine ecosystems in protected areas and the importance of these as a buffer against climate change cannot be disregarded. In accordance with its Terms of Reference, VEAC has looked for options to establish a comprehensive, adequate and representative (CAR) reserve system while maintaining a viable timber industry. The high level of riverine environment depletion limits scope for change and so, although there is an increase in state forest (and Murray River Park), the public land use configuration remains largely unchanged since the Draft Proposals Paper.

VEAC's floodplain watering recommendations provide benefits for biodiversity conservation as well as enhancing timber growth rates in state forest; mainly over the long term as climate change reduces water availability. The current extended dry period has impacted upon River Red Gum growth rates and hence the level of sustainable harvest. VEAC has endeavoured to retain areas of state forest where environmental watering can be readily achieved.

Domestic firewood will continue to be available from Gunbower State Forest. In regions where little state forest remains, zones for domestic firewood collection are recommended in the Murray River Park. In addition domestic firewood strategies can guide the transition to new arrangements, particularly in regional centres with few affordable alternatives (especially reticulated gas).

Many recreation activities have been, and continue to be, provided for across public land in the investigation area. Recommendations relating to campfires, dog walking, horseriding, camping, and recreational hunting are described in more detail in chapter 2—Recreation and tourism.

RECOMMENDATIONS

General recommendations for state forests

C

That the state forests (numbered C1 to C3) shown on Map A be used to:

- (a) produce hardwood timber and other forest products, including domestic firewood
- (b) conserve and protect biodiversity, natural landscapes and natural processes
- (c) protect significant cultural and historic sites and places, including Aboriginal cultural sites and places
- (d) provide opportunities for recreation (including hunting) and education
- (e) provide for flood mitigation;

and that:

- (f) the following activities be generally permitted:
 - (i) bushwalking, nature observation, heritage appreciation, picnicking, recreational fishing
 - (ii) camping, in particular dispersed camping and overnight camping with horses
 - (iii) dogwalking and camping with dogs
 - (iv) hunting
 - (v) car touring, including four wheel driving, on formed roads and tracks
 - (vi) mountainbike and trailbike riding on formed roads and tracks
 - (vii) horseriding on formed roads and tracks
 - (viii) apiculture
 - (ix) exploration and mining
 - (x) research, subject to permit;

and that:

- (g) the following activities not be permitted:
 - (i) domestic stock grazing
 - (ii) solid fuel fires during the high fire danger period

and that:

- (h) DSE review the forest management zoning within the state forests of the Mid-Murray Forest Management Area
- (i) DSE give consideration to increasing silvicultural thinning programs to enhance the development of sawlogs and produce additional volumes of firewood.

C1–C2 Benwell and Guttram State Forests

Benwell (551 hectares) and Guttram (1179 hectares) State Forests both adjoin the River Murray between Koondrook and Murrabit. These state forests will be managed by DSE and continue to be available for timber harvesting, dispersed camping, horseriding and firewood collection.

The ecological vegetation classes (EVCs) in Benwell and Guttram State Forests are typical of these floodplains. At Benwell they include Riverine Swamp Forest, Grassy Riverine Forest, Floodway Pond Herbland/Riverine Swamp Forest Complex and small areas of Spike-sedge wetland. The EVCs at Guttram State Forest include Riverine Swamp Forest, Floodway Pond Herbland/Riverine Swamp Forest Complex and Sedgy Riverine Forest along the river.

Community views

VEAC received very few community comments specifically about Benwell and Guttram forests. However, many community sectors wanted to retain access to all state forests, mainly for recreational activities and timber harvesting.

Response

VEAC has retained the proposed state forest areas.

RECOMMENDATIONS

Benwell State Forest

C1 That:

- (a) the area of 551 hectares shown on Map A as the Benwell State Forest be used in accordance with the general recommendations for state forests C.

Guttram State Forest

C2 That:

- (a) the area of 1179 hectares shown on Map A as the Guttram State Forest be used in accordance with the general recommendations for state forests C.

C3 Gunbower State Forest

Gunbower State Forest (10,563 hectares) is situated along the River Murray between Torrumbarry and Koondrook. Two sections of the current Gunbower State Forest have been recommended for inclusion into the Gunbower National Park. The southern section consists of predominantly Black Box woodland and sections of the current Murray River Reserve. The western part includes the wetlands along the Gunbower Creek. Gunbower State Forest will be managed by DSE and continues to be available for timber harvesting, dispersed camping, horseriding and firewood collection.

The main ecological vegetation classes in the recommended Gunbower State Forest are Riverine Swamp Forest, Floodway Pond Herbland/Riverine Swamp Forest Complex, Riverine Grassy Forest with small areas of Sedgy Riverine Forest along the river and Spike-sedge Wetland lining the internal depressions.

Gunbower Forest is an important wetland under the Ramsar international convention. It contains significant wetlands that are currently managed as Special Management Zones under the Mid-Murray Forest Management Plan. These sites are significant breeding areas for colonial waterbirds. The most recent breeding event was in 2005/06 when egrets bred along Little Gunbower Creek after environmental water flooded parts of the forest. The current level of protective management in place for this area will continue.

Community views

A significant number of comments were made about Gunbower forest in submissions. These largely focussed on proposals including or excluding the entire area in national park while relatively few cited specific locations or new public land use configurations. Access for recreation activities and timber harvesting were promoted as a basis for retaining the entire area as state forest. Some people focussed on natural values such as colonial waterbird breeding sites and threatened species and argued for the entire area to be included in the new Gunbower National Park.

Response

The popularity of a broad range of recreation activities that occur within Gunbower forests was an important matter considered by VEAC. Boundary re-configurations have focussed on expansion of the Murray River Park and retention of state forest at McNab Bend to accommodate such activities. Other recommendations provide greater clarity around access for camping, fishing, horseriding and four wheel driving across the investigation area. Inadequate representation of riverine ecosystems in conservation reserves limits VEAC's flexibility to provide larger areas of state forest for timber harvesting and at the same time achieve conservation reserve targets.

RECOMMENDATIONS

Gunbower State Forest

C3 That:

- (a) the area of 10,563 hectares shown on Map A as the Gunbower State Forest be used in accordance with the general recommendations for state forests C, and
- (b) areas currently zoned for the protection of colonial waterbird breeding sites under the Mid-Murray Forest Management Plan continue to be managed for this purpose.

D Nature conservation reserves

Some areas of public land are highly significant for their ecosystems, plant or animal habitats, or both but have limited recreation use. Nature conservation reserves are set aside to conserve rare or threatened species, significant plant associations or communities, or valuable habitat for populations of significant fauna. The primary land use objective is nature conservation, although education, scientific research and passive recreation are permitted subject to the maintenance of the particular values of the reserve. Nature conservation reserves differ from parks in that they are generally smaller, and that recreation is not a primary use. Together with national parks and some regional parks, nature conservation reserves make up the major part of the protected area system.

Many of the new nature conservation reserves in the River Red Gum Forests Investigation area protect native grasslands and grassy woodlands in the Victorian Riverina bioregion. These ecosystems have been severely depleted by intensive irrigated and dryland agriculture and domestic stock grazing. The quality of the remaining grasslands can vary from very small, but high quality, sites to larger sites containing less floristic species diversity, but important fauna habitat. Indeed several of the threatening processes that have reduced the diversity of some of the larger sites continue today. Overgrazing and, in some instances, cropping (legal and illegal) of grasslands have occurred on a number of public land blocks in the investigation area. Since this region was last studied by the Land Conservation Council in 1985, our knowledge of grassy ecosystem ecology and distribution has improved considerably. There has been significant investment in the conservation of these ecosystems through state and commonwealth government land purchase programs and private land conservation programs. The recommendations for establishment of a series of new nature conservation reserves, will complement these efforts. A description of the location and values of the 21 existing and expanded, and 29 substantially new nature conservation reserves are provided here. Some areas included as existing nature conservation reserves were wildlife areas that do not permit hunting, and are in effect already managed—and in some cases reserved— as nature conservation reserves.

Community views

Few submissions commented specifically on nature conservation reserves, but some suggested minor changes or inclusion of specific areas in other public land use categories or offered more general comments. Some stakeholders proposed that either the number of nature conservation reserves be reduced or expanded. Other submissions suggested some nature conservation reserves be included in nearby national parks. Detailed comments, such as allowing dog walking, hunting, horseriding in specific areas, were considered by VEAC in formulating the final recommendations presented below.

Many of the nature conservation reserves in the River Red Gum Forests Investigation area are wetlands. There were a large number of submissions that opposed the loss of hunting opportunities by inclusion of wetlands in nature conservation reserves and other protected areas such as national parks. These comments are discussed in more detail in chapter 1 (Response to main issues in submissions).

Response

VEAC has endeavoured to retain popular hunting areas as state game reserves (see recommendation G82-G104) whilst achieving a comprehensive, adequate and representative reserve system as described in both the investigation terms of reference and the VEAC Act.

The following management objectives and summary land use recommendations are those that generally apply for the land use category, however exceptions to these may apply to specific reserves in special circumstances.

RECOMMENDATIONS

General recommendations for nature conservation reserves

D

That the nature conservation reserves shown on Map A (numbered D1 to D50):

(a) be used to:

- (i) conserve and protect species, communities or habitats of indigenous animals and plants
- (ii) provide for educational and scientific study if consistent with (i) above
- (iii) provide for recreation by small numbers of people, if consistent with (i) above;

and that:

(b) the following activities generally be permitted:

- (i) bushwalking, nature observation, heritage appreciation, picnicking
- (ii) car touring, including four wheel driving, on formed roads and tracks
- (iii) apiculture on existing licensed sites, subject to the outcome of scientific research into the ecological impacts of this industry, and management requirements
- (iv) exploration and mining for minerals and searching for and extraction of stone resources subject to the consent of the Crown land Minister under the relevant legislation;

and that:

(c) the following activities not be permitted:

- (i) grazing of domestic stock (see note 1 below)
- (ii) harvesting of forest products
- (iii) hunting and use of firearms (see note 2 below)
- (iv) solid fuel fires at any time of year (see note 7 below)
- (v) dogwalking (see note 3 below)
- (vi) horseriding;

and that:

(d) they be permanently reserved under the *Crown Land (Reserves) Act 1978* for the purpose of 'preservation of an area of ecological significance'.

Notes

1. Grazing contracted for ecological purposes or for short-term management purposes such as targeted weed control may be permitted.
2. Hunting and the use of firearms may be authorised as part of a pest animal control program.
3. Dog walking on lead be permitted in D46 Gemmill Swamp Nature Conservation Reserve.
4. The above management objectives and summary land use recommendations are those that generally apply for the land use category. Exceptions to these may apply to specific reserves in special circumstances.
5. A number of areas containing native grasslands have been planted with non-indigenous trees or shrubs. They have the potential to degrade grassland values and should be removed unless considered important for native fauna habitat.
6. A small but significant area of Buloke-dominated Plains Woodland occurs on the border of the investigation area (Crown Allotment 11B, Section C, Parish of Charlton East, Parcel No. P121341). This was not subject to a recommendation in the Environment Conservation Council's Box-Ironbark Forests and Woodlands Investigation and VEAC considers it warrants reservation as a new nature conservation reserve (the Aristida Nature Conservation Reserve).
7. Solid fuel fires may be permitted outside the high fire danger period at the land manager's discretion and in accordance with recommendations R35–R36 in the large nature conservation reserves at Lambert Island (D1) and Murrumbidgee Junction (D4).

D1 Lambert Island Nature Conservation Reserve

This 1222 hectare site incorporates the Lambert Island Flora Reserve, adjoining state forest and River Murray Reserve south of Mildura. It includes a diverse range of EVCs including Lignum Swampy Woodland, Riverine Grassy Woodland, Riverine Chenopod Woodland and Lignum Shrubland. In particular, it contributes to the representation of two under-reserved EVCs (Floodway Pond Herbland and Shallow Freshwater Marsh) in the Robinvale Plains bioregion. The endangered Tough Scurf-pea and Yellow Tails have been recorded at the site.

D2 Karadoc Nature Conservation Reserve

The existing Karadoc Flora Reserve (111 hectares), on the Murray River south of Mildura, includes a diverse range of EVCs including Lignum Shrubland, Shrubby Riverine Woodland, Grassy Riverine Forest, Grassy Riverine Forest/Floodway Pond Herbland Complex, Riverine Chenopod Woodland, Semi-arid Chenopod Woodland and Floodway Pond Herbland.

D3 Lakes Powell and Carpul Nature Conservation Reserve

This 725 hectare site includes the Lakes Powell and Carpul Wildlife Reserve (where hunting is currently excluded) and adjoining uncategorised Crown land to the south east of Robinvale. It contains at least 35 flora species of conservation significance, including the endangered Hoary Scurf-pea and Woolly Scurf-pea, as well as providing habitat for a number of threatened waterfowl species. A diverse range of EVCs including Lake Bed Herbland, Intermittent Swampy Woodland, Riverine Chenopod Woodland, Lignum Swampy Woodland, Lignum Shrubland, Chenopod Mallee and Woorinen Mallee are represented on this site.

D4 Murrumbidgee Junction Nature Conservation Reserve

Between Boundary Bend and Robinvale, the recommended Murrumbidgee Junction Nature Conservation Reserve (1223 hectares) comprises 916 hectares of the existing Murrumbidgee State Forest, 286 hectares of River Murray Reserve and the Passage Camp Flora Reserve (21 hectares). This area includes the junction of three bioregions (Robinvale Plains to the west, Murray Mallee to the south and Murray Fans to the east) as well as the confluence of the Murrumbidgee and Murray Rivers. Inland Carpet Pythons and Regent Parrots have been recorded on the site, as have 10 threatened flora species, including the endangered Grey Scurf-pea and the Dwarf Swainson-pea. The Murrumbidgee Junction Nature Conservation Reserve will contribute significantly to representation of Lignum Swampy Woodland, Lignum Shrubland, Riverine Chenopod Woodland, Shallow Freshwater Marsh and Riverine Grassy Woodland Ecological Vegetation Classes.

D5 Towaninny Nature Conservation Reserve

This 81 hectare site is the existing Towaninny Flora Reserve. Black Box wetland occupies a well-developed example of a gilgai soil—a feature that was common on Quaternary sedimentary land surfaces before ploughing became widespread. Chenopod Grassland EVC is also represented.

D6 Ninyeunook–Lalbert Creek Nature Conservation Reserve

This eight hectares site is the existing Ninyeunook I205 Bushland Reserve. It is a high quality example of Riverine Swampy Woodland/Lignum Wetland Mosaic and provides habitat for the endangered Hoary Scurf-pea. This block of Crown land is part of the Bunguluke Wetlands, Tyrell Creek and Lalbert Creek Floodplain system, which is listed on the Directory of Important Wetlands in Australia.

D7 Ninyeunook Township Nature Conservation Reserve

This five hectare site of uncategorised Crown land is located at the old Ninyeunook township site. It is an important remnant of Savannah Grassland EVC connected to larger grasslands in the district by vegetated roadsides. The reserve is likely to contain sites of some historical significance, with a plaque on the site indicating the various buildings and uses that previously occurred in the Ninyeunook village.

D8 Towaninny South Nature Conservation Reserve

This 35 hectare site incorporates the Towaninny South Flora Reserve and adjoining township land. The high quality remnant Plains Savannah has a number of significant flora species including Buloke, Bluish Raspwort, Pale Spike-sedge, Long Eryngium, Leafless Bluebush and Bush Minuria.

D9 Towaninny North Nature Conservation Reserve

This 40 hectare Lignum Swampy Woodland is the existing Towaninny I203 Bushland Reserve and is linked via a vegetated creekline to the Towaninny Nature Conservation Reserve to the south.

D10 Cannie Nature Conservation Reserve

This 16 hectare site is the existing Cannie Flora Reserve and protects relatively undisturbed Buloke woodland and associated grassland growing on calcareous clays. The vulnerable Umbrella Wattle and Buloke Mistletoe have been recorded on the site.

D11 Griffith Lagoon Nature Conservation Reserve

This 69 hectare site is the existing Quambatook Flora and Fauna Reserve, a Lignum Swampy Woodland. However the recommended name change is intended to more accurately reflect the area protected.

D12 Terrappee Nature Conservation Reserve

This new reserve totalling 18 hectares includes the Terrappee Water Supply Purpose Reserve, an unused recreation reserve and uncategorised public land. It is a significant Plains Grassland and Plains Woodland remnant, with threatened flora including the vulnerable Riverine Flax-lily, Wedderburn Wattle, Inland Pomaderris and Northern Golden Moths. Hairy Tails and Buloke also occur on the site, part of which has been subject to unauthorised cropping.

D13 Buckrabanyule Nature Conservation Reserve

This 40 hectare site is the existing Buckrabanyule Water Conservation Reserve to the north of Wychitella. It contains an area of Plains Woodland and Plains Grassland EVCs with scattered Bulokes.

D14 Wychitella North Nature Conservation Reserve

This 40 hectare site is a Water Supply Reserve to the south west of Boort. It is an important Buloke-dominated Plains Woodland, with the vulnerable Buloke Mistletoe present. Parts of the western section of this site have been illegally cropped and are now recovering.

D15 Korrak Korrak Nature Conservation Reserve

This 273 hectare site incorporates the existing Korrak Korrak Nature Conservation Reserve and Back Creek Water Frontage Reserve. The Korrak Korrak block is a high quality Chenopod Grassland and Riverine Chenopod Woodland, recently purchased for conservation. It contains a number of significant flora species, including Chariot Wheels, Cane Grass, Leafless Bluebush and Smooth Minuria. The grasslands provide likely habitat for the Plains-wanderer which has been recorded nearby. The Black Box-dominated Back Creek provides an important ecological link between the grasslands in this reserve with the Trust for Nature's Korrak Korrak Grassland Reserve and the grasslands at Yassom Swamp (now part of the recommended Leaghur-Koorangie National Park) to the north.

D16 Boort Nature Conservation Reserve

The 43 hectare site is the existing Boort Flora Reserve, north west of Boort. It contains Semi-arid Woodland, Plains Woodland and Low Rises Woodland EVCs and habitat for the Tree Goanna.

D17 Woolshed Swamp Nature Conservation Reserve

This 497 hectare site incorporates the Woolshed Swamp Wildlife Reserve, Woolshed Swamp Sheepwash Historic Reserve and disused quarry south of Boort. Listed on the Directory of Important Wetlands in Australia, Woolshed Swamp is a high value wetland for its large size, habitat diversity and lack of disturbance. The wetland is an intermittent shallow freshwater swamp fringed by River Red Gum and Yellow Box. It supports a diversity of fauna species and is a valuable waterbird breeding habitat when it contains water. Significant numbers of Pink-eared Duck and Australian Shelduck have bred here in the past. This is also the location of significant Aboriginal heritage sites.

D18 Mysia Nature Conservation Reserve

These two blocks totalling 42 hectares at Mysia are recommended to be added to the existing Mysia Nature Conservation Reserve (just outside of the investigation area). They contain significant areas of Plains Grassland and Plains Woodland, including scattered Bulokes. The inter-tussock spaces, soil cracks, natural undulations and moss and lichen cover over much of the area provide good potential habitat for grassland fauna.

D19 Lake Yando Nature Conservation Reserve

This 87 hectare site is the existing Lake Yando Wildlife Reserve to the north of Boort. It is a freshwater marsh surrounded by woodland dominated by River Red Gum and Black Box, with a herbaceous layer dominated by Southern Cane-grass.

D20 Duck Lake South Nature Conservation Reserve

This 116 hectare reserve is the southern section of the Duck Lake Wildlife Reserve, north west of Kerang. A saline wetland, the muddy edges of this lake provide habitat for wading birds. Small areas of fringing vegetation include Plains Woodland and Semi-arid Woodland EVCs. The lake and associated lunette area are sites of local geomorphological significance. The northern section of Duck Lake will continue to be available for duck hunting (recommendation G86).

D21 Winlaton Nature Conservation Reserve

This important 86 hectare Chenopod Shrubland is the existing Winlaton Nature Conservation Reserve, most of which was recently purchased by the state government. It contains the first record of Paddle Saltbush for Victoria, and other significant flora species such as Winged New Holland Daisy, Leafless Bluebush, Yakka Grass, Mealy Saltbush, Bladder Saltbush and Spiny Lignum. It adjoins high quality grassland and woodland areas protected on private land by conservation covenants.

D22 Benjeroop-Dartagook Nature Conservation Reserve

This large nature conservation reserve (totalling 1179 hectares) combines the Dartagook Wildlife Reserve (where hunting is currently excluded) (728 hectares), Benjeroop State Forest (Special Protection Zone) (336 hectares), and adjoining water frontage reserves along the Barr Creek and Loddon River. The Dartagook section is Black Box-River Red Gum forest and lignum swamp at the junction of the Loddon River and Sheepwash Creek. The Benjeroop section is an open woodland dominated by Black Box with a Tangled Lignum and Rounded Noon-flower understorey. The new reserve contributes to the representation of Riverine Chenopod Woodland and Lignum Swampy Woodland in the Murray Fans bioregion. It provides habitat for a number of significant fish species including the critically endangered Silver Perch, the endangered Murray Cod and Freshwater Catfish and the vulnerable Golden Perch. It also provides important habitat for declining woodland birds such as the Hooded Robin and Brown Treecreeper while the Grey-crowned Babbler occurs on adjoining private land. A number of rare flora species are present including Branching Groundsel, Three-wing Bluebush, Shining Glasswort, Spreading Emu-bush and Spotted Emu-bush.

D23 Tragowel Swamp Nature Conservation Reserve

The 274 hectare existing Tragowel Swamp Wildlife Reserve (where hunting is currently excluded), to the south of Kerang, contains Lignum Swampy Woodland and Lignum Swamp EVCs. Listed on the Directory of Important Wetlands in Australia, the swamp supports an ibis rookery and a number of threatened waterbird species.

D24 Plumpton's Nature Conservation Reserve

This 160 hectare block of uncategorised Crown land to the north of Kerang (locally known as Plumpton's Forest) contains a relatively large area of Riverine Chenopod Woodland EVC, with small areas of Chenopod Grassland. It provides known habitat for Curl Snake, Bush Stone-curlew and Grey-crowned Babbler. Restoration activities by local community groups have been undertaken in the past.

D25 Pyramid Creek Nature Conservation Reserve

This reserve is a 50 hectare block of uncategorised public land adjoining Pyramid Creek to the southeast of Kerang. It contains Lignum Swamp and Lignum Swampy Woodland EVCs and complements the recommended Kerang Regional Park to the north.

D26 Gladfield Nature Conservation Reserve

The 28 hectare block of uncategorised Crown land contains Chenopod Grassland EVC around a Lignum Swamp in a region with very little native vegetation remaining. The wetland area contains the rare Spiny Lignum, and the new reserve adjoins a roadside with good quality native grassland.

D27 Yarrowalla Nature Conservation Reserve

This reserve comprises a 15 hectare area of remnant ephemeral wetland area surrounding the Calivil Creek in an area where little native vegetation remains. The vulnerable Cane Grass and rare Spiny Lignum are present on the site and the wetland provides known habitat for Brolga. Some revegetation is required.

D28 Johnson Swamp Nature Conservation Reserve

This 555 hectare site is the existing Johnson Swamp Wildlife Reserve and contains Lignum Swampy Woodland and Riverine Chenopod Woodland EVCs. It is part of the internationally significant Kerang Wetlands Ramsar site and supports the endangered Freckled Duck and Inland Carpet Python and provides potential habitat for the Australian Painted Snipe. Johnson and Hird Swamps (recommendation G96) receive a guaranteed 2600 megalitres of environmental water annually provided through the Victorian flora and fauna entitlement.

D29 Gannawarra Red Gum Swamp Nature Conservation Reserve

This 148 hectare site is the existing Red Gum Swamp Wildlife Reserve (where hunting is currently excluded), to the south west of Koondrook. The wetland, which is currently dry, contains saltbush, lignum, and numerous dead River Red Gums with Lignum Swampy Woodland EVC.

D30 Rowland Nature Conservation Reserve

This 143 hectare site is the existing Rowland Wildlife Reserve (where hunting is currently excluded) on Pyramid Creek. Predominantly a wetland with saltbush and lignum, it contains areas with Black Box.

D31 Flannery Nature Conservation Reserve

This 56 hectare site is the existing Flannery Wildlife Reserve (where hunting is currently excluded), on the junction of Pyramid and Box Creeks. A Lignum Swamp with some Black Box, the endangered Grey-crowned Babbler has been recorded here.

D32 Prairie Nature Conservation Reserve

This 35 hectare site is an existing timber and public purpose reserve south of Mitiamo. It is a significant and relatively large block containing Plains Grassland, and Lignum Swamp EVCs. Connected to Bendigo Creek via Myers Creek, it provides suitable habitat for a range

of threatened flora and fauna species found on similar habitat nearby, such as Brolga and threatened grassland plant species.

D33 Tang Tang Swamp Nature Conservation Reserve

The existing 129 hectare Tang Tang Swamp Wildlife Reserve to the east of Dingee is recommended as a new nature conservation reserve. This significant River Red Gum Swamp and Plains Grassland reserve is listed on the Directory of Important Wetlands in Australia. The swamp is a known breeding site of Brolgas and nomadic waterbirds. The Plains Grassland area protects the endangered Red Swainson-pea and vulnerable Silky Swainson-pea.

D34 Thunder Swamp Nature Conservation Reserve

The existing 90 hectare Thunder Swamp Wildlife Reserve to the south east of Dingee is recommended as a nature conservation reserve. It contains part of a significant River Red Gum Swamp and a relatively large surrounding area of Plains Grassland. The nationally vulnerable River Swamp Wallaby-grass has been recorded on the site and Eastern Great Egret and Royal Spoonbill are known to use the wetland.

D35 Milloo Nature Conservation Reserve

This 61 hectare site incorporates the Milloo Bushland Reserve and adjoining uncategorised Crown land to the west of Tennyson. It contains a relatively large grassland/grassy woodland block on public land for this part of the landscape.

D36 Mount Terrick Road Nature Conservation Reserve

This site contains three small parcels of Plains Grassland totalling eight hectares linked by grasslands on the Mount Terrick Road, near Mitiamo, including a water reserve, uncategorised Crown land and unused road reserve. The rare Club-hair New Holland Daisy is found on one of these blocks.

D37 Pannoobamawm Nature Conservation Reserve

This eight hectare site is uncategorised Crown land next to the Pannoobamawm Cemetery. It contains Northern Plains Grassland with significant flora species such as Red Swainson-pea, Leafless Bluebush and Buloke.

D38 Patho Plains Railway Nature Conservation Reserve

This 92 hectare section of disused railway between Kotta and Patho is part of the Elmore–Cohuna line. It contains significant areas of Plains Grassland and provides an ecological link through the Patho Plains. Significant flora species include Red Swainson-pea, Pale Flax-lily, Umbrella Wattle and Spiny Rice-flower.

D39 Little Kotta Nature Conservation Reserve

This 19 hectare site is the existing Kotta (Torrumbarry) Bushland Reserve. It is a significant area of Plains Grassland and Plains Woodland with River Red Gum and Buloke in the overstorey.

D40 Welton Nature Conservation Reserve

This 162 hectare area of Riverine Chenopod Woodland includes the Patho Wildlife Reserve (where hunting is currently excluded) and adjoining public land water frontage reserve. It protects known habitat of the nationally endangered Winged Peppercreep and is linked to the new Gunbower National Park (Recommendation A4).

D41 Pipit Nature Conservation Reserve

This important area of Plains Grassland (33 hectares) to the west of Echuca includes the Roslynmead Natural Features Reserve and adjoining uncategorised public land and unused road reserve. It contains red soils grassland and *Juncus* grassland subcommunities.

D42 Cantwell Nature Conservation Reserve

The 30 hectare existing Millewa Nature Conservation Reserve protects an important area of Plains Grassland to the south west of Echuca. This reserve has been re-named to avoid confusion with Millewa state forest (NSW).

D43 Strathallan Nature Conservation Reserve

This small area (one hectare) of uncommitted public land contains Northern Plains Grassland with a population of the endangered Red Swainson-pea and potential habitat for the endangered Small Scurf-pea. It adjoins larger areas of grassland along the Bendigo–Echuca Railway line.

D44 Wallenjoie Swamp Nature Conservation Reserve

This 425 hectare site is the existing Wallenjoie Swamp Wildlife Reserve. The Wallenjoie wetlands are of national significance and valued for their size, rarity of wetland type, species diversity and habitat value. Wallenjoie Swamp is primarily a River Red Gum Wetland containing a variety of other EVCs, including Red Gum Swamp/Plains Grassy Wetland Mosaic, Plains Grassy Wetland, and small areas of Plains Grassland/Plains Grassy Woodland/Gilgai Wetland Mosaic. It is a known egret nesting site and has previously been a nesting area for Blue-billed Ducks.

D45 One Tree Swamp and Two Tree Swamp Nature Conservation Reserve

This new reserve combines the existing One Tree Swamp Nature Conservation Reserve, the Two Tree Swamp Wildlife Reserve (where hunting is currently excluded) and small areas of adjoining public land (totalling 856 hectares). One Tree, Two Tree and Wallenjoie Swamps are part of the Wallenjoie Wetlands complex, a closely interlinked system of deep and shallow freshwater marshes north of Colbinabbin. The wetlands are of national significance and valued for their size, rarity of wetland type, species diversity and habitat value. In particular One Tree and Two Tree Swamps provide valuable breeding habitat for Brolga. One Tree Swamp was recently purchased through the National Reserve System Program and is one of the largest Southern Cane-grass dominated wetlands in the district.

D46 Gemmill Swamp Nature Conservation Reserve

The existing Gemmill Swamp Wildlife Area (216 hectares), also known as 'Youngs Bend', is a semi-permanent freshwater wetland comprising rushes and reeds with a River Red Gum forest and some Yellow Box woodland to the north. Although the general recommendations for

nature conservation reserves exclude dogs, continued 'onleash' walking of dogs at Gemmill Swamp Nature Conservation Reserve will be permitted due to its proximity to Shepparton and the current popularity of dog walking on the walking tracks.

D47 East Wangaratta Nature Conservation Reserve

The addition of this 177 hectares of state forest, public land water frontage reserve and uncategorised Crown land to the reserve system contributes to meeting reservation targets for the endangered Riverine Grassy Woodland/ Riverine Swampy Woodland Mosaic and vulnerable Floodplain Riparian Woodland EVCs in the Victorian Riverina bioregion. Vulnerable waterbirds such as Australasian Shoveler, Hardhead, Musk Duck and Eastern Great Egret have been recorded in this reserve.

D48 Moodemere Nature Conservation Reserve

This 12 hectare site is the existing Moodemere Nature Conservation Reserve and an unused road reserve, west of Rutherglen. This recently purchased reserve contains a high quality Grey Box–Buloke Grassy Woodland community, which is threatened at the state and national levels. The Moodemere Nature Conservation Reserve provides important habitat for a number of declining woodland bird species, and the site supports the vulnerable Buloke Mistletoe. It adjoins Lake Moodemere, recommended to become part of the Murray River Park (Recommendation B3).

D49 Ryans Lagoon Nature Conservation Reserve

This 151 hectare site is the existing Ryans Lagoon Wildlife Reserve (where hunting is currently excluded) to the east of Wodonga. Listed on the Directory of Important Wetlands in Australia, Ryans Lagoon is a River Red Gum-dominated deep freshwater marsh with a rush-dominated understorey consisting of two billabongs and a small anabranch off Ryans Creek. It is a particularly good example of riverine billabongs in the upper parts of the River Murray.

D50 Bonegilla Nature Conservation Reserve

Three small bushland reserves totalling 12 hectares to the east of Wodonga are recommended to form a new nature conservation reserve. They contain examples of Grassy White Box Woodland community, part of the 'White Box–Yellow Box–Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands' community, considered critically endangered at a national level. Plant populations of endangered Wedge Diuris, and vulnerable Purple Diuris and Western Silver Wattle occur on these blocks. The land manager will need to restrict inappropriate access to this site from the abutting recreation rail trail community use area.

RECOMMENDATIONS

Nature conservation reserves

D1–D50

That new and existing nature conservation reserves, indicated on Map A and listed above, be used as such and managed in accordance with general recommendations D.

E Historic and cultural features reserves

Throughout the investigation area there are many sites associated with many thousands of years of Aboriginal history and more recent non-indigenous exploration, settlement, agriculture, timber production and mining.

Many surveys have located and recorded Aboriginal sites and places revealing an extensive array of Aboriginal cultural heritage values across a rich cultural landscape. For example River Red Gum 'scarred trees' are an important reminder of this cultural connection. Other tree species in these forests were also used, with their heritage values similarly seen through scars caused by the removal of bark—in particular Grey and Black Box. One of the most significant clusters of scarred trees occurs at Bumbang Island near Robinvale (see recommendation E2). In many areas important Aboriginal cultural heritage sites co-occur with other outstanding values: for example, the fish traps and Aboriginal mounds in Barmah forest where important biodiversity values are also known. While the new *Aboriginal Heritage Act 2006* acknowledges the central decision-making role of relevant Aboriginal groups in protecting and managing Aboriginal cultural heritage values, identifying and protecting these values is the role of all land managers.

Some 1100 sites of non-indigenous historic significance have been identified on public land in the investigation area. Many of these are buildings and transport infrastructure that remain in use today (e.g. Echuca Court house, Koondrook road bridge). There are many other sites that have not been identified in the investigation area, notably the often extensive Aboriginal cultural heritage places and landscapes. For some sites, identification places them at risk of destruction or progressive deterioration. Specific legislation exists to protect all sites from destruction and vandalism both on public and private land.

Historic and cultural features reserves are established primarily to protect places with highly significant historical or cultural values, including remnant historical features such as buildings, structures, relics or other artefacts. These reserves may also include places with no tangible onground features, such as meeting places or areas of spiritual or mythological importance. The historic and cultural heritage reserves listed below are identified for specific management that not only protects the physical elements of the place, but also enhances values through provision of visitor experiences and interpretations associated with cultural heritage. These sites have been recommended as, or to continue as, historic and cultural features reserves, historic areas or historic reserves reflecting these important values.

Many features of historic or cultural significance are included within other public land use categories such as national parks and state forest. VEAC considers that these sites can be managed to protect the historic and cultural heritage values and also provide opportunities for enhanced visitor experiences. In some places these values may form key visitor attractions to the area. For other sites, mechanisms such as zoning, listing on heritage registers and identification through planning schemes provide adequate protection and guide management practices.

Several existing historic and cultural features or historic reserves have been recommended to be included within new public land use categories. These are:

- Lock Nine Pump historic site is included in the expanded Murray-Sunset National Park (A1)
- Woolshed Swamp Sheepwash Historic Reserve (12.8 hectares) is now included in the recommended Woolshed Swamp Nature Conservation Reserve (D17)
- Major Mitchell Lagoon Historic Area (12.7 hectares) is now included in the recommended Murray River Park (B3).

Community views

Relatively few comments were made about historic and cultural features reserves during public consultation. In general, those comments were supportive of the draft proposals, with the exception of Echuca Historic and Cultural Features Reserve. Of concern to a few stakeholders was the inclusion of the area east of the Echuca–Moama bridge known as Banyula forest—an area which is seen as having relatively few historic values—with the highly visible attractions of the historic port precinct. The recommendation below retains the earlier proposal for this new reserve and provides a more detailed description of the historic values present on the site.

RECOMMENDATIONS

General recommendations for historic and cultural features reserves

E

That historic and cultural features reserves, according to their specific characteristics, be used to:

- (a) protect historic and cultural heritage values, features and sites (Aboriginal and non-indigenous)
- (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 by the land manager and compatible with (a)
- (c) protect areas with remnant natural vegetation or habitat value

and that:

- (d) timber harvesting not be permitted
- (e) low impact exploration for minerals be permitted, and mining, subject to consideration of the impact on values in (a) for each application or case
- (f) prospecting and apiculture generally be permitted
- (g) grazing not be permitted, except where required for short periods as a land management tool at the discretion of the land manager, and
- (h) the areas be permanently reserved under the *Crown Land (Reserves) Act 1978*.

RECOMMENDATIONS

Existing historic and cultural features reserves

E1–E10

That existing historic and cultural features reserves, historic areas or historic reserves indicated on Map A and listed below continue to be used as such and be managed in accordance with general recommendations E:

- E1 Psyche Bend, Kings Billabong (11 hectares)
- E2 Bumbang Island, Robinvale (570 hectares)
- E3 Boort (Old Courthouse) (0.05 hectares)
- E4 Kinypanial Creek (40 hectares)
- E5 Serpentine Creek Weir (0.04 hectares)
- E6 Cohuna (Old Courthouse) (0.1 hectares)
- E7 Days Mill, south of Murchison (4 hectares)
- E8 Echuca & Waranga Trust Irrigation Pump and Channel, Murchison (17 hectares)
- E9 Murchison Police Paddocks (9 hectares)
- E10 Happy Valley Creek, Myrtleford (1 hectare)

Notes:

1. Management of the existing Bumbang Island Historic Area (E2) should be conducted in consultation with an Aboriginal Advisory Committee established as described in recommendation R28.
2. Where appropriate, a committee of management may be appointed to manage, or continue to manage, historic and cultural features reserves in accordance with general recommendations E.

E11–E13 New historic and cultural features reserves

E11 Koondrook Historic and Cultural Features Reserve (14.6 hectares)

This new historic area encompasses significant sites and cultural heritage themes such as transport (tramway, bridges, wharf, moving goods, bridging waterways), industry (timber harvesting and water management) and unique engineering constructions (Condidorios bridge, tramway). Remnants of the former Koondrook Tramway Complex (Victorian Heritage Register H1570) run parallel to the Kerang–Koondrook Road and terminate in Koondrook. The largest intact features are the station building and Y-shaped yard, situated in the main street. Two historic bridges connect the town to the north and east: Condidorios Bridge (VHR H1799) (1906) across Gunbower Creek, and Barham–Koondrook Bridge (1904) spanning the Murray River. Other features include a pumphouse, an operational timber mill (Arbuthnot Sawmill), shipping shed and barge slipway. Together these form a historically important precinct containing many rare and possibly unique features and design.

E12 Echuca Historic and Cultural Features Reserve (115 hectares)

The Echuca Historic and Cultural Features Reserve highlights the very significant role Echuca played in the development of Victoria. It includes historical features representing several themes—goods and people, natural resources exploitation and building settlements. The reserve focuses on Echuca Wharf, a major River Red Gum timber structure and a hub of nineteenth century paddlesteamer commerce. The associated railhead—the terminus of the Murray Valley (Melbourne to Echuca) Railway—transported Murray River and Riverina produce to the Port of Melbourne. The reserve also includes the cargo shed and a functioning sawmill on the wharf, the old police station (VHR H377 currently occupied by the Echuca Historical Society museum), the railway pumping station (VHR H1053) as well as approaches to the Murray road and rail bridge.

The forested eastern portion of this new reserve consists of Macintosh's sawmill site, Shin Bone Alley and Southern Cross Village Settlement sites (HV Heritage Inventory H7825-0002, HV Database No.10233). These late 19th century settlements along the Murray River were *ad hoc*, low cost housing for timber mill and other town workers, abandoned after the 1906 floods. Today very little material evidence remains. In places timber slip rails and portions of a broad gauge railway to Macintosh's mill are present. Pepper trees, ceramic fragments and handmade brick fragments indicate the Southern Cross settlement. A footbridge near Pakenham Street and the Maidens Punt slipway (Tannery Bend) are more tangible evidence of past use. This area, known locally as Banyula forest, offers potential for interpretive nature and historic walking trails that will provide a different visitor experience to the established Echuca Wharf precinct.

Other nearby historical features, not in the recommended reserve but open to the public, include Shackells Bond Store (VHR H558), the former Star Hotel and the Port Dioramas, on Campaspe Shire land.

E13 Bonegilla Historic and Cultural Features Reserve (15.7 hectares)

Bonegilla migrant camp or reception centre (Block 19) is of both historical and social significance (VHR 1835). The original army camp was constructed in 1940 as 24 separate blocks comprising more than 800 buildings. Block 19 was converted to a reception centre for migrants of non-British origin with about 320,000 immigrants received from 1947 until it ceased operation in 1971. This site is of national significance and has important values related to the expansion of defence building activities and operations for the Second World War and later, the Vietnam War.

The majority of the area is currently reserved as a museum and for the promotion of tourism. The recommended historic and cultural features reserve includes an abutting parcel of unreserved Crown land (one hectare) and the change of reserve purpose allows the land manager to more appropriately manage and conserve the site's historical values as the primary objective. The current management body has received funding for visitor and interpretative facilities. A conservation management plan was completed prior to transfer to the Victorian Government from the Commonwealth in 1996. VEAC considers that the new

reservation purpose will not specifically alter the current management arrangements, but more closely align the reservation purpose with the key site values.

RECOMMENDATIONS

New historic and cultural features reserves

E11–E13

That the following areas, indicated on Map A be managed in accordance with the general recommendation E:

E11 Koondrook (15 hectares)

E12 Echuca (115 hectares)

E13 Bonegilla (16 hectares)

Notes:

1. Currently two authorised uses exist in the area recommended as Koondrook Historic and Cultural Features Reserve (reserve for sawmill, and a licence for residence and gardens). VEAC recommends that provision be made for continued use and management of the features on these sites where sympathetic to the reserve purpose. Should these uses no longer be required, the features of historic and cultural value on the site are to be retained and managed in accordance with the reserve purpose.
2. Where appropriate, a committee of management may be appointed to manage historic and cultural features reserves in accordance with general recommendations E. VEAC notes that there are existing committees of management over some of these reserves.

F Reference areas and heritage rivers

Three categories of land use overlay are defined by legislation: reference areas, heritage rivers and declared water supply catchments (see H: Water production, drainage and distribution areas). Recommendations are presented below for the continuation of existing reference areas and heritage rivers in the investigation area. For some of these areas, there are changes recommended for the underlying public land use category.

Reference areas

Reference areas are relatively small areas of public land containing viable samples of one or more land types that are relatively undisturbed and that are proclaimed under the *Reference Areas Act 1978*. Reference areas are generally located away from access tracks and not used by the public. Such areas are set aside as a reference for the comparative study of land, particularly in relation to problems arising from land uses. The primary management objective of reference areas is that natural processes should be allowed to continue undisturbed and that areas should remain in as natural a state as possible.

Within reference areas, only activities associated with protecting the natural processes of the area, emergency operations or approved research are permitted. Grazing, mineral exploration, mining, harvesting of forest produce, apiculture, quarrying, educational activities and recreational activities are specifically prohibited in reference areas. Access is restricted to authorised researchers and people undertaking management tasks or emergency operations, as well as those with Ministerial approval. Reference area management plans typically define a surrounding buffer area on public land which restricts land uses that may have a detrimental effect on the reference area. Buffer widths vary depending upon the specific activity.

There are six existing reference areas in the investigation area. All but one of these currently overlay national or state parks. Tarpaulin Bend Reference Area is at present within state forest. In the recommendations above, the area of state forest encompassing Tarpaulin Bend is an addition to Murray–Kulkyne Park (recommendation B5), and the two reference areas within Barmah State Park are included in the new Barmah National Park (recommendation A7). Therefore all reference areas in the investigation area are recommended as overlays to either national or other parks under the *National Parks Act 1975*. A brief description of the land values in each reference area is provided below.

The two largest reference areas, Toupnein Creek (1659 hectares) and Lake Wallawalla (996 hectares), are within the existing Murray–Sunset National Park in the Murray Scroll Belt bioregion. Toupnein Creek Reference Area is located on a floodplain and higher alluvial plain adjoining the Murray River and vegetated with largely depleted ecological vegetation communities (EVCs) dominated by Riverine Chenopod Woodland with a Black Box overstorey, Low Chenopod Shrubland, Alluvial Plains Semi-arid Grassland and some areas of Lignum Shrubland or Lignum Swampy Woodland. Grassy Riverine Forest, Floodway Pond Herbland and Shrubby Riverine Woodland, form areas of River Red Gum forest, swampy woodlands and ephemeral wetlands. This area uniquely supports floodplain vegetation in a semi-

arid environment. Lake Wallawalla Reference Area is located on red-brown duplex soils of the higher alluvial plains, but includes both a lunette and a portion of the River Murray floodplain. Depleted EVCs Riverine and Semi-arid Chenopod Woodlands, with either a Black Box or Belah/Buloke or native pine overstorey, and alluvial rise Low Chenopod Shrubland are represented here.

Tarpaulin Bend Reference Area is located on the grey clays of the present floodplain of the River Murray in the Robinvale Plains bioregion. Tarpaulin Bend is unique amongst reference areas being located on a meander of the River Murray. The area was isolated as an inlier within New South Wales when the river cut a new course to the south of the meander. It is predominantly River Red Gum forest and Black Box Riverine Chenopod Woodland, and is a good representation of the mid-mallee vegetation communities of the River Murray floodplain. Other EVCs include Shrubby Riverine Woodland, Lignum Shrubland, Floodway Pond Herbland, Grassy Riverine Forest, and Intermittent Swampy Woodland.

VEAC acknowledges that there are some difficulties associated with management of unauthorised access (recreation and pest animals) in this area. Council considers that although there are some issues specific to this reference area, particularly access from New South Wales, it is likely that there are other reference areas across the state that require comparable management effort. The range of values provided by Tarpaulin Bend Reference Area should be retained. Any revision of reference area values and management would be best undertaken within a broader context. Additional resourcing and innovative solutions may be required to ensure that this unusual land feature, located along the River Murray, is managed in accordance with the existing reference area overlay as part of Murray–Kulkyne Park.

Chalka Creek Reference Area is on a flat floodplain consisting of clay, sand and sandy clay with shallow channels within the existing Hattah–Kulkyne National Park (recommendation A2). Vegetation is River Red Gum and Black Box woodland, and the area is flooded by overflow from the River Murray along Chalka Creek although this has not occurred since the early 1990s. The dominant ecological vegetation classes in this reference area—Riverine Chenopod Woodland and Riverine Grassy Woodland—are both depleted in the Robinvale Plains bioregion.

Top Island and Top End Reference Areas are within the existing Barmah State Park. Inclusion in the recommended Barmah National Park and removal of domestic stock grazing will provide greater security for these reference areas. Both reference areas are located on floodplains subject to relatively frequent flooding by the River Murray and contain vegetation communities that are depleted or vulnerable in the Murray Fans bioregion. Top Island Reference Area vegetation consists of an open River Red Gum forest with an understorey of Moira Grass, Warrego Summer-grass, Swamp Wallaby-grass and Common Spike Rush. The area consists largely of Riverine Swamp Forest/Tall Marsh Mosaic, Tall Marsh and Grassy Riverine Forest EVCs. A number of other EVCs, including Riverine Grassy Woodland and Rushy Riverine Swamp comprise about a fifth of this reference area and are of limited extent outside Barmah Forest. Also present are tall closed grasslands of

Giant Rush and grasslands dominated by Moira Grass. Top End Reference Area is dominated by River Red Gum open forest with an understorey of Terete Culm-sedge and Warrego Summer-grass. Sedgy Riverine Forest, Riverine Swamp Forest and a mosaic of these EVCs comprise most of this reference area. Some areas have Terete Culm-sedge in association with Warengo Summer-grass and Swamp Wallaby-grass or Grey Box in the endangered Plains Woodland EVC.

Community views

Relatively few comments were made about reference areas during public consultation. Those few comments were supportive of existing reference areas and restated the need for improved management arrangements to retain the integrity of these areas. As such, inclusion in national or other parks was seen as an appropriate and effective approach to improving and assisting future management of reference areas.

RECOMMENDATIONS

Reference areas

F1

That the following areas, totalling 3721 hectares, shown on Map A, continue to be used as reference areas proclaimed under the *Reference Areas Act 1978*:

- (a) Toupnein Creek (1659 hectares)
- (b) Lake Wallawalla (996 hectares)
- (c) Tarpaulin Bend (436 hectares)
- (d) Chalka Creek (329 hectares)
- (e) Top Island (177 hectares)
- (f) Top End (124 hectares)

Notes:

1. VEAC notes that fencing and management actions are required to restrict stock access to Tarpaulin Bend Reference Area from New South Wales.

Heritage rivers

Victoria's 18 heritage river areas were established under the *Heritage Rivers Act 1992* to protect those river corridors with outstanding values for current and future generations. The areas identified have at least four values of state or greater significance focussed on the biodiversity, recreational, cultural heritage and scenic values. New and extended impoundments, barriers and impeding structures are prohibited in all heritage river areas to retain their free-flowing condition and protect native fish habitat, recreational canoeing or scenic values. Other recommended uses must also be appropriate to protect the rivers' heritage values. The Goulburn and Ovens Rivers are the only designated heritage river areas in the investigation area.

Both heritage river areas contain significant River Red Gum vegetation communities providing habitat for threatened

flora and fauna species and a high native fish diversity including Murray Cod. These rivers are also very scenic, popular for recreational fishing and have significant cultural heritage sites within a substantially cleared landscape.

The Goulburn River Heritage Area extends 430 kilometres downstream from Lake Eildon to the River Murray near Echuca. The Goulburn is a highly regulated river, with water stored at Lake Eildon and Goulburn weir and then diverted downstream for irrigation. By contrast the Ovens River Heritage Area—extending from Killawarra to the River Murray confluence with Lake Mulwala—is the only unregulated large river in the investigation area. The vegetation along this corridor is highly significant, especially because of the intact understorey of Silver Wattle and River Bottlebrush. In 2002 the Victorian River Health Strategy highlighted the Ovens River—together with the Mitchell River in Gippsland—as very high value, relatively intact, large, natural and entire river systems and recognised that these areas need to be managed in order to protect these values.

VEAC's recommendations include these heritage river areas largely in new national parks. This reflects the significant ecological importance of these corridors, particularly in the face of climate change, and ensures future management retains a high standard of river health. Draft management plans for these rivers were released for comment in 1997, but were not finalised. In 2006 changes to the heritage rivers legislation updated the management plan provisions and acknowledged the role of other public land plans or strategies in managing heritage river areas. Regional river health strategies have been prepared by catchment management authorities for the Goulburn and Ovens Rivers, which establish regional priorities for river protection and restoration of heritage river values.

Community views

Relatively few comments were made about heritage river areas during public consultation. The inclusion of these areas in national parks was viewed as a way of ensuring protection by retaining the free flowing condition of the rivers and providing native fish habitat, recreational and scenic values. Retaining access to these river corridors for recreation was also important, particularly for recreational fishers. Some adjoining land owners and licensees—particularly along the Ovens River where environmental management plans have been established in partnership with the North East Catchment Management Authority—were supportive of improved heritage river management although some did not support inclusion of these areas in national parks because of perceived management or resourcing inadequacies.

RECOMMENDATIONS

Heritage rivers

F2

That the following areas, as described on Schedule One of the *Heritage Rivers Act 1992* and totalling 20,410 hectares, continue to be used as heritage river areas proclaimed under the *Heritage Rivers Act 1992*:

(a) the Goulburn River Heritage Area (16,660 hectares)

(b) the Ovens River Heritage Area (3750 hectares)

Notes:

1. Some 2650 hectares of the Goulburn Heritage River, outside the investigation area, should be managed in a manner consistent to that area described above.

G Natural features reserves

Natural features reserves include public land use categories with a variety of natural features worthy of protection, including scenic areas, bushland, lakes, rivers and streams, geological and geomorphological features. Protection of these particular natural features is the primary focus of the reserve, however a variety of opportunities for recreation and other uses may also be provided, including duck hunting in selected reserves such as wildlife areas (state game reserves).

Although the values present on these reserves are worthy of protection, they are typically not as significant as those within national or state parks and nature conservation reserves and may be more resilient to a higher level of recreation activity or minor resource use. Many of these areas are relatively small parcels of vegetated public land or in linear strips along waterways.

Some 27,161 hectares of public land are recommended to be included in this grouping in the investigation area, within the following subcategories:

- bushland areas
- streamside areas
- wildlife areas (seasonally available for hunting and sometimes known locally as state game reserves)
- public land water frontages
- stream beds and banks.

Those areas previously in River Murray Reserve, highway park and lake reserve categories are incorporated into various other public land use categories in this investigation area. VEAC recognises the importance of the River Murray corridor and recommends that the majority of public land river frontage be added to either the new Murray River Park (recommendation B3), or national parks.

Smaller strips and areas of bushland are also important habitat links across a fragmented landscape. Some reserves are small pockets of remnant vegetation in largely cleared agricultural land. In particular, public land water frontages and streamside areas provide important corridors for the movement of native plants and animals both seasonally and during changing climatic conditions. The general recommendations for natural features reserves present a strategic shift in the use of these areas by removing or phasing out domestic stock grazing (see recommendation R38) and excluding timber harvesting in all natural features reserves. Degradation of wetlands and lakes through salinisation and unnatural water regimes is a major land management issue throughout the investigation area, and particularly in the Kerang lakes area. With water production requirements also dictating the management of these areas, it is important for the environmental needs of wetlands and natural lakes to be taken into consideration. These wetlands should receive a sufficient water regime to enhance the ecological, aesthetic and recreational potential of these sites (see environmental water recommendations R13–R20).

Community views

Few submissions commented on bushland areas, or stream beds and banks. Issues relating to the detail of these categories or specific proposals were considered by VEAC in formulating the recommendations presented below.

The issue of wetlands, and specifically access for duck hunting, drew a large number of submissions, some calling for further protection of wetlands, but the majority opposing loss of access to hunting opportunities. The opposition was mainly at a broad level and rarely specified which wetlands were more important. Many such submissions erroneously represented the number of wildlife areas (including state game reserves) being lost to hunting under the draft proposals. These comments are discussed in more detail in Part A Chapter 1 (Response to main issues in submissions).

The practicality of removing grazing from riparian public land water frontages including the length of a phase out period, implementation costs and ongoing management, especially related to flood damage, were highlighted in public consultations as an area for consideration. Additionally the desirability of adjoining landowner licensees maintaining a 'stewardship' relationship with the licence area, even in the absence of grazing, and ongoing management responsibilities including resourcing was raised.

Response

VEAC acknowledges the role of hunting groups in conservation and management, particularly state game reserves (wildlife areas). Improved environmental watering will improve environmental values and increase hunting opportunities in wetlands that are available for hunting but that would otherwise likely be dry.

VEAC is required under s.18(d) of the VEAC Act to have regard for 'the need to provide for the creation and preservation of a comprehensive, adequate and representative system of parks and reserves within the State of Victoria'. Despite a large proportion of wetlands in the investigation area being included in the Ramsar Convention and listed on the Directory of Important Wetlands, these provisions afford no specific legislative protection in Victoria. In addressing the under-representation of wetlands in parks and reserves, a 'paired approach' has been adopted to spread geographically both the impact on, and opportunities for, recreational hunting. This approach allows for a 'wildlife refuge' conservation reserve to be located in close proximity to a wildlife area (state game reserve) and seeks to ensure that environmental water is allocated to both conservation and wildlife areas located within a single hydrological system. VEAC believes that the provision of environmental water to the investigation area will significantly enhance recreational hunting opportunities and outweigh any reduction in area available for such activities.

The economic costs and benefits of removal of stock grazing from streamside and public land water frontages is discussed in more detail in Part C and appendix 1. Fencing costs may be considered as part of the implementation of recommendations (see general recommendation R2), although a significant length of fencing is currently in place along licensed frontages. Current programs conducted by CMAs can readily achieve stock exclusion given appropriate resources. Costs associated with survey of the Crown-freehold land boundary (along which any fencing should be installed) are likely to be mitigated by the provision of digital cadastral mapping and survey-corrected digital imagery.

RECOMMENDATIONS

General recommendation for natural features reserves

G

That the natural features reserves, according to their specific characteristics:

(a) be used to:

- (i) protect natural features and values
- (ii) protect and restore areas with remnant vegetation or habitat value and conserve native flora and fauna
- (iii) protect water quality where appropriate,
- (iv) provide protection for historic and Aboriginal cultural heritage features, values and sites
- (v) provide opportunities for education and recreation, including hunting where specified below, at levels consistent with (i) to (iv) above
- (vi) maintain scenic features and the character and quality of the local landscapes, and
- (vii) preserve features of geological or geomorphological interest;

and that:

- (b) timber harvesting not be permitted
- (c) exploration for minerals be permitted, and mining, subject to decisions on particular cases
- (d) prospecting and apiculture generally be permitted
- (e) domestic stock grazing not be permitted as specified in general recommendation R38
- (f) unused road reserves adjoining natural features reserves be added to those reserves where appropriate ecological or recreational values are identified, and
- (g) they be permanently reserved under the *Crown Land (Reserves) Act 1978*.

Notes:

1. The above management objectives and summary land use recommendations are those that generally apply for the land use category. Exceptions to these may apply to specific reserves in special circumstances.
2. Stock grazing contracted for ecological purposes or for short-term management purposes such as targeted weed control may be permitted by the land manager where required.
3. Apiculture sites should be located away from picnic areas, car parks, walking tracks and other focal points for recreation.
4. On-ground management may be assigned or delegated to organisations or institutions other than DSE, such as committees of management, under licence or other arrangement subject to review of management effectiveness.
5. Several natural features reserves have values other than those related to their primary use, that are worthy of specific protection.

Bushland areas

Many bushland areas are typically small Crown land reserves often containing remnant native vegetation in a largely cleared landscape. In the past these areas may have provided camping and watering points for travelling stock, and opportunities for passive recreation in relatively natural surroundings. Many of the new and existing bushland areas reflect a history of past land use (e.g. stock watering or disused railways). Although these areas typically do not have highly significant values, remnant native vegetation and wetlands are of increasing importance for nature conservation. This is particularly the case in areas of intensive agriculture and broadscale land clearing.

The 59 new and retained bushland areas comprising some 3396 hectares are shown on Map A and listed in appendix 8.

RECOMMENDATIONS

Bushland areas

G1–G59

That existing and new bushland reserves, shown on Map A and listed in appendix 8, be used in accordance with the natural features reserves general recommendations G.

Streamside areas

Streamside areas are typically scenic and accessible reserves adjoining rivers and streams. Often these areas are located where a wider section of public land is intersected by a road or stream crossing. Originally set aside for passive recreation such as picnicking and camping, these areas are also ecologically important protecting riparian vegetation along watercourses. The ecosystem services provided by streamside areas and riparian public land more generally will have greater significance in the future under the predicted climate change impacts of less rainfall leading to reduced runoff, more erratic rainfall and average higher temperatures. The streamside areas recommended in this investigation area encompass those existing streamside areas, and new areas comprising existing state forest, public land water frontage and stream beds and banks. Domestic stock grazing is recommended to cease in streamside areas (see general recommendation R38).

The 22 retained and new streamside areas comprise some 2145 hectares and are shown on Map A and listed in appendix 8.

RECOMMENDATIONS

Streamside areas

G60–81

That existing and new streamside areas, shown on Map A and listed in appendix 8, be used in accordance with the natural features reserves general recommendations G, and:

(a) where appropriate, be used for more intensive recreation such as camping, at the discretion of the land manager and where this does not conflict with the maintenance of the water quality in the adjacent stream.

Wildlife areas

Wildlife areas within the investigation area are typically wetlands (often known as ‘state game reserves’) which are seasonally available for hunting. These areas protect the habitat of wetland plants and animals. There are currently 32 wildlife reserves in the investigation area, the majority in the Kerang area, in which seasonal hunting is permitted. Those wildlife areas in which hunting is not permitted are reclassified as nature conservation reserves (if they have not been added to other land categories) (see recommendations D1–D50).

VEAC has endeavoured to retain access to numerous wildlife areas (including those previously designated as state game reserves) for recreational hunters. Accordingly, 23 wetlands are recommended as wildlife areas including high value recreational hunting sites such as Cullens Lake, Hird Swamp, Lake Murphy, Mansfield Swamp, Gaynor Swamp and Reedy Swamp (Shepparton). The 23 retained and new wildlife areas comprising some 5738 hectares are shown on Map A and listed in appendix 8.

RECOMMENDATIONS

Wildlife areas

G82–G104

That existing and new wildlife areas, shown on Map A and listed in appendix 8, be used in accordance with the natural features reserve general recommendations G, and:

(a) to conserve and protect species, communities or habitats of indigenous animals and plants

(b) for public recreation (including hunting in season as specified by the land manager) and education, where this does not conflict with the primary objective, and

(c) be reserved under the *Wildlife Act 1975* as state game reserves for the purpose of hunting.

Public land water frontages

Public land water frontages comprise long, narrow corridors of Crown land along major streams and rivers. Many of these areas were set aside in 1881, although some streams have a discontinuous Crown frontage. On the Northern Plains, these linear reserves—along with vegetated road reserves—provide much of the remaining habitat for many threatened species. Water frontage reserves are also an important recreation resource, particularly for bushwalking, fishing and hunting. Public land water frontages and riparian land more generally play an important role in maintaining stream health and water quality. This service will be particularly important in areas where climate change affects rainfall and reduces runoff. Retention of riparian vegetation, strengthens habitat corridors, improves water quality and river ecology and reduces water pollution. These environmental and economic effects are likely to be most beneficial in lower catchment areas, but all adjoining landowners are likely to gain from a reduction in bank erosion, improved soil structure and enhanced stream health, water quality and ecosystem services.

Many public land water frontages are currently licensed to adjoining land holders, mostly for grazing and stock watering. It has long been the practice of river health managers to recommend the exclusion of stock from near-riparian areas. VEAC recommends a significant shift in the management priorities for public land water frontages in keeping with the process established by catchment management authorities to fence off and revegetate these areas. As described in the general recommendations, domestic stock grazing is to be phased out of all public land water frontages over the next five years (general recommendation R38). Licence holders should be encouraged with an incentive scheme structured to advantage those who complete fencing and stock exclusion early in the phase out period, particularly for those along high value riparian corridor ‘river reserves’, and high priority reaches identified by catchment management authorities. Costs and benefits associated with this shift in management are described in more detail in chapter 4 and appendix 1.

The public land water frontages recommended in this investigation area encompass adjoining stream beds and banks. Recommended public land water frontages along the Avoca, Loddon, Campaspe, Goulburn, Ovens, King and Kiewa Rivers are high value riparian corridors to be known as ‘river reserves’ (appendix 8).

RECOMMENDATIONS

Public land water frontages

G105–G112

That public land water frontages including those to be known as 'river reserves', where not otherwise recommended for a specific use, be used in accordance with the natural features reserves general recommendations G, and to:

- (a) conserve native flora and fauna as part of an integrated system of habitat networks or corridors
- (b) protect adjoining land from erosion, and provide for flood passage
- (c) provide access for recreation (including hunting where appropriate) at levels of use consistent with (a) to (b) above and that:
 - (d) catchment management authorities, in cooperation with adjoining landholders, implement programs to gradually restore frontages on currently grazed, degraded, eroded or salt-affected streambanks, where frontage vegetation is degraded or not regenerating and to protect natural, cultural, recreational and scenic values or water quality
 - (e) programs to restore frontages be implemented according to local priorities and a practical timetable, with particular emphasis on the Victorian Riverina bioregion
 - (f) where frontages adjoin farmland, fencing and offstream stock watering points be encouraged by appropriate support
 - (g) where stream frontage vegetation is to be restored, particularly in cleared or degraded areas, native trees, shrubs and ground species be planted, using stock of local provenance
 - (h) where appropriate, suitable areas for more intensive recreational use be identified and facilities established
 - (i) where land exchanges are recommended that involve frontage land that is no longer adjacent to rivers, efforts be made to prevent loss of any nature conservation or other values of this land from the public land estate
 - (j) no new licences for domestic stock grazing be issued, and that existing licences be systematically reviewed, with a view to completing the phasing out of domestic stock grazing within five years in accordance with recommendation R38
 - (k) where a Riparian Conservation Licence has been issued for a public land water frontage (see recommendation R39), recreation use by the public for activities such as walking, nature observation or fishing be permitted, while motorised forms of recreation not be permitted (except for launching of boats)
 - (l) licensees be required to provide stiles in any fences erected across their licence area if requested to do so by the land manager
 - (m) no new cultivation of stream frontages for agriculture be permitted in accordance with recommendation R38, and areas currently cultivated be revegetated
 - (n) sand and gravel extraction may be permitted by the land managers where this is consistent with the above uses, and where necessary for bed and bank stability, and
 - (o) public land water frontages be managed by the relevant catchment management authority and the Department of Sustainability and Environment, and in accordance with general recommendation R39 for Riparian Conservation Licences where applicable.

Note:

1. Short-term grazing may be contracted for ecological or management purposes such as targeted weed control.

Stream beds and banks

The beds and banks of many watercourses are deemed to have remained Crown land under the *Water Act 1905* and subsequent Acts. Stream bed and bank recommendations apply to watercourses outside other major public land use categories, whether or not there is an adjoining public land water frontage, where the watercourse forms the boundary between allotments. In many cases, current stream beds and banks have been recommended as part of an adjoining public land use category.

RECOMMENDATIONS

Stream beds and banks

G113

That stream beds and banks, subject to other relevant recommendations, guidelines and statutory requirements, be used in accordance with the natural features reserves general recommendations G, and to:

- (a) conserve or restore habitat for native flora and fauna
- (b) provide for appropriate recreational activities (including hunting where appropriate) at levels of use consistent with (a)
- (c) provide for flood passage and drainage requirements of adjacent land
- (d) provide, where necessary, for the passage of artificial flows of water stored within the catchment or transferred from other catchments
- (e) maintain streams in a stable condition using environmentally sound techniques, and
- (f) provide a source of sand and gravel where this does not conflict with the above.

H Water production, drainage and distribution areas

From a water industry perspective, water production includes harvesting, storing and distributing water from local catchments. However, from a public land use perspective this category also includes water storage areas, bores, off takes, diversion weirs, pump intakes and associated buffer areas that obtain their supply from catchment flows. The River Red Gum Forests Investigation area includes few areas that are solely used for collection of water or water production. Many of the large water bodies in the investigation area serve as holding basins for distribution and storage of water derived from a distant catchment source or as salinity disposal basins. These distribution or holding facilities and channels, storage tanks, and most drainage or flood protection channels are described here as the water distribution and drainage public land use category (see J Services and Utilities Areas).

Many of the Kerang lakes are utilised for water distribution via a linked series of channels and lakes that include areas reserved as wildlife and nature conservation reserves. In this area water is moved through a series of previously natural lakes connected by both natural and constructed waterways or channels. Water is also pumped directly from the River Murray into some of these storage basins. Management of water is important in this region, most notably for primary industry and the environment. The role of water for environmental purposes is described in greater detail in general recommendations for environmental water (chapter 1).

The precise boundaries of the water production areas and, in particular, the buffer strips surrounding the defined facilities, are normally defined in detailed plans called special area plans (or pre-existing 'land use determinations') following the declaration of 'special water supply catchment areas' under the *Catchment and Land Protection Act 1994*. Parts of two declared water supply catchments currently exist and are recommended to continue in the investigation area—Lake Hume and Ovens River (upstream of Wangaratta). Access to domestic water supply storages should generally be restricted to protect and retain high water quality and yield.

There are significant areas of public land currently used to support irrigation industries in the Murray and Goulburn Valleys. Many of these areas also support significant biodiversity, historic, recreational and other values and are managed by water authorities. VEAC believes that the relevant water authorities should continue to manage such areas in a way that is sympathetic to these other secondary values.

Community views

Relatively few comments were made about water production, drainage and distribution areas during public consultation. In general, those comments received were supportive of the draft proposals, with additional detailed information provided proposing minor boundary adjustments considered. Of concern to some stakeholders was their ability to retain access to commercial water use, water supply, flood mitigation or recreation activities in areas that had a new primary use recommended such as nature conservation reserve or national park.

The importance of nature conservation, protection of ecological values and cultural heritage in water production, drainage and distribution areas was raised by some stakeholders.

RECOMMENDATIONS

General recommendations for water production areas

H1

That water production areas; storage areas, diversion works and associated facilities; protective buffer zones around diversion works and storages where defined in a special area plan; and any other public land considered necessary, as shown on Map A be used for:

- (a) water supply purposes
- (b) other activities permitted by the water supply authority after consultation with the Department of Sustainability and Environment, and other agencies, as appropriate
- (c) the protection of natural and cultural heritage values, and
- (d) unless otherwise securely reserved, these areas be permanently reserved under the *Crown Land (Reserves) Act 1978* for water supply purposes and be managed by the water supply authority.

General recommendations for water distribution and drainage areas

H2

That water distribution and drainage areas and associated facilities; and any other public land considered necessary, as shown on Map A be used for:

- (a) storage and distribution of water for irrigation and domestic supply purposes
- (b) flood mitigation purposes
- (c) salt drainage or disposal purposes
- (d) other activities permitted by the water supply authority after consultation with the Department of Sustainability and Environment, and other agencies, as appropriate
- (e) the protection of natural and cultural heritage values, and
- (f) unless otherwise securely reserved, these areas be permanently reserved under the *Crown Land (Reserves) Act 1978* for water distribution and drainage purposes and be managed by the water supply authority.

Notes:

1. Several large water storage areas not primarily used for domestic water supply are also used for water-based recreation. This may continue except where it results in deteriorating water quality.

I Community use areas

Community use areas are primarily used for education, recreation or other specific community purposes. Many are within towns and are used for purposes such as sporting ovals, public gardens, playgrounds and camping areas. The majority of these reserves are managed by local committees of management providing a focus for community activities (in accordance with the general recommendations I). Some contain small areas of remnant vegetation that contribute to local habitat and landscape values. Community use areas include:

- Recreation areas—mostly small reserves close to townships with facilities for organised sports and informal recreation, e.g. sports ovals, shooting ranges, speedways, public golf courses
- Parklands and gardens—small intensively used community parklands, playgrounds and ornamental gardens
- Buildings in public use—such as schools, public halls, court houses, police stations, and
- Education areas—specifically set aside as reserves where students can study natural ecosystems, practice methods of environmental analysis or field techniques, and conduct simple natural science experiments. While nature study is permitted on most areas of public land, use is usually restricted to passive forms, mostly relying on observation.

There are many existing community use areas within the investigation area, the majority of which are within or nearby townships. VEAC recognises the value of these public open spaces and community facilities and recommends that those currently in use largely be retained. These areas are not individually listed but can be viewed in detail on the public land use maps of recommendations for major townships in the investigation area (see Map C in pocket at rear of this report). New community use areas and those for which there are substantial changes recommended are described below.

Community views

Relatively few submissions were received for community use areas. Specific comments were made about the inclusion, exclusion or exemption of locations from this public land use category. In particular there were a number of submissions supporting a reconfiguration of public land use adjoining Lake Cullulleraine, Swan Hill Pioneer Settlement Museum, Moira park scout camp south of Shepparton, and a few public golf courses. In general the Barmah Forest Community Use Area was supported, but some stakeholders called for the handback of this area to the Traditional Owners.

RECOMMENDATIONS

General recommendations for community use areas

I

That new and existing community use areas be used for recreation, parks and gardens, buildings for community purposes and education; and

(a) appropriate facilities be provided

(b) where relevant, and where compatible with the above, features of cultural significance, natural surroundings and the local character and quality of the landscape be maintained or restored

(c) harvesting of forest products, hunting and 'stone' extraction, as defined in the *Extractive Industries Development Act 1995*, not be permitted

(d) be reserved under the *Crown Land (Reserves) Act 1978*,

Note:

1. The Pine Grove Recreation Reserve contains significant Plains Grassland values which should be protected.
2. Where appropriate, a committee of management may be appointed or continue to manage community use areas in accordance with the general recommendations I.

riverine regions including the paddlesteamer Gem (VHR 1742). The Gem— one of the largest paddlesteamers on the Murray River— was once owned by the Chaffey brothers of Mildura and operated from 1876 until the early 1950s. It is technologically important as an example of an iron-framed River Red Gum planked vessel designed for river use and forms the focal point of the museum. The settlement area includes nature walks and various interpretative materials. The museum is currently operated under contract for Swan Hill Rural City Council and this arrangement should not be affected by the recommended change to a community use area.

I4 Spence Bridge Education Area

Education areas are specifically set aside as reserves where students can study natural ecosystems, learn environmental analysis and field techniques and conduct long term experiments. Environmental education is the long term primary land use. Education areas are usually selected to show both areas of undisturbed natural vegetation as well as areas which have been altered by activities such as timber production and agriculture. Appropriate facilities, including accommodation, may be established onsite or be located nearby.

Two of the three existing education areas are recommended for inclusion in other public land use categories. Spence Bridge Education Area is recommended as a smaller area with new boundaries encompassing the popular Treetops scout campsite and buildings. The smaller community use area will continue to provide for a range of recreation activities in a natural setting and opportunities for study of natural ecosystems or environmental education. Wemen Education Area is included in Hattah–Kulkyne National Park (recommendation A2) and Darling Junction Education Area is encompassed within Murray River Park (recommendation B3)

I5 Little Lake Boort Recreation Area

The area adjoining and including Little Lake Boort is currently used for recreation. Facilities on the site include buildings, caravan and camping areas, swimming pool, picnic facilities and tennis courts. Also within this precinct is a water treatment area. VEAC recommends that the area encompassing the water treatment plant be categorised for water production, while the remainder is allocated to a community use area primarily for recreation. A rifle and clay target shooting range with an associated clubhouse, are also recommended as part of Little Lake Boort Recreation Area.

I6 Barmah Forest Community Use Area

Approximately 22 hectares around the Dharnya Centre and muster yards is recommended as a new community use area to accommodate a broad range of activities and uses. The existing Barmah Forest Community Use Area comprises 5.7 hectares around the Dharnya Centre and associated buildings in Barmah forest, but excludes the muster yards. The area is reserved under the *Forests Act 1958* for 'special purposes'. The existing buildings and cultural heritage information and services at this 'gateway to Barmah Forest' have the potential to be further developed as a visitor information and cultural heritage node for the surrounding new Barmah National Park (recommendation A7). Such a node might also include some commercial activities.

I1–I7 Recommended new and modified community use areas

I1 Lake Cullulleraine Community Use Area

Lake Cullulleraine township is located on the southern shores of a large, artificially maintained water storage of the same name. Much of the existing community use area is cleared with many access tracks and intensive recreation use in some parts. VEAC recommends an expansion of the community use area to encompass most public land abutting the lake in keeping with recent detailed township planning undertaken by the local municipality and to retain existing community use.

I2 Gadsen Bend Rifle Range Community Use Area

Gadsen Bend Rifle Range is a licensed area within state forest, near Robinvale. The recommended Gadsen Bend Rifle Range Community Use Area is a long narrow, mostly cleared area (20.7 hectares) with many access tracks. It abuts the new Gadsen Bend Park (recommendation B6) to the west and south and is bounded by private land to the east. Community safety in the adjoining new park should be a priority and every effort should be made to revegetate land that is not directly used for the rifle range.

I3 Swan Hill Pioneer Settlement Museum Community Use Area

Swan Hill Pioneer Settlement Museum is located on public land fronting the Little River Murray in Swan Hill. This area is a major tourist attraction and displays a range of cultural heritage artefacts relating to the mallee and

17 Moira Park Community Use Area

Currently an area of the Goulburn River state forests known locally as Moira Park is utilised for a number of recreation activities based around a scout camp. An area encompassing the licensed scout camp is recommended as a community use area to provide for existing use to continue.

RECOMMENDATIONS

New or modified community use areas

11–17

That new or modified community use areas indicated on Map A and listed below be used as such and managed in accordance with general recommendations 1:

- 11 Lake Cullulleraine Recreation Area (355 hectares)
- 12 Gadsen Bend Rifle Range Community Use Area (21 hectares)
- 13 Swan Hill Pioneer Settlement Museum Community Use Area (35 hectares)
- 14 Spence Bridge Education Area (3.5 hectares)
- 15 Little Lake Boort Recreation Area (119 hectares)
- 16 Barmah Forest Community Use Area (22 hectares)
- 17 Moira Park Community Use Area (5.8 hectares)

J Services and utilities areas

Numerous utilities are located on public land, such as transport, communications, cemeteries, water, sewerage, waste disposal, electricity and gas and other services. Within townships there are hospitals, schools and municipal buildings, depots and other utilities on public land. Many of these areas are too small to be displayed on Map A or the detailed township maps.

Some of these reserves have other important values. This is particularly the case for roads and railways which, together with water frontages, provide a habitat network across the largely cleared or fragmented landscape of farmland and townships. Narrow avenues of large old trees have scenic appeal along many roadsides in the investigation area. These corridors may house small remnants of rare vegetation types and provide key habitat not only for species that live in large old trees, but also for understorey species in ungrazed areas. Additionally many important geological sites are exposed in road and railway cuttings.

Land managers and local municipal councils have put a great deal of effort into assessing and managing natural values on road and railway reserves. Public land managers should continue to protect these important biodiversity and other natural values. Where the area is no longer required for service and utilities, the primary management objective should be assessed and the capability for other public use considered.

Community views

No new proposals were made specifically for the services and utilities public land use category. A small number of stakeholders supported the general recommendations.

RECOMMENDATIONS

General recommendations for services and utilities areas

J

That reserves and easements for public services and utilities such as transport, electricity and gas, communications, cemeteries, water and sewerage be used for those purposes, and that

- (a) new services, or utility sites and easements or lines, not be sited in or across reference areas, and wherever possible not be sited in or across national or other parks or nature conservation reserves
- (b) railway lines and other service and utility sites be managed to protect natural values including remnant vegetation and habitat, as far as practical
- (c) organisations responsible for road reserve management conserve and protect indigenous flora and fauna communities and habitat occurring on roadsides, in accordance with the guidelines above and as part of roadside management plans
- (d) a review be conducted of unused road reserves and those identified as containing significant environmental values be conserved and protected, and
- (e) should a public land area or building and site used for service or utility purposes no longer be required for its primary designated use, it be assessed for its natural, recreational and cultural heritage values, and capability for other public uses including firewood plantations (recommendation R43).

Notes:

1. While DSE, VicRoads and municipalities are commonly responsible for road reserve management, many unused roads are licensed to adjoining landholders. Roads and unused road reserves may not be distinguishable on Map A.
2. There are numerous cemeteries across the investigation area that have remnant natural vegetation. These should be managed to protect this vegetation where it does not interfere with the primary aim of the cemetery.
3. The Pyramid Hill airstrip contains important areas of Plains Grassland EVC which should be managed for conservation purposes in conjunction with the airstrip. If this Crown land is no longer required for airstrip purposes in the future, the land should become a nature conservation reserve.

K Earth resources and extraction areas

Mineral and stone production contributes significantly to the future prosperity of the Victorian economy. Access to areas for exploration and production also need to be balanced against other values such as aesthetic, water or nature conservation. Although there are currently limited exploration, mining and extractive areas within the River Red Gum Forests Investigation area, there remains potential for currently uneconomic resources to be economically exploitable in the future or for new deposits to be discovered.

Currently there are ten earth resource extraction areas in the investigation area for gravel, stone and industrial minerals such as salt and gypsum. These currently operate under various arrangements including stone reserves, extractive material licences, work authorities and industrial leases. Earth resource extraction is administered under several Acts. Generally:

- quarrying for stone requires a work authority under the *Extractive Industries Development Act 1995* (EIDA Act)
- extraction of minerals including coal, mineral sands, gold and gypsum requires a mining licence under the *Mineral Resources (Sustainable Development) Act 1990*
- harvesting of salt requires an industrial lease (section 134) or extractive materials licence (section 138) under the *Land Act 1958*.

VEAC recommends that areas operating as earth resource extraction areas for some period of time, and have this as the primary land use, are categorised as extractive resource areas. Those areas that encompass a relatively small area of public land or have a short term use for earth resource areas will be assessed for other public land use values and categorised appropriately.

The standards of operation and rehabilitation for short term resource extraction such as stone, gypsum and sand mining should be similar to comparable scale mining operations. The following principles and guidelines for earth resource extraction are designed to minimise the impacts of these activities on natural values in surrounding areas.

Principles and guidelines

- Native vegetation should preferably not be removed for extraction, particularly where the same extractive resource is available on already cleared land or where the resource is shallow and extraction will be short term.
- If vegetation is to be removed, it should in accordance with the Native Vegetation Management Framework.
- An assessment of possible impacts on Aboriginal cultural heritage values should be carried out for new proposals.
- Reclamation of extraction sites needs to be of a high standard.
- Extraction sites should be rationalised to the smallest practical number of sites.
- Sites in use should be progressively rehabilitated.

- Disused extraction sites should be rehabilitated where possible, including removal of rubbish, measures taken to stabilise the surface and ensure public safety, and revegetation as required.
- Location of sites and conditions imposed should aim at minimising adverse effects on adjoining public land from noise, dust, unsightliness, and erosion.
- Particular care is necessary to avoid affecting water quality in runoff from extraction sites.
- Extraction should avoid sites susceptible to erosion. The potential for adverse impacts of extraction in streambeds and granitic sands is severe, and if no alternative source is available, specific protective measures should be applied.
- In large public land areas, the land manager may extract stone from appropriate sites as required for management needs and in accordance with regulatory requirements such as work authorities and planning permits.

Community views

Few submissions specifically commented on the earth resources extraction area public land use category. Comments from key industry groups focussed on clarification of wording of the principles and guidelines, while others did not support any use of public land for earth resources. Some stakeholders suggested that there is limited access to earth resources in the investigation area and restrictions to exploration and development should be lifted. An increase in exempted or restricted public land (not available for resource use under the MRSD Act) was opposed by industry groups.

RECOMMENDATIONS

General recommendations for earth resources and extraction areas

K

That existing earth resource areas shown on Map A continue to be used for the extraction of stone, sand, salt, gypsum and other mining resource use in accordance with current legislative and regulatory requirements, and the principles and guidelines described above, and that

(a) recommended new extraction sites be located and operated in accordance with the current legislation and regulations, and as appropriate the above principles and guidelines

(b) extraction sites preferably be located on already cleared land, and

(c) when no longer required for extraction, each site be considered uncategorised public land and assessed for public land values and uses, and where appropriate assigned to another public land use category or made surplus.

K1 Mining sites

Currently salt and gypsum mining are undertaken on public land in the investigation area. Although there is potential for precious mineral deposits and brown coal below the surface and a number of exploration licences are held over parts of the investigation area, there are currently no established mine sites for these resources. Three existing gypsum mining sites are recommended to continue operations as earth resource extraction areas (recommendation K1). Two gypsum mining licences operate over an area of the existing natural features reserve, the Duck Lake Wildlife Area. This area is recommended to be retained as a natural features reserve and be renamed the Duck Lake North Wildlife Area (G86) to distinguish this area from the adjoining Duck Lake South Nature Conservation Reserve (recommendation D20).

RECOMMENDATIONS

General recommendations for mining sites

K1

That existing mining sites shown on Map A and listed below continue to be used as such and in accordance with general recommendations K:

- (a) McDonald Road Salt Lake Mining Area (67 hectares)
- (b) Micks Lake Mining Area (119 hectares)
- (c) Copi Mining Area (3.8 hectares).

K2 Stone reserves

Specific small areas were recommended in previous Land Conservation Council studies as stone reserves. Typically local municipal councils use these areas as gravel and crushed rock resources for construction and road making materials. Extraction of material from stone reserves requires authorisation under the EIDA Act.

VEAC recommends that operating stone extraction sites continue, but encourages the industry to improve land management practices in line with the principles and guidelines recommended above.

The majority of existing stone reserves are no longer operational and are recommended as additions to other public land categories. Notably the Merbein Stone Reserve is recommended to be included in the new Wargan–Mallee Bushland Reserve (G1) and requires rehabilitation and revegetation works.

RECOMMENDATIONS

General recommendations for stone reserves

K2

That existing stone reserves shown on Map A and listed below continue to be used as such and in accordance with general recommendations K:

- (a) Hyem Gravel Reserve (0.3 hectares)
- (b) Milawa Gravel Reserve (0.7 hectares)
- (c) Boort Gravel Reserve (35 hectares).

L Plantations

Public land is used for both softwood (pine) and hardwood (eucalypt) plantations. The River Red Gum Forests Investigation area includes a small area (174 hectares) of softwood timber plantations located on public land along the Ovens River between Myrtleford and Porepunkah (Braithwaites and Junction plantations). The Victorian Plantations Corporation currently licence these areas to Hancock Victorian Plantations. VEAC is not recommending any changes to this arrangement and recommends these areas remain as plantation public land use category.

Community views

No submissions specifically proposed changes to the plantation public land use category. Many comments were received relating to the use of wood lots and plantation timbers to replace commercial forestry activities derived from native forests on public land. Access to plantations was raised as an issue by some recreation groups.

RECOMMENDATIONS

General recommendations for plantations

L

That existing plantations held under licence and shown on Map A continue under present use and management.

M Uncategorized public land

Uncategorised public land is a broad category for which no specific use is recommended. In some cases, this includes areas that are formally reserved and have a reservation purpose, but have not been categorised because they were excluded from previous Land Conservation Council investigations. This includes a number of townships in the River Red Gum Forests Investigation area (Echuca, Mildura, Swan Hill and parts of Shepparton and Wangaratta) and land acquired by government agencies or statutory authorities since the last systematic assessment. In many of these areas, new public land use recommendations simply formalise existing reservation or use.

In other cases, public land that has no clear primary use is recommended as uncategorised public land and, subject to assessment of any public land attributes present on the site, either assigned to an appropriate land manager or disposed of through sale. The Department of Sustainability and Environment carries out these assessments of Crown land parcels. Public land attributes are the resources (or natural, recreational, heritage or scenic values) present on a site that would generally require its retention as Crown land. Crown land that has minimal or no such values or resources is considered surplus to government needs and may be disposed of. In certain circumstances, and after native title assessments have been made, this may be undertaken as a land exchange for nearby freehold land that has high values.

A number of public land blocks have been recommended for revegetation or re-establishment of native vegetation, many of which are found in the Victorian Riverina bioregion (see appendix 8). Prior to any revegetation, these sites will require assessment for the presence of existing native vegetation, particularly native grasslands. In some circumstances, the removal of domestic stock grazing will allow the natural re-establishment of native grasslands or grassy woodlands. In other situations, revegetation should be undertaken with native seed local to the area and with species appropriate to the ecological vegetation class.

Community views

Few proposals or comments were made specifically on this public land use category. A number of submissions sought a reconfiguration of public land at Lake Cullulleraine to reflect recent township planning by the local municipality. A small number of stakeholders supported the general recommendations for uncategorised public land.

RECOMMENDATIONS

General recommendations for uncategorised public land

M

Public land other than that recommended for specific uses in this report, or subject to previous approved specific land use recommendations:

- (a) be uncategorised public land
- (b) existing legal use and tenure continue for the time being
- (c) when Crown land assessments are completed, the land be either:
 - (i) assigned to a Department of Sustainability and Environment land manager and treated as outlined above if it has public land values (i.e. native forest or native grasslands), or
 - (ii) disposed of if assessed as surplus, and
- (d) those parcels identified in appendix 8 and shown on Map A be revegetated with native species local to the area or be managed in a way which allows for the natural regeneration of native vegetation.



C

Implications



4 Social, economic and environmental implications of the final recommendations

This chapter summarises and discusses the implications of the recommended land use changes that are contained in the preceding two chapters. The recommendations are examined overall and for each major public land use in the investigation area. Under the *Victorian Environmental Assessment Council Act 2001*, VEAC must address the potential environmental, social and economic consequences of implementing its recommendations. In addition, the final recommendations have also been subjected to further economic analysis since the Draft Proposals Paper. A team of consultants led by Gillespie Economics was commissioned by VEAC to independently assess the social and economic implications of VEAC's final recommendations (see appendix 1 for their report).

The consultants had two main tasks. The first task was to measure the benefits and costs to the Victorian economy of VEAC's final recommendations for each of the key uses of public land in the investigation area. The second task was to use regional impact analysis to identify places in the investigation area that may be adversely affected. These tasks involved reviewing, refining and updating the data and socio-economic report prepared for the Draft Proposals Paper, and taking account of relevant information from public consultation and submissions. Importantly, this review incorporated the changes made by VEAC to the draft proposals, as presented in previous chapters.

The social and economic effects of the final recommendations are quantified in the benefit-cost analysis as the net economic contribution to the state economy, and in the regional analysis as the economic activity and employment effects in and adjoining the River Red Gum Forests Investigation area.

The Gillespie Economics benefit-cost analysis for this investigation uses material from a separate study commissioned by VEAC and undertaken by URS (Australia) in 2006 which quantifies in financial terms various non-market values of public land (including non-use values such as the existence, bequest and option values of biodiversity now, and in the future). This choice modelling study surveyed samples of Victorians on the values they place on environmental protection, using the River Red Gum forests and wetlands of northern Victoria as a study site. Consequently, the values used in the benefit-cost analysis are those currently expressed by Victorian people for the River Red Gum forests explicitly rather than values extrapolated from past studies interstate or overseas. The result is a more robust, relevant and reliable quantification of the values expressed by people for different uses of public land in the analysis of VEAC's recommendations.

Identifying the economic value of land uses such as recreation or conservation provides a comparable unit of measurement with other land uses with more obvious economic values (such as forestry, for example). The economic values, in themselves, have not driven VEAC's deliberations. Rather, in developing its recommendations, VEAC has taken economic values into account, while seeking to balance social, economic and environmental benefits in a broad sense. The following discussion of the implications of the recommendations refers to the results of the economic and social analyses where appropriate, and also describes the environmental consequences of implementing the recommendations.

Overview

In order to identify and value the benefits and costs of VEAC's recommendations, the consultants made certain assumptions and placed a number of caveats on their results. These are documented in detail in their full report (appendix 1).

The most significant factor in the assessment was the estimated environmental benefits from VEAC's recommendations. The next largest component, while not quantified, is likely to be the cost of providing adequate environmental water for identified natural assets—in particular, flood-dependent ecosystems and threatened species. Additional environmental benefits will be realised with adequate environmental water. Rather than indicating a volume of water required for overbank environmental flows—as in the Draft Proposals Paper—the final recommendations focus on identifying these flood-dependent natural values and what water regimes they require.

Assessing the costs—in terms of water resources—of providing additional environmental benefits is obviously very important. However, environmental water for the Murray Darling Basin is the subject of rapidly developing policies and programs involving three other state governments and the Commonwealth government. Delivering additional environmental water would provide benefits to other states and carry interstate costs. Accordingly it was beyond the scope of the benefit-cost analysis and regional impact analysis carried out by VEAC's social and economic consultants.

The consultants compared two scenarios reflecting VEAC's recommended public land use changes with and without adequate environmental water, against Scenario One—the base case without land use changes. These are explained further below. The consultants' analysis determined that the recommendations would result in the implied increases in economic value to Victoria as summarised in the following table.

Benefit Cost Analysis outcomes	Scenario 2 – VEAC’s changes but no additional environmental water			Scenario 3 – VEAC’s changes and adequate environmental water		
	\$M/yr			\$M/yr		
Environmental benefits and costs ⁽¹⁾	Low	Average	High	Low	Average	High
Environmental, wetland and riparian protection, and tourism and recreation benefits	19.0	41.7	64.4	48.8	111.3	173.7
Costs for timber, grazing, hunting, riparian areas, park management and maintaining rural communities	4.8	4.8	4.8	4.7	4.7	4.7
Net economic benefit to Victoria (excluding the cost of environmental water)	14.2	36.9	59.6	44.2	106.6	169.1
Cost of additional environmental water	0	0	0	Not quantified	Not quantified	Not quantified

Note: (1) The low and high results reflect the statistical 95 percent confidence limits placed on the environmental valuations.

The table illustrates that environmental benefits can be demonstrated under both scenarios. The environmental benefits would accrue to Victorians as a whole, and to future generations of Victorians. They are calculated on a ‘per household’ basis and largely correspond to the distribution of Victoria’s population. Accordingly large centres including Melbourne and regional cities outside the investigation area can be attributed major environmental benefits. The cities of Mildura, Shepparton, Wodonga, Swan Hill, Wangaratta and Echuca, which are entirely or partly within the investigation area, can also be attributed significant environmental benefits, and additional expected benefits from tourism, recreation and protection of wetlands and riparian areas.

The costs of the recommendations would be largely borne in the areas near where public land timber harvesting and grazing are focussed. The small communities of Cohuna, Koondrook, Nathalia and Picola are likely to be most sensitive to the effects of cessation of timber harvesting, as small towns have relatively little flexibility to accommodate change, particularly in the context of economic difficulties these areas have experienced in recent years. VEAC has recommended that assistance be given to individuals or local communities adversely affected as a result of the implementation of the recommendations (see recommendation R4). An example of such assistance was the industry restructuring carried out as part of the implementation of the Environment Conservation Council’s Box–Ironbark recommendations in 2003.

Ecosystem protection

Biodiversity includes the genetic diversity, species diversity and ecosystem diversity of all lifeforms and their interactions with each other and the physical environment. As many species are poorly known or undescribed, conservation planning has focused on establishing dedicated reserve systems (where biodiversity protection is paramount) that are comprehensive, adequate and representative. The establishment of such a reserve system in the River Red Gum Forests Investigation area is central to VEAC’s recommendations. Indeed the reserve system is a key component of the terms of reference given to VEAC by the government for the investigation and, under VEAC’s legislation, the need to provide for such a system must be taken into account in all its investigations.

In developing its recommendations, VEAC has used ecological vegetation classes (EVCs) as surrogates for ecosystems, and the nationally agreed criteria for establishing the comprehensive, adequate and representative reserve system (also known as the ‘JANIS criteria’). EVCs and the JANIS criteria are described in more detail in the River Red Gum Forests Investigation Discussion Paper. The key elements of the JANIS criteria are that targets should be met for representation of ecosystems in reserves. The targets are: 100 percent of the current extent of rare or endangered EVCs; 60 percent of the remaining extent of vulnerable EVCs; and at least 15 percent of the pre-1750 (that is, pre-European) extent of all other EVCs. There was a particular emphasis on achieving comprehensiveness, adequacy and representativeness in the four main bioregions in the investigation area—Murray Fans, Murray Scroll Belt, Victorian Riverina and Robinvale Plains (see appendix 9 for reservation status in the investigation area, and the VEAC website— www.veac.vic.gov.au—for representation across the bioregions).

Appendix 9 shows that VEAC's recommendations more than double the total area of EVCs in permanent reserves from 68,388 hectares to 169,950 hectares. Appendix 9 also shows that VEAC's proposed new dedicated reserves satisfy the JANIS targets for the majority of EVCs. Key EVCs for which protected area representation is recommended to increase significantly include:

Murray Fans Bioregion

- Riverine Grassy Woodland
- Grassy Riverine Forest
- Riverine Chenopod Woodland
- Plains Woodland
- Riverine Swamp Forest
- Riverine Swampy Woodland
- Lignum Swampy Woodland
- Grassy Riverine Forest/Riverine Swamp Forest Complex
- Sedgy Riverine Forest/Riverine Swamp Forest Complex

Murray Scroll Belt Bioregion

- Semi-arid Chenopod Woodland
- Low Chenopod Shrubland
- Riverine Chenopod Woodland
- Lignum Shrubland
- Shrubby Riverine Woodland
- Lignum Swampy Woodland

Robinvale Plains Bioregion

- Lignum Swampy Woodland
- Shrubby Riverine Woodland

Victorian Riverina Bioregion

- Plains Grassland
- Riverine Grassy Woodland
- Sedgy Riverine Forest
- Lake Bed Herbland
- Lignum Swampy Woodland
- Floodplain Riparian Woodland.

For some EVCs, such as Plains Grassy Woodland and Plains Savannah, the recommended protected area system does not satisfy the JANIS targets. For many such EVCs, much of the remaining extent occurs on private land, particularly in the Victorian Riverina bioregion. Other EVCs which do not meet reservation targets occur in thin strips or small sections of the Murray River Park or in public land water frontages which are not considered to be protected areas. However VEAC considers the increased emphasis on management for conservation within these land use categories would provide an appropriate balance. Subsequent management planning in the Murray River Park can assist in protection of areas of threatened or endangered EVCs.

VEAC has been particularly conscious of creating large and well connected protected areas, where feasible, to ensure reserves are viable in the long term and allow for species movement across the landscape. In addition, other values such as sites of Aboriginal cultural heritage, sites of historic significance and scenic landscapes have also been incorporated into the recommended protected area system.

The economic value of biodiversity protection has been estimated from the results of a non-market valuation study in order to ensure that non-marketed environmental benefits can be considered alongside the more readily established economic value of uses where products are exchanged in markets (e.g. commercial timber, grazing). For this investigation, the economic value of biodiversity protection is measured in terms of the financial values that people are willing to pay to gain additional biodiversity protection. See appendix 1 for a full discussion of this work including the assumptions involved in these estimates. The Gillespie Economics team applied the non-use values from this 2006 study to estimate the values derived from protecting environmental attributes. They estimated that Victorians are willing to pay an average of approximately \$111 million per year over 20 years to secure the environmental benefits that will come from VEAC's recommendations (see the table on the previous page). The estimate differs slightly from that in the Draft Proposals Paper because of changes to the recommendations since then, the use of newly available ABS 2006 Census data, and new information on flood-dependent natural values and the potential impacts of climate change.

Threatened species

A comprehensive, adequate and representative reserve system is designed to provide optimal protection for biodiversity, including protecting ecosystems and the habitat of species for which we currently have little or no information. However, where we have specific knowledge relating to particular species or processes, we can also make more precisely targeted provisions within the reserve system. For example, the inclusion of threatened species habitats within permanent conservation reserves is a high priority. Appendix 10 outlines the representation of key threatened species in the recommended reserve system.

The populations of many threatened plant species are limited by land clearing, exotic plants, overgrazing and soil disturbance associated with cropping. The extended protected area system in the Victorian Riverina bioregion will significantly improve the protection for many of these species. The removal of grazing in Barmah forest will significantly improve conditions for species such as the endangered Mueller Daisy. Improved water regimes should reduce the encroachment of River Red Gums and Giant Rush on Moira Grass plains. Many ground dwelling, riverine species such as Inland Carpet Pythons rely on coarse woody debris on the ground for refuge from predators and as breeding habitat. VEAC is recommending measures to retain coarse woody debris, which would otherwise be collected for firewood. Prohibiting commercial and domestic firewood collection in the Murray River Park (except in designated domestic firewood collection zones) should also increase this vital habitat element.

Some threatened species, particularly birds, are recorded over a wide geographic range but only breed in very limited locations under certain conditions. For example, the Superb Parrot only breeds in Victoria in the hollows of old trees near water, but which are also close to feeding grounds in open country. Regent Parrots, like Superb Parrots, require hollows in mature or dead trees close to their mallee feeding grounds. In order to protect these species, we need to protect trees with hollows and allow younger trees to mature into this age class. Similarly, egrets will only breed in Victoria in living trees surrounded by water for many months. Protecting these specific habitat elements is vital for the conservation of these species in Victoria.

Sites of geological and geomorphological significance

VEAC commissioned a study of sites of geological or geomorphological significance, which were previously poorly documented in the investigation area. The study revealed many outstanding sites relating to river and floodplain geomorphology in the investigation area (see Discussion Paper). Of the 21 sites of high significance, most are on public land and two thirds have been included in conservation reserves (see appendix 10). Notably, three sites of national significance (Barmah forest, Hattah lakes and Lindsay Island) are in recommended or existing national parks. Two sites of state significance are also proposed for inclusion in the conservation reserve system: palaeolake Kanyapella area and Wallpolla Island.

Environmental water

Delivery of adequate environmental water to flood-dependent riverine ecosystems will be required to fully realise the objectives sought through VEAC's recommendations for parks, conservation reserves and state forest to be achieved. A healthy floodplain, with a high degree of floodplain connectivity and protection of flood-dependent ecosystems, depends upon the delivery of sufficient water for the environment.

Since the publication of the Draft Proposals Paper, there has been wide debate on the health of the Murray–Darling system, specifically regarding the need for significantly more environmental water. The Federal Government has announced that it will spend \$3 billion purchasing water to return 1500 gigalitres to the environment. As well as the established environmental water entitlements from existing programs of 500 gigalitres per annum for the Living Murray Icon sites and 127 gigalitres for Barmah and Millewa Forests and from other Victorian environmental allocations, the Victorian government has announced water savings from its FoodBowl modernisation project from which Stage One will return 75 gigalitres to the environment and the foreshadowed Stage Two will potentially return a further 100 gigalitres. Ultimately, the cost of providing water for the environment additional to these commitments, will require considerable resources and the cooperation of state and Commonwealth governments if the riverine forests and their associated ecosystems are to be protected and survive into the future.

In assessing the implications of VEAC's recommendations for environmental water the social and economic consultants developed three scenarios to gain a better understanding of the role of environmental water and how particular scenarios will affect wellbeing for the people of Victoria:

Scenario 1 (Base Case): This scenario is what would eventuate with no changes to existing public land use and established environmental water allocations (part of the environmental water allocations referred to above). Note that the FoodBowl Stage One 75 gigalitres and FoodBowl Stage Two were not included in Scenario One when this economic analysis was carried out.

Scenario 2: The implementation of VEAC's recommendations including new protected areas, with the established environmental water commitments as for Scenario One but without additional environmental water. This scenario provides a benchmark for assessing the benefits of the recommendations without additional water.

Scenario 3: The implementation of VEAC's recommendations including new protected areas, but with adequate additional environmental water to sustain the flood-dependent ecosystems of the floodplain.

In both Scenarios Two and Three the values of the benefits and likely value of the costs associated with environmental water exceed the total benefits and costs of other uses combined. Excluding the cost of environmental water, the net benefits of the recommendations with existing environmental water amount to an average \$36.9 million per annum (Scenario Two—see appendix 1 and the table on page 97), and the benefits with adequate additional environmental water to sustain the flood-dependent ecosystems of the floodplain are \$106.6 million per annum.

Regional impacts of providing adequate environmental water are much more difficult to predict. Irrigated agriculture (where the effects are most likely to manifest) has changed considerably in recent decades and continues to change as a result of water trading, salinity, increasing water prices and the profitability of different enterprises. Further constraints on water are likely to impact most heavily in the least profitable areas, industries and uses. Where the cost of water becomes too high for irrigators, they may sell their water, use less water more efficiently, shift to dryland agriculture or ultimately sell both their land and water. These changes in land and water use patterns are already occurring through water trading within and across regions in the Kerang–Swan Hill area. Similar trends are likely to be seen throughout the irrigation districts of Victoria as well as New South Wales and South Australia following the changes already occurring as a result of the prolonged drought, climate change and current Commonwealth and state initiatives.

The requirements for environmental water for the riverine forests and wetlands will require a shift towards greater security of environmental flow allocations, relative to other water user needs, and this may result in some dislocation for users. However, there would also be some consumptive use benefits, including for recreational fishing and hunting, apiculture, increased timber productivity and maintenance of the forests' aesthetic attributes for recreation and camping uses more generally.

Ultimately, adequate environmental watering requires an acknowledgement that a significant volume of water is required. For the Murray Darling Basin broadly, this is already acknowledged in recent Commonwealth government announcements. The benefit-cost analysis of VEAC's recommendations indicates that there is considerable scope to redefine the current water sharing rules and/or purchase water to achieve environmental flows, ensuring the long-term protection of the riverine forests and their associated ecosystems on public land in the investigation area.

Indigenous involvement

VEAC considered a number of issues when developing recommendations for enhancing the role of Aboriginal people in public land management (see chapter 2). While Aboriginal community aspirations broadly include increased involvement in public land management, there is a clear need for a flexible range of options for the involvement of Traditional Owners. Adequate resources are required to support such increased involvement including capacity building, training, provisions for group decision making and administrative support.

VEAC considers that there is a need for increased involvement of Aboriginal people generally and Traditional Owners specifically in public land management in the investigation area. The recommendations provide for greater involvement by Aboriginal people in public land management, whilst acknowledging that institutional and legislative change is also required to accommodate the existing capacity and aspirations of each Traditional Owner group. In order to facilitate greater and more meaningful involvement in public land management, progress needs to be made towards Traditional Owner identification and registration. However progress can only be made within established internal decision making processes and informed consent protocols.

VEAC's recommendations for shared management of two specified parks, with management boards which have majority Aboriginal membership, is a major change in the way national parks and other public land are managed in Victoria. Such a management framework should facilitate the active engagement of the relevant Aboriginal groups in park management and decision making. VEAC is also recommending legislative change to establish the framework for joint management of parks in Victoria. Without such a statutory framework, progress towards joint management will stall.

Traditional cultural practice is one of the key ways that Aboriginal people can keep their culture alive and teach younger generations. VEAC considers that ensuring Traditional Owners have a genuine role in decision making about contemporary cultural practice is extremely important. VEAC's recommendations allow for traditional cultural practice on public land across the investigation area and provide opportunities for Aboriginal people to build capacity and training. The recommendations support the renewal of Traditional Owners' cultural ties with their traditional Country through the practice of and shared responsibilities for management, decision making and planning.

In a broader sense, the recommendations will address some of the social and economic inequities that exist between Aboriginal and non-Aboriginal people in the investigation area and more widely, as well as furthering the Victorian government's efforts towards reconciliation. However, it must be acknowledged that the legacy of the past cannot be rectified either quickly or easily, and that support and leadership from both within and beyond Aboriginal groups will be required to achieve the best outcomes. Working on Country and supporting Aboriginal responsibilities to care for Country has the potential to provide real social benefits for Aboriginal people.

The investigation process has utilised and extended existing relationships between public land managers and Aboriginal people or groups, but VEAC acknowledges that its consultation is limited in both scope and timeframe. The building of long term relationships and trust between government and Aboriginal people is critical to the success of any future land management arrangements particularly those under shared governance structures. The amount of time and resources to achieve positive social, economic and cultural outcomes should be realistically estimated and genuinely accommodated. VEAC believes that the recommendations provide a range of positive opportunities for Aboriginal people and the wider Victorian community. Ultimately, however, the way in which these recommendations are implemented will be critical to their success and indeed measuring such outcomes may be highly subjective.

The social and economic assessment of VEAC's recommendations for increasing Aboriginal involvement in public land management (appendix 1) concluded that there was no increased contribution or cost to the Victorian economy, nor additional employment beyond that required for additional management costs.

Recreation and tourism

Recreation and tourism contribute significantly to the economy of the investigation area and environs, with around five million visitor days and \$870 million being spent each year in Tourism Victoria's Murray Region. Camping and associated activities along the River Murray and its tributaries are major attractions for visitors to the region, drawing around 241,000 visitors a year to specific parks. Camping holidays, particularly along the river frontages, play a significant social role in visitors' lives with many families visiting the same site for many years.

In its Draft Proposals Paper, VEAC took the view that the recommendations would have a neutral effect on tourism and recreation in the investigation area. After considering submissions, reviewing visitor data and amending various recommendations relevant to camping, VEAC now considers that the recommendations will significantly increase the number of tourist visits and campers to the recommended national parks.

VEAC has acknowledged that the majority of campers prefer dispersed camping along the river frontages at sites of their choosing, and with few amenities. This use is recommended as the main form of camping across all land categories. As a result of this recommendation, there will be little change to access for dispersed camping activities. A camping and recreation strategy, to be

developed by land managers in consultation with the community, will look broadly at all recreational uses and define sites where other styles of camping may be developed (see chapter 2). The strategy will also need to develop solutions to address the environmental degradation of the river frontages and the negative social aspects that occur when large numbers of people camp in close proximity during peak holiday periods and major events.

In general, dogs are not allowed in national parks in Victoria, as these areas are primarily established to protect native flora and fauna. Dogs are allowed in state forests, regional parks and many other categories of public land. VEAC's recommendations for new national parks and nature conservation reserves have consequently reduced the areas available for dog walking and camping with dogs and this will affect some people. Visitors will not be able to camp with their dogs in the recommended new national parks and additions to national parks. However, it is VEAC's intention that people should be able to camp at nearby locations with their dogs. Thus, dogs will be allowed in the extensive Murray River Park, the proposed Kings Billabong, Murray–Kulkynne, Gadsen Bend and Nyah–Vinifera Parks, state forests and regional parks. The Murray River Park has been enlarged since the Draft Proposals Paper to provide additional areas for camping with dogs—along the River Murray adjoining Wallpolla Island and the southern (Torrumbarry Weir) part of Gunbower National Park, and to take in Barmah Island. In addition the proposed Lower Goulburn River National Park has been reduced and Shepparton Regional Park enlarged, for similar purposes. The overall impact of reduced areas for camping with dogs is relatively minor in terms of total area—the Murray River Park and other regional parks represents approximately 75 percent of the River Murray frontage between the South Australian border and Wodonga. National parks and nature conservation reserves represent approximately 23 percent of the River Murray frontage.

As Victoria has recently experienced a series of significant bushfire seasons, bushfires are at the forefront of people's minds. Escaped campfires are the largest single source of bushfires in the investigation area over the summer period according to DSE data. VEAC proposes that Victoria align with parts of New South Wales and South Australia and ban solid fuel fires on public land over the high fire danger period. Campers will be able to cook with gas or liquid fuel stoves on all but total fire ban days. The number of campfire escapes should decrease (based on New South Wales experience), increasing the safety for campers and adjoining property holders. The amount of wood on the ground should also increase providing essential habitat for many ground-dwelling species which are presently affected by firewood collection.

It is estimated that approximately five percent of all tourist visitors to the region actually visit the River Red Gum parks and forests. A change in status from state forest or state park to national park is likely to increase recreation and tourism visits. Based on the recorded increased visitation following creation of the Grampians, Murray–Sunset and Yarra Ranges National Parks, the consultants have conservatively predicted a 20 percent increase in visitors to Barmah, Leaghur–Koorangie, Gunbower, Lower Goulburn River and Warby Range–Ovens River National Parks, and smaller increases for other parks. This indicates considerable scope for product development, marketing and park

interpretation programs to increase the numbers of people visiting the investigation area once the parks are created.

VEAC's park recommendations will ensure greater diversity and sustainability of the recreational and tourism experience and facilitate growth in park visitors. As a result of analyses undertaken by the consultants, the increases in net economic values for tourism that potentially arise as a result of VEAC's recommendations for the national parks in the investigation area are estimated to be approximately \$0.87 million per year.

VEAC's recommendations to include a number of wildlife reserves (state game reserves) in the conservation reserve system will reduce the number and area of wetlands available for duck hunting. In a wet year, around 4390 duck hunters use these wetlands on the opening weekend of the hunting season. A reduction in duck hunters in the investigation area may cost Victoria \$0.49 million and up to 15 direct and flow-on jobs in the region (e.g. Kerang) from reduced demand for fuel, accommodation and other services. Many of these duck hunters will be able to access other areas for duck hunting both within and outside the investigation area, reducing these to local impacts. VEAC anticipates that improved environmental water regimes for a number of wetlands in the region will improve hunting opportunities on many wetlands that continue to be available for hunting but have been dry for a number of years.

The public lands of the investigation area are popular for a wide range of other recreational activities such as fishing, horseriding, trailbike riding, four wheel driving, car touring and picnicking. These activities would not be affected by VEAC's recommendations, except that camping with horses would not be permitted in the recommended new national parks and horses would not be permitted in nature conservation reserves. Camping with horses is permitted in recommended state forests and regional parks, including the recommended Murray River Park. Horseriding is permitted in national parks, regional parks and state forests on formed roads and tracks.

Domestic stock grazing

The investigation area includes important areas of intensive primary production industry, notably both dryland and irrigated crops or pasture. Agricultural activities are largely undertaken on private land, however the use of water for irrigation has a major effect on the natural values of public land in the investigation area, and on uses (such as grazing and forestry) which depend on environmental values. The implications of VEAC's recommendations relating to provision of adequate environmental water are explained earlier in this chapter.

There are currently some 88,300 hectares of public land licensed for domestic stock grazing in the investigation area, mostly in state forest, public land water frontage and the River Murray Reserve. There are approximately 2930 licenses and permits issued that authorise grazing, held by 1084 licensees and permit holders. Public land grazing is closely aligned with original European settlement in the region, but has declined in economic importance as private land enterprise has expanded. Domestic stock grazing on public land in the investigation area results in an estimated economic contribution of \$0.9 million per annum (appendix 1).

While domestic stock grazing can be an effective tool to address specific land management problems at particular locations and times, scientific evidence indicates that, in general, grazing damages natural values especially biodiversity, water quality and soil condition. Accordingly, VEAC proposes a major shift in public land management priorities and recommends that domestic stock grazing be generally excluded from public land in the investigation area, with the exception of unused road licences (about 4600 hectares). The recommendations provide for limited future use of grazing as a targeted management tool, to address particular environmental or management problems, such as controlling particular weed infestations or maintaining a specific grassy habitat structure.

Some 1725 licences are recommended to be cancelled over an area of approximately 54,040 hectares worth approximately \$0.76 million economic contribution and five fulltime equivalent total jobs. VEAC recommends phasing out domestic stock grazing over five years from public land water frontages (1260 licences over about 9280 hectares), while grazing in other areas (e.g. national parks and nature conservation reserves) is recommended to cease immediately (about 44,760 hectares). In addition, removal of grazing from Barmah forest will affect 38 permit holders over 29,600 hectares at an estimated economic cost of \$0.14 million and one fulltime equivalent job. Although not a large economic value from a regional perspective, the recommended grazing and timber changes are more likely to have an impact on small towns such as Nathalia, Picola and Barmah.

Excluding stock grazing from public land water frontages is likely to require considerable fencing and, over time, the installation of offstream water points. These, and pest control, will cost an estimated \$0.9 million per year. Access to water points across public land water frontages remains an important use of public land and water resources. Many adjoining landowners have undertaken streamside rehabilitation activities supported by catchment management authorities. The recommendations encourage the continuation of these projects, accelerated to exclude grazing from all public land water frontages within five years. Those licences held over unused roads within largely cleared freehold land, which are cleared of native vegetation, may continue. Where significant ecological values have been identified on unused roads adjoining larger public land blocks, these have been recommended for inclusion in conservation land categories.

As a cultural activity, domestic stock grazing is celebrated at the annual Barmah muster. The Barmah muster yards are a site of cultural heritage significance. With the exclusion of commercial grazing from the Barmah National Park (recommendation A7), the muster yards will no longer have a functional use. VEAC has recommended an area encompassing both the muster yards and the Dharnya cultural centre as a community use area (recommendation I6) to provide for a range of activities not generally permitted in a national park. This may include camping with horses and dogs and commercial activities, and could potentially allow for the annual Barmah muster to continue in a modified form as a community cultural event.

Timber harvesting

The River Red Gum forests of the investigation area sustain a diverse timber industry with products ranging from sawlogs, fine furniture to firewood and sawdust. Nearly all production comes from the largest forests—Gunbower and Barmah but also Cobrawonga and along the lower Goulburn. Commercially harvested sawlogs go to mills in Koondrook, Echuca and Benalla, as well as a number of smaller producers mostly based in the areas surrounding Gunbower and Barmah forests. Riverine forests across the investigation area also supply domestic firewood to many local and regionally based permit holders. Firewood is also supplied commercially to Melbourne.

VEAC's recommendations would significantly reduce the total area of state forest in the investigation area and, in particular, would reduce available area of merchantable forest from 37,390 hectares to 9880 hectares (see appendix 6). This will greatly decrease the volume of wood produced and, consequently, the size of the timber industry. Increased wood volumes could be expected in the future as a result of additional silvicultural thinning in state forests (R42) and additional environmental water that would increase flooding of the remaining state forests and thereby increase current timber growth rates.

The net result of these changes would be to reduce the harvest of sawlogs from the current allocation of 6072 cubic metres per year (2006–07 licence volume) to a sustainable harvest figure of 1366 cubic metres per year, or 22.5 percent of its current size (see appendix 6 or 'C State forests' in chapter 3 for details). However, the sustainable harvest level would fall to 4294 cubic metres per year, or 71 percent of its current size, without implementation of any VEAC recommendations as a result of several factors, notably lower growth rates caused by reduced forest flooding in recent years. This assumes delivery of existing environmental water commitments. Reasons for the changes in these volume estimates since the Draft Proposals Paper are outlined in chapter 3.

In addition to sawlogs, some 4428 cubic metres of standard logs and 10,983 cubic metres of residual logs and firewood were licensed commercially in 2006–07 (domestic firewood is considered separately below). Sustainable harvest volumes are even more difficult to determine for these than for sawlogs. However, given that the same biological factors (growth rates and so on) operate over the same areas, the changes in sawlog availability are likely to be reflected in availability changes for other products over the long term.

In financial terms, VEAC's recommendations would reduce the net economic contribution of the timber industry to the Victorian economy from \$2.6 million per annum (assuming 6702 cubic metres of sawlogs are cut) or \$1.83 million (assuming existing environmental water delivery) to \$0.6 million per annum. Employment in the industry, including multiplier or flow on effects would reduce from current employment of up to 102 fulltime equivalent jobs to an estimated average of up to 23 fulltime equivalent jobs. Further details of the analysis behind these figures, as well as the impact on several other social and economic indicators, are provided in the consultants' full report in appendix 1. Approximately 38 percent of the employment effects will occur even without implementation

of VEAC's recommendations, as harvest is reduced to a sustainable level based on the revised timber resource assessments outlined in chapter 3 and appendix 6.

While these impacts are relatively small in the regional context—the sector represents 0.08 percent of the regional economy—the impact will be felt disproportionately in a few local towns. The larger towns of Echuca and Benalla have substantial economies unrelated to the timber industry and are unlikely to be significantly affected. The town of Koondrook is more likely to be adversely affected. This is a small town where the contribution of the sawmill and its ancillary services plays a significant part in the economy. Similarly, the many smallscale producers located close to Barmah and Gunbower forests form a more substantial part of the local economy than in other parts of the investigation area.

However, it not possible to be regionally specific about the effects of the recommendations because operators, including the three sawmills, may not be equally affected. Rationalisation of the industry may reduce the impacts in some areas and increase it in others. The government and the Department of Sustainability and Environment decide on detailed matters such as future sawlog and other licence allocations, industry restructure or refocus, alternative supplies and measures to assist the industry to deal with VEAC's recommended changes.

Domestic firewood

Domestic firewood harvesting will be affected by the recommendations. Current harvesting amounts to about 10,000 cubic metres per year. As with the commercial timber industry, location is a key factor in assessing the impact of the recommendations on domestic firewood harvesting. Key local factors include the availability of affordable alternatives, particularly reticulated natural gas and the travel distance to forest areas to obtain firewood.

There are several population centres with limited or no access to the reticulated gas network and where domestic firewood use is currently high. The Department of Sustainability and Environment will need to develop a firewood management strategy that provides a wood supply to dependent local communities (recommendation R44). The management of firewood supply will require close attention by the land managers to ensure that the following areas recommended by VEAC for this purpose make a significant contribution to the strategy (recommendation R40):

- Kerang, Koondrook and Cohuna areas from the recommended Gunbower, Benwell and Guttram State Forests
- Mildura and Robinvale from firewood zones in the recommended Murray River Park
- Nathalia, Picola and Barmah from firewood zones in the recommended Murray River Park
- Towns around Shepparton and Wangaratta from firewood zones in the recommended Shepparton Regional Park and Murray River Park.

The Department has implemented successful strategies for firewood management in other areas similarly

affected (e.g. in northeast Victoria and Bendigo as part of implementation of the ECC Box-Ironbark recommendations). Such strategies have included five year firewood plans for specific localities, revised licensing procedures, encouragement of firewood plantations and farm woodlots, and establishment of regional firewood implementation committees (see recommendation R43).

Apiculture

The investigation area plays an important role in the Victorian apiculture industry contributing around one million dollars to the economy and supporting about 30 fulltime equivalent jobs. Apiculture is generally proposed to continue as a resource use in the investigation area and at existing apiary sites in recommended national parks. In other places where currently permitted, apiculture can continue to operate and is unaffected by VEAC's recommendations. Overall, the recommendations are not expected to have any effects on the apiculture industry. However, the viability of apiculture is inseparable from the health of the River Red Gum forests and additional environmental water to the floodplain forests will significantly benefit production for this industry.

Earth resources

The extractive and mining resources industries produced material with an average combined annual value of \$12.78 million in the investigation area from 2003 to 2005. Almost the entire value—more than 98 percent— was derived from extractive industries producing crushed rock, sand, gravel and clay used in construction and roadmaking industries. Such resources need to be close to where they are used, as transport is expensive and can make up to 25 percent of production costs.

A number of stone reserves in the investigation area are no longer in use and have been proposed for rehabilitation and inclusion in other public land use categories. Where stone reserves and extractive industries are currently operating on public land, these areas have been recommended as earth resource extraction areas (recommendations K1–2) where this is the primary use. VEAC encourages the extractive industry to improve land management practices in line with the recommended principles and guidelines similar in intent to those currently applicable to mining operations.

The mining industry is of relatively low economic value in the investigation area, and consists largely of the industrial minerals salt and gypsum. There are a number of exploration permits including those for mineral sands, gold, base metals and potential for brown coal in the future. Existing permits will continue under current provisions.

Other social, economic and environmental implications

Increased cost of management of new parks

DSE currently manages most public land in the investigation area, through regional and statewide programs with existing state budget allocations. For the River Red Gum Investigation area, the social and economic consultants needed to estimate the additional cost to the Victorian economy of managing this public land in accordance with VEAC's recommendations. Primarily this recognises that

providing more rangers and visitor services for the extra visitors attracted to national parks is an additional cost. All other costs of managing, regulating and administering these public land areas—such as for existing DSE, DPI and PV employees, and for fire protection, pest plant and animal control, and road construction and maintenance—will continue to be paid from budget allocations and so are not new costs. Any reductions in management costs resulting from timber harvesting and grazing ceasing are removed. The consultants have estimated that the additional management costs for the new national parks would be \$1.0 million per year.

Many submissions put the view that existing parks are already under-resourced and expressed the concern that adding to the area of parks may exacerbate this perceived problem. However recent examples of park implementation demonstrate a different outcome. Funding allocated to implementing the Environment Conservation Council (ECC) recommended Box–Ironbark parks and reserves was \$20.8 million over four years. This funding provided for industry adjustment and a range of programs for park and reserve management, formal implementation, recreation and firewood supply. Funding for implementation of VEAC's Angahook–Otway recommendations was \$13.1 million over four years and \$3.4 million ongoing. The marine national parks system and associated elements from the ECC's Marine, Coastal & Estuarine Areas recommendations were also implemented with a comprehensive funding package. Expenditure by DSE and PV on park management increased substantially in real terms over the 12 years from 1995/96 to 2006/07.

Note that these figures are total budget allocations, and are not comparable with net contributions to the state economy. The Box–Ironbark funding included financial adjustment packages for displaced timber cutters, which are 'transfer payments' from one group in the economy to another and not included in benefit cost analyses as they cause no net change in contributions to the economy. Various overhead costs—substantial components of budget allocations—are 'sunk costs' and are similarly excluded from benefit-cost analyses. Capital changes and depreciation do not represent on-ground expenditure.

Protecting riparian areas

VEAC's recommendation to remove stream frontage grazing has both a cost in terms of fencing, provision of water points and pest control, and substantial benefits. Allowing grazing of frontages and stock access to streams has consequences for river condition, the health of riverside vegetation, water quality, populations of native fish, and native waterbird and animal species numbers. These values are difficult to quantify directly, however the consultants have included an estimated benefit for frontage fencing, derived from a valuation of healthy vegetation on stream banks in a choice modelling study carried out for DSE in 2006 for rivers including the Goulburn.

Protecting small communities

The rural sector across Australia has had to continually adjust to changing economic conditions. Populations in rural areas have declined. Services provided to rural areas (and rural populations) have become more concentrated in larger rural centres and the fortunes of many small towns have waned. In 1911, 43 percent of Australia's population was located in rural areas. By 1976 that figure was 14 percent, and in the mid-1990s it began to fall again. The rural communities facing the reality or prospect of decline are largely those dependent on primary production.

There is some evidence that the broader Australian society would like to avoid a continuation of this decline in the viability of rural communities. Commonwealth and state governments have implemented specific policies to support rural communities.

Responding to such concerns in public consultations and submissions, the consultants have obtained values from several studies addressing precisely this issue. They assessed society's willingness to pay to maintain viable rural communities. The average valuation from relevant studies—\$161,000 per annum—has been applied to small towns in the investigation area and included as a cost in the benefit cost analysis.

Strategic planning

Land use planning is currently fragmented and area or site specific, and lacks co-ordination across the entire River Murray region. Fifteen local government areas, four catchment management authorities, nine wholesale and retail water authorities and several regional and central offices of the Department of Sustainability and Environment, Parks Victoria and other state government departments and agencies all contribute to planning for public land and development on adjacent private land. Adding to the complexity are the multiple agencies with planning responsibilities on the other side of the River Murray, and the fact that the river itself is within the jurisdiction of New South Wales. VEAC considers it essential that long term, strategic planning for conservation, recreation, tourism, and a range of economic uses is applied to public and private land along the River Murray corridor as a whole and has recommended a River Murray Strategy be undertaken by the government (recommendation R37). This will enable areas for development and high and low intensity of use to be planned and coordinated at the landscape scale, similar to planning for the Victorian coastal strip.

Acronyms

AAV	Aboriginal Affairs Victoria, a division of the Department of Planning and Community Development
ABS	Australian Bureau of Statistics
CAMBA	China-Australia Migratory Bird Agreement
CAR	Comprehensive, Adequate and Representative
CD	Census Collection District
CMA	Catchment Management Authority
COAG	Council of Australian Governments
CRG	Community Reference Group for VEAC's River Red Gum Forests Investigation
DPI	Department of Primary Industries
DSE	Department of Sustainability and Environment
ECC	Environment Conservation Council
EVC	Ecological Vegetation Class
FFG	Flora and Fauna Guarantee
FMA	Forest Management Area
GB CMA	Goulburn Broken Catchment Management Authority
GCG	Government Contact Group for VEAC's River Red Gum Forests Investigation
GL	Gigalitres
GMW	Goulburn Murray Water
ISC	Indigenous Steering Committee for VEAC's River Red Gum Forests Investigation
IUCN	International Union for Conservation of Nature
JAMBA	Japan-Australia Migratory Bird Agreement
JANIS	Joint ANZECC/MCFFA National Forest Policy Statement Implementation Sub-committee
LCC	Land Conservation Council
LGA	Local Government Area
MALLEE CMA	Mallee Catchment Management Authority
MDBC	Murray Darling Basin Commission
ML	Megalitres
MLDRIN	Murray-Lower Darling Rivers Indigenous Nations
NC CMA	North Central Catchment Management Authority
NE CMA	North East Catchment Management Authority
NSW	New South Wales
RCS	Regional Catchment Strategy
ROKAMBA	Republic of Korea-Australia Migratory Bird Agreement
SA	South Australia
SMZ	Special Management Zone in state forest
SPZ	Special Protection Zone in state forest
RFA	Regional Forest Agreement
TFN	Trust For Nature (Victoria)
QLD	Queensland
VEAC	Victorian Environmental Assessment Council

Glossary

Adaptive management. Land management practices are periodically reviewed and refined based on new information and research.

Benefit–cost analysis (BCA). Assessment of the net economic gains or losses that may arise as a consequence of changed public land management. The BCA in appendix 1 is Statewide—benefits and costs are considered from the viewpoint of all Victorians—while the separate regional impact analysis is confined to VEAC's investigation area and uses different methodology.

Advisory committee (Aboriginal). A formally appointed committee consisting of Aboriginal Traditional Owners or Aboriginal people more generally that provides the land manager with advice on one or more aspects of public land management.

Bioregion. A geographic region characterised by a combination of physical and biological features such as terrain, climate and ecological communities.

CAR reserve system. A system of forest reserves established by agreement between Commonwealth, state and territory governments to provide for biodiversity protection. The system is based on the principles of comprehensiveness, adequacy and representativeness.

Catchment management authority (CMA). Regional statutory authority established under the *Land and Catchment Protection Act 1994* responsible for strategic planning and coordination of natural resources; including land, water and biodiversity within its catchment region. Catchment management authorities also have floodplain management functions under the *Water Act 1989*.

Choice modelling. A stated preference non-market valuation technique involving a sample of people being asked to make a sequence of choices between different management strategies described in terms of their impacts on particular attributes. This technique works best where the study area, attributes and responses are complex. In the study commissioned by VEAC, respondents were asked to make a series of choices between scenarios with different levels of protection for several attributes, including status quo, and for different annual payments including \$0. The analysis allows respondents' trade-offs between various attributes to be identified, rather than just broadly indicating support for 'the environment' or the status quo.

Coarse woody debris. Fallen wood, branches, and logs often collected as campfire wood. Many ground-dwelling native animals are dependent on coarse woody debris for habitat.

Community Reference Group (CRG). A group of community representatives established under s.13 of the *VEAC Act 2001* for a VEAC investigation with the purpose of providing advice to Council. The group should have representatives with a broad range of interest as described in s.13.

Co-management (Aboriginal). Land management issues and decisions between Aboriginal groups and government are shared to varying extents in this model in accordance with a formal co-management agreement. Management decisions are made through a board or committee of management comprising a majority of Aboriginal Traditional Owner group/s representatives.

Country (Traditional country). Aboriginal people regularly refer to the land and natural resources of an area as 'Country'. The land and waters of Australia have sustained Aboriginal people for thousands of years and this long occupation has resulted in a profound cultural and spiritual relationship between Aboriginal people and Country.

Declared water supply catchment areas. Under the *Catchment and Land Protection Act 1994*, water catchments can be declared as 'special water supply catchment areas'—a mechanism that identifies the importance of the area for water supply. 'Special area plans' can be prepared for such areas to guide land use.

Dedicated reserve. A term used in the CAR reserve system to describe reserves that are equivalent to the IUCN Protected Area Management Categories I, II, III or IV as defined by the International Commission for National Parks and Protected Areas (IUCN 1994) and have secure tenure that requires, for example, action by a Parliament to be revoked. In practice such reserves include natural feature reserves (such as bushland areas and streamside areas), and some regional parks, as well as national, state and wilderness parks, reference areas and nature conservation reserves.

Dispersed camping. Camping at a site of one's choosing, which is accessible by vehicle and where there are generally no toilets, drinking water, or fireplaces. It may include the ability to have an open fire and obtain firewood.

Ecological vegetation classes (EVCs). Components of a vegetation classification system derived from groupings of vegetation communities based on floristic, structural and ecological features.

Ecosystem services. The public good services from natural ecosystems, and the species of those ecosystems, which provide benefits to humans. Included are provision of clean air and water, biodiversity services and sequestration of carbon.

Ecological thinning. The practice of managing forest establishment, composition and growth, to achieve specified ecological objectives such as restoring a particular forest structure.

EVC complex. A vegetation unit where two or more EVCs are unable to be distinguished in an area but are known to exist discretely elsewhere.

EVC mosaic. A vegetation unit consisting of two or more discrete EVCs, which were unable to be distinguished in mapping because of the scale used.

Exempt Crown land. Crown land which, under the *Mineral Resources (Sustainable Development) Act 1990*, is in a public land-use category in which exploration or mining is not permitted. Exempt Crown land includes national, state and wilderness parks, and reference areas. Exceptions to allow mining exist under Section 40 of the

National Parks Act 1975 which provides for the continuance of an exploration or mining licence current at the time the land is declared in one of those public land-use categories.

Fire protection plans. Plans prepared within the context of the Code of Practice for Fire Management on Public Land. They define fire protection strategies adopted to achieve those objectives. Each Fire Protection Plan has four main strategies: wildfire prevention, wildfire preparedness, wildfire suppression and wildfire recovery.

Flora and Fauna Guarantee (FFG) Action Statements. Documents prepared for selected species, ecological communities and potentially threatening processes listed under the *Flora and Fauna Guarantee Act 1988*.

Forest management area (FMA) plan. A plan developed to address the full range of values and uses in state forest, including nature conservation and timber production. There are 14 forest management areas in Victoria, and a plan is produced for each FMA.

Formed roads and tracks. Under existing legislation, four wheel driving/motor car driving and trail bike riding are restricted to formed roadways on public land. The *Road Management Act 2004* describes a public road or roadway as the area of the public road that is open to or used by members of the public and is developed by a road authority for the driving or riding of motor vehicles. In some places, walking or bridle trails have been constructed. The use of motor vehicles on these trails is not permitted. The term track is generally applied to a constructed roadway of lower class (C or D) such as a narrow earth road on which speed is severely restricted by grades, curves or surface conditions. The term track should not be applied to an area that is shaped by off-road use. Off-road riding or driving on Victoria's public land is illegal. Some 36,000 km of legal roads and tracks have been constructed for the passage of vehicles on public land with limited restrictions or closures typically due to seasonal weather effects, erosion or safety reasons.

Fuel reduction burning (FRB). The use of low intensity fires as a management tool to remove more flammable fuel from parts of forests and parks, with the purpose of reducing flame height, decreasing intensity and slowing spreading patterns of any potential bushfire and making firefighting easier.

Gigalitre (GL). One billion litres (1,000,000,000 L).

Habitat links. Areas of often linear remnant or planted vegetation that connect two or more patches of vegetation. These links may be continuous or discontinuous strips and patches of vegetation. Often also referred to as corridors.

Hand back-lease back. Also known as 'joint management', this land management model applies where the land title is transferred to an Aboriginal group/s and then leased back to the state for a specified period and typically as a park or protected area. The role that Aboriginal people have in management of the area is decided as part of an agreement forming the basis for the lease and any associated settlement.

Heritage Rivers. Rivers or reaches of rivers designated under the *Heritage Rivers Act 1992*, managed primarily to protect their significant nature conservation, recreation, scenic or cultural heritage values.

High fire danger period. What VEAC has called the High Fire Danger Period is called the Fire Danger Period by the CFA and the Prohibited Period by DSE. Fires in the open air are subject to legal restrictions when the CFA Fire Danger Period is declared for a particular municipality and restrictions remain in place until 1 May, unless revoked earlier due to seasonal conditions. No fires can be lit or be allowed to remain alight on Total Fire Ban days.

Indigenous steering committee (ISC). The Indigenous Steering Committee was established under s.12 of the *VEAC Act 2001* for the River Red Gum Forests Investigation to advise Council and the consultant appointed to undertake Indigenous community consultation on methods and procedures for such consultation.

Indigenous vegetation. Vegetation native to a particular location.

IUCN. The IUCN was created in 1948. It is the world's largest conservation-related organisation and brings together 76 states, 111 government agencies as well as a large number of non-government organisations, and some 10 000 scientists and experts, from 181 countries. Through various programs it supports the conservation of natural heritage—for instance the work of the IUCN World Commission on Protected Areas aims to promote the establishment and effective management of a worldwide, representative network of terrestrial and marine protected areas.

JANIS criteria. Criteria defined by the Joint ANZECC/MCFFA National Forest Policy Statement Implementation Sub-committee for the establishment of the CAR system of forest reserves.

Joint management. See hand back-lease back.

Living Murray icon sites. Also known as 'significant ecological assets', these six sites were selected by the Murray-Darling Basin Commission for their regional, national and international ecological importance. These sites are: Barmah-Millewa forest; Gunbower and Koondrook-Perricoota forest; Hattah lakes; Chowilla floodplain including Lindsay and Wallpolla Islands; Murray River mouth, Coorong and lower lakes; and the River Murray channel.

Non-market benefits. Those benefits that are not directly transacted in markets, and where values can not be estimated directly from market transactions. Non-use benefits are a key subset of non-market benefits. Other non-market benefits include some direct use values (e.g. recreation) as well as indirect use benefits (water filtration, carbon sequestration).

Northern Region Sustainable Water Strategy. A discussion paper outlining the options for water resource use over a planning period of 50 years in the Northern Region of Victoria was released in early 2008. A draft strategy is due for release in mid 2008 and the final strategy in early 2009.

Pre-1750 EVC. The extent of an ecological vegetation class (EVC) prior to the year 1750 as defined by existing vegetation supplemented by predictions and modelling of vegetation that has been cleared since European settlement.

Public land. Under the *Victorian Environmental Assessment Council Act 2001* public land refers to (a) any unalienated land of the Crown, including land temporarily or permanently reserved under the *Crown Land (Reserves) Act 1978*; (b) state forest within the meaning of the *Forests Act 1958*; (c) park, within the meaning of the *National Parks Act 1975*; (d) land under the ownership or control of Melbourne Parks and Waterways, established under the *Water Industry Act 1994*; (e) land vested in any public authority, other than – (i) a municipal council; or (ii) an Authority under the *Water Act 1989*, to the extent that the land vested in the Authority is within a sewerage district listed in column 3 of Schedule 12 of that Act.

Ramsar Convention. Treaty for protection of wetlands of international importance. For a wetland to be placed on the register certain criteria have to be fulfilled such as being important to the survival of migratory birds or endangered animals and plant species.

Regional impact analysis (formerly regional assessment). This impact analysis provides estimates of the impacts on local and regional community employment and incomes, including both direct and flow-on effects. This method uses an input-output model but does not determine whether the people of Victoria are likely to incur a net economic gain or loss as a result of changed management.

Regional Forest Agreement (RFA). An agreement between the Commonwealth and a state government, for the long-term management and use of forests in a particular region.

Regional water authorities. Statutory authorities responsible for supplying water, primarily to urban consumers, and the disposal of waste-water from towns.

Regulated river/stream. Controlled flows within a river system resulting from the influence of a regulating structure such as a weir or dam.

Residual logs. Produced as a by-product of sawlog harvesting and regrowth management operations. Comprises logs too small to meet sawlog or sleeper specifications or may meet sawlog specifications for size but with greater than 50 percent defect. Residual logs may be harvested under annual licence or tender from areas not required for production of commercial and domestic firewood.

Restricted Crown land. Land owned by the Crown upon which, under the *Mineral Resources (Sustainable Development) Act 1990*, any exploration or mining requires the consent of the Minister for Environment and Climate Change; includes nature conservation reserves, regional parks and natural features and other reserves.

Riparian. The area of land along the bank of a river or watercourse.

Roads and tracks (formed). See 'formed roads and tracks'.

Sawlog. Any length of log of merchantable species which is of suitable quality for producing sawn timber.

Site quality. A measure of the growth potential of a forest site (as determined by soils and climate). Often expressed in terms of the dominant height of trees at a particular age.

Sustainable yield. Rate of harvest of timber that can be maintained for a defined period. This figure may increase in the future if the condition of the forest is improved but should not decrease except in the case of a catastrophic event such as fire (*cf* long-term sustainable yield).

Silvicultural thinning. The practice of managing forest establishment, composition and growth, to achieve specified forestry objectives.

Solid fuel fire ban. A prohibition on the use of solid fuel fires—established using wood, logs, sticks, coal etc for a specified period.

Special Management Zone (in FMA plans). Delineates an area that is managed to maintain specified values, such as flora and fauna habitat or catchment values, while catering for timber production under certain conditions.

Special Protection Zone (in FMA plans). Delineates an area that is managed for the conservation of natural or cultural values and where timber harvesting is excluded. It forms part of a network designed to link and complement conservation reserves. An informal reserve.

State border (Victoria and New South Wales).

The Surveyor-General defines the state border as a boundary line running along the top of the southern or left bank (looking downstream) of the River Murray. The top of the bank is not always easily identified. The whole River Murray watercourse is within New South Wales. The ordinary common law principles of erosion and accretion apply including undercutting by water abrasion and subsequent landslip, but the border is not altered by rapid changes in course such as avulsion (e.g. meander cut-off).

Traditional Owner (groups). Aboriginal people and groups who have established over hundreds of generations a spiritual tie with specific tracts of land or traditional Country.

Unrestricted Crown land. Land owned by the Crown that, under the *Mineral Resources (Sustainable Development) Act 1990*, can generally be prospected, explored or mined, but over which conditions may apply.

Visitor days. Accumulated number of visits to a site including overnight stays.

Water entitlement. The volume of water authorised to be taken and used by an irrigator or water authority. Water entitlements include bulk entitlements, environmental entitlements, water rights, sales water, surface water and ground water licences.

Yorta Yorta Co-Management Agreement. A formal agreement between Yorta Yorta Nation Aboriginal Corporation and the State of Victoria relating to management of Crown land and waters over a total area of approximately 50,000 ha in northern Victoria.

APPENDIX 1

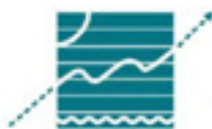
River Red Gum Forests Investigation – Socio-Economic Assessment Final Report

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To those we have omitted – our apologies.

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1 INTRODUCTION

The purpose of this report is to outline a social and economic assessment of VEAC's final recommendations for the River Red Gum Forests (RRG) Investigation.

Background information for this report has appeared in the VEAC River Red Gum Forests Investigation Discussion Paper, published in October 2006, and the Draft Proposals Paper (DPP) for Public Comment, published in July 2007. The Discussion Paper includes comprehensive treatment of the Environmental, Social and Economic Setting; the Public Land Use Framework; Uses of Public Land; and Discussion of Issues. The Draft Proposals Paper included a description of VEAC's draft recommendations.

The outcomes sought through the report are:

- (a) an assessment of the costs and benefits of VEAC's recommendations and how those costs and benefits are distributed;
- (b) an assessment of the social implications of VEAC's recommendations, with particular attention to the viability of small towns, including those dependent on timber;
- (c) suggestions on measures that could be adopted to either strengthen the positive, or mitigate the negative effects of the recommendations; and
- (d) a description of a survey of timber industry businesses to quantify key factors (including employment, product markets, value adding and trends, and production from New South Wales) required to achieve outcomes (a) to (c) above.

All costs and benefits are identified and described, and quantified in dollar terms where possible. Where this was not possible, a qualitative assessment is provided, together with order of magnitude estimates where appropriate. Economic and social implications are determined both for the study area¹ and for Victoria as a whole.

The two main types of socio-economic impact assessment employed in this study are Benefit Cost Analysis (BCA) and Regional Impact Analysis (RIA). *The two methods have quite distinct roles.*

Benefit Cost Analysis – BCA assesses the net economic gains or losses to Victorians² that may arise as a consequence of changed public land management. The analysis would support implementing the recommended changes if the benefits of the changes exceed the costs. Whether or not a project is adopted by government should be guided by the results of a BCA, not by RIA. If government decides that the project is to be implemented, the BCA would normally be followed by financial analysis incorporated in a business plan.

Regional Impact Analysis – Local and regional communities have a strong interest in the possible immediate impacts of changed public land management on their employment prospects and incomes. In this study the consultants used an Input-Output (IO) model to provide estimates of these impacts on regional economies, including both direct and flow-on effects. This method of analysis *does not* determine whether the people of Victoria are likely to incur a net economic gain or loss as a result of changed management. Rather, it is of use, for example, in guiding the development of assistance packages for those who may be disadvantaged by the project.

In this analysis the BCA is State-wide – benefits and costs are considered from the viewpoint of all Victorians – while the regional impact analysis is confined to VEAC's study area.

A number of submissions to VEAC confused the two methods of analysis so the consultants have attempted to clarify the differences between the methods in a number of places in this report.

With respect to the regional economic impact framework used here, it should be noted that many proposals, whether economically beneficial in net terms or not, will provide an economic stimulus to a region. For instance, the Exxon Valdez oil spill generated significant amounts of economic activity, however, it could not be argued that the spill was socially desirable. Unproductive job creation schemes, such as 'digging holes and filling them in again' would be seen to create jobs in a regional analysis but, more sensibly, would show net losses in a BCA.

Hence while RIA can be used to estimate changes in regional economic activity (value-added, output, income and employment) associated with alternative policy scenarios, unlike the benefit cost analysis framework there are no guidelines for interpreting whether or not an increase or decrease in economic activity is economically desirable. The technique can however be useful for social planning purposes, particularly where the activities affected represent a significant proportion of the regional economy.

2 BENEFIT COST ANALYSIS

The Victorian River Red Gum (RRG) forests, wetlands and floodplains of the Murray Valley are valuable environmental resources with many, sometimes competing, public land uses giving rise to benefits for a wide range of people. Determining the appropriate balance of these uses from a society-wide perspective requires information about the relative values generated from those uses to be incorporated into the conceptual framework of a benefit cost analysis. Under this framework, alternative scenarios for future use of the River Red Gum forests (Scenarios 2 and 3) are compared against the base case or 'do-nothing new' option (Scenario 1) to identify if the alternative scenarios will lead to an improvement in well-being for the people of Victoria. The scenarios are:

- Scenario 1 BASE CASE – No new management changes over the next 20 years (includes delivery of 127 GL per annum (average) for existing environmental allocations and 500 GL per annum (average) for The Living Murray icon sites but no water from other sources such as Foodbowl Modernisation Stages 1 or 2 or allocation purchases).
- Scenario 2 Scenario 1 plus all VEAC's public land use recommendations but no additional water.
- Scenario 3 Scenario 2 plus adequate additional volume, duration and frequency of environmental water to conserve specified natural values of the River Red Gum floodplains.

An explanation of how each of the scenarios was derived is included in Appendix A.

Information about the commercial values of forest uses such as timber production and grazing in the River Red Gum forests is available from the markets in which outputs are exchanged. Forest protection benefits arise from recreation and tourism activities, and ecosystem and cultural heritage conservation.

¹ The 'study area' is that applying to the social and economic analyses. It does not correspond precisely to VEAC's 'Investigation area' due to restrictions reflecting Australian Bureau of Statistics (ABS) boundaries.

² VEAC's recommendations are to be made to the Government of Victoria so this determines the scale of the analysis. However, some of the benefits and costs may in practice have national, or even international implications.

Quantification of these non-market values was the focus of an earlier study for VEAC on the Non-Use Values of Victorian Public Land (Bennett et al. 2007), available on the VEAC website (www.veac.vic.gov.au). Additional non-market values are estimated in this report.

2.1 Estimating the Market-Based Values Associated with Forest Use

In terms of market based values, VEAC recommendations for public land use mainly affect the timber and grazing uses of the RRG forests and, potentially, the allocation of water to existing users. As documented in the social and economic assessment of VEAC's Draft Proposals, there are many factors that make reliable costing of water for the environment difficult. It would require the cooperation of three State governments and the Commonwealth Government. Environmental water in the Murray Darling Basin is the subject of a number of rapidly developing state and national policies and programs. In addition, in its Final Report VEAC's approach to environmental water does not focus on specifying a required volume. Accordingly, VEAC advised it was outside the scope of this social and economic study to quantify the cost of environmental water.

The implications for duck hunting are assessed in the non-market sections of the report.

2.1.1 The Timber Industry

The economic impacts on the timber industry were based on the results of a financial survey of participants in the industry, including mill operators, sleeper cutters and commercial firewood licensees. The survey questionnaire is shown in Appendix B. Interviews were held in person and included open ended discussion of issues. A total of 19 operators were interviewed out of approximately 22 licensees in the study area. The survey was confidential and individual responses were not given to VEAC or any other party. Around 10 operators provided financial information in sufficient detail to allow extrapolation to the rest of the industry, based on licensed volumes of four categories of timber.

The currently licensed allocations of timber in the study area are shown in Table 1. In practice, some adjustments have been made to these allocations as is usual when managing the forests. The figures do not include domestic firewood collection or volumes associated with some recent thinning operations.

Table 1: Timber Licence Volumes – 2006/2007 Allocations

Licence category	Volume (m³)
Red Gum sawlogs	6,072
Red Gum standard logs	4,428
Red Gum residual logs	6,603
Red Gum firewood	4,380
TOTAL	21,483

The direct gross annual value of the RRG-based timber industry is currently about \$9.3m with a net economic contribution to the Victorian economy of about \$2.58m per year. Assets dedicated to the industry are valued at approximately \$11.3m.

VEAC has advised that the sawlog harvest to be expected over the next 20 years for the Base Case (Scenario 1) will be about 71 percent of the 2006/07 allocations (as a result of lower tree growth rates due to reduced forest flooding), resulting in a net

economic contribution for all timber products of \$1.83m per year³. The calculated contributions for the other two scenarios, respectively, are \$0.46m and \$0.58m per year, reflecting the impacts of VEAC's recommendations, and increased water availability for Scenario 3. Details of the timber yields that are to be expected based on the various scenarios, are shown in Appendix C.

Estimates of timber volumes supplied by DSE differ from those in the draft report for a number of reasons – which are described in VEAC's Final Report.

While DSE's estimates indicate the sustainable volume available from the remaining area of state forest, VEAC advises that Gunbower forest has extensive areas of relatively young River Red Gum trees which will not provide harvestable timber for several years.

2.1.2 Grazing

VEAC's recommendations include cessation of grazing in the Barmah forest (about 29,600 ha), other recommended parks and reserves (about 44,760 ha), and exclusion of grazing from water frontage reserves and streamside areas (about 9,280 ha). It is assumed in the BCA that only the water frontage and streamside areas will require provision of fencing and watering points. Graziers were not surveyed as part of this study and the analysis is based largely on other studies conducted for the Victorian (Read Sturgess & Associates 2000, URS 2005) and NSW Governments (Hassall & Associates 1998) and on area estimates provided by VEAC.

Two methods were used for estimating the costs associated with fencing: one using per hectare costs for all components, based on the above studies; and a second which used per hectare costs for pest management and lost feed value, per kilometre costs for fencing, and per licensee costs for watering points. Both methods gave very similar results (Appendix D).

For the Barmah forest it is estimated that the annual net economic contribution of grazing is \$0.14 m in the base case scenario (Scenario 1), based on grazing of 2,000 head of cattle in the summer six month period and 800 head in the winter six month period. For the other two scenarios (Scenarios 2 and 3) the net economic contribution is zero.

For the other public land, including water frontage areas, grazing returns an annual net economic contribution of \$0.76m in the base case and annual net costs of \$0.87m per year for the other two scenarios – due to the need for fencing, watering points and increased pest management. It is assumed, conservatively, that these costs are incurred immediately, although they may not be due for up to five years.

Grazing licences in the study area represent a small proportion of the farm area for most licensees. It is therefore unlikely that the removal of grazing licences will significantly change the financial performance of those landholders affected by VEAC's recommendations. In addition, the estimates of costs of fencing etc. reported here do not include any subsidies. For some, if not many graziers, assistance of up to 50 percent of the costs of fencing is available from Landcare and Catchment Management Authorities. In some cases, assistance is also available for pest management and watering points.

Recent estimates provided by CMAs for the study area suggest that about 60 percent (about 870 km) of licensed Crown frontage (total of about 1,450 km) is already fenced.

3 Throughout the report small differences in totals are due to rounding. In addition, VEAC made small changes to some components of their investigation after the economic analyses were completed which had no material implications for our results. Therefore, some totals in the VEAC report may not be exactly the same as those reported here.

2.2 Estimating the Non-Market Environmental Values Associated with Forest Protection

2.2.1 Context

The Victorian River Red Gum (RRG) forests, wetlands and floodplains of the Murray Valley are valuable environmental resources with many, sometimes competing, land uses giving rise to benefits for a wide range of people. Determining the appropriate balance of these uses from a society-wide perspective requires information about the relative economic values generated from those uses. It is only with access to such information that trade-offs between competing uses for the resources can be assessed and sound policy and management decisions made (Bennett et al. 2007).

For example, parts of the forests may be managed for recreational use in an undisturbed natural setting, or for timber harvesting. Making that choice is facilitated where information about the benefits society enjoys if an area of forest is set aside primarily for recreation can be directly compared against the benefits generated from the harvesting of its timber. In the case of some RRG forests, grazing is a licensed activity. Significant ecological values may be affected by timber harvesting, grazing or some recreation activities. Alternatively, parts of the forest could be managed for a range of recreation, conservation and minor resource uses, as was recommended for the Forest Park land use category in VEAC's recent Angahook-Otway Investigation.

Information about the commercial value of timber production and grazing in the River Red Gum forests is readily available from the markets in which the products are exchanged. More problematic is the estimation of values associated with forest benefits that are not marketed. These benefits arise from ecosystem conservation, protection of cultural heritage, and recreation and tourism activities.

If resource management decisions are made with reference only to information on the values of the *marketed benefits*, there is a risk that the outcome will not be in the best interests of society as a whole. Efforts to estimate the *non-marketed*⁴ (un-priced) benefits are therefore to be encouraged in order to secure balanced decision making.

The non-market values of forests can be based on evidence of such values collected from other case studies. For example, the international EVRI database maintained by the Canadian EPA sets out the results of non-market valuation exercises in a wide range of different contexts. Value estimates could be extracted from that database and used as approximations for the values of the River Red Gum forests. This practice – called 'benefit transfer' – is prone to inaccuracies if there is no strict comparability between the circumstances of the case at hand and those pertaining to the original study site. This is likely to be the case with the River Red Gum forests because their characteristics, both in terms of their ecology and the human communities that enjoy their benefits, are not represented in any existing valuation study. Hence, using benefit transfer as a means of generating value information for resource management decisions may not be satisfactory in this case.

The alternative is to conduct original research with the specific goal of estimating the non-marketed benefits of the River Red Gum forests, as was done for the VEAC investigation (Bennett et al. 2007).

A practical outcome of quantifying non-market benefits is that it assists in resolving conflicts between the various vested interest groups and helps to clarify the choices open to those who ultimately make decisions on the balanced use of public land

and other natural resources. The values derived from this exercise can be directly included in benefit cost analyses and social assessments of VEAC's recommendations.

2.2.2 Previous studies employing non-market valuation

Non-market valuation now has widespread application to assist policymaking in Australia, Europe and the US. The UK Treasury (2004) has adopted similar methods to those described here. In the USA the NOAA (1993) panel's high level review of the methods following the Exxon Valdez environmental disaster, has led to an increased array of applications. Internationally, the World Bank and the OECD routinely apply the methods to assist in environmental decision-making and policy formulation (Pagiola 1996, 2001, Pagiola et al. 2004).

The Victorian Government has supported the use of non-market valuation methods in a wide range of applications in recent years, including assessment of the economic value of: historic places; reducing the frequency of algal blooms, recreation in Victorian parks; the Royal Botanic Gardens, Cranbourne; and creating new national parks and expanding existing national parks. The Government has also supported other studies employing the methods in: river management; floodplain management; and nutrient management.

Members of the consulting team have conducted non-market valuation studies in all the eastern states of Australia, with applications covering national parks, heritage rivers, environmental flows, wetlands, river health, farm forestry, wind farms, coal mining, gold mining, urban streams, sewage disposal, recycled water, and environmental contributions by agriculture.

2.2.3 Other estimates of the value of national parks

Several studies that consider the values associated with forest restoration and protection have been undertaken in Australia and overseas:

- The Nadgee Nature Reserve on the south coast of New South Wales has some characteristics in common with parts of Victorian damp forests. The Reserve contains a number of endangered species of birds and a diverse set of habitats in a natural setting. Using the contingent valuation method, Bennett (1984) estimated that the average existence benefit (measured as a once-only lump sum) of this preserved natural area to the residents of Canberra over the age of 18 years was about \$27 per person in 1979 dollars.
- In 1989 the Resource Assessment Commission (1992) used a contingent valuation study to assess the community's willingness to pay for those areas currently used for timber production in south-east NSW and East Gippsland to be converted to conservation zones of the National Estate. This revealed that the median willingness to pay for total preservation of the National Estate was about \$43.50 per household per year or \$22 per person per year.
- Lockwood et al (1992) used contingent valuation procedures to estimate the Victorian Community's willingness to pay to reserve unprotected National Estate forests in East Gippsland from timber harvesting. The median value of the willingness to pay was \$25 per household per year.
- A contingent valuation study of the preservation values of East Gippsland forests, undertaken by Lockwood and Loomis (1993) estimated that 50 percent of Victorian households were willing to make an annual contribution of \$52.

4 *Non-market benefits* refer to those benefits that are not directly transacted in markets, and where values can not be estimated directly from market transactions. *Non-use benefits* are a key subset of non-market benefits. Other non-market benefits include some direct use values (e.g. recreation) as well as indirect use benefits (water filtration, carbon sequestration).

Non-use values are the values that people in the community might hold for environmental assets, irrespective of whether they use them. Examples of the sorts of drivers for non-use values are that people gain enjoyment from knowing that assets exist, want to bequest them to future generations, want to be cautious about development to maintain future options, or want to preserve them until better knowledge is available. Non-use benefits are part of a package of benefits that are normally associated with assets such as forests, with other key areas being use and indirect-use benefits.

- Macmillan et al. (2001) used contingent valuation procedures to assess the values that people attached to the restoration of two large areas (80,000 ha each) of native forest in Scotland. The values ranged from UK£ 24-53 per household per year.

Nunes et al. (2001) reviewed a total of 61 representative biodiversity valuation studies published between 1983 and 1999 from various countries, but mainly the United States. Contingent valuation and choice modelling were the preferred methods used since the other methods are unable to identify and measure passive or non-use values. The other methods used included travel cost and tourism revenues – particularly for biodiversity values related to recreational values.

Values ranged from US\$5-126 per household per annum for protection of single species; US\$18-194 per household per annum for protection of multiple species; and US\$27-101 for protection of ecosystems and natural habitat diversity.

A study by Lockwood et al. (2000) and Lockwood and Walpole (2000) included market and non-market valuations of conserving remnant native vegetation (RNV) on private land in north-east Victoria and southern NSW. The Victorian study area covered 1,880,056 ha, including 113,313 ha of RNV; 1,205,498 ha of forested public land; 8,000 ha of private pine plantations; and 553,245 ha of predominantly cleared private land.

Lockwood et al. (2000) used two stated preference methods, contingent valuation (CVM) and choice modelling (CM), to assess the non-market economic values of remnant native vegetation (RNV) in the two study areas. Both of these methods involved the use of mail surveys to determine community willingness to pay (WTP) for RNV conservation. The economic estimates from the two methods were not significantly different, providing evidence for the convergent validity of the results. The CM data were used in subsequent analyses, because they allowed calculation of WTP for a range of different scenarios.

Average household WTP for RNV conservation in north-east Victoria was about \$73, as a one-off payment. If we assume a discount rate of 7 percent in perpetuity, this value translates into \$5 per household per year, or \$6.90m per year for all Victorian households (adopting the ABS 1996 Census figure of 1.35 m households in Victoria). It is likely that Victorians would be willing to pay more for biodiversity conservation in national and state parks than in remnant native vegetation areas on private land so these values are likely to be conservative.

Participants in the WTP survey were recruited from random samples of 2,000 Victorian and 2,000 NSW voters obtained from the state electoral rolls. Each of the four survey instruments (CVM and CM for each State) was mailed to 1,000 potential participants. The return rate for Victoria was about 60 percent, relatively high for this type of survey.

2.2.4 Choice Modelling

Choice Modelling (CM), a *stated preference* non-market valuation technique, was used to estimate the protection values associated with the RRG forests (Bennett et al. 2007). The CM technique involves a sample of people being asked to make a sequence of choices between different forest management strategies described in terms of their impacts on particular attributes.

For the RRG forests, the attributes and the ranges over which they may vary over the next 20 years under the various management scenarios are summarised in Table 2. For each attribute the levels are based on the experience of experts consulted for the choice modelling study. For example the current populations of Murray Cod and other threatened native fish are about 10% of their levels before European settlement. With sufficient resources, over 20 years their populations could be increased to about 60%. Options for how much people were willing to pay to protect the environmental values range from zero to \$100 – around the upper limit in comparable studies.

Table 2: Attributes and their Levels for River Red Gum Forests

Attribute	Description	Levels
Cost	Compulsory annual payment (\$)	0; 20; 50; 100
Healthy RRGs	Area in hectares	54,000; 67,000*; 74,000; 80,000
Threatened Parrots	Number of breeding pairs (Regent and Superb Parrots)	900; 1,200; 1,500; 1,800
Murray Cod and other threatened native fish	Percentage of pre-European numbers	10; 20; 40; 60
Recreation Facilities	Number of campsites with facilities	6; 9; 12; 18

* The current extent of healthy River Red Gum forest is approximately 67,000 ha. Without additional resources and management, this is expected to decline to about 54,000 ha in 20 years.

The three environmental attributes, viz. (1) healthy River Red Gums, (2) threatened parrots, and (3) Murray Cod and other threatened native fish are surrogates for, respectively, (1) terrestrial ecosystem health, (2) terrestrial threatened species and species diversity, and (3) aquatic ecosystem health, threatened species and species diversity. Collectively, these three components effectively cover the range of non-market benefits that most people associate with protection of the natural environment in the River Red Gum Forests Investigation area.

Descriptions of the survey materials used and survey logistics are provided by Bennett et al. (2007). The six samples used in the surveys are shown in Table 3. They include samples from towns and rural areas within the RRG area; and from Melbourne and Bairnsdale to gauge the views of people remote from the Murray River.

Table 3: Selection of Samples

	REGION			
	Melbourne (out of region)	Murray Region		Gippsland Region
STUDY AREA River Red Gum forests (RRG)	1. Metro	2. Echuca 3. Mildura 4. Wodonga	5. Rural*	6. Bairnsdale (out of region)

* The rural sample involved respondents living on farms, outside urban areas.

The surveys were conducted using a drop-off-pick-up process in November 2006.

2.2.5 Results for River Red Gum forests

Models explaining respondents' choices between alternative forest management options are used to estimate the marginal values of the Healthy RRGs, Parrots, Cod and Recreation attributes. These values are expressed in terms of *implicit prices*: the marginal willingness to pay for the average respondent household (per year) over a 20 year period for a unit increase in the attribute. Refer to the report on VEAC's website (www.veac.gov.au) under 'Economic evaluation of forest environmental attributes' for explanations of these attributes and the material provided to survey respondents. This report also describes the procedure for condensing complex ecological concepts into terms which respondents can understand.

The results in the table below show that respondents in the Bairnsdale and Melbourne sub samples are willing to pay \$3.29 and \$1.45 (per annum per household for 20 years) respectively for a 1,000 hectare increase in the area of healthy RRG forest. 'Within region' respondents (an aggregate of the Echuca, Wodonga and Mildura samples) recorded values that are not significantly different from zero. People in those areas were prepared to accept the status quo with respect to that attribute.

Respondents were found to attach a positive value to increasing the numbers of breeding pairs of threatened parrots, ranging from around \$4 to \$8.40 per 100 pairs. The implicit price for

a one-percent increase in the populations of Murray Cod and other threatened native fish species varies across the sub samples from about \$1 to \$1.40. Implicit prices for the recreation attribute are not significant for any of the sub samples.

Table 4: Implicit Price Estimates for River Red Gums

Attribute	Sub sample		
	Melbourne (\$/yr/hh)	Bairnsdale (\$/yr/hh)	Within region (\$/yr/hh)
Healthy RRGs / 1,000 ha	1.45*** (0.46)	3.29** (1.29)	0.0677 (0.47)
Parrots /100 pairs	4.39*** (1.04)	8.39*** (2.76)	3.96*** (1.04)
Cod /1 percent increase	1.02*** (0.17)	1.37*** (0.44)	1.09*** (0.17)
Recreation /campsite	-0.11 (0.62)	-0.85 (1.53)	-0.24 (0.66)

Notes: Significance levels indicated by: * 0.1, ** 0.05, *** 0.01. Standard Errors in parentheses.

Based on comments made in the questionnaires, the non-significance of the recreation/ campsite attribute may be due to a conflict of preferences between those seeing positive outcomes (eg. more facilities providing a better camping experience) and those seeing negative outcomes (eg. more facilities leading to more congestion and environmental damage).

The ABS data that were available at the time of the CM survey were from the 2001 Census and were therefore out of date for comparisons with survey socio-economic characteristics. The required ABS 2006 Census data became available (October 2007) well after the CM report deadline. Comparisons with both Censuses are shown in Appendix E. There were difficulties in comparing household income data due to the ABS changing their income categories three times over the two censuses – as shown in the appendix. Nevertheless, the comparisons demonstrate that the sample data are consistent with the ABS data with few exceptions. Some of the exceptions are to do with age and sex – the respondents submitted their own details and the questionnaires were more frequently completed by older males. The other exceptions are mainly due to the changes in ABS income categories.

2.2.6 Application to Benefit Cost Analysis

The implicit prices estimated from the choice data are directly applicable to the consideration of alternative forest management options. Specifically, they are compatible with the principles of BCA. The process of employing implicit prices in the BCA involves four basic stages:

1. Predicting the impact of a management change on the attributes used in the choice modelling exercise relative to the predicted continuation of the 'status quo'.
2. Multiplying the implicit prices by the respective predicted attribute change to estimate the willingness to pay (per household) for each attribute change.
3. Aggregating the willingness to pay across all attribute changes.
4. Extrapolating across the relevant population, using the percentage survey response rate, to estimate the societal willingness to pay for the management change.

It should be noted that the implicit prices (IPs) are based on respondents' values when asked what they would be willing to pay for environmental improvements that take place over a 20 year period. The IPs are therefore discounted at the

respondents' personal discount rates so they can be regarded as applying from the commencement of implementation of the parks, not from when the benefits are actually realised on the ground later in the 20 year period. Personal discount rates are likely to be higher than the social rates that are used in the BCA so this may be a source of under-estimation of environmental benefits.

2.3 Assumptions for Environmental Outcomes

The assumptions for environmental outcomes were specified by VEAC in April 2008 and are summarised below. The derivation of the values for each scenario is described in Appendix A.

Table 5: Assumptions for Environmental Outcomes

Environmental attribute	Scenario 1	Scenario 2	Scenario 3
Healthy RRGs ('000 ha)	54	64	80
Threatened parrots ('00 pairs)	6	10	16
Murray Cod & other threatened native fish (%)	20	20	30

Non-market issues that are not addressed in this analysis include implications for Indigenous cultural heritage, and the cultural heritage value of the Barmah muster and other red gum related heritage issues. The implications of different forest management regimes for emissions of greenhouse gases have not been considered. In the view of the consultants, it is not likely that the net effect of these issues will change the conclusions to be drawn from the BCA.

Environmental Water

VEAC has emphasised the importance of 'adequate' environmental water and the effect is apparent in the comparison of the outcomes for Scenarios 2 and 3. 'Adequate' watering offers improved outcomes that may be disproportionately greater than the additional amount of water. According to VEAC this result may be expected for a number of reasons:

1. The additional environmental water under Scenario 3 should significantly ameliorate the effects of climate change.
2. The area watered (and therefore, the environmental benefits derived) increases more than proportionally as the water level rises above natural levees, and flooding extends over the floodplain.
3. VEAC's approach, focussing on mapping and watering areas with flood-dependent natural values, should provide the following benefits:
 - greater ecological connectivity along and across the floodplain (including between the river and the floodplain);
 - greater emphasis (and therefore greater likelihood of watering) on those natural values most susceptible to reduced flooding;
 - greater confidence that key natural values are not overlooked and thereby not adequately watered; and
 - greater opportunity to react to environmental changes (particularly water availability) and adjust floodplain watering to continually maximise environmental benefits.

However, as explained earlier, the consultants were advised by VEAC that while assessing the costs of providing these benefits in terms of water resources is obviously important, it was beyond the scope of this study.

2.3.1 Demographic data

Demographic data (from the ABS Census for 2006) and the Choice Modelling survey response rates relevant to estimating the environmental values are summarised in Table 6. Victorian rural areas outside rural cities and towns are not included due to the low survey response rate for these areas.

Table 6: Demographic Data

	Number of households (m)	Survey response rate
Melbourne	1.382	50
Murray region cities and towns	0.105	80
Out of region cities and towns	0.31	70

2.4 Estimating the Values Associated with Wetland Protection and Duck Hunting

In addition to the above environmental outcomes, VEAC recommendations involve increased protection of about 6,710 ha of wetlands and restrictions affecting approximately 4,390 duck hunters. Appendix F provides details of the wetland areas to be protected and Appendix G provides details of the number of duck hunters affected.

Duck hunting

A study in South Australia (Whitten and Bennett 2001) puts the economic value (measured as consumer surplus) of duck hunting at about \$48 per trip, with 95 percent confidence limits of about \$30 and \$120. These values are consistent with the economic values estimated for other highly valued recreational pursuits such as fishing.

Duck hunting is increasingly taking place along rivers and streams and the hunting season normally runs for 12 weeks, mid-March to mid-June.

The estimate of 4,390 duck hunters is probably too high as it draws on numbers in wet years and does not take account of dry years when the duck season is cancelled. A more realistic estimate of the number of hunters affected is 2,790⁵ but the economic analysis conservatively relies on the higher figure.

Based on estimated hunter numbers for the whole season and an assumption concerning the percentage of duck hunters who could find alternative sites within Victoria (60 percent), the annual loss of consumer surplus is \$545,163 per year for Scenario 2 and \$490,646 for Scenario 3 where more water is available for wetlands.

Wetland protection

Functions of wetlands

Wetlands perform many economically valuable functions including:

- providing habitat for native plants and animals;
- providing refuges for rare and threatened species;
- assimilating and recycling nutrients;
- trapping sediments;
- functioning as flood control basins;
- providing hydrological stability between surface water and ground water in catchments;
- providing sites for recreation; and
- providing landscape values.

Many of these functions produce goods or services which are of a public nature, that is, they cannot be appropriated exclusively by the owners of wetlands and one person's use does not diminish another person's use. Because landowners usually cannot collect revenue on the environmental services provided by the wetlands, such as pleasant landscapes, flood protection, habitat for wildlife, and nutrient assimilation, they will tend not to account for them

in their decision making. Thus, the area and quality of remaining wetlands are likely to be lower than the community would desire, providing an argument for protection by the State, normally on public land.

Values of wetlands

Jensen (1993) notes that estimates of indirect use values in the United States put the value of wetlands for flood retention buffers at A\$19,285 per ha and up to A\$286,000 per ha for nitrogen retention. Jensen also cites a demonstration by the US Army Corps of Engineers that intact wetlands stored 70 percent of a 1 in 2 year flood, providing a cheaper and more effective method of flood mitigation than levees. Other studies in the United States, have shown high values, up to US\$14,600 per ha (1971 values), for the life support values of forested wetlands (see Young 1991).

A study of the wetlands of the Barmah Forest using contingent valuation procedures found a value of about \$3,000 per ha for both direct use and non-use (Stone 1992). The Barmah wetlands can be regarded as above average wetlands because of their listing under the Ramsar Convention.

Sappideen (1992), also using contingent valuation, estimated the total annual willingness to pay to preserve the Sale wetlands in Victoria for recreational purposes (direct use value) to be about \$766,000. Using a four percent real rate of discount and a 30-year planning period, the present value of the future recreational benefits of preserving the Sale wetlands would be \$13 million or about \$3,600 per ha. Non-use values were not estimated but 60 percent of respondents in Sappideen's survey regarded such values as important or very important.

These examples show that the total economic value of wetlands can be high. Therefore, the payoff to policies and practices which conserve the functions and values of wetlands are likely to be high.

While it may be inappropriate to transfer directly values such as those estimated for Sale and Barmah to all wetlands in the study area, they provide indicative values for wetlands which are prized for their recreation opportunities or their conservation status. Using this approach, Jensen (1993) valued the Coorong section of the Ramsar site (36,000 ha) at \$108 million (\$3,000 per ha).

A conservative value of \$1,000 for wetlands without these characteristics has been used in other studies for which an indicative value of wetlands was required (McGregor, Harrison and Tisdell 1994).

Wetlands can be threatened by many processes, including those which take place at the wetland itself (such as, land reclamation and drainage for other uses, and recreation pressure) and those which take place elsewhere (such as, reductions in the quality and quantity of inflows, whether from surface water or groundwater). As implied in the discussion of wetland functions, the damage caused to wetlands can express itself at the site (loss of recreation opportunities) or elsewhere (increased flooding downstream). These 'externality' effects associated with wetlands and the public-good nature of many of the goods and services provided by them (noted above), mean that it is likely that there would be an under-supply of the conservation benefits of wetlands if left entirely to the market. In some cases this problem can be particularly serious because the damages are irreversible.

As noted by Pearce and Turner (1990) the absence of integrated resource policies means that inconsistencies between the policies of various sectors can produce 'government failure'. For example, artificially high producer prices for agricultural commodities or tax concessions for land development can threaten the environmental values of wetlands. While this type of failure is most likely to affect wetlands on private land, wetlands on public land are not immune, as is illustrated by the debate over the use for chemical storage

5 Based on data from State-wide mail surveys provided by DSE.

camping in the new national parks may be balanced by reductions in campers as a result of tighter management of camping. There is currently a high level of camping use along the rivers, and at peak times available campsites at most beaches from Yarrowonga to Koondrook, and near Mildura, are occupied. However, Parks Victoria visitation statistics demonstrate that except in the Christmas – early January peak, and to a lesser extent at Easter, there is ample camping space available, so there is potential to increase camping at these times.

During public consultation, and in submissions, there was much concern over the perceived effects of VEAC's draft proposals amongst regular users of these areas.

In addressing the possible reduction in camper numbers, in its Final Report VEAC Council has:

- clarified the situation regarding continuation of dispersed camping and the application of its camping proposals on-ground;
- modified its recommendations on campfires under certain conditions; and
- proposed several long, popular areas along the Murray River be excluded from the proposed national parks and remain available for camping with dogs.

Further, VEAC effectively ignored non-camping tourism in the Draft Proposals Paper. Tourists who come to the area with the purpose of visiting the national parks but who stay in nearby towns were not considered. Tourists already in the area but who stay an extra day or two to visit the parks, were not included. Day visitors were not considered. Future tourism developments near the proposed national parks were not anticipated.

The new parks will have a number of possible advantages:

- they are accessible from Melbourne and other population centres and are easily accessed by road;
- the river(s) provide an integrating theme with other regional tourist attractions;
- the rivers with their bends, beaches and River Red Gum trees are highly valued scenic resources;
- there are numerous biodiversity, recreational and cultural heritage attributes associated with the new parks; and
- national park status will lead to increases in expenditure on promotion and facilities.

The study of Box-Ironbark parks (Dumsday 2001) estimated the likely increase in visitation, based on two previous cases where land has changed designation from state forest to national park — the Grampians National Park and Murray-Sunset National Park.

The Grampians were declared a National Park in 1985. Visitor numbers prior to declaration (2 years' figures) averaged 1.12 million visitor days. Visitor numbers following the park declaration (figures for 11 years) have averaged 1.50 million. That is, the increase in visitors following Park designation was approximately 30 percent.

Murray-Sunset National Park was declared in 1991. Visitor numbers post designation have averaged 2.3 times those pre designation (27,200 average compared with 12,000). Statistical analysis revealed that visitation following declaration as a park increased by 32 percent for the Grampians and 62 percent for the Murray-Sunset National Park. Both these increases were net of trends due to increase in population, for example, and were significant at the 1 percent level.

A large number of people made submissions to VEAC that introduction of restrictions on the use of the new RRG national parks would negatively impact on current users. This may be so but the same sorts of restrictions have applied in other cases where

the establishment of national parks in areas previously designated as state forest has led to substantial increases in visitor numbers to those areas. Presumably the attractions of national parks more than negate the perceived effects of such restrictions on overall visitor numbers.

An analysis conducted as part of this study for the more recently established Yarra Ranges National Park showed a statistically significant increase in visitation of approximately 28 percent. Unfortunately, visitor data for the other recently established national parks – in the Box-Ironbark area and the Great Otway National Park have not been collected in a form that is useful for comparison with earlier data.

On the basis of these analyses, the consultants have assumed a possible increase of up to 20 percent in visitation following designation as a national park and associated promotion. This assumption is important to the benefit cost analysis and to the analysis of regional economic activity.

It should be noted that reliable visitor statistics for public land are difficult to collect, particularly in areas such as the RRG forests where there are many access points and some major through roads, so the data need to be interpreted cautiously. They may be based on vehicle counts at the entry to parks. They are frequently based on sample head counts taken at irregular intervals. The visitor data used in statistical analysis also have numerous missing values and these affect the results depending on how they are dealt with in the analysis. So the estimate of 20 percent increase in visitation should be seen as a 'what if' analysis based on the best available information, not a forecast of what is likely to happen.

From a State-wide perspective, increasing visitor numbers for the RRG parks may be at the expense of visitation to other parks in the State. However, offsetting this possible source of overestimation of benefits to some degree, we make the conservative assumption that the above increases apply to visitors to the expanded national parks and not to the establishment of other protected areas recommended by VEAC.

The unit values for the net economic contribution of visitors to the RRG national parks are based on a number of earlier studies (Read Sturgess & Associates 1999, Dumsday 2001, URS 2004). We have assumed a consumer surplus of \$35 per visitor day, weighted for the likely ratio of recreationists (originating from the local area) and tourists from overseas, interstate and other parts of Victoria. It is likely that the number of tourists will increase following the establishment of the new national parks, as noted in the regional analysis.

As a result of these analyses, the increases in net economic values for tourism that potentially arise as a result of VEAC's proposals for the RRG national parks are estimated to be approximately \$872,000 per year. The detailed calculations are shown in Appendix H.

It should be noted that while the BCA analysis assumed total increased annual visitation of about 24,900 per year, the regional analysis assumed a uniform 20 percent increase in visitation over all new RRG parks – 48,000 visitors per year – because the regional model did not allow differentiation of visitor numbers between the parks.

2.5.1 Additional park management costs

Administrative responsibility for managing recreation on public land proposed to be included in the new parks is likely to be shared between DSE and Parks Victoria. Parks Victoria have higher management costs with respect to visitors because of the higher level of facilities and promotion associated with national parks compared with state forest.

DPI/DSE and Parks Victoria are likely to retain existing responsibilities for fire protection, management of pest plants and animals, and researching ecological management, as appropriate, hence those costs should not be affected.

It was assumed that *additional* management⁶ costs for the public land areas, including new national parks, would be \$1m per year. This is an estimate based on other studies of the establishment of national parks (Dumsday 2001) and advice from VEAC and has not been explicitly calculated for this study. The cost is over and above the costs of the DPI/DSE employees now involved in managing, regulating and administering these public land areas, and the costs for other items such as road construction and maintenance, fire protection, and pest plant and animal control. The costs are net of any reductions in DSE management costs due to the removal of timber harvesting and grazing. The assumption would need to be re-examined in the course of undertaking the implementation program should the Government ultimately accept VEAC's recommendations.

It is quite difficult to extract the appropriate cost data from various departmental and government sources, partly because of the influence of large scale fire control in recent years and because financial statements do not always reveal whether the funds expended are new funds or have been redirected from somewhere else. Despite all this, there is the possibility that the estimate of \$1m is an underestimate.

Several VEAC recommendations in the RRG Final Report imply that some Indigenous employment should result if the recommendations are implemented. Jobs for Indigenous people are relevant as they relate specifically to roles in the new RRG parks. Recommendations refer to properly resourced programs to: identify Traditional Owners; employ (Indigenous) contractors to work on land and natural resource management projects; employ Aboriginal rangers; set up opportunities for increased employment and training; and provide for park co-management. Taken together there is a clear expectation that at least several part-time Indigenous jobs should result from implementation of the recommendations.

Several people submitted the view that existing parks in Victoria were already under-resourced and that adding to the area of parks would only exacerbate this problem. This view has been consistently put to the consultants in other national park assessments that they have conducted. A recent example of park implementation contradicts this assertion – funding allocated to implementing the Box-Ironbark Parks and reserves was \$20.8m over four years⁷. This amount included financial assistance to those who were directly disadvantaged by the establishment of the parks, and a range of other programs for park management, recreation and firewood supply. Appendix I details the implementation of the Box-Ironbark recommendations.

Furthermore, as shown in Appendix J, expenditure by DSE/NRE and PV on park management has trended upwards over the eleven years from 1995/96 to 2005/06, showing an increase of about 154 percent over the period. Expenditure increased in real terms (ie. net of inflationary increases). While there were significant additions to the park and reserve estate in Victoria over this period (including the Yarra Ranges & Great Otway National Parks, Box-Ironbark parks and reserves, and Marine National Parks), the total area of these additions only added 10.5 percent to the extent of parks and reserves in Victoria.

While these examples do not 'prove' that existing public land management is adequately funded (that would depend in part on what different people would consider 'adequate'), they show that resourcing of parks and reserves has improved over the eight years examined, both in general, and especially in association with the establishment of new parks and reserves such as in the implementation of the Box-Ironbark recommendations.

2.6 Protecting Riparian Areas

Introduction

The following introduction draws on Vollebergh (2006).

Riparian land performs important terrestrial and riverine ecological functions. From an instream perspective, riparian land with intact native vegetation provides:

- a supply of organic matter into the river, both from vegetation and invertebrates, a major food source for instream biota;
- a supply of woody debris for the river which forms key habitat areas for many fish and invertebrates;
- shade in upland areas which influence water temperature and light penetration;
- a filter for runoff to improve instream water quality, and
- stability to the bed and banks, reducing erosion of banks and sedimentation of streams.

Intact riparian vegetation is also important in the terrestrial landscape:

- it contains highly diverse flora and fauna;
- it can act as a refuge for fauna in dry times;
- it is often the only remaining remnant native vegetation in largely cleared catchments;
- it can act as a wildlife corridor, and
- it may act as important refuges and biolinks and assist in adaptation to climate change.

Riparian land can also be of significance to the community for recreation, particularly for access for fishing, swimming and boating. Riparian land also often contains cultural heritage sites of significance to Indigenous and non-Indigenous communities.

Riparian land is also often highly valued by farmers as productive farming land and, often more importantly, as access to rivers and creeks for stock watering. This potentially brings their current management into conflict with managing riparian areas for their environmental and social values of a public nature.

Valuing riparian areas

River management in Victoria presents decision makers with a set of complex issues that involve trade-offs between competing uses. Information on which to base sound river management decisions should include details of the relationships between alternative uses and the biophysical condition of rivers. For instance, decision makers should be aware of the consequences for attributes of river condition (such as native fish species numbers, the health of riverside vegetation, native waterbird and animal species numbers, and water quality) of various river management strategies (such as permitting more extraction, excluding stock from river banks, increasing the cap on extractions, etc.) (URS 2006).

There have been a number of Australian and international studies which value the environmental services of riparian areas in economic terms. The Australian studies are reviewed in Appendix K.

For the purposes of this report we have derived values from the first choice modelling survey conducted in Victoria (URS 2006). This study assessed the value of improved environmental health in Victorian rivers, focussing on the Goulburn, Moorabool and Gellibrand Rivers. The environmental attributes included for the Goulburn River are shown in Table 7.

6 The subject of park management costs highlights the difference between BCA and RIA. In the former case, higher park costs make the project less attractive, other things equal. In the RIA case higher park costs lead to more jobs, among other things, so it is seen as a good thing.

7 This figure is not to be compared with the park management costs discussed as financial assistance, for example, is a 'transfer payment' from one group in the economy to another and is not included in a BCA as there is no net change in contributions to the economy.

The vegetation attribute for the Goulburn River was taken as representing the values obtained from increasing protection of the riparian areas (excluding the Murray River). This is probably an underestimate of the value of protecting riparian areas – other attributes such as ‘fish’ could be added but the consultants took a conservative approach. The implicit price for the vegetation attribute was averaged over all samples, as shown in Appendix L. Some comparisons with values from similar studies in NSW are also included in this appendix.

Table 7: Environmental Attributes for the Goulburn River

Attribute	Description	Levels/ unit: Goulburn
Cost	Compulsory one-off payment to a trust fund	\$0, 20, 50, 200
Fish	Percentage of pre-settlement species and population levels	5, 10, 20, 30
Vegetation	Percentage of river's length with healthy native vegetation on both banks	50, 60, 70, 80
Birds	Number of native waterbirds and animal species with sustainable populations	35, 45, 55, 65
Water quality	Percent of the river suitable for primary contact recreation without threat to public health	70, 80, 90, 100

Applying the average implicit price to 30 percent of Melbourne households at a discount rate of six percent yields an annuity in perpetuity of around \$2,335,700. This procedure of assuming a conservative response rate and applying it to only Melbourne households is used throughout the report where we use ‘benefit transfer’ from other studies to estimate values. This conservative approach is taken because these values are not as reliable as those obtained in the CM study for the RRG Forests that preceded this study and which was specific to the VEAC Investigation.

Another source of underestimation of riparian values in this report is due to using the value from just one river in the study area, the Goulburn, and applying it to all the riparian areas. In the DSE healthy rivers study the questionnaires focused on each of the three rivers separately. In the case of the Goulburn the estimates were derived for the Goulburn below Eildon – representing about twice the length of the Goulburn in the VEAC investigation area. It is not appropriate to simply calculate the lengths of the affected rivers in the VEAC investigation area and scale the Goulburn estimate to reflect the whole area because if the survey was done in that context in the first place the respondents’ values would probably have been lower.

2.7 Maintaining Viable Rural Communities

Australian rural society has undergone change as the agricultural sector has adjusted to changing economic conditions (Bennett et al. 2004). Populations in rural areas have declined. Services provided to rural areas (and rural populations) have become more concentrated in larger rural centres and the fortunes of many small towns have waned. Many rural inland regions have experienced net migration and this has generated falls in population.

In 1911, 43 percent of Australia’s population was located in rural areas. By 1976, that figure had fallen to 14 percent as the terms of trade experienced by many Australian agricultural industries declined and capital substituted for the relatively more expensive labour input. It remained relatively constant at that level until the mid-1990s when it began to fall again. That is not to say that there have not been pockets of rural population growth – largely centred on some larger rural centres. However the populations of many other country towns have fallen and those of the large urban centres have risen. In the Australian context, the rural communities

facing the reality or the prospect of decline are largely those that are dependent on primary production.

There is some evidence to suggest that the broader Australian society would like to avoid a continuation of this decline in the viability of rural communities. Specific policies to support rural communities have been implemented. Governments have imposed rules to maintain levels of telecommunication services in rural areas and have convinced banks to install charters of “social responsibility”. The urban-dwelling public’s demand for maintaining the social structure of rural areas is regularly witnessed through donations made to various media appeals in times of “crisis” – such as droughts, floods and fires.

Whilst this evidence points to the existence of a public demand for supporting country people, it is not in a form that is useful to the design of specific policies. More detailed empirical evidence of the extent of the demand held by urban people for viable rural communities would be useful in the policy process.

Bennett et al. (2004) describe the results of two Australian studies that were aimed at estimating the non-marketed values associated with the outcomes of alternative natural resource management strategies. Both studies employed the Choice Modelling technique for estimating non-market values but in different settings. The first involved the estimation of values associated with wetland management strategies for the Murrumbidgee River Floodplain (MRF), situated in southern inland New South Wales. The second study investigated values associated with the implementation of alternative natural resource management strategies across the whole nation and, specifically, in two agricultural regions – the Great Southern in south west Western Australia and the Fitzroy River Basin in Central Queensland. The two studies therefore offer empirical evidence on the extent of community willingness to pay for maintaining the populations of rural communities. Specifically the studies investigate situations where the viability of communities is threatened by measures designed to provide environmental protection benefits but which reduce the profitability of agricultural enterprises.

The results of the two studies demonstrate that both rural and urban Australians value the continued viability of rural communities. This finding is robust in that it has been replicated for three diverse and geographically separated regions across a variety of rural, regional and urban populations, as well as in the national context.

In the MRF study, the social impact attribute was defined as the number of farmers leaving the region. In the second study, the number of people leaving country towns was the focus. These two attributes are not the same. The net migration of people from country towns is a ‘catch all’ measure for population change while farmers leaving is open to interpretation. That is, the exit of farmers may also lead to the closure of businesses that support other members of the community.

Despite various complications, it can be concluded that both studies reveal a consistency in value estimates between rural and urban populations. Comparisons within each study of the values estimated for respondents living in rural and urban areas showed no significant differences. This is a result not expected *a priori* given that the composition of the values enjoyed by the two groups of people could be expected to be different. However, it appears that the values of a viable rural community enjoyed directly by people living in a rural area are equivalent to the “nostalgic attraction” of the areas felt by urban dwellers for country townships.

There are numerous policy implications that follow from these results. Not the least of these is a justification for the redirection of wealth from the city to rural areas to ensure that rural Australia remains viable. It is worth reinforcing the point that this should not be achieved through price intervention in commodity markets but rather through payments specifically designed to achieve the goal of maintaining rural communities. Payments for environmental stewardship may assist in this quest.

A caveat to this conclusion is that the results do not necessarily justify the provision of support to rural areas in the absence of any environmental stewardship obligations. The context of the study was one in which environmental damage control and rural viability were directly linked. Where no such link exists, the conclusion that declining rural viability warrants wealth redistribution cannot necessarily be drawn. In line with this contextual caveat, the converse of the support argument is that policies impacting rural and regional Australia need to be assessed carefully for any detrimental impact they may have on the viability of country communities. These impacts should be factored into the policy assessment process.

Appendix M shows the process for estimating the willingness to pay for maintaining rural communities. An average value of \$161,310 per annum is included in the BCA as it is likely that many of those losing their current employment if VEAC recommendations are implemented will be able to find other employment.

2.8 An Assessment of VEAC Recommendations

A summary of undiscounted annual benefits and costs for each scenario relative to the base case is shown in Table 8. The benefits include the non-marketed environmental protection values, including wetlands. The costs include the foregone value of timber and grazing production and duck hunting.

Table 8: Undiscounted Benefits and Costs of VEAC Recommendations

SCENARIO	BENEFITS (\$m/year)			COSTS (\$m/year)
	Low	Average	High	Average
Scenario 2 (no additional water)	18.99	41.72	64.45	4.84
Scenario 3 (‘adequate’ water)	48.84	111.29	173.74	4.66

The Low and High results reflect the 95 percent confidence limits placed on the estimates of the environmental values.

A more detailed summary, using ‘average’ values for the environmental benefits of establishing the new parks, is shown in Table 9. It is apparent from Table 8 and Table 9 that the environmental benefits of VEAC’s recommendations dominate both other non-market benefits, and the costs in terms of lost timber, grazing and duck hunting opportunities. *However, it is important to note that the costs do not include the costs of provision of ‘adequate’ water for Scenario 3.*

Assuming a planning horizon of 20 years and a real discount rate of 6 percent and in the absence of water costs, annuities and Net Present Values (NPVs) for all three scenarios are strongly positive. However, because water has been excluded from the analysis the results that we present should be seen as part of a pre-feasibility analysis and further work is warranted before making decisions on the allocation of ‘adequate’ water from the Murray River and tributaries.

It should be noted that the benefits of VEAC’s recommendations considered in this analysis are only those enjoyed by Victorians. The management regime considered under Scenario 3 will inevitably also benefit ecosystems in NSW and SA with consequent environmental benefits to people in those States.

Table 9: Summary of the Benefit Cost Analysis

	Scenario 2 no additional water (\$m/year)	Scenario 3 ‘adequate’ additional water (\$m/year)
BENEFITS OF VEAC RECOMMENDATIONS		
Increased environmental benefits from establishing parks in the study area (using average values from CM study)	37.906	107.417
Other non-market benefits (conservative estimates from benefit transfer)		
Increased protection of wetlands	0.604	0.664
Increased protection of riparian areas	2.336	2.336
Increased tourism and recreation (assuming visitation increased by up to 20%)	0.872	0.872
Total benefits	41.718	111.289
COSTS OF VEAC RECOMMENDATIONS (excluding costs of ‘adequate’ water)		
Additional park management	1.000	1.000
Reduction in timber harvest	1.363	1.245
Reduction in grazing in Barmah Forest	0.140	0.140
Reduction in grazing in riparian areas	0.759	0.759
Increased costs in riparian areas (fencing, watering points, pest control)	0.867	0.867
Reduction in duck hunting	0.545	0.491
WTP for maintaining rural communities	0.161	0.161
Total costs	4.835	4.663
UNQUANTIFIED		
Costs of ‘adequate’ water (Scenario 3)		
Indigenous and non-indigenous cultural heritage		

2.8.1 Distribution of benefits

Table 10 shows the distribution of environmental benefits for Scenario 3 that would occur if VEAC’s recommendations are adopted by government. The distribution is similar for the case of Scenario 2. Because the analysis depends in part on values per household and the vast majority of households are located in Melbourne, it is not surprising that the environmental benefits are distributed 59 percent to Melbourne (population share 77 percent); 4 percent to the in-region/study area (population share 6 percent) and 37 percent to out of region areas in the State (population share 17 percent).

Table 10: Distribution of Environmental Benefits

Scenario 3 – ‘adequate’ water				
Attribute	LOCATION			Total
	Melbourne	In Region	Out of Region	
Healthy RRG	24%	0%	17%	42%
Parrots	28%	3%	17%	48%
Cod	7%	1%	3%	10%
Total	59%	4%	37%	100%
Population share	77%	6%	17%	

2.8.2 Conclusions to BCA

The BCA reveals an estimated net benefit to the Victorian economy of approximately \$107 million per year on average for 20 years, excluding the cost of the environmental water which is essential to realising this net benefit. The costs of allocating 'adequate' environmental water are likely to be substantial. The other benefits and costs assessed are relatively small.

The environmental benefits of VEAC's recommendations as assessed in this work are distributed according to where Victorians live, as indicated in Table 10, while the bulk of the costs affect people living in the study area. This issue is addressed in the next part of this report.

3 REGIONAL IMPACT ANALYSIS

3.1 Introduction

Benefit Cost Analysis is concerned with the net costs and benefits of VEAC's recommendations to the *whole* Victorian community in terms of changes in net benefits to consumers and producers. Regional Impact Analysis is concerned with changes in economic activity associated with changes in expenditure patterns *within* the RRG study area that may arise as a consequence of VEAC recommendations. Regional economic impacts are measured in terms of a number of specific indicators:

- **Gross regional output** – is the gross value of business turnover;
- **Value-added** – is the difference between the gross value of business turnover and the costs of the inputs of raw materials, components and services bought in to produce the gross regional output;
- **Income** – is the wages paid to employees including imputed wages for self employed and business owners; and
- **Employment** – is the number of people employed (including full-time and part-time).

Unlike BCA, these indicators do not measure net benefits to the Victorian or regional community and hence care needs to be taken in interpreting them.

There are a range of methods that can be used to examine the regional economic impacts of an activity on an economy including Keynesian multipliers, econometric models, mathematical programming models and input-output models.

Input-output models are the most commonly used and involve two broad steps:

- construction of an appropriate input-output table (regional transaction table) that can be used to identify the economic structure of the region and multipliers for each sector of the economy; and
- identification of the initial impact or stimulus of the recommendations in a form that is compatible with the input-output equations so that the input-output multipliers and flow-on effects can then be estimated.

This latter step typically involves collecting primary data on the revenue, expenditure and employment of the industry or sector that will be affected.

VEAC recommendations are likely to have impacts on regional economic activity in terms of output, value-added, income and employment. It is important to recall that while the proposals

generate substantial economic benefits as shown in the Benefit Costs Analysis, few of these benefits and most of the costs are captured in the RRG study area.

It is also important to note that the following impact analysis only applies to Scenario 2 where additional areas of River Red Gum forests are protected (and receive existing commitments for environmental water allocations) but no additional water is made available. The regional impacts of diverting additional 'adequate' water for environmental flows would be substantial, potentially, in terms of irrigated agriculture and horticulture but the quantification of these effects was beyond the scope of this study.

This section of the report comprises three parts:

- A review of an input-output study undertaken by La Trobe University and submitted as part of the Murray River Councils of North Central Victoria's response to VEAC's River Red Gum Forests Investigation Discussion Paper;
- Estimation of the likely regional economic impacts of VEAC recommendations on the timber industry, duck hunting, grazing and tourism. Consideration of impacts from changes in water allocation was beyond the scope of the study;
- Consideration of the regional impacts at a more micro (town) level.

3.2 La Trobe Study of the Economic Contribution of the Timber Industry

As was the case for many submissions to VEAC in response to the Draft Proposals Paper (DPP), critics of the socio-economic analysis appeared to have confined their reading to the Executive Summary of our report attached to VEAC's draft report, or to Section 4 of VEAC's report, and had not read the full report (Gillespie Economics et al. 2007) which was available on VEAC's website. One of the criticisms was the claim that we had not addressed the La Trobe University study. The following section is the same⁸ as that which was included in our 2007 report.

La Trobe University examined the economic contribution of the timber and related industries to the North-Central Murray region, which comprises Mildura (RC), Swan Hill (RC), Campaspe (S), Gannawarra (S) and Moira (S).

An input-output table was built for the North-Central Murray region using 2001 census data. Four sectors of the economy were examined as representative of the timber industry in the region:

- Forestry and logging – which consists of units engaged in growing standing timber (both native or in plantations) including government agencies engaged in management of commercial or business activities and those engaged in felling trees for logs, posts, sleepers, firewood etc;
- Sawmill products – which consists of units engaged in producing rough sawn timber, sleepers, palings, scantling etc, resawn timber from logs sawn at the same units, manufacturing of woodchips and production of dressed timbers such as floorboards, weatherboards or mouldings, kiln drying or seasoning timber.
- Other wood products – which consists of units engaged in manufacturing plywood and veneers, particle boards, chip boards, other fabricated boards of wood and laminations of timber and non timber materials, manufacturing of wooden structural fittings, wooden components for prefabricated wood buildings, wooden or wooden framed doors or wooden roof trusses or wall frames or shop fronts etc. It also includes units engaged in installing shop fronts made of wood or joinery; and units engaged in manufacturing wooden containers, pallets or packing cases or articles of cork, or wood, bamboo or cane products.

8 With the exception that the title of 'La Trobe University' has been corrected.

- Furniture – which includes units engaged in manufacturing wooden furniture, upholstery, re-upholstering or French polishing furniture, manufacturing upholstered seats for transport equipment, manufacturing furniture, storage structures, shelving or parts of furniture predominantly from steel, manufacturing mattresses, pillows or cushions.

The model was used to identify the magnitudes of the above sectors in terms of direct and indirect output, employment, income (wages and salaries) and valued added.

The results are summarised below.

Forestry and Logging Impacts

	Direct	Industrial Induced Effect	Consumpt. Induced Effect	Total Effect
Output	\$9.27m	\$4.22m	\$7.73m	\$21.23m
Type 11A Ratio Multiplier	1.00	0.45	0.83	2.29
Value-added	\$4.37m			
Income	\$3.22m			
Employment	59	17	49	125
Type 11A Ratio Multiplier	1.00	0.29	0.83	2.12

Sawmill Products

	Direct	Industrial Induced Effect	Consumpt. Induced Effect	Total Effect
Output	\$19.00m	\$7.28m	\$9.20m	\$35.48m
Type 11A Ratio Multiplier	1.00	0.38	0.48	1.87
Value-added	\$7.26m			
Income	\$3.31m			
Employment	59	29	58	146
Type 11A Ratio Multiplier	1.00	0.49	0.98	2.47

Other Wood Products

	Direct	Industrial Induced Effect	Consumpt. Induced Effect	Total Effect
Output	\$40.61m	\$18.59m	\$23.76m	\$82.96m
Type 11A Ratio Multiplier	1.00	0.46	0.59	2.04
Value-added	\$13.48m			
Income	\$8.89m			
Employment	196	71	150	418
Type 11A Ratio Multiplier	1.00	0.36	0.77	2.13

Furniture

	Direct	Industrial Induced Effect	Consumpt. Induced Effect	Total Effect
Output	\$29.43m	\$10.37m	\$15.77m	\$55.57m
Type 11A Ratio Multiplier	1.00	0.35	0.54	1.89
Value-added	\$10.30m			
Income	\$6.43m			
Employment	163	40	100	303
Type 11A Ratio Multiplier	1.00	0.25	0.61	1.86

The study concluded that:

- The timber sector directly employs 477 people, and once industrial and consumption related flow-on effects are taken into consideration the total contribution to employment in the region is estimated at 991 jobs
- The contributions of the timber related sectors are relatively modest – the entire manufacturing sector in the region has an output value of \$4.386 billion while the region has a gross regional product of \$5.820 billion

The covering letter from the Murray River Councils of North Central Victoria identified the following results:

- Total value of (direct) output generated by the timber related industry is estimated at \$98.31 million per annum;
- 477 people were employed in the timber related sectors in the region in 2001;
- Value-adding to timber products contributes \$35.41 million to the regional economy.

However, care must be taken in interpretation of the La Trobe data because:

- no primary data on these sectors in the region was collected and inserted into the model. Instead secondary data was used which in the context of the input-output modelling means that broad national or state ratios of output to employment etc. were used to estimate the total value, value-added and income of the timber industry sectors.
- the secondary data reflects *all* the timber industry in the region (including timber sourced from East Gippsland), not just that related to river red gum;
- while the furniture sector has been included as part of the timber industry, the sector is very broad and includes upholstery and the manufacturing of steel furniture, mattresses, pillows or cushions. Also, while this sector has links to the timber sector it is likely that because of the availability of substitutes it would be little affected by changes to forestry activities in the region. Specialist redgum furniture manufacturers would be most affected, at least in the short run;
- flow-on effects summarise backward linkages so it is incorrect to sum the total employment (or other) effect of furniture, other wood products, sawmill products and forestry and logging, since this will result in double counting of employment impacts. For example, industrial effect flow-on employment for the sawmill sector relate to employment associated with purchases of timber from the forestry and logging sector. Similarly, industrial effect flow-on employment for the Other Wood Products sector includes employment associated with purchases of sawn timber from the Sawmill products sector;
- output is a poor measure of value because the output of one sector may be an input into another and hence adding up the output of all sectors results in double counting. Value-added is the best measure in a regional economic context.

Nevertheless, some conclusions can be drawn from the study:

- The direct timber industry, in its entirety, is a small contributor to the regional economy i.e. in the order of 0.6 percent of regional value added and 0.8 percent of regional employment.
- The estimated direct employment of 477 is equal to less than half the annual growth in regional employment between 1996 and 2001.
- The industry associated with river red gum is an even smaller contributor.

The regional impact assessment described in the following sections is aimed, in part, at remedying some of the deficiencies of the La Trobe study

3.3 Regional Economic Impact Assessment

3.3.1 Introduction

The economy on which an impact is measured can range from a township to the entire nation (Powell et al., 1985). For this study, regional economic impacts have been estimated for an approximation of the River Red Gum Forests Investigation area comprising the ABS statistical local areas (SLAs) of Mildura (RC), Swan Hill (RC), Campaspe (S), Gannawarra (S), Moira (S), Gr. Shepparton (C), Loddon (S) – north, Wodonga (RC), Indigo (S), Benalla (RC), Wangaratta (RC) and Mansfield (S). The ABS has changed some of the boundaries of the regions from those used in the 2007 draft report which had to rely on ABS data from the 2001 Census. Data from the 2006 Census are used in this report.

This region is larger than that used in the La Trobe study, and is larger than the River Red Gum Forests Investigation area due to constraints imposed by ABS boundaries.

This assessment is concerned with regional impacts arising from the VEAC scenarios including:

- Reduction in the River Red Gum timber industry;
- Reduction in hunting;
- Reduction in forest grazing;
- Reduction in grazing of riparian areas; and
- Increases in tourism and park management costs.

3.3.2 Input Output Table and Economic Structure of the Region

For this study, a 2006 input-output table of the regional economy was developed using the Generation of Regional Input-output Tables (GRIT) procedure, developed by the University of Queensland (refer to Appendix N for an overview of the GRIT procedure). The regional table was developed from a 2006 Victorian input-output table provided by Monash University and 2006

census data on employment by ANZSIC Industry Class, purchased from the Australian Bureau of Statistics.

A 109 sector input-output table of the regional economy was aggregated to 30 sectors and 6 sectors for the purpose of describing the economy.

A highly aggregated 2006 input-output table for the regional economy is provided in Table 11. The rows of the table indicate how the gross regional output of an industry is allocated as sales to other industries, to households, to exports and other final demands (OFD - which includes stock changes, capital expenditure and government expenditure). The corresponding column shows the sources of inputs to produce that gross regional output. These include purchases of intermediate inputs from other industries, the use of labour (household income), the returns to capital or Other Value Added (OVA - which includes gross operating surplus and depreciation and net indirect taxes and subsidies) and goods and services imported from outside the region. The number of people employed in each industry is also indicated in the final row.

From Table 11, it can be seen that the value of the gross regional output for the regional economy in 2006 is estimated by the model at \$49,953m. However, it is generally considered that gross regional product (value-added) is a better measure of economic activity, as it avoids double counting associated with purchases of intermediate products.

Gross regional product for the regional economy is estimated at \$11,792m, comprising \$6,522m to households as wages and salaries (including payments to self employed persons and employers) and \$5,270m in Other Value Added.

The employment total was 123,249.

The economic structure of the regional economy is summarized in Figure 2. This reveals the economic significance of the agriculture, forestry and fishing sector, manufacturing sectors and services sectors.

Figure 2: Summary of Aggregated Sectors: Regional Economy (2006)

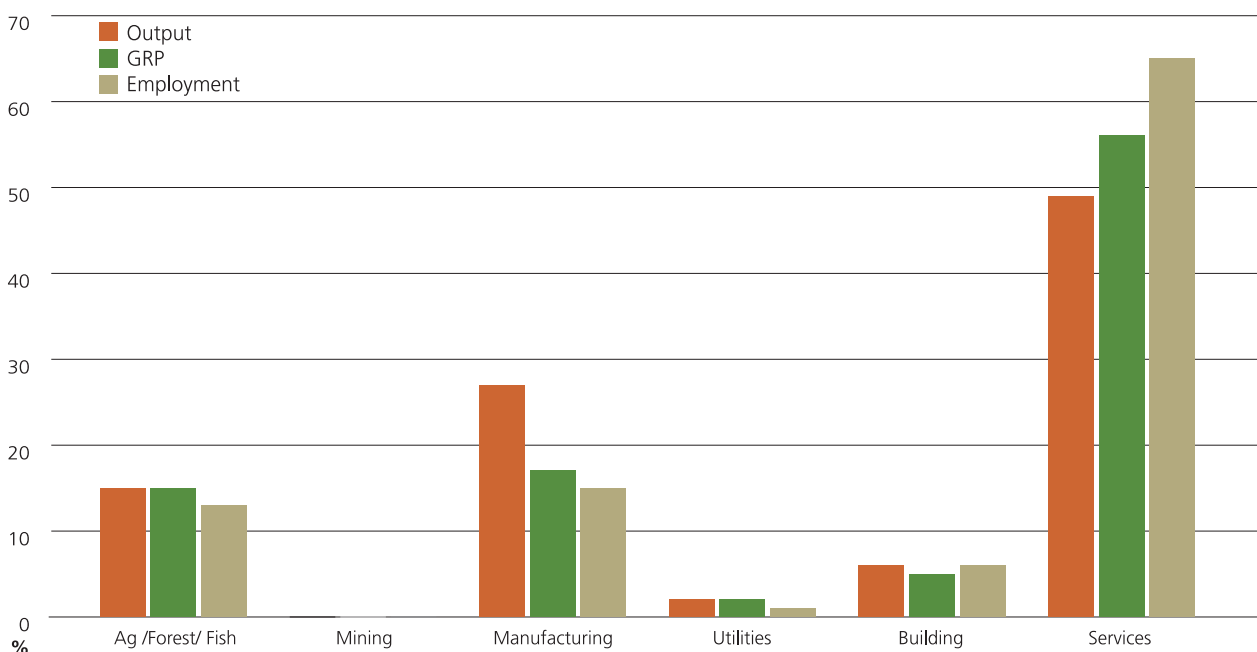


Table 11: Aggregated Transactions Table: Regional Economy 2006 (\$'000)

	Ag/Forest/ Fish	Mining	Manufacturing	Utilities	Building	Services	TOTAL	H-hold Exp	O.F.D	Exports	Total
Ag/Forest/Fish	315,383	12	802,904	42	979	23,280	1,142,600	39,801	564,920	2,160,476	3,907,798
Mining	197	615	17,933	194	2,023	1,408	22,370	707	135	28,677	51,889
Manufacturing	220,732	1,816	834,495	12,270	169,499	486,989	1,725,800	395,257	666,721	4,342,792	7,130,570
Utilities	57,035	147	40,077	57,061	5,096	68,054	227,470	71,983	17,632	259,426	576,510
Building	18,979	653	11,729	9,851	305,968	103,040	450,220	0	998,596	154,553	1,603,369
Services	318,999	3,883	879,658	29,431	139,928	1,784,206	3,156,105	2,780,655	2,865,299	3,892,061	12,694,119
TOTAL	931,325	7,125	2,586,796	108,848	623,493	2,466,976	6,724,564	3,288,404	5,113,301	10,837,986	25,964,255
H-hold Income	988,400	10,247	944,967	78,288	381,048	4,119,756	6,522,706	0	0	0	6,522,706
O.V.A.	775,059	20,937	1,111,812	205,264	177,545	2,437,403	4,728,019	323,957	186,618	31,798	5,270,392
Imports	1,213,014	13,580	2,486,995	184,110	421,283	3,669,984	7,988,966	2,243,275	1,242,741	721,217	12,196,199
TOTAL	3,907,798	51,889	7,130,570	576,510	1,603,369	12,694,119	25,964,255	5,855,636	6,542,661	11,591,001	49,953,552
Employment	16,283	181	18,010	1,210	7,073	80,491	123,249				

Figures 3 to 5 provide a more expansive sectoral distribution of gross regional output, employment, household income, value-added, exports and imports, and can be used to provide some more detail in the description of the economic structure of the economy.

In terms of gross regional output and value-added the Food Manufacturing sector (predominantly dairy products, wine and spirits, fruit and vegetable products and other food products) is the most significant sector of the regional economy followed by Other Agriculture (which includes horticulture). While these sectors are also significant to the regional economy in terms of income and employment, the retail sector is the most significant sector for employment and income. The services sectors are also significant.

There are a number of timber industry sectors in the input-output table, namely:

- forestry and logging
- sawmill products manufacturing; and
- other wood products manufacturing

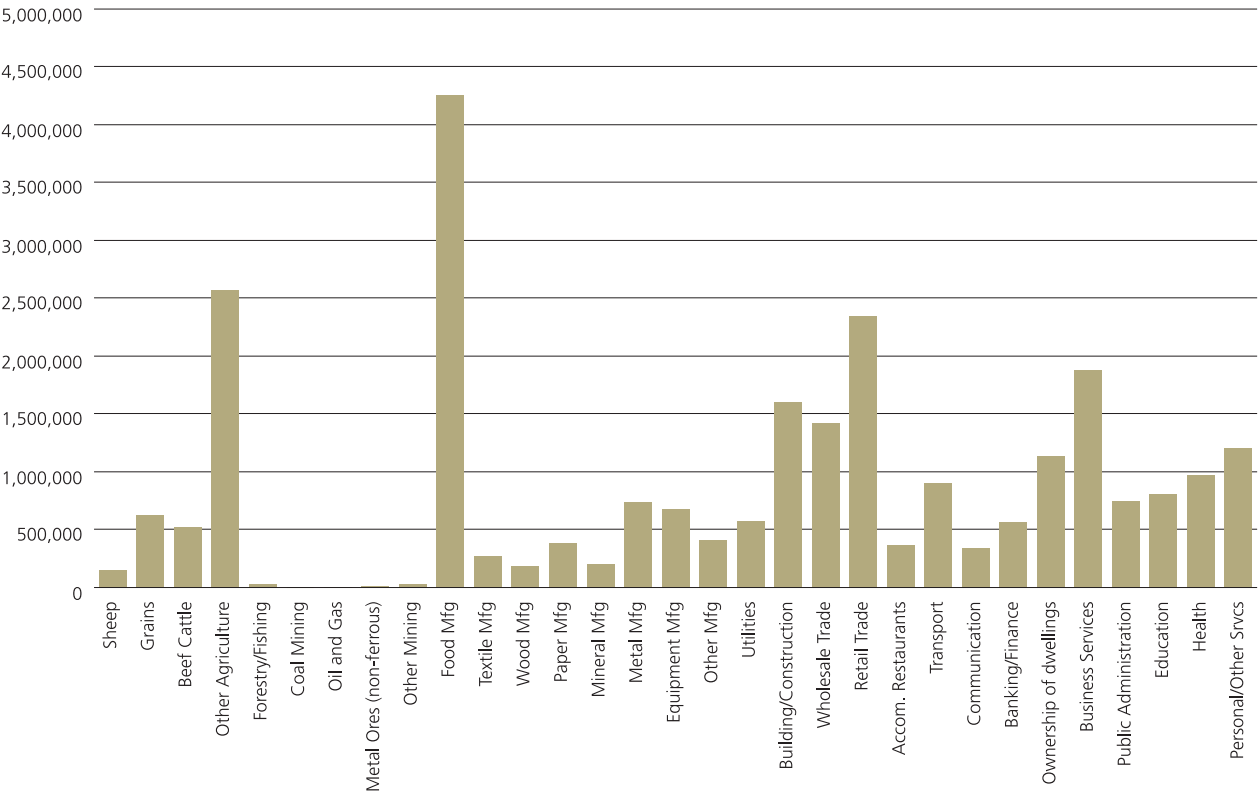
Table 12 summarises the magnitude of these sectors relative to the estimated magnitude of the regional economy. In terms of direct output, value-added, income and employment the total timber sectors are less than 1 percent of the regional economy. The timber industry associated with River Red Gum forests is a portion of the total timber industry.

Table 12: Relative Magnitude of Entire Timber Industry Sectors

	Gross O/P (\$'000)	Value-added (\$'000)	Income (\$'000)	Employment (no.)
Forestry and logging	25,427	9,290	4,844	86
Sawmill products	63,021	32,800	10,044	239
Other wood products	119,355	39,653	26,948	625
Sub-total	207,803	81,743	41,836	950
TOTAL REGION	49,953,552	11,793,098	6,522,706	123,249
	0.42%	0.69%	0.64%	0.77%

Figure 3: Sectoral Distribution of Gross Regional Output and Value-added (\$'000)

Gross Regional Output



Gross Value Added

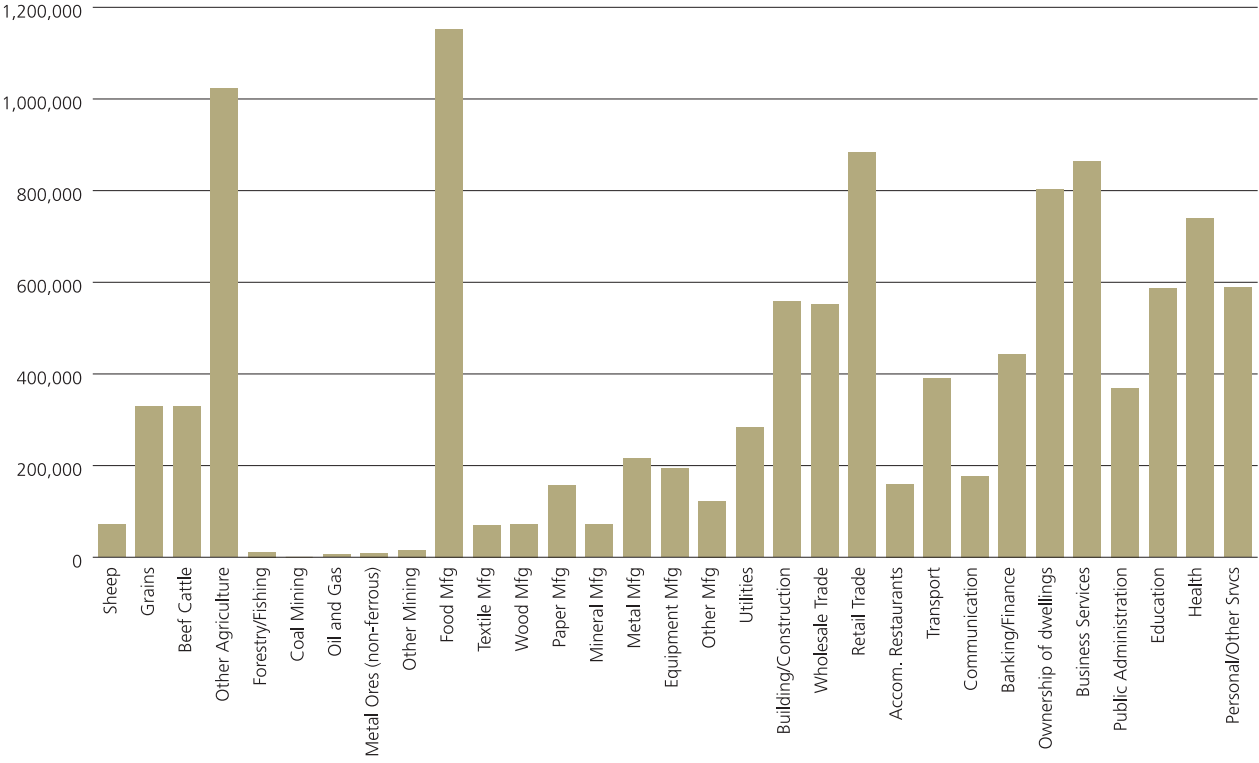
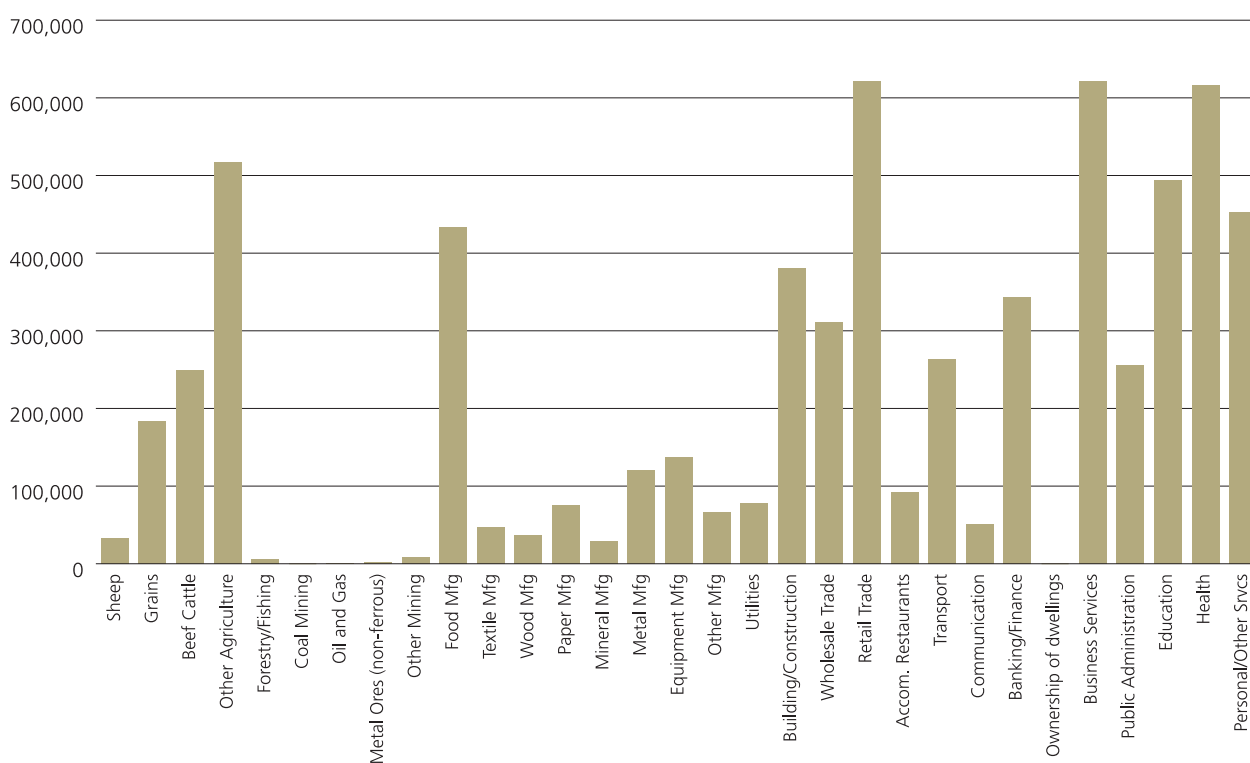


Figure 4: Sectoral Distribution of Gross Regional Income (\$'000) and Employment (no.)

Income



Regional Employment

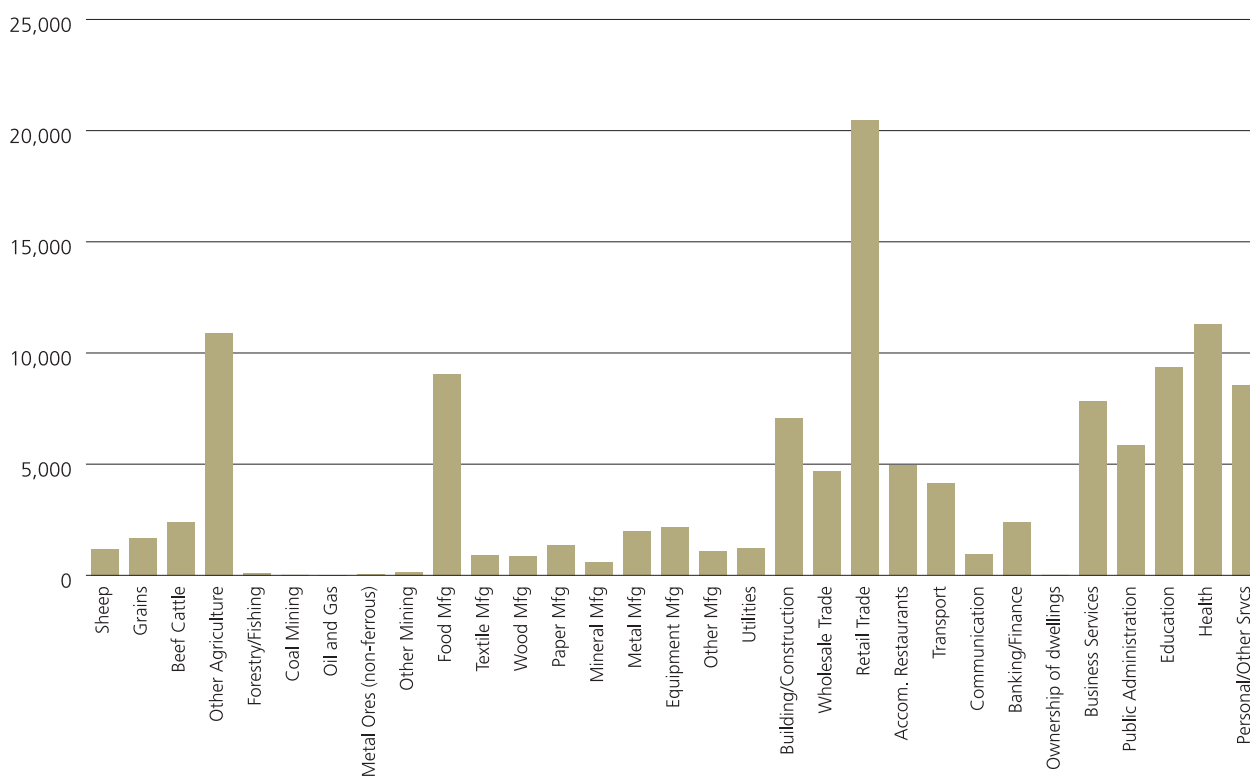
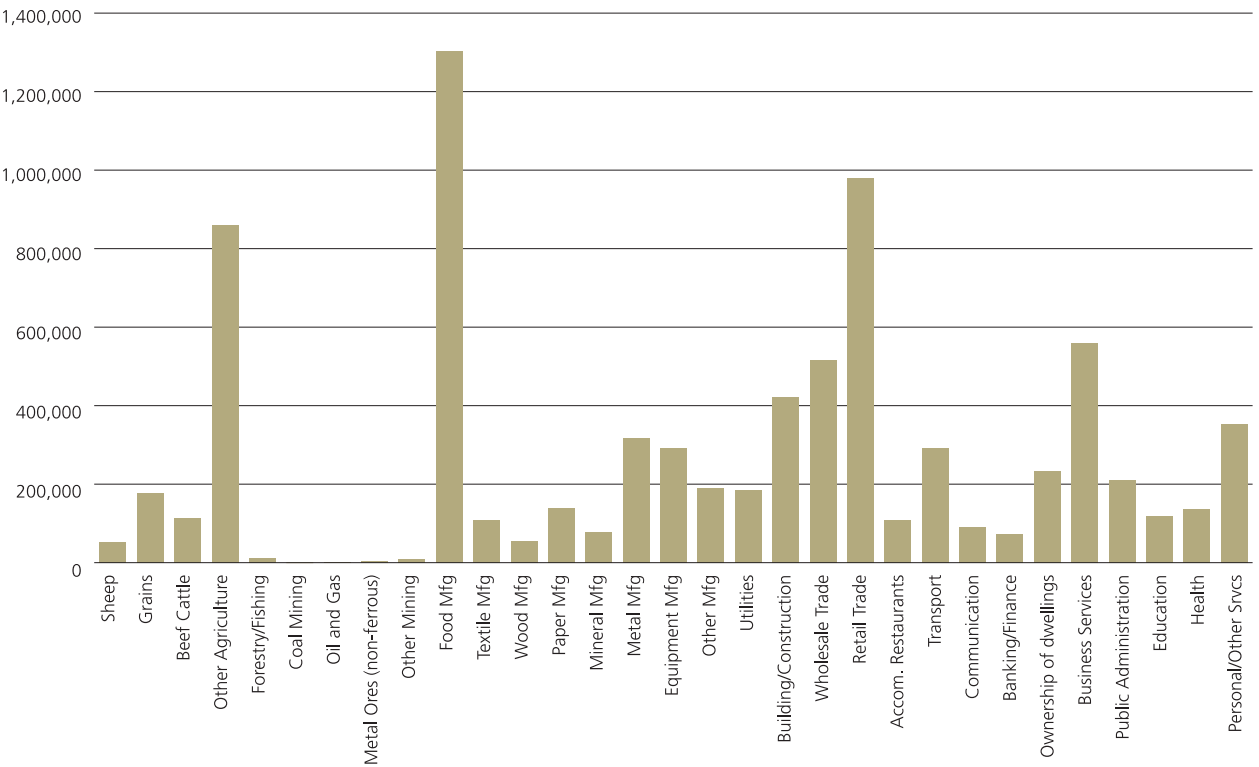
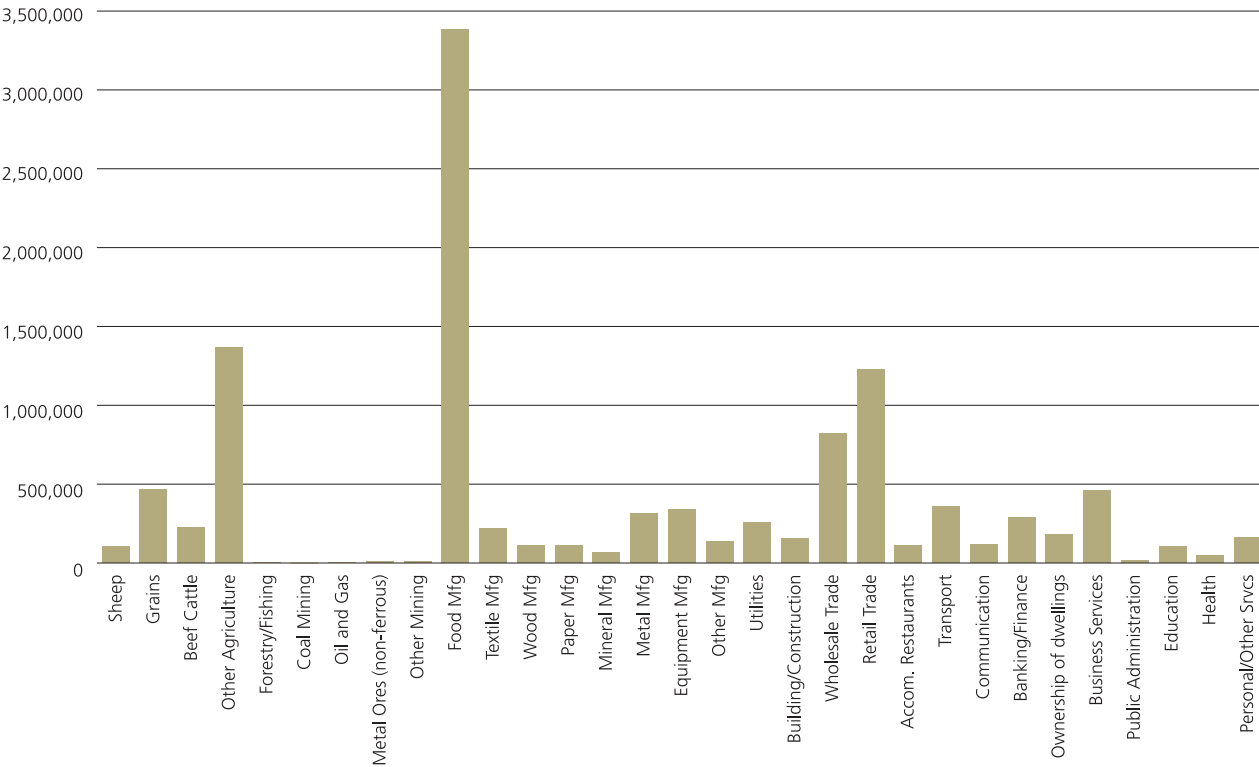


Figure 5: Sectoral Distribution of Imports and Exports (\$'000)

Regional Imports



Regional Exports



3.4 Regional Economic Effects of the River Red Gum Timber Industry

Annual revenue, expenditure and employment data for the River Red Gum Timber Industry was obtained from a financial survey of a sample of mills and sleeper cutters. This sample was aggregated to the estimated population of mills and cutters.

The financial and employment data was then used to develop a River Red Gum Timber sector for insertion into the input-output table. For this new sector:

- the estimated average annual gross revenue was allocated to the *Output* row;
- expenditure items were allocated to appropriate *intermediate sectors*, the *household wages* row, the *other value-added* row and *imports*;
- purchaser prices were adjusted to basic values, margins and taxes using relationships in the national input-output tables; with taxes and margins allocated to appropriate sectors;
- location quotients were used to adjust basic values for intermediate expenditure further between local expenditure and imports;
- the difference between total revenue and total costs was allocated to the *other value-added* row;
- direct employment was allocated to the *employment* row.

The total and disaggregated annual effects of the River Red Gum Timber Industry on the regional economy (in 2007 dollars) are shown in Table 13.

It is estimated that VEAC's recommendations and reductions in sustainable timber yields will affect in the order of 75 percent of the River Red Gum timber industry⁹. Hence, regional economic

Table 13: Annual Regional Economic Effects of the River Red Gum Timber Industry

	Direct Effect	Production Induced	Consump. Induced	Total Flow-on	TOTAL EFFECT
OUTPUT (\$'000)	9,610	3,681	2,781	6,462	16,072
<i>Type 11A Ratio</i>	<i>1.00</i>	<i>0.38</i>	<i>0.29</i>	<i>0.67</i>	<i>1.67</i>
INCOME (\$'000)	2,431	854	689	1,543	3,974
<i>Type 11A Ratio</i>	<i>1.00</i>	<i>0.35</i>	<i>0.28</i>	<i>0.63</i>	<i>1.63</i>
VALUE ADDED (\$'000)	5,622	1,391	1,452	2,844	8,465
<i>Type 11A Ratio</i>	<i>1.00</i>	<i>0.25</i>	<i>0.26</i>	<i>0.51</i>	<i>1.51</i>
EMPL. (No.)	74	15	14	28	102
<i>Type 11A Ratio</i>	<i>1.00</i>	<i>0.20</i>	<i>0.18</i>	<i>0.38</i>	<i>1.38</i>

This sector represents 0.08 percent or less of the regional economy. Refer to Table 14.

impacts will range between 75 percent of the direct effects plus production induced effects and 75 percent of total effects, that is:

- \$10.0m to \$12.1m in annual regional output;
- \$2.5m to \$3.0m in annual income;
- \$5.3m to \$6.4m in annual value-added;
- 67 to 77 jobs.

This range is because consumption effects are associated with spending of employees and if these people remain in the region then not all consumption-induced effects will be lost.

These represent an upper estimate of the impacts of the VEAC recommendations because they assume that current harvest levels could be maintained into the future in the absence of VEAC recommendations. VEAC advice is that future sawlog harvest levels would be only about 71 percent of current allocation, reflecting a revised sustainable harvest level, even if the area available for harvest was not reduced.

Apart from the direct impacts on the mills and forestry and logging flow-on output, value-added and income effects are likely to be mainly in the :

- forestry and logging sector;
- wholesale trade sector;
- retail trade sector;
- road transport sector;
- other repairs sector;
- other machinery and equipment manufacturing sector.

Examination of the estimated direct and flow-on employment impacts gives an indication of the sectors in which employment would be lost.

Table 14: Relative Magnitude of the River Red Gum Timber Industry

	Gross O/P (\$'000)	Value-added (\$'000)	Income (\$'000)	Employment (no.)
Direct contribution	9,610	5,622	2,431	74
Total contribution	16,072	8,465	3,974	102
TOTAL REGION	49,953,552	11,793,098	6,522,706	123,249
Direct contribution (%)	0.02%	0.05%	0.04%	0.06%
Total contribution (%)	0.03%	0.07%	0.06%	0.08%

⁹ As is shown in Appendix C, there is likely to be a reduction in timber yields of about 29 percent, even in the absence of VEAC recommendations, so the estimate of 75 percent is an overestimate in terms of the impacts of the recommendations.

Table 15: Sectoral Distribution of Total Regional Employment Impacts for the Timber Industry

Sector	Average Direct Effects	Production Induced	Adjusted Consumption-induced	Total
Milling and forestry & logging	56	3	0	58
Other Primary	0	0	0	0
Mining	0	0	0	0
Other Manufacturing	0	4	1	5
Utilities	0	0	0	0
Wholesale/Retail	0	1	2	3
Mechanical & other repairs	0	0	0	1
Accommodation, cafes, restaurants	0	0	1	1
Building/Construction	0	0	0	0
Transport	0	2	0	2
Services	0	1	5	6
Total	56	11	10	77

Note: Totals may have minor discrepancies due to rounding.

Table 15 indicates that direct, production-induced and consumption-induced employment impacts of a reduction in the River Red Gum Timber sector on the regional economy are likely to have different distributions across sectors.

The direct effects would be felt in the timber milling sector and forestry and logging sectors.

Production-induced employment impacts would occur across a range of sectors including the primary sector, manufacturing sectors, wholesale and retail trade sectors, transport sector and services sectors, while consumption induced employment impacts would be felt primarily in the services sectors and wholesale and retail trade sectors.

3.5 Regional Economic Impacts of Reduction in Duck Hunting

There are in the order of 22,000 active duck hunters in Victoria. The average annual expenditure per hunter can be estimated from the mail survey of hunters in Victoria 1995, adjusted to 2008 dollars (Table 16).

Table 16: Average Annual Duck Hunter Expenditure

Items	\$
Ammunition	267
Fuel	287
Food	197
Clothing	164
Accessories	128
Gundogs - food and care	212
Boats -operational costs	90
Camping equipment	192
Other	346
Total	1,883

While it is estimated that in the order of 4,390 hunters will be impacted by VEAC proposals, duck hunters who travel from outside the region to hunt are likely to have a different regional expenditure pattern to those who reside in the region. For the latter group all expenditure was assumed to occur regionally while for the former group only 10 percent of ammunition, and 50 percent of fuel, food and boat operating costs (fuel) were assumed to occur within the region. Following the results of survey by Whitten and Bennett (2001), 33 percent of duck hunters were assumed to reside in the immediate region. The assumed final demand regional expenditure for the 4,390 hunters was allocated to appropriate intermediate sectors with location quotients used to further adjust intermediate expenditure between local expenditure and imports.

The total and disaggregated annual impacts of losing the expenditure of 4,390 hunters on the regional economy (in 2008 dollars) are shown in Table 17.

Table 17: Annual Regional Economic Impacts of Displaced Duck Hunters

	Direct Effect	Production Induced	Consump. Induced	Total Flow-on	TOTAL EFFECT
OUTPUT (\$'000)	1,842	633	496	1,129	2,971
<i>Type 11A Ratio</i>	<i>1.00</i>	<i>0.34</i>	<i>0.27</i>	<i>0.61</i>	<i>1.61</i>
INCOME (\$'000)	431	155	123	278	709
<i>Type 11A Ratio</i>	<i>1.00</i>	<i>0.36</i>	<i>0.29</i>	<i>0.65</i>	<i>1.65</i>
VALUE ADDED (\$'000)	691	257	259	516	1,207
<i>Type 11A Ratio</i>	<i>1.00</i>	<i>0.37</i>	<i>0.37</i>	<i>0.75</i>	<i>1.75</i>
EMPL. (No.)	10	3	2	5	15
<i>Type 11A Ratio</i>	<i>1.00</i>	<i>0.26</i>	<i>0.23</i>	<i>0.49</i>	<i>1.49</i>

In the order of 4,390 hunters would potentially be affected by VEAC recommendations resulting in impacts of:

- \$2.5m to \$3.0m in output;
- \$0.6m to \$0.7m in income;
- \$1.0m to \$1.2m in value-added; and
- 13 to 15 jobs.

The regional impacts of a reduction in regional expenditure of 4,390 hunters will range between the direct effects plus production induced effects and total effects. This is because consumption effects are associated with spending of employees and if these people remain in the region then not all consumption induced effects will be lost.

However, this is a worse case scenario because it assumes that there are no substitute sites within the region for the displaced duck hunters and that there are no alternative recreation activities in the region to which they can divert their expenditure.

The impacts are linear and hence if it is assumed that 40 percent of duck hunters can be accommodated in substitute sites within the region then the impacts will be 60 percent of those identified in Table 17¹⁰.

As explained for the BCA, the estimated number of duck hunters affected is probably too high as it draws on estimates from wet years.

10 The assumed substitution rate for the BCA (60%) is larger because it applies to Victoria as a whole – that is, more hunters are likely to be able to find alternatives elsewhere in Victoria as a whole than just the potential alternatives in the study area.

Impacts of fewer duck hunters for output, value-added and income effects are likely to be mainly in the:

- retail trade sector;
- wholesale trade sector;
- fabricated metal products sector;
- other food products sector;
- petroleum and coal products manufacturing sector;
- accommodation, cafes and restaurants;
- health services sector; and
- road transport sector.

Examination of the estimated direct and flow-on employment impacts gives an indication of the sectors in which employment would be lost under the worse case scenario.

Table 18: Sectoral Distribution of Total Regional Employment Impacts for Duck Hunting

Sector	Average Direct Effects	Production Induced	Consumption-induced	Total
Primary	0	0	0	0
Mining	0	0	0	0
Manufacturing	2	1	0	3
Utilities	0	0	0	0
Wholesale/Retail	5	1	0	6
Mechanical and other repairs	0	0	0	0
Accommodation, cafes, restaurants	1	0	0	2
Building/Construction	0	0	0	0
Transport	0	0	0	1
Services	2	1	1	4
Total	10	3	2	15

Note: Totals may have minor discrepancies due to rounding.

From Table 18 it can be seen that the main employment impacts are direct impacts in the wholesale and retail trade sectors.

3.6 Regional Economic Impacts of Restrictions on Forest Grazing

3.6.1 Barmah Forest

It is estimated that an average of 1,400 head of cattle are grazed in the Barmah forest each year, 2,000 head during the summer term and 800 in the winter term. In recent times there has been an overall reduction in numbers, due to persistent dry conditions. One year's grazing in the Barmah forest is estimated to contribute in the order of \$100 in gross value to each cow. Hence, loss of this grazing resource under the VEAC recommendations is estimated to result in a loss of \$140,000 per annum in gross revenue.

No detailed expenditure profile was available for cattle grazing in the forests and hence the expenditure pattern for the beef cattle sector of the input-output table was assumed to be representative.

On this basis, the total and disaggregated annual impacts of 1,400 head of cattle on the regional economy (in 2008 dollars) are shown in Table 19.

Table 19: Annual Regional Economic Impacts of Displaced Grazing in the Barmah Forest

	Direct Effect	Production Induced	Consump. Induced	Total Flow-on	TOTAL EFFECT
OUTPUT (\$'000)	140	30	62	92	232
<i>Type 11A Ratio</i>	<i>1.00</i>	<i>0.21</i>	<i>0.44</i>	<i>0.65</i>	<i>1.65</i>
INCOME (\$'000)	66	7	15	22	89
<i>Type 11A Ratio</i>	<i>1.00</i>	<i>0.10</i>	<i>0.23</i>	<i>0.34</i>	<i>1.34</i>
VALUE ADDED (\$'000)	88	12	32	44	132
<i>Type 11A Ratio</i>	<i>1.00</i>	<i>0.14</i>	<i>0.37</i>	<i>0.50</i>	<i>1.50</i>
EMPL. (No.)	1	0	0	0	1
<i>Type 11A Ratio</i>	<i>1.00</i>	<i>0.18</i>	<i>0.50</i>	<i>0.68</i>	<i>1.68</i>

The regional impacts of a reduction in cattle grazing expenditure in the region will range between the direct effects plus production induced effects and total effects. This is because consumption effects are associated with spending of employees and if these people remain in the region then not all consumption induced effects will be lost.

Flow-on impacts of the beef cattle sector for output, value-added and income effects are likely to be mainly in the:

- wholesale trade sector;
- grains sector
- retail trade sector;
- road transport sector;
- services to agriculture sector;
- legal and accounting sector.

There are in the order of one direct and one indirect jobs associated with the loss of \$140,000 of beef output.

3.6.2 Riverside Reserves and Other Public Land Grazing

VEAC estimates that grazing in 9,280 ha of riverside areas and 44,760 ha in parks (other than Barmah) and other public land would be affected by VEAC's recommendations. It is estimated that in the order of \$758,700 of gross revenue would be lost each year from withdrawing grazing over that area. As for Barmah forest grazing, the beef cattle sector of the input-output table was assumed to be representative of grazing expenditure in the region.

On this basis, the total and disaggregated annual regional impacts (in 2008 dollars) of taking parks (excluding Barmah), riverside reserves and other public land out of grazing production are shown in Table 20.

Table 20: Annual Regional Economic Impacts of Displaced Grazing in Other Public Land

	Direct Effect	Production Induced	Consump. Induced	Total Flow-on	TOTAL EFFECT
OUTPUT (\$'000)	759	161	336	496	1,255
<i>Type 11A Ratio</i>	1.00	0.21	0.44	0.65	1.65
INCOME (\$'000)	359	37	83	120	480
<i>Type 11A Ratio</i>	1.00	0.10	0.23	0.33	1.33
VALUE ADDED (\$'000)	476	64	175	240	716
<i>Type 11A Ratio</i>	1.00	0.14	0.37	0.50	1.50
EMPL. (No.)	3	1	2	2	5
<i>Type 11A Ratio</i>	1.00	0.19	0.50	0.69	1.69

The restriction of cattle grazing in other public land would have the following regional economic impacts:

- \$919,000 to \$1,255,000 in output;
- \$540,000 to 716,000 in value-added;
- \$397,000 to \$480,000 in income; and
- 4 to 5 jobs.

The regional impacts of a reduction in cattle grazing expenditure in the region will range between the direct effects plus production induced effects and total effects. This is because consumption effects are associated with spending of employees and if these people remain in the region then not all consumption induced effects will be lost.

Flow-on impacts of cattle grazing for output, value-added, income and employment effects are likely to be in the same sectors as described above for grazing in the Barmah Forest.

3.7 Regional Economic Impacts of Additional Tourism

Land allocated for conservation may stimulate regional economic activity through management expenditures and expenditures associated with additional tourists attracted to the region.

To assess the regional economic impacts of park management expenditures the estimated additional management expenditure of \$500,000 per annum¹¹ (including salaries to 5 direct jobs) was assumed to have a pattern resembling those for other national parks¹² (Gillespie Economics 2004).

Additional annual visitation of up to 48,000 people was assumed. As explained for the BCA, the regional model did not allow increases in visitors to be differentiated between individual parks. This number is based on an assumed 20 percent increase in visitors to *all* parks, and is likely to be an overestimate.

Visitor breakdown between domestic day visitors, domestic overnight visitors and international visitors was assumed to be the same as for the Murray Tourism Region. Visitor length of stay and daily expenditure for each of these categories of visitor was also assumed to be the same as for the Murray Tourism Region. The expenditure profile for day visitors, domestic overnight visitors and international visitors was assumed to be as reported by the Bureau of Tourism Research.

National Park management expenditure and tourism expenditure was allocated across relevant intermediate sectors, adjusted for margins and taxes and adjusted between local expenditure and imports based on location quotients.

The total and disaggregated annual impacts of the management of additional lands as National Parks, and 48,000 additional visitors, on the regional economy (in 2008 dollars) are shown in Table 21 and Table 22, respectively.

Table 21: Annual Regional Economic Impacts of Additional Park Management Expenditure

	Direct Effect	Production Induced	Consump. Induced	Total Flow-on	TOTAL EFFECT
OUTPUT (\$'000)	500	292	240	532	1,032
<i>Type 11A Ratio</i>	1.00	0.58	0.48	1.06	2.06
INCOME (\$'000)	200	84	60	144	344
<i>Type 11A Ratio</i>	1.00	0.42	0.30	0.72	1.72
VALUE ADDED (\$'000)	205	119	126	245	450
<i>Type 11A Ratio</i>	1.00	0.58	0.61	1.19	2.19
EMPL. (No.)	5	1	1	3	8
<i>Type 11A Ratio</i>	1.00	0.29	0.23	0.53	1.53

Table 22: Annual Regional Economic Impacts of Additional 48,000 Visitors

	Direct Effect	Production Induced	Consump. Induced	Total Flow-on	TOTAL EFFECT
OUTPUT (\$'000)	2,584	909	719	1,628	4,212
<i>Type 11A Ratio</i>	1.00	0.35	0.28	0.63	1.63
INCOME (\$'000)	626	223	178	401	1,027
<i>Type 11A Ratio</i>	1.00	0.36	0.28	0.64	1.64
VALUE ADDED (\$'000)	1,015	374	375	749	1,764
<i>Type 11A Ratio</i>	1.00	0.37	0.37	0.74	1.74
EMPL. (No.)	19	4	3	7	26
<i>Type 11A Ratio</i>	1.00	0.21	0.19	0.39	1.39

11 This is conservative compared with the figure of \$1m per annum used in the BCA but the regional analysis had been completed before estimates of management costs were revised.

12 The average expenditure profile across seven national parks was used.

Management of lands as National Park would have the following regional economic impacts:

- \$792,000 to \$1,032,000 in annual regional output;
- \$284,000 to \$344,000 in annual income;
- \$324,000 to \$450,000 in annual value-added;
- 6 to 8 jobs.

The assumed 48,000 additional visitors to the reserves would have the following regional economic impacts:

- \$3.5m to \$4.2m in annual regional output;
- \$0.9m to \$1.0m in annual income;
- \$1.4m to \$1.8m in annual value-added;
- 23 to 26 jobs.

This range is because consumption effects are associated with spending of employees who migrate into the region and if these people are already in the region then the consumption-induced effects are negated.

Output, value-added and income flow-on effects of park management are likely to be mainly in the:

- Wholesale trade sector;
- Wholesale mechanical repairs sector;
- Mechanical repairs sector;
- Construction services sector; and
- Other property services sector.

Output value-added and income effects of visitation are likely to be mainly in the:

- Retail trade sector;
- Ownership of dwellings sector;
- Health services sector; and
- Other business service sector.
- Accommodation, cafes and restaurants sector;

Examination of the estimated direct and flow-on employment impacts gives an indication of the sectors in which employment would be gained.

Table 23: Sectoral Distribution of Total Regional Employment Impacts of Park Management

Sector	Average Direct Effects	Production Induced	Consumption-induced	Total
NP management	5	0	0	5
Primary	0	0	0	0
Mining	0	0	0	0
Manufacturing	0	0	0	0
Utilities	0	0	0	0
Wholesale/Retail	0	0	0	0
Mechanical and other repairs	0	0	0	0
Accommodation, cafes, restaurants	0	0	0	0
Building/Construction	0	1	0	1
Transport	0	0	0	0
Services	0	0	1	1
Total	5	1	1	8

Note: Totals may have minor discrepancies due to rounding.

Table 24: Sectoral Distribution of Total Regional Employment Impacts of Visitors

Sector	Average Direct Effects	Production Induced	Consumption-induced	Total
Primary	0	0	0	0
Mining	0	0	0	0
Manufacturing	1	1	0	2
Utilities	0	0	0	0
Wholesale/Retail	5	1	1	6
Mechanical and other repairs	0	0	0	1
Accommodation, cafes, restaurants	10	0	0	10
Building/Construction	0	0	0	0
Transport	1	0	0	2
Services	1	1	2	4
Total	19	4	3	26

Note: Totals may have minor discrepancies due to rounding.

The direct, production-induced and consumption-induced employment impacts of additional park management and visitors on the regional economy are likely to have different distributions across sectors.

The direct effects of park management (Table 23) would be felt in the national park management sector. Production-induced employment impacts would occur in the building construction sectors while consumption induced employment impacts would be felt in the services sectors.

The direct effects of additional visitors (Table 24) would be felt mainly in the accommodation, cafes and restaurants sectors and wholesale/retail trade sectors. Production-induced employment impacts would occur in the manufacturing sectors, wholesale/retail trade sectors and services sectors while consumption induced employment impacts would be felt in the wholesale/retail trade sectors and services sectors.

3.8 Summary of Regional Impacts

A summary of the likely impacts of VEAC's recommendations on the regional economy are shown in Table 25.

Table 25: Summary of Regional Impacts

	Output (\$'000)	Income (\$'000)	Value Added (\$'000)	Employment (no. jobs)
Activity Lost				
Timber	12,054	2,981	6,349	77
Duck Hunting	2,971	709	1,207	15
Barmah Grazing	232	89	132	1
Riverside Reserves Grazing	1,255	480	716	5
Total	16,512	4,259	8,404	98
Activity Gained				
NP Management	1,032	344	450	8
Visitation	4,212	1,027	1,764	26
Total	5,244	1,371	2,214	34
Net Activity	-11,268	-2,888	-6,190	-64

3.9 Cities and Towns Affected

3.9.1 Introduction

Notwithstanding the relatively small regional impacts associated with loss of River Red Gum timber harvesting, duck hunting and forest grazing and the gain in tourism, some towns are likely to be more affected by VEAC's recommendations than others. This is because some rural and remote towns are often relatively specialised, with activity centred on a handful of core industries. Hence closure of a major business in a small regional centre is likely to have a larger impact on the surrounding community than would the closure of a similar operation in a more diverse or growing town.

The ultimate impact is therefore a function of the location of potentially affected production activities, the residential location of affected employees and the size and trend of economic growth of regional centres. Impacts in a growing economy are likely to be less significant than those in a declining economy. Indeed impacts in a declining economy can contribute to a cycle of decline whereby population losses result in closure of services, which in turn makes it difficult to attract new populations (Sorensen 1990).

Detailed information is not available on the residential location of potentially affected employees. However, based on the location of affected forests and mills it is anticipated that the effects will be mainly seen in Echuca, Picola and Nathalia, Koondrook, Cohuna and Shepparton.

The sensitivity of these areas to loss of employment can be gauged by examining some of the simple indicators of regional economic health. Whether a population is growing or declining can be an important indicator of the economic health of a regional community (Collits 2001). Other indicators include employment opportunities, unemployment levels and diversity of economic activity.

These indicators are examined below for the statistical local areas (SLAs) and towns most likely to be impacted by the VEAC policy options¹³:

- Gannawarra (S) SLA which contains the towns of Cohuna and Koondrook;
- Campaspe (S) – Echuca (SLA) which contains the town of Echuca;
- Moira (S) West (SLA) which contains the towns of Barmah, Nathalia and Picola.
- Shepparton

3.9.2 Gannawarra (S) (SLA)

Gannawarra (S) SLA has been experiencing declining population over time.

Population for Gannawarra SLA

Year	1996	2001	2006
Population	11,922	11,394	10,898
Average annual population change		-106	-99

Employment has also been declining. However, because the number of people in the labour force has declined at a faster rate than employment levels, the unemployment rate has declined and reached a steady state.

Employment for Gannawarra SLA

	1996	2001	2006
Unemployed	365	218	206
Employed	5,006	4,971	4,777
In the labour force	5,371	5,189	4,984
Not in the labour force	3,643	3,288	3,229
Unemployment rate	7%	4%	4%
Average annual employment change	-44	-7	-39

13 ABS boundaries for some of these areas have changed from those defined for the 2001 Census so the data from the two censuses are not always comparable.

The agricultural sector (29 percent) is the largest employer in the region followed by retail trade (11 percent) and manufacturing (9 percent) (predominantly food manufacturing). While employment in the agricultural sector has declined over time and employment in manufacturing has oscillated, employment in retail trade and health and social services has increased. Nevertheless, from Figure 6 it is evident that the Gannawarra economy is heavily reliant on agriculture with limited diversity.

At the 2006 census, employment in the region in forestry and logging was 11 and employment in sawmilling and wood product manufacturing was 35. This represents 0.2 percent and 0.7 percent of the SLA employment.

Cohuna urban locality within the Gannawarra SLA has a population of in the order of 1,893 down from 1,956 in 2001. Employment levels are 723 and unemployment at 4.2 percent.

Cohuna Urban Locality Employment Information

Employed:	
Full-time	438
Part-time	212
Not stated	127
<i>Total</i>	<i>723</i>
Unemployed	32
<i>Total labour force</i>	<i>755</i>
Not in the labour force	728
Unemployment rate	4.2%

Employment of the population of Cohuna is predominantly manufacturing (18 percent), agriculture/forestry/fishing (14 percent) and construction (14 percent).

Koondrook urban locality within Gannawarra SLA has population of in the order of 802. Employment levels are 319 and unemployment of 4.5 percent

Koondrook Urban Locality Employment Information

Employed:	
Full-time	178
Part-time	112
Not stated	38
<i>Total</i>	<i>319</i>
Unemployed	15
<i>Total labour force</i>	<i>334</i>
Not in the labour force	313
Unemployment rate	4.5%

Employment of the population of Koondrook is predominantly manufacturing (13 percent) and retail trade (13 percent) followed by agriculture, forestry & fishing (11 percent). There is also some heritage tourism, although that is not evident from the ABS data.

Any losses in employment (and population) in Gannawarra SLA as a result of VEAC's recommendations would be in a declining rural economy and hence potentially significant in terms of Sorensen's (1990) cycle of decline even if the magnitude of losses is relatively small.

3.9.3 Campaspe (S) - Echuca (SLA)

Campaspe (S) - Echuca SLA has been experiencing population growth over time.

Population for Campaspe (S) - Echuca

Year	1996	2001	2006
Population	10,014	10,717	12,401
Annual population change		+141	+336

Employment has also been growing. Because employment has been growing faster than the potential workforce the unemployment rate has been declining.

Employment for Campaspe (S) - Echuca

	1996	2001	2006
Unemployed	316	302	270
Employed	4,032	4,530	5,448
In the labour force	4,348	4,832	5,718
Not in the labour force	3,293	3,125	3,382
Unemployment rate	7%	6%	5%
Average annual employment change		+100	+184

The economy of Campaspe (S) – Echuca SLA is very diverse compared to that for Gannawarra SLA. The manufacturing sector is the largest in the economy followed by the retail trade retail trade sector and health and social services. Most sectors have been experiencing growth over time except agriculture, forestry and fishing, and wholesale trade.

According to the 2006 census, employment in the region in forestry and logging was 0 and employment in sawmilling and wood product manufacturing was 29. This represents 0.0 percent and 0.5 percent of the SLA employment.

Possible losses in employment are potentially greatest for Echuca. However, any such losses as a result of VEAC's recommendations would be in a growing rural economy and hence likely to be less significant.

3.9.4 Moira (S) West (SLA)

Moira (S) SLA has also been experiencing a growing population over time.

Population for Moira (S) West (SLA)

Year	1996	2001	2006
Population	17,339	17,605	19,976
Average annual population change		53	474

Employment has also been growing. Because the number of people in the labour force has been growing slower than the growth in employment, the unemployment rate has declined.

Employment for Moira (S) West (SLA)

	1996	2001	2006
Unemployed	515	473	397
Employed	7,176	7,595	7,839
In the labour force	7,691	8,068	8,236
Not in the labour force	5,280	4,990	5,177
Unemployment rate	7%	6%	5%
Average annual employment change		+84	+49

While the Moira (S) West (SLA) has been growing it is less diverse than Campaspe (S) – Echuca with a great reliance on the agricultural sector followed by manufacturing (predominantly food and beverage manufacturing) and retail trade. While employment in the agricultural sector has declined over time it remains significant to the region. Employment in manufacturing grew between 1996 and 2001 but declined between 2001 and 2006. Employment in retail has grown strongly. Other growth sectors include accommodation and food, construction, transport and storage, technical services, public administration and health and social services.

Figure 6: Gannawarra SLA Employment by Industry

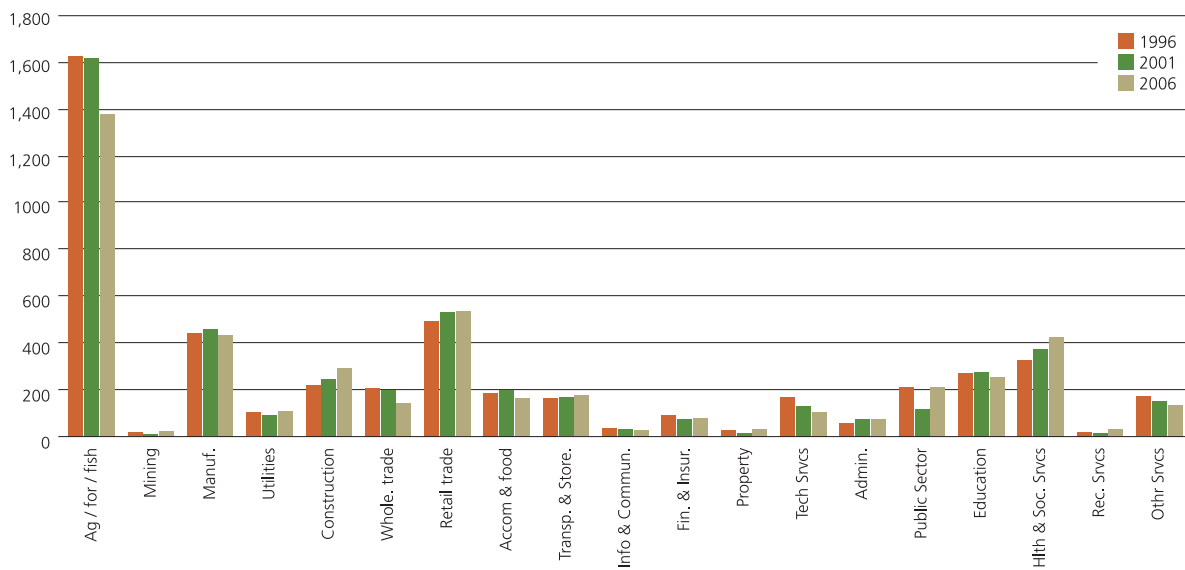


Figure 7: Campaspe (S) – Echuca Employment by Industry

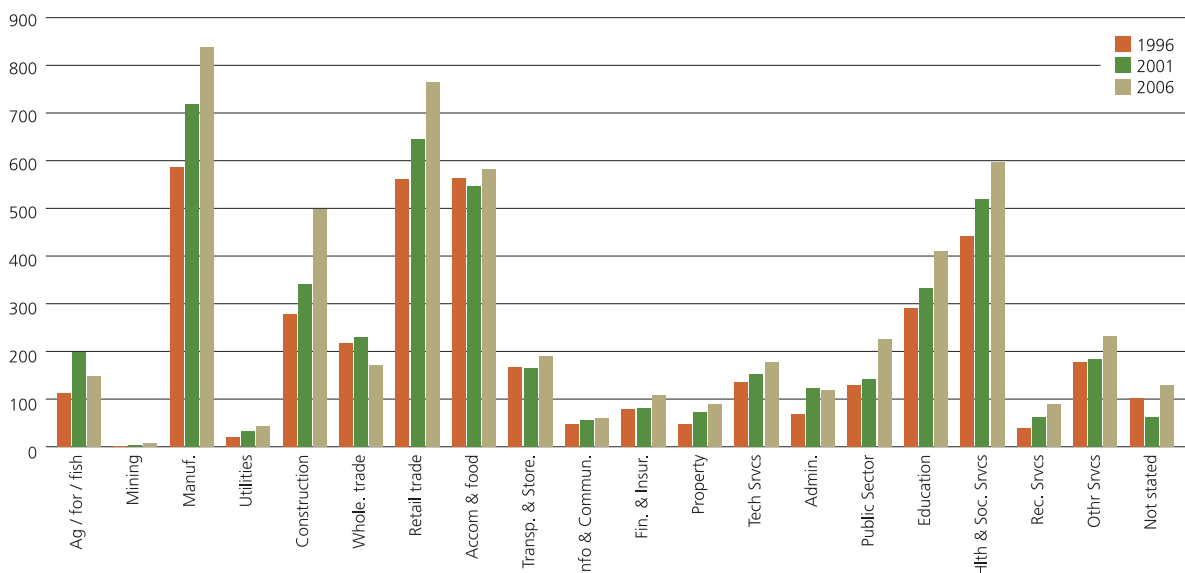
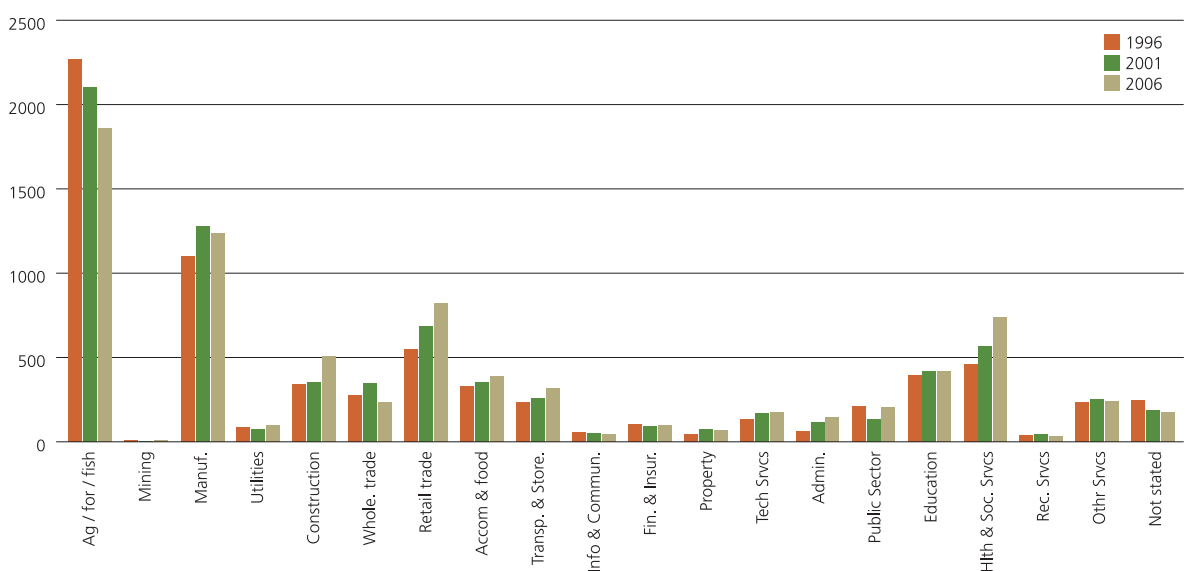


Figure 8: Moira (S) West (SLA) Employment by Industry



At the 2006 census, employment in the region in forestry and logging was 0 and employment in wood and paper products manufacturing was 21. This represents 0.0 percent and 0.3 percent of the SLA employment. Timber workers were all recorded under sawmilling.

Nathalia urban locality within the Moira (S) West SLA has a population of in the order of 1,431, compared to 1,416 in 2001. Employment levels are 561 and unemployment of 4.1 percent.

Nathalia Urban Locality Employment Information

Employed:	
Full-time	343
Part-time	185
Not stated	15
<i>Total</i>	<i>561</i>
Unemployed	23
<i>Total labour force</i>	<i>584</i>
Not in the labour force	555
Unemployment rate	4.1%

Employment of the population of Nathalia is predominantly retail trade (13 percent), manufacturing (17 percent) and health and community services (15 percent).

The towns of Picola and Barmah have very small populations (110 for Picola) and hence no ABS data is available for them. These small towns (including Nathalia, despite its growth) are already likely to be experiencing 'backwash' effects of growth in surrounding larger towns including Echuca and Shepparton. They are therefore likely to be sensitive to any loss of employment and population.

3.9.5 Greater Shepparton City Part A

Greater Shepparton City Part A has been experiencing a growing population over time.

Population for Greater Shepparton City Part A

Year	1996	2001	2006
Population	39,694	42,749	43,999
Average annual population change		+611	+250

Employment has also been growing. Because the number of people in the labour force has been growing slower than the growth in employment, the unemployment rate has declined.

Employment for Greater Shepparton City Part A

	1996	2001	2006
Unemployed	2,042	1,622	1,368
Employed	16,253	18,526	19,510
In the labour force	18,295	20,148	20,878
Not in the labour force	11,178	11,175	11,065
Unemployment rate	11%	8%	7%
Average annual employment change		+455	+197

Shepparton has a growing and diverse economy. The predominant sector is retail trade followed by manufacturing (predominantly food and beverage manufacturing). While the employment in the manufacturing sector has oscillated over time, employment in the retail sector as well as construction, accommodation and food, technical services, public administration, education and health and social services, have been growing over time.

At the 2006 census, employment in Shepparton in forestry and logging was 0 and employment in sawmill and wood product manufacturing was 89. This represents 0.0 percent and 0.4 percent of the workforce in Shepparton Statistical District. Timber workers were all recorded under sawmilling.

This city is likely to be very resilient to modest losses in direct employment (and population).

Overall the towns of Cohuna, Koondrook, Nathalia and Picola are likely to be the most sensitive towns to any job losses (and potential population losses).

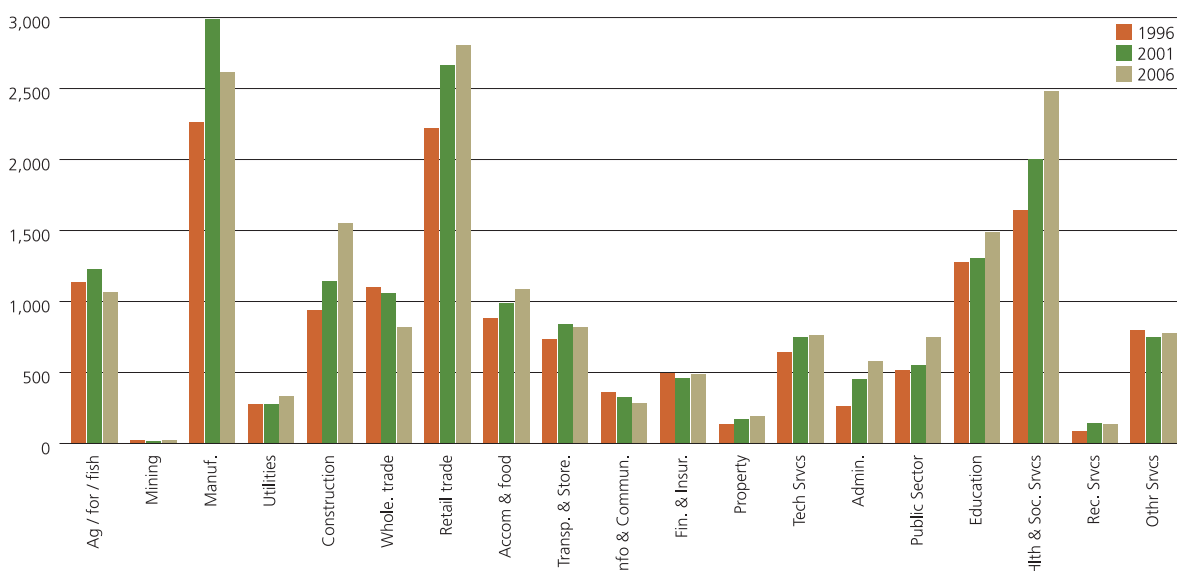
While tourism has the potential to offset some job losses, spatial and skills mismatches mean that those individuals adversely impacted by VEAC's proposals are unlikely to be those that benefit from creation of tourism jobs. Similarly, the towns most sensitive to jobs losses may not be the towns that benefit from increased tourism.

3.10 Impacts on Individuals

At an individual level the loss of employment for individuals and their families can potentially have a range of impacts including financial hardship, reduced future work opportunities, reduced participation in mainstream community life, and strains on family relationships (Ganley 2002-2003).

In severe cases there may also be psychological difficulties that can cause distress to individuals and their families; prevent a return to work; and be costly to the community (Ganley 2002-2003). Prolonged unemployment can also

Figure 9: Employment for Greater Shepparton City Part A Employment by Industry



generate a range of personal and social problems including increased drug and alcohol dependency and increased demand for health services (University of NSW, 2006).

For these reasons it is important that the implementation of any approved recommendations that result in loss of economic activity be accompanied by a structural adjustment package containing elements for addressing impacts on businesses, employees and towns.

A significant number of submissions to VEAC made much of the potential impacts on individuals that were described in the consultants' draft report on VEAC's Draft Proposals Paper (Gillespie Economics et al. 2007). This was partly due to an inadvertent omission of the italicised paragraph above during the editing for the Executive Summary that was included in VEAC's report. And many people responding did not refer to the consultants' full report.

However, the important point here is that the above outcomes are possible only if nothing is done to support people adversely affected by implementation of VEAC's recommendations. In addition, as is noted elsewhere in this report, the impacts described in the regional analysis section of this report are *maximum* potential impacts – they take no account of the fact that at least some of the people potentially adversely affected if VEAC's recommendations are adopted, will be able to move to other jobs, occupations, or businesses within the study area.

4 MITIGATION MEASURES

The BCA shows that the net economic benefits of VEAC's recommendations fall mostly outside the study area, with approximately 59 percent going to Melbourne, 37 percent going to regional urban areas, and 4 percent going to the study area. The regional impact analysis provided estimates of the direct and indirect impacts of the recommendations on employment and incomes in the study area.

In the absence of government intervention, most of the direct costs of VEAC's recommendations are likely to be borne by those living in the study area, particularly those in the timber and grazing industries. The potential recreation and tourism benefits will take some time to be felt in the study area.

Assessment of the impacts of VEAC's recommendations on current water users is an important matter for Government consideration. However, it was beyond the scope of this study and would require the cooperation of three State governments and the Commonwealth Government. Nevertheless, it is likely that a combination of mitigation measures for major water users, predominantly irrigators, would include: purchasing water entitlements on a temporary or permanent basis; water savings schemes; and structural adjustment of irrigation areas. These measures also need to be examined in the context of climate change.

Mitigation measures for those in the timber industry could be similar to those implemented for the case of the Box-Ironbark National Parks (eg. see Dumsday 2001). Some people in the industry would have difficulty in adjusting to new forms of employment and some live in small towns that are already in decline. Adjustment in rural areas is generally more difficult than that in cities and the regional impact assessment addresses this issue for the timber industry. Financial assistance would be based on lost income and loss of assets that have no alternative uses.

Mitigation of the losses imposed on graziers in the Barmah Forest and other public land could be similarly based on lost income, but in this case most assets would have alternative uses and would therefore not require the same level of assistance. Graziers on water frontage reserves in particular would also have access to Landcare and other funding to meet some of the costs of providing fencing, watering points and pest control. The transaction costs

of negotiating with graziers outside the Barmah Forest could be substantial and would need to be considered when drawing up mitigation measures. For these graziers it may be better to work through the relevant Catchment Management Authorities.

Increased expenditure and employment in the management of the new proposed parks and reserves would also mitigate the losses imposed on people living in the study area.

Of those directly employed in the RRG Forests, timber cutters are likely to be the most affected if VEAC's recommendations are adopted. In the short to medium term at least, several of them may lose their livelihoods completely while others may face cut-backs in their timber allocations.

In contrast, most of the benefits of VEAC's recommendations are likely to go to people living in Melbourne and other parts of the State, in the form of environmental values obtained through the conservation of biodiversity. In other words, the benefits of the VEAC recommendations are widely dispersed while the costs are localised. This helps to explain the vigorous opposition to the recommendations from those affected within the study area, and provides a case for appropriate assistance. However, not all individuals in the study area oppose VEAC's recommendations and it was apparent from the Choice Modelling survey that there was statistically significant support from people within the study area for protecting the environmental attributes associated with threatened parrots and threatened native fish.

The existing income distributions of those expected to suffer losses are likely to be below those expected to gain, even if adjusted for the relative living costs of rural vs urban areas. The effects of VEAC's recommendations in some areas may be potentially regressive, reinforcing the case for assistance. However, inspection of the charts included in Appendix E suggests that the main difference between the income distributions of people in the VEAC study area and those living in Melbourne occurs in the high income categories.

There is agreement among many economists and sociologists that adjustment in rural industries can be more difficult than that in urban industries, other things being equal. The lack of access to re-training facilities, the average age of those affected, the need to consider moving house, and the lack of other job opportunities are just some of the reasons for this view. They present yet another case for assisting those affected.

It is important to recognise that the regional centres – in areas affected by VEAC recommendations – are continuing to grow in population and employment, with employment generally growing at a faster rate than population growth, as demonstrated by the 2006 Census data. Echuca (Figure 7) and Shepparton (Figure 9) are growing strongly across a range of industry sectors. As described in Section 2.7, decline of population in rural areas, and growth in regional centres, are longstanding, entrenched, trends.

Many people making submissions expressed disquiet about the perceived lack of resources for public land management in national and state parks and reserves, and state forest areas, particularly with respect to the management of fire and pests.

Particular attention should be paid to the resourcing of new parks and reserves recommended by VEAC. Additional resources for park management would also create possibilities for increased employment, particularly in those areas likely to be hardest hit by the recommendations. Timber cutters and graziers may not necessarily win the new positions but many of them have a keen interest in caring for the forests.

In conclusion, it should be noted that the regional impact analysis shows that the share of the regional economy that is taken up by timber and grazing activities on public land is small to negligible. The impacts of VEAC's recommendations will be important to the people living in some small towns but overall the region will not be significantly affected. The main issue that could not be addressed concerns the potential impacts on irrigators and their communities.

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Note: Appendices to this report are not included in the hard copy version of the VEAC Final Report. They are available at VEAC's website www.veac.vic.gov.au

APPENDIX 2

Advisory Groups: Community Reference Group, Government Contact Agencies and Indigenous Steering Committee

River Red Gum Forests Investigation Community Reference Group

Organisation	Member
Australian Motorcycle Trail Riders Association	Peter Ellard ¹
Barmah Forest Cattlemen's Association	Kelvin Trickey
Barmah Forest Preservation League	Stan Vale
Birds Australia	Chris Tzaros; Euan Moore
Bush Users' Group Victoria	Audrey Dickins ²
Bushwalking Victoria	Steve Robertson; Phil Brotchie
Campaspe Shire	Cr Neil Repacholi
Confederation of Australian Motor Sport, Victoria	Gary Grant; Ian Crook
Country Fire Authority	Rachel Rogers
Environment Victoria	Rod Orr
Four Wheel Drive Victoria	Doug Parke; Zac Powell; Josh Ambrosy
Friends of Nyah Vinifera Forest	Joe Blake
Gannawarra Shire Council	Cr Neville Goulding
Goulburn Valley Environment Group	Doug Robinson; Louise Costa
Horse Riding Clubs Association of Victoria	Debbie Warne
Minerals Councils of Australia (Victorian Division)	Laura Chibnall; Trevor Shard; Jeff Dunwoodie
Moira Shire Council	Cr David McKenzie
Murray Lower Darling Rivers Indigenous Nations	Wayne Webster
Sporting Shooters' Association of Victoria	Colin Wood
Timber Communities Australia	Faye Ashwin
Tourism Alliance Victoria	Matthew Rechner, Nicholas Hunt; Jacqueline Blackwood
Victorian Association of Forest Industries	Paul Madden
Victorian Farmers' Federation	Ian Lobban
Victorian National Parks Association	Nick Roberts
VRFish	John Corbett

¹ until September 2006

² until August 2006

* Meetings were also attended by proxies and other guests.

River Red Gum Forests Investigation Government Contact Agencies

Aboriginal Affairs Victoria, Department of Planning & Community Development
Coliban Water
Department of Water, Land & Biodiversity Conservation (South Australia)
Department of Environment & Climate Change (New South Wales)
Department for Environment & Heritage (South Australia)
Department of the Environment, Water, Heritage and the Arts (Commonwealth)
Department of Planning (New South Wales)
Department of Primary Industries (Victoria)
Department of Sustainability & Environment (Victoria)
Goulburn Murray Rural Water
Goulburn Valley Water
Goulburn-Broken Catchment Management Authority
Grampians Wimmera Mallee Water Authority
Lower Murray Urban & Rural Water Authority
Mallee Catchment Management Authority
Murray Darling Basin Commission (Commonwealth)
North Central Catchment Management Authority
North East Water
North-East Catchment Management Authority
Parks Victoria
Regional Development Victoria (Department of Innovation, Industry & Regional Development)
Tourism Victoria
VicForests
VicRoads

River Red Gum Forests Investigation Indigenous Steering Committee

Members*

Henry Atkinson
John (Sandy) Atkinson
Rose Kirby
Sam Morgan
Gary Murray
Bobby Nicholls
Darren Perry
Sissy Pettit-Havea
Ken Stewart
Wayne Webster (Co-Chairperson)

Victorian Environmental Assessment Council

Duncan Malcolm (Co-Chairperson)
William Glenbar (consultant)
Karen Milward (consultant)
Mel Mitchell
Paul Peake

Additional people involved

Brett Ahmat (DSE)

* Meetings were also attended by other Indigenous community members and other guests.

APPENDIX 3

River Red Gum Forests Investigation Draft Proposals Paper
(July 2007)

Report on the Indigenous Community Consultation Workshops

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Executive Summary

A series of Indigenous specific consultation workshops were organised to obtain feedback from Indigenous people on the draft recommendations contained in VEAC's *Draft Proposals Paper for Public Comment (July 2007)*. Indigenous consultants were engaged to organise and facilitate these workshops in selected locations within the River Red Gum Forests Investigation area.

Feedback obtained from Indigenous participants indicated a high level of support for all Indigenous specific recommendations. Specifically there was widespread support at all workshops for recommendations focusing on the provision of funding and other resources for Traditional Owner Groups and other Indigenous stakeholders to be more actively involved in the co-management and advisory board structures which will be established if the draft recommendations are implemented by government.

At the same time, there was consistent agreement at all workshops that proposals for creating more employment and training opportunities for Indigenous people at a local level in public land management tasks and activities was a positive approach. This would create more accessible opportunities for Indigenous people living in the Investigation area to participate in land management.

One of the key issues raised at all workshops was the need to provide more examples of how each recommendation may impact on Indigenous stakeholders. In particular, what the options may be in relation to funding and other resources to enable Traditional Owner Groups and other Indigenous stakeholders to fully participate in the future.

A high level of support was indicated for the proposed creation of co-management boards and advisory committees for specific areas of public land, however, it was suggested that more detail could be provided to describe how these may involve Indigenous stakeholders. In particular, it was suggested that a detailed set of *Selection Criteria* be developed to ensure that the most experienced and knowledgeable Indigenous persons are selected to fill representative positions in these management structures.

Recommendations for changes to legislation to clarify and allow for traditional cultural practices to take place on public land areas in the Investigation area were widely supported. However, issues were raised about the 'use of fire' and other proposals limiting the use of campfires on public land. Given the importance of this particular issue, it is suggested that consideration be given to the merits of making provision for further discussions to take place with Traditional Owner Groups.

Finally, it should be noted that a number of Indigenous people who did not attend the workshops due to other commitments also provided feedback and voiced strong support for Indigenous-specific recommendations in the Draft Proposals Paper. Where this occurred, individuals were encouraged to contact VEAC directly and provide a written submission outlining their views.

Introduction

On 19 July 2007, the Victorian Environment Assessment Council (VEAC) released copies of its *Draft Proposals Paper for Public Comment (July 2007)* outlining a range of draft recommendations for public land in the River Red Gum Forests Investigation area. Of these, 10 recommendations (R18 to R27) relate specifically to opportunities to improve Indigenous involvement in public land within the Investigation area.

A series of Indigenous specific consultation workshops were organised to obtain feedback from Indigenous people about the draft recommendations. VEAC engaged external independent consultants to organise and conduct the Indigenous consultation workshops in a number of locations within the River Red Gum Forests Investigation area and in Melbourne.

The strong spiritual ties Aboriginal Traditional Owner Groups have with specific tracts of land in the River Red Gum Forests Investigation Area, established over hundreds of generations, based on belief systems, practices, social and ceremonial rules and responsibilities are acknowledged and continue to evolve and exist today. The connection between Aboriginal people and land is expressed in terms of 'being related to' rather than 'owning' the land or country and that Aboriginal people often express this relationship as being custodians rather than landowners.

Country is a place that gives and receives life. Not just imagined or represented, it is lived in and lived with.

Country in Aboriginal English is not only a common noun but also a proper noun. People talk about country in the same way that they would talk about a person: they speak to country, sing to country, visit country, worry about country, and feel sorry for country, and long for country.

People say that country knows, hears smells, takes notice, takes care, and is sorry or happy. Country is not a generalised or undifferentiated type of place, such as one might indicate with terms like 'spending a day in the country' or 'going up the country'. Rather, country is a living entity with a yesterday, today and tomorrow, with a consciousness, and a will toward life. Because of this richness, country is home, and peace; nourishment for body, mind, and spirit; heart's ease.

Each country has its sacred origins, its sacred and dangerous places, its sources of life and its sites of death. Each has its own people, its own Law, its own way of life. In many parts of Australia, the ultimate origin of the life of country is the earth itself...
(Rose 1996)

The purpose of this report is to provide a summary of the issues raised by participants who attended the Indigenous Consultation Workshops which can be used by VEAC during their deliberations about what changes, if any, should be made to the draft recommendations before they are finalised. A summary of the key points and issues raised at each workshop against each draft recommendation appears in the Appendices to this report.

Indigenous Steering Committee

The community consultation project was guided by an Indigenous Steering Committee established by VEAC. A 'Terms of Reference' document outlining the role and responsibilities of the Indigenous Steering Committee was prepared and circulated to identified Indigenous community members along with an invitation to nominate for membership on the VEAC Indigenous Steering Committee.

The purpose of the Steering Committee was:

- 1) To ensure that Indigenous stakeholders have:
 - a) as substantial a role as possible in setting the direction of and overseeing the running of the project, and
 - b) as effective as possible channels with which to communicate their views and information to VEAC staff and, in particular, Council;
- 2) To provide advice and assistance to the consultants about issues and stakeholders that may need to be taken into consideration in both the consultation and report production stages – particularly in relation to Indigenous involvement in public land management;
- 3) To provide feedback on the planning and conduct of consultation activities (meetings, workshops, etc.); and
- 4) To comment on drafts of written material.

Meetings of the VEAC Indigenous Steering Committee were convened in two phases of the River Red Gum Forests Investigation process.

Input from Indigenous Stakeholders

The Indigenous community consultation process occurred in two separate and distinct phases. Phase 1 occurred in March 2007 where Indigenous stakeholders were invited to participate in a series of Indigenous community consultation workshops convened in 12 locations in major population centres and throughout the Investigation area. The purpose of these workshops was to obtain input from workshop participants on what specific and general opportunities may be considered to increase Indigenous participation in public land planning, decision-making and management processes within the Investigation area.

Members of the VEAC Indigenous Steering Committee provided advice to the project consultants about where the Indigenous community consultation workshops should be held – see Table 1 below.

Table 1 – Phase 1 Indigenous Community Consultation Workshops (by Date, Location and No. of Participants)			
Date	Location	No. Participants	Other Comments
10 March 2007	Echuca	16	Yorta Yorta Workshop
14 March 2007	Wodonga	3	
15 March 2007	Bendigo	2	
16 March 2007	Echuca	5	
17 March 2007	Swan Hill	6	
18 March 2007	Barham (NSW)	6	+ 2 other guests
18 March 2007	Deniliquin (NSW)	6	
19 March 2007	Robinvale	3	
20 March 2007	Mildura	4	
21 March 2007	Berri (SA)	9	
22 March 2007	Shepparton	6	
25 March 2007	Thornton	11	
Total No. of Participants		79 persons	

To ensure consistency in the issues discussed, a Workshop Program was prepared and used at each of the workshop sessions conducted in Phase 1. Participants at each workshop were provided with a copy of the following documents:

- “VEAC River Red Gum Forests Investigation – Submissions Invited” brochure (October 2006)
- VEAC Resource Document 1: Indigenous Land Management Framework Discussion Paper
- VEAC Resource Document 2: Models of Indigenous Involvement in Land Management
- VEAC Resource Document 3: Views from the Community – Indigenous Issues
- VEAC Resource Document 4: VEAC Angahook-Otway Investigation Final Recommendation R12 – Enhancing Indigenous Involvement
- “Permitted Uses and Activities in Major Public Land Use Categories” handout
- River Red Gum Forests Investigation – Discussion Paper (October 2006)

Large scale current public land use maps of selected areas along the River Red Gum Forests Investigation area were displayed at each workshop. The purpose of the large scale maps was to provide participants with a more detailed view of the public lands within the Investigation area including areas around the townships where the workshops were held.

Information gathered from these workshops was collated, compiled, analysed and reported to VEAC for consideration. Information contained in the written submissions received directly from individuals and groups was also presented for consideration.

The second phase of Indigenous community consultation occurred in September 2007 following the release of the Draft Proposals Paper for Public Comment (July 2007). Copies of the draft recommendations in this report were made available to participants who attended Phase 2 Indigenous Community Consultation Workshops.

Following advice from members of the VEAC Indigenous Steering Committee, a series of workshops were organised and conducted in September 2007 – as shown below in Table 2.

Table 2 – Phase 2 Indigenous Community Consultation Workshops (by Date, Location and No. of Participants)		
Date	Location	No. Participants
1 September 2007	Shepparton	4
2 September 2007	Melbourne	1
8 September 2007	Robinvale	5
9 September 2007	Gunbower Island	20
15 September 2007	Echuca (YYNAC)	8
Total No. of Participants		38 participants

To ensure consistency in the information gathering process, the following format was used at each workshop to obtain feedback/comments from participants. The primary focus of these workshops was to consider and comment on Indigenous-specific draft recommendations R18 to R27. The workshops followed the format described below.

- An overview was given about the process used by VEAC to obtain comments and views from Indigenous and non-Indigenous stakeholders who have an interest in public land areas in the Investigation area.
- Participants were each provided with a Recommendations Summary Sheet which contained a compilation of the Indigenous specific draft recommendations made in the Draft Proposals Paper. Participants also received a copy of the Draft Proposals Paper and Discussion Paper for their information.
- Copies of maps showing proposed public land use were made available to workshop participants so they could view the proposed changes to public land use within the Investigation area.
- Participants were then asked to consider each draft recommendation individually and time was set aside for questions to be asked and explanations or clarification to be provided by the consultants and the VEAC staff member who attended each workshop.
- A number of examples were provided about how the recommendations may be implemented and how Indigenous people and Traditional Owner Groups could be involved in various aspects of the proposed recommendations (if they are implemented by Government).

- Comments made at each workshop about each draft recommendation were noted and compiled into individual workshop reports (see Appendices).
- Comments made for each draft recommendation were collated, cross-referenced and analysed to form the report outlining the findings and feedback to emerge from workshops.

Participants were invited to review each recommendation separately and to ask questions. Where possible, examples were provided and any comments made or issues raised were responded to.

Promotion of the Indigenous Consultation Workshops

There were at least 17 distinct Aboriginal Traditional Owner Groups who were invited to participate in Indigenous specific VEAC River Red Gum Forests Investigation community consultation workshops. Information about workshops was sent to representatives of the following Traditional Owner groups:

- | | | |
|---------------------|---------------|---------------|
| - Bangerang | - Latje Latje | - Wamba Wamba |
| - Bararapa Bararapa | - Ntait | - Way Wurru |
| - Dhudoroa | - Nyeri Nyeri | - Wergaia |
| - Dja Dja Wurrung | - Tati Tati | - Yorta Yorta |
| - Jarra Jarra | - Taungurung | - Yulupna |
| - Jupagulk | - Wadi Wadi | |

An information flyer containing details about the purpose, dates, locations and start/end times of the workshops was prepared and distributed as follows:

- The Indigenous Steering Committee recommended that Native Title Services Victoria (NTSV) mailing list would provide a comprehensive contact list of Indigenous people who may be interested in attending VEAC Indigenous Consultation Workshops. Information about the workshops was sent to 260 Indigenous people in Phase 1 and 340 people in Phase 2 who were registered with the NTSV as being Native Title Claimants in the Investigation area.
- Copies of the workshop information flyer prepared for Phase 2 were sent to people who participated in the Phase 1 consultation workshops held in March 2007.
- Information about the workshops was also emailed to staff of Natural Resource Management agencies to be circulated to Indigenous people in their local communities who may not be on the NTSV mail list or attended a Phase 1 workshop.

Key Findings from Indigenous Community Consultations

This section of the report provides a summary of the feedback provided and the issues raised at each workshop for each recommendation contained in the Draft Proposals Paper for Public Comment (July 2006). Direct quotes from Indigenous community members who participated in the VEAC workshops are made throughout the report to illustrate the comments received.

General Comments about draft Indigenous- specific recommendations

Participants at all workshops indicated a strong level of support for the work undertaken by VEAC and were very appreciative of arrangements VEAC had made to undertake specific consultation activities with Indigenous stakeholders. There was some concern expressed at all workshops about the level of negative publicity occurring in the local media in communities located in the Investigation area and the impact this was having on Indigenous people generally.

There was widespread support for the Indigenous specific and other recommendations made in the Draft Proposals Paper especially the clearly identified actions needed to create more opportunities to involve Indigenous people in public land management, planning and decision-making processes. It was suggested that more examples could be provided in the final report to government about how the Indigenous specific recommendations may be implemented.

Participants at each workshop were asked to make specific comment about each draft recommendation. They also raised a number of other issues during the discussions which are outlined below.

Location	Participant Comments
Shepparton	<p>We would like the two Traditional Owner Groups (Yorta Yorta and Bangerang) to work together on the land area to generate funds and employment and economic opportunities for all Aboriginal people who live on the lands that both families' groups represent.</p> <p>The main issue with the draft recommendations is that the suggested changes outlined don't say which parcels of public land, water areas or parks, etc that it will be applicable or not applicable to.</p>
Melbourne	<p>All the recommendations are good but they need to be deliverable (examples of how, what, when, who and resources). The consultation process is really good to provide comments and discuss any issues. It is really good to see that no cultural centres and buildings are being recommended.</p>
Robinvale	<p>Concern was raised about the membership of the VEAC Indigenous Steering Committee and how it was established and confirmed. An issue of concern raised at Robinvale, was that one member of the Steering Committee had been opposed to the VEAC proposals paper through statements made in public VEAC forums held in Mildura that were reported in the local paper.</p>
Echuca	<p>The main issue raised was the terminology used throughout the VEAC Draft Proposals Paper and not wanting VEAC to leave words open for misinterpretation by government, Indigenous and non-Indigenous people.</p> <p>The term used by the non-Indigenous economic consultants that contributed to this process was 'Intergenerational welfare dependency'. Even though this is targeting non-Indigenous people it impacts Indigenous people through past usage.</p> <p>National Park – Can have employment and education for our young ones. Are adults in our group denied the right to take their kids into the bush and light a campfire when they need to?</p> <p>Hand back-lease back needs to be a focus on the VEAC agenda in the future (currently in the paper it recommends the option to change legislation so that HB/LB and other opportunities can occur for Traditional Owners)</p> <p>Dharnya Centre needs protection and recognition (and other issues) in the recommendations and to have this in the Indigenous recommendations not just in the general recommendations.</p> <p>Discuss the role of the media campaign and whether VEAC's got some resources to counteract these claims re. negative fears that other stakeholders have to the Draft Proposals Paper and recommendations.</p> <p>Traditional Owner identification and having complete control over spiritual connection that is there on country – need to stipulate who comes and goes as opposed to what AAV introduces (highlighting the lighting of fires in the forest for camping). It is currently included under Recommendation R26 (cultural ceremony) but it needs to be made clearer about what this really means in more detail.</p>

Recommendation R18 - Increasing Indigenous community capacity

That government provides assistance with strategic decision-making regarding public land management along the River Murray and across boundaries of Aboriginal Traditional Owner Groups by establishing a properly resourced program to provide the following services:

- (a) a mediated and resourced process to facilitate:
 - (i) Aboriginal Traditional Owner identification and registration,
 - (ii) engagement of Aboriginal Traditional Owner Groups or bodies with public land management agencies,
 - (iii) group internal decision-making and procedures or protocols such as informed consent and choice of spokespersons,
 - (iv) the establishment of boundaries of Country between groups, and
 - (v) dispute resolution.
- (b) administrative support for relevant Aboriginal Traditional Owner Groups,
- (c) coordination of consultation requests from government agencies and preferential selection of appropriately qualified Traditional Owner Groups or organisations for contract services to work on land and natural resource management projects on Country,
- (d) assistance for relevant Aboriginal Traditional Owner Groups with targeted training and capacity building exercises such as work placements, traineeships and use of existing programs to establish Aboriginal rangers and land management contractors to work on public land on traditional Country,
- (e) assistance with coordination of relevant Aboriginal Traditional Owner Groups' responsibilities under cultural heritage and native title processes where these coincide with public land management,
- (f) support for initiatives aimed at retaining traditional knowledge and expertise and assisting with the integration of this knowledge in land and natural resource management projects and partnerships on Country, and
- (g) support for Aboriginal Traditional Owner Groups wanting to develop a permit regime as described in recommendations R26 and R27 for the traditional hunting, gathering and ceremonial use of Country.

Notes: 1. Aboriginal Traditional Owners are defined as those people who are the direct descendants of specific Indigenous groups present prior to European settlement.

2. Indigenous people refer to land and natural resources of an area over which they have a profound cultural and spiritual relationship as their traditional Country.

A significant majority of workshop participants indicated that increasing Indigenous involvement in management, planning and decision-making processes on public land in the Investigation area was an opportunity they and other members of Traditional Owner Groups would actively embrace.

All workshop participants were highly supportive of Recommendation R18 and indicated that a critical first step was for government to provide initial and sufficient resources to Traditional Owner Groups so they could establish viable administrative infrastructure to enable them to be effective, active and equal participants in management, planning and decision-making processes occurring on public land areas within the Investigation area.

It was confirmed at all workshops that properly resourced programs would enable Traditional Owner Groups to engage in management, planning and decision-making processes with Government agency staff as well as with other land holders and stakeholder groups who may have an interest in public land areas within their local area.

"We want to build partnerships with other interested groups (farmers, graziers, etc). It's the way you approach people and the interest groups that is the key to effective outcomes." (*Shepparton*)

Some participants raised the issue of past promises being made by government for provision of resources to Indigenous groups but then not following through on these undertakings. It was suggested that in its final report VEAC could provide more details outlining how this recommendation would be implemented by providing some practical examples.

"We would need more examples provided on how the recommendations would look in practice rather than theory." (*Gunbower Island*)

Workshop participants agreed that it was important for sufficient resources being available to facilitate mediation and dispute resolution processes where there were differences of opinion occurring within and between members of Traditional Owner Groups.

It was agreed that this issue was of particular importance given that unresolved issues may influence and impact on action taken to establish the joint management and co-management arrangements as well as membership selections for advisory committees set up for specific public land areas.

"As long as the process undertaken and proposed is properly resourced there is support for this recommendation. That is - for overlapping boundaries with Traditional Owners and Native Title that is still an issue to be resolved between the three Traditional Owner groups. Representatives to be proposed for these structures need to be in town for a few days on a couple of occasions – no 'blow ins' will be accepted."
(*Robinvale*)

Issues were raised with the identification recommendation in the proposals paper.

"This recommendation should include whether or not it means 'identification as an individual or Traditional Owner Group' the word identification should be changed to 'recognition'." (*Gunbower Island*)

Participants attending the Yorta Yorta Nations Aboriginal Corporation (YYNAC) workshop in Echuca indicated that they were very supportive of Recommendation R18. Specifically, they want government to ensure that their Corporation also receives matched funding that is given to other parties contracted to undertake scientific and research activities on public land areas within their traditional boundary area.

"There needs to be resourced research to Yorta Yorta Nations whenever Yorta Yorta is engaged by non-Indigenous groups and businesses. That is - if Yorta Yorta are engaged and have a non-Indigenous consultant to do a scientific report on country, then Yorta Yorta should be resourced to do their own research and scientific reports." (*Echuca*)

The following comment was also made in relation to Recommendation R18 (g):

"Non-Indigenous people would need to get a permit but not Indigenous people." (*Robinvale*)

Recommendation R19 - Enhancing Indigenous involvement

- (a) That planning and management relating to traditional interests and uses acknowledge the unique relationship of Aboriginal people with Country and be based on recognition and respect for the traditional and contemporary relationship of Aboriginal people with the land,
- (b) That prior to implementing VEAC's recommendations for parks and reserves, and changes in public land management, government consult with Traditional Owners and Aboriginal groups regarding their native title rights and interests,
- (c) That government, in consultation with Aboriginal Traditional Owner Groups, establish mechanisms to improve and resource Indigenous participation in land and water management including:
 - (i) development of principles and protocols to improve the policy and planning processes of public land and water management agencies and resource the representation and participation of Aboriginal people in these processes,
 - (ii) preparation of a strategy to improve the participation of Aboriginal people in land, water and resource use decision-making and day-to-day management,
 - (iii) provision of information to assist the facilitation of land and water use agreements between agencies and Aboriginal Traditional Owner Groups,
 - (iv) facilitation of surveys and site visits necessary for planning and development purposes,
 - (v) development of cross-cultural awareness programs for land, water and natural resources agency staff to improve knowledge and understanding of, and communication with, Aboriginal communities, and
 - (vi) assistance to provide Aboriginal communities with the capacity (including resources and skills) to fully participate in future consultation and management planning arrangements.
- (d) That opportunities for increased employment and training for local Aboriginal people be resourced and provided in the implementation of parks and reserves in the River Red Gum Forests Investigation area.

A significant majority of workshop participants supported all aspects of draft Recommendation R19. It was agreed that the Government and its agencies could make more policy statements to acknowledge the traditional and contemporary relationship that Indigenous people have to land in Victoria. In particular, it was suggested that:

"Government need to consider the Reconciliation Australia's Road Map to Reconciliation in relation to human rights and the rights of Aboriginal people to effectively participate in this recommendation, particularly part c(i)." *(Shepparton)*

A significant majority of workshop participants agreed that Government should consult with Traditional Owners and Aboriginal groups regarding their native title rights and interests before any changes are made to the management of parks and reserves. It was also strongly supported that sufficient resources needed to be provided to Indigenous groups as part of this process given that most groups do not have or receive any financial support. Specifically, it was suggested that funds needed to be made available to meet the participation costs of Indigenous stakeholders.

"Any resourcing agreed to needs to be adequate to Indigenous representatives and participants. Aunties and Uncle's can't just wait around for contracts to become available. Need to make it worth the Elders' while." *(Robinvale)*

Concerns were raised about how the process for undertaking hand-back/lease-back would occur as the process outlined in the VEAC Draft Proposals Paper did not seem to be clear. It is suggested that VEAC provide an expanded and more detailed explanation about how this process will occur and include reference to how Indigenous stakeholders may be involved in the process.

"If the Traditional owners propose and implement Hand-back/Lease-back, government would need to make the public land freehold first before it can be considered. How would this be achieved by government?" *(Gunbower Island)*

Recommendation R19 (d), which focused on creating more opportunities for employment of Indigenous people in parks and reserves located in the Investigation area, was widely supported. It was agreed that the creation of training opportunities would also provide a greater choice of career options for locally based Indigenous people who may have limited employment options in their local area.

Participants at the Echuca workshop also expressed a strong view that, from their perspective, the Dharnya Centre played a pivotal role in any future decisions taken. The following key points were raised about this particular issue in response to Recommendation R19 (c)(v):

- We need to see where the Dharnya Centre will be included and to provide this training. The Dharnya Centre provides an important facility for cultural awareness training to occur – it is the ‘Jewel in the Crown’ for a “Bush University”. There needs to be a campaign to keep the Dharnya Centre going as it rose from the LCC study done in 1983. Government then came to Yorta Yorta and agreed to build the Dharnya Centre with \$1.2M from the Commonwealth to create economic and employment outcomes. Families can then go there and spend time and keep the culture going and strong.
- Dharnya Centre is vital in this process. Shane Walker concept – Bush University concept (does this need a separate recommendation in the final report or does the existing written text just need to be strengthened more?).
- Bring the Dharnya Centre recommendation to the Indigenous recommendations – cross reference. The Dharnya Centre is important to deliver the cultural awareness training on country. The Yenbena Indigenous Training Centre is also an important centre as it has the middens, trees for canoes, etc.
- The Dharnya Centre written material on page 60 of the Draft Proposals Paper under the Community Use Areas Recommendation was discussed. There are problems with mixing the Dharnya Centre with the Muster Yards. Only area for specific Yorta Yorta use is under the co-operative management board proposed in part of the Barmah Forest. The Muster Yards can’t be jointly considered with the Dharnya Centre.
- The white ant damage has been known since 1996 (15 years). Parks need to put its hand in the pocket to repair it. This was highlighted in the original submission.
- The development of cultural awareness needs to be done which recognises and acknowledges the Traditional Owners and the land of where it is delivered. Recognises prior and existing ownership of the land by Yorta Yorta ancestors and existing people. Recognised why it is being done. Cultural awareness that occurs in this part of the VEAC study area must be delivered by Yorta Yorta people.

It was also suggested by participants at this workshop that VEAC consider the inclusion of an additional recommendation in the final report as follows:

That the Dharnya Centre is handed back to total control of Yorta Yorta Nations as part of a Hand-back/Lease-back arrangement.

Recommendation R20 - Joint management provisions for national parks

That the *National Parks Act 1975* be amended to make provision for a process for scheduled areas to be transferred to Aboriginal Traditional Owners, identified in accordance with Recommendation R18, as national park Aboriginal Land (inalienable freehold), subject to agreement to enter into a lease for use of the land as a national park, that the board of management has a majority of Traditional Owners, and that a process be established for nomination and addition of parks to the schedule.

There was widespread support at all workshops for Draft Recommendation R20 and the implementation of hand-back/lease-back arrangements for specific public land areas within the Investigation area. There were, however, some concerns raised about what the implications would be for Traditional Owner Groups in relation to their native title rights – now and in the future.

It was agreed that the provision of resources to assist with mediation and dispute resolution processes (as outlined in Recommendation R18) would be critical as part of this process.

"If this recommendation is supported it should be made clearer for Indigenous groups to fully comprehend and understand when the final report is published." (*Shepparton*)

"Really need National Parks and support for Hand-back/Lease-back opportunities and discussions." (*Melbourne*)

"This recommendation is supported because Government will need to change the legislation for the changes not already recognised to be implemented." (*Robinvale*)

"Some Traditional Owner Groups are not as up to speed as the Yorta Yorta as we have not been resourced in the past to be involved in processes to discuss and negotiate public land management." (*Gunbower Island*)

"Need to ensure that the Traditional Owners are recognised in all negotiating processes. Government is also increasing Indigenous community capacity building through other mechanisms and all of these commonalities need to come back to each other and to be complimentary. It is all inclusive." (*Echuca*)

Recommendation R21 - Co-management provisions for parks and reserves

That the *National Parks Act 1975* be amended to make provision for co-management of the specific parks listed below with which an Aboriginal group or groups have a traditional association by establishing co-management agreements, and

- (a) the co-management agreements will be between relevant Aboriginal Traditional Owner Groups, identified in accordance with Recommendation R18, and government, and
- (b) the park or reserve be managed by a co-management board consisting of a majority of members of the relevant Aboriginal Traditional Owner group or groups, identified in accordance with Recommendation R18, and
- (c) the co-management board provide for (amongst other obligations):
 - (i) protection for the natural environment, flora and fauna, and other natural values
 - (ii) continued enjoyment of the area by members of the public in a manner consistent with the designated public land-use category
 - (iii) preservation and protection of Aboriginal sites, features, objects and structures of spiritual or cultural significance within the area, and
 - (iv) continued enjoyment of the area by the relevant Aboriginal groups for cultural, spiritual and traditional uses.
- (d) the co-management partners prepare a management plan for the park, and
- (e) the co-management partners manage the park or reserve on the 'business as usual' basis agreed between the co-management partners that the park can continue to operate normally until the first co-management plan comes into operation.

There was widespread support indicated at all workshops for Draft Recommendation R21 and the creation of opportunities for formally involving Traditional Owner Group representatives on co-management boards that may be established for public land areas within the Investigation area. It was also pointed out that sufficient financial resources needed to be provided to Traditional Owner Groups so they could participate in these processes.

"This recommendation is supported but adequate resourcing is required to meet the Traditional owners and groups' needs for proper participation on Advisory Committees and Boards." (*Robinvale*)

The preservation and protection of Aboriginal sites, features, objects and structures of spiritual and/or cultural significance should be a priority focus of co-management board members – as outlined in Recommendation R21 (c) (iii) and was strongly supported.

"Most important recommendation and this should be highlighted as such in the final report. Need to recognise Aboriginal 'Dreaming' more in this recommendation so everyone understands the importance of why this recommendation has been suggested." (*Shepparton*)

A number of workshop participants understood the importance of Management Plans being prepared for parks and other similar public land areas in the Investigation area – as stated in Recommendation R21 (d). It was suggested that VEAC could provide examples in their final report which outline how this will impact on Traditional Owner Groups.

"The final report needs to have an example provided (such as Lake Mokoan). All Traditional Owners groups would have a say in the management if all groups have an interest." (*Shepparton*)

Recommendation R22 - Co-management provisions for parks and reserves

That the *National Parks Act 1975*, and other relevant legislation such as the *Crown Land (Reserves) Act 1978* be amended to provide for:

- (a) a process for additional areas with which an Aboriginal group or groups have a traditional association to be added to the areas over which the above co-management arrangements may apply, and
- (b) other co-management arrangements not necessarily involving a board of management or a board of management with majority Aboriginal Traditional Owners.

Draft Recommendation R22 was widely supported by participants at all workshops and it was agreed that government should change relevant legislation to allow for greater involvement of Traditional Owner Groups.

"This recommendation is supported. There are too many logging groups in the forests and parks cutting down our scarred trees." (*Gunbower Island*)

Recommendation R23 - Aboriginal advisory committees

That provision be made for involvement of Aboriginal people in management of designated areas of public land by establishing:

- (a) advisory committees (under existing legislation) consisting of Aboriginal Traditional Owner representatives, identified in accordance with processes outlined in Recommendation R18, to provide the land manager with advice on one or more aspects of land management, and that:
- (b) advisory committees be adequately resourced to perform their functions and that, if required, legislation be amended to provide for allowances and expenses, and that:
- (c) the specific role of the advisory committees can be changed following review and agreement by the parties.

Draft Recommendation R23 was widely supported at all workshops, however, some participants were not clear about roles and responsibilities an advisory committee would have as compared to those of a co-management board. To clarify these differences, it was suggested that information sessions could be conducted in locations in the Investigation area.

"Advisory committee term used needs to have the reasons for why 'advisory' is used and to explain the differences in the roles of advisory committees as compared to the suggested co-management board." (*Shepparton*)

"Advisory committees are supported but need more detail regarding representation and how they would operate over what period of time and who with (i.e. government, business, etc)." (*Gunbower Island*)

A number of workshop participants also suggested that a clearly defined selection process could be developed and put in place to ensure that the appropriate and most suitably qualified and experienced Indigenous representatives are made members of co-management boards and advisory committees.

"We need to get everyone's opinion and not just the opinion of one person." (*Melbourne*)

"There is no real selection criteria determined in Recommendation R23. Maybe these comments could be included under Recommendation R23 (c) or as a footnote in the final report." *(Melbourne)*

"A 'Terms of Reference' should be developed for the advisory committees and distributed to the Elders and the Traditional Owners for comment." *(Melbourne)*

It was also suggested that consideration needed to be made about terminology and language used in advisory committee documents to ensure that Indigenous representatives could understand and grasp the issues being raised and discussed.

"We need to have 'true Elders' on the advisory committees. Some Elders have the same ideas as the bureaucracy. Traditional Owners need to be there to explain and present the story telling and make sure it is sustainable for the future. The Traditional Owners and the State Government are becoming the same at the moment because they are bound by the rules and legislation of the State Government." *(Melbourne)*

"Elders need to be acknowledged by putting them on these advisory committees. Need the language changed so that Elders know and understand what is going on. The best people should be on these advisory committees." *(Melbourne)*

Recommendation R24 - Co-management of specific parks

That a co-management agreement be entered into between the government and the relevant Aboriginal Traditional Owner Group or groups identified in accordance with Recommendation R18 and that the following areas be managed by a co-management board consisting of government and a majority of Aboriginal Traditional Owner group representatives in accordance with Recommendation R21:

(a) Barmah National Park (Recommendation A7)

(b) Nyah-Vinifera Park (Recommendation B7).

Note: The establishment of this co-management arrangement for the proposed Barmah National Park is not intended to affect the existing agreements for other areas of public land under the Yorta Yorta Cooperative Management Agreement.

Recommendation R24 was widely supported at all workshops.

"A lot of discussion has been held around the public land use areas suggested by VEAC to be changed re. public access. These suggested changes will need to include the exact public land use areas and be made clear to Indigenous people." *(Robinvale)*

All participants at the Echuca workshop were very supportive of the draft recommendation to create the Barmah National Park. They also indicated a strong preference to be part of the co-management board for the new national park when it is established.

"Agreement that there are advisory committee structures and co-management boards in place and that Barmah is made a national park." *(Echuca)*

At the Shepparton workshop one participant indicated strong opposition to the creation of the Barmah National Park as they believed that it would create strong divisions in the Shepparton community with other non-Indigenous stakeholders who have had access to this area of public land. Other participants at the workshop did not hold the same view.

"Agree with all the recommendations with the exception of Recommendation R24. I don't agree with making the Barmah Forest a national park. No to closing the Barmah forest for good. We don't want Indigenous people to be held responsible by other non-Indigenous interests as the reason for the closure." *(Shepparton)*

Advice was received from participants at another workshop that they also knew of one other Indigenous person in their area who also publicly expressed concern about the draft VEAC recommendations as they believed the Indigenous specific recommendations would do more harm than good.

It is noted all other Indigenous participants at the workshops strongly disagreed with these opinions as they were of the view that the Victorian government should implement the recommendations as soon as possible.

Recommendation R25 - Specific Aboriginal advisory committees

That an Aboriginal advisory committee be established as described in Recommendation R23 for:

- (a) west Wallpolla Island area of Murray-Sunset National Park
- (b) Bumbang Island Historic and Cultural Features Reserve.

Draft Recommendation R25 was widely supported at all workshops. It was suggested that VEAC consider expanding this recommendation to advisory committees for the Hattah-Kulkyne National Park and the Murray-Kulkyne Park as well as for Gunbower Island.

Recommendation R26 - Aboriginal traditional cultural practice

That policies and legislative restrictions inhibiting traditional cultural practice on specified areas of public lands and waters be amended to provide for Aboriginal Traditional Owners to undertake the following activities for personal, domestic and non-commercial communal use:

- (a) hunt (including using firearms), gather, collect and fish,
- (b) collect earth materials, and
- (c) conduct a cultural or spiritual ceremony, including (if required) having exclusive use of specified areas for a specified time.

Recommendation R26 generated a lot of discussion at all workshops convened. It was strongly agreed at all workshops that legislative changes should occur to include greater opportunities for Traditional Owners to access public land areas so they could undertake activities associated with traditional cultural practices.

"Need to be able to collect wood for cultural practices to make boomerangs, artefacts, etc." (*Echuca*)

It was also suggested that park management plans make specific reference to the provision of access to public land by Traditional Owner Groups for the purposes of traditional cultural practices.

"This recommendation is ok. Always need to suggest that any management agreements have all interested Indigenous people to be consulted." (*Shepparton*)

Participants at the Gunbower Island workshop highlighted the need for consideration to be made for the use of fire by Indigenous people as this is a critical aspect of any traditional cultural practices. It was suggested that VEAC may need to make more specific reference in their final report to the importance of this issue from an Indigenous perspective. The following example was raised by participants at this workshop to highlight their concerns:

"We don't want to be told we can't go down to the river and light a (camp)fire when I need to do this. I need to be able to go and do this so I can think clearly about things and my culture, etc.

Issues and discussions focused on needing to have camp fires and smoking ceremonies to occur in the parks and specifically at Gunbower Island.

"We don't want government to manipulate our traditional and contemporary cultural practices".

"One male Elder was getting flux and his food was not going down properly. He went to 3 health specialists who said it was the cooking on gas that was causing his health problem. He went back up the bush and went back to cooking his food on the open fire and then his health improved and the flux disappeared. Cooking on gas is bad for blackfellas."

Finally, it was suggested at one workshop that the wording in this recommendation could be 'tightened up' more. When this issue was raised at each workshop, it was suggested to participants that it may be more practical and appropriate to establish a separate process involving Indigenous stakeholders working with Government agency staff to more clearly define the actual mechanics behind how this particular recommendation will be implemented. All workshop participants agreed that this option was acceptable, however, they indicated that resources would need to be made available so they could participate in these processes when they occur.

"The wording in these recommendations needs to be tightened up more in relation to hunting, gathering and fishing - needs to include resources to do these cultural practices and to include natural resources for cultural practices before the dot points. Examples could also include: bark trees, ochre, gypsum, etc." (*Echuca*)

Recommendation R27 – Permits for Aboriginal traditional cultural practice

That traditional cultural practice be governed by a permit regime and protocols established by the land manager in partnership with the identified Aboriginal Traditional Owners for the specific area(s).

A majority of workshop participants supported Draft Recommendation R27, however, it was agreed that more information needed to be made available on how the permit regime would operate. It was also suggested that a working group be formally established by government to facilitate discussion about the proposed permit regime and that representatives of Traditional Owner Groups be invited to participate in and lead these discussions.

"If someone takes bark off the tree but has to get permission to take the bark from a Traditional Owner Group that has been agreed upon through this new system proposed then a letter of understanding should come from the Minister and the Traditional Owner Groups." (Shepparton)

"We would not support a whole blanket permit system but would consider a permit system for some areas to ensure areas and species of cultural significance would be protected and sustained for the future." (Robinvale)

Participants in Robinvale provided and discussed the following case study example in relation to not having a permit system in place:

"Permits for contractors that want to remove sand, soil, etc is needed.

One contractor went to a burial ground, removed sand and disturbed our burial site. Local Council gave permission to the contractor for this to happen. Local contractors don't know what they are to look out for re. Indigenous interests and issues.

Earth removers should be trained on what to look out for and get a certificate of confirmation and understanding from Traditional Owners to approve this knowledge and understanding by the contractor. They then can't claim ignorance like they do now. The Sandy Hills (high ground) is where we buried Indigenous people. They go to NSW DPI and get permission to do this and the royalties the contractors get goes back to the NSW DPI.

We need to be able to say 'this track' goes over a midden so don't have access to remove the sand or soil that is in that area.

The areas we are referring to are Gadsens, Lake Powell and all around Robinvale.

Need to be able to restrict NSW access to Victorian side of the Murray River. Cross border arrangements has been with Traditional Owners on the NSW side and Robinvale side".

Gunbower Island workshop participants made the following comments about Recommendation R27:

"There were many issues raised under this recommendation.

Should not be restrictions on areas along the whole River for access by Indigenous people. We should just have a permit for Milverton Bend only. We camp and traversed along the River within our traditional boundaries and this should be recognised.

Fishing – we don't fish and take a lot of fish at once and go home and put it in our freezers because it doesn't taste fresh or like we just caught the fish that day. We only hunt and fish when needed and eat and use the fish at the time of catching the fish. We just chuck it straight on the 'nickie' the ashes, we don't use frying pans or whitefella stuff.

Need to be able to collect wood for cultural practices to make boomerangs, artefacts, etc".

Other Issues – Co-management and Advisory Committee Provisions

It was evident from comments made at a number of the workshops that participants were not familiar with the process that is required to put in place legislative changes which would result in the creation of co-management boards or advisory committees for selected public land areas – as proposed in the VEAC draft recommendations. A number of participants requested further information about how this would occur and what the opportunities and implications would be for them - if the VEAC recommendations are taken up by the government.

It is suggested that VEAC consider the merits of including a specific recommendation that government make arrangements for information sessions to occur about these provisions and that funding be made available to meet some of the participant costs – where appropriate.

The use of evolving technology

Aboriginal people have long recognised the benefits of taking up new technology when it becomes available to add value to their hunting and gathering lifestyles thus confirming that Aboriginal culture is evolutionary in nature – as with all world cultures. In a paper written about *Native Title and Intellectual Property*, Dr David H Bennet noted that Australia is a signatory to the Convention on Biological Diversity which came into force on 29 December 1993 and that Section 8 (j) of the Convention states that each government shall, as far as possible and as appropriate:

Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilisation of such knowledge, innovations and practices.¹

Section 10(c) of the Convention on Biological Diversity states that each Contracting Party shall, as far as possible and as appropriate:

Protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements.²

In considering native title rights and interests to hunt, fish and gather as being more than an acknowledgement of Aboriginal and Torres Strait Islander peoples' right to collect food, Bennet stated that two points need to be made immediately:

First, conducting these activities in accordance with "traditional laws acknowledged, and the traditional customs observed, by the Aboriginal peoples and Torres Strait Islanders" does not mean that those laws, customs and practices were fixed once and for all time in 1788. Second, as a corollary to the first point, traditional practice does not mean that exclusively traditional implements (tools and weapons) must be used to conform with traditional practice.³

Finally, Bennet expressed the following view about the evolutionary nature of Indigenous culture:

Traditional practice is not static. Traditional practice informs and guides Aboriginal and Torres Strait Islander peoples, it does not fossilise them.

On the second point:

the use of present day tools in the harvesting of plants, modern transport and firearms in hunting animals, boats and nest made of present day materials in fishing still comprise the exercise of traditional right, albeit in a modern way (Sweeny 1993, 115-116)

In cases, such as *Regina v Sparrow*, *Simon V Regina*, and *Campbell v Arnold*, the point is made that in the absence of statutory provisions, the implements used for hunting, fishing and gathering in accordance with traditional rights are not frozen in time and indigenous people may use modern implements to carry out their traditional practices.

Another issue to consider in relation to the use of modern technology is the impact on animal welfare where firearms are used. In considering the significance of traditional hunting to Indigenous peoples, Dominique Thiriet made the following comments in an article titled "*Tradition and Change – Avenues for improving animal welfare in Indigenous hunting*":

The economic, social, cultural and ecological significance of traditional hunting for many Indigenous people cannot be underestimated. Many Aboriginal and Torres Strait Islander people, particularly those living in urban areas, do not hunt at all and many others do so only as a recreational activity or as a chance to enjoy particular foods.

The greatest significance of traditional hunting, however, concerns its spiritual dimension but is one that is virtually impossible for non-Indigenous people to fully comprehend. Most writers agree that traditional hunting does much more than merely meet physical and economic needs:

Foraging and hunting [allows Indigenous women and men] to express profound environmental knowledge stretching back over many generations, and continually reinforces their beliefs in the spiritual value of such knowledge; it is also an important medium of education, whereby both spiritual and ecological knowledge is handed on to succeeding generations. (Young 1991).

¹ Bennet, Dr David H., "Native Title and Intellectual Property", Land, Rights, Laws: Issues of Native Title, Issues Paper No 10, April 1996, page 4.

² Ibid, page 5.

³ Ibid, page 6.

In considering the nature and reasons of traditional change, Thiriet also made the following comments (selected extracts):

It would be an error to think that all traditional hunting practices are fixed in time and incapable of sustaining change.

Hunters now use vehicles rather than walk. They also use aluminium dinghies instead of outrigger canoes, firearms instead of spears and boomerangs, metal instead of wooden spearheads, nylon instead of fibre fishing lines, and crowbars instead of digging sticks.

The considerable changes to the extent, nature and methods of traditional hunting do not make the current hunting itself less traditional. The Supreme Court of the Northern Territory accepted this much when it held in *Campbell v Arnold* that the shooting of kangaroos with a firearm met the traditional requirements outlined in the *Crown Lands Act 1978* (NT).

It is argued that the reason for the change or adaptation is immaterial and that in general the significant changes to hunting practices outlined above, whether they be imposed or chosen, do not affect the legitimacy of the relevant traditions. As a result, any changes to current traditional hunting practices introduced for the purpose of eliminating animal cruelty would not make these practices less traditional, whether such changes were chosen or imposed.

In general, changes to killing methods do not make the hunting less traditional, unless the changes are extreme.

In most cases when the purpose of the hunt is traditional but the killing methods have no inherent cultural value, modifying the methods will not detract from the tradition. In such cases, it would be unnecessary, unjustifiable and unreasonable to continue using methods which inflict or are likely to inflict pain on animals in preference to humane alternative methods. Indigenous representatives have already acknowledged that 'the use of modern methods has reduced the suffering of animals [killed for traditional purposes]', so there appears to be no valid reason why widespread changes would not be supported by communities.

There are a number of examples and legal precedents from other States and Territories where the use of modern technology (including the use of firearms) by Aboriginal people as part of their traditional cultural practices have been accepted by Government and included in legislation and regulations. A number of studies have also been undertaken over the past 20 years which have examined and made specific conclusions about this particular issue. Below are examples of two of these.

Aboriginal Access and Living Areas – Pastoral Industry Working Group Final Report (September 2003)

What is meant by 'accustomed manner'?

Because of changing times, the Working Group acknowledges that 'accustomed manner' now includes modern techniques such as the use of cars and firearms. According to the National Native Title Tribunal 'accustomed manner' may be defined as 'customary, habitual', but this does not resolve the issue of firearm use. This appears to conflict with s267 of the LAA which provides that it is an offence to discharge a firearm or weapon on Crown land without the Minister's permission or without reasonable excuse. It may be that Aboriginal people (either for the purposes of s104 of the LAA or s44A Native Title Act or in accordance with a relevantly framed determination of native title) exercising their right to hunt with a firearm may have 'reasonable excuse' under s267. This may rely on whether using a firearm is:

- a) in accordance with their 'accustomed manner'
- b) was a traditional activity
- c) was the exercise of a native title right or interest (see s223 Native Title Act).

It has become widely accepted that 'accustomed manner' now includes the use of firearms for hunting. Various agreements, including those discussed in relation to Term of Reference Three, set down a regime for the use of high calibre firearms through the use of 'code of conduct' type guidelines.

The Working Group also considered the issue of excessive harvesting of native animals through exercising their right to hunt. It was the view of some members that appropriate management and education should address the issue, rather than introducing provisions that serve to restrict peoples' rights to hunt.

The Bush Tucker Ruling

In 1994, Murrandoo Yanner, a member of the Gunnamulla clan of the Gangalidda tribe of Aboriginal Australians, speared two juvenile estuarine crocodiles on country in the Gulf of Carpentaria. These were then shared with other members of his clan for food. For this he was charged with hunting without a permit under the Queensland Fauna Act. The action ricocheted through the courts until, in October 2000, the High Court of Australia set aside the prosecution and confirmed the native title right of Aboriginal traditional owners to hunt wild animals.

In November 2005, the Research Unit at the National Native Title Tribunal published "*Traditional Hunting with Firearms in National Parks – A Short Review*" which contained examples of how governments in other States and Territories have taken action to allow or disallow the use of firearms by Indigenous people in public lands. This document was updated in March 2006.

Information obtained during this project indicates that the Victorian government has yet to formalise any legislation which supports Indigenous Traditional Owners undertaking traditional hunting and gathering activities on public land areas in Victoria. A Management Plan for Barmah State Park and Barmah State Forest, published in September 1992 by Department of Conservation and Environment, contained the following references about Aboriginal Heritage and hunting and gathering of food:

6 MANAGEMENT OF CULTURAL RESOURCES

6.1 ABORIGINAL HERITAGE

The Yorta Yorta Aboriginals have a long and continuing association with the Barmah Forest and adjacent NSW forests. They consider these areas living examples of Aboriginal cultural heritage and an important part of their ancestral homelands.

The hunting of native wildlife and collection and use of native plants for food and ceremony is an integral part of Aboriginal culture. At present it is contrary to the National Parks Act 1975 (for State Park) and Wildlife (General) Regulations 1980 under the Wildlife Act 1975 (for State Forest) for anyone to catch and kill animals such as kangaroo in the forest. A variety of traditional food plants can also be found in the forest (Wilson 1990). DCE is currently preparing a State-wide policy on the taking of native plants and animals by Aboriginals for traditional purposes.

Medium Priority - Allow limited hunting and gathering of traditional foods in Zone 4 by Aboriginal people if and when arrangements for such use are established by DCE policy and related regulations.

The following case studies taken from other States and Territories demonstrate how traditional cultural practices may be administered.

Case Study 1 - Malimup communiqué (Malimup Spring - May 1998)

This communiqué was developed at a meeting of indigenous representatives, staff of government land management agencies and representatives of non-government environmental groups at Malimup Spring, Western Australia in May 1998.

The communiqué is concerned with indigenous people and the management of areas reserved or zoned as 'wilderness', primarily within national parks or other lands reserved for conservation or recreational purposes. However, the meeting participants believe the broad management principles developed apply equally to all protected areas managed by government agencies. It is proposed that land management agencies use these guidelines with this in mind.

Management Framework

Rightful indigenous communities should be involved in joint management partnerships with land management agencies and participate in the making of 'wilderness' planning and management decisions which affect their rights and the maintenance of their cultures. This involvement should occur within a framework which includes:

- the inclusion of rightful indigenous people at all administrative levels of planning and management, including representation on all relevant committees;
- the involvement of rightful indigenous communities in relevant policy formulation, management plan preparation and day-to-day management;
- the direct management of areas, sites and matters of indigenous significance within 'wilderness' areas by rightful indigenous people;
- requiring the approval, control and participation of rightful indigenous communities before permitting;
- the publication of sensitive indigenous knowledge;
- access to indigenous cultural sites (including fragile, sacred and culturally important places); and
- scientific research on indigenous sites and issues;
- the incorporation of indigenous resource knowledge and land use practices in 'wilderness' management regimes;
- the involvement/employment of members of rightful indigenous communities in undertaking land management practices and programs in 'wilderness' areas;
- the promotion of indigenous themes in 'wilderness' educational and interpretive material (as approved by the rightful indigenous communities);

Hunting and Gathering (Native Species)

- enabling sustainable hunting and gathering by rightful indigenous people in their ancestral lands, including the use of firearms;
- the resolution of nature conservation or park user conflicts associated with indigenous hunting and gathering activities through specific provisions in park management plans, wildlife management plans or other agreed mechanisms;

Case Study 2 - Knuckey Lagoons Conservation Reserve Management Plan (NT)**3.6 FAUNA**

All mammals, birds, reptiles and amphibians in the Reserve are protected under the *Territory Parks and Wildlife Conservation Act (NT)*. As a declared protected area the use of firearms and traps is prohibited. Aquatic life is protected under the *Fisheries Act (NT)*. Under section 122 of the *Territory Parks and Wildlife Conservation Act* traditional hunting and collecting by Aboriginal people may be carried out on the Reserve (refer to section 3.9).

Management Plan

- Parks and Wildlife Commission will carry out a biological study of the Reserve, in consultation with the Reserve Management Committee, during the life of this plan. The study will aim to refine knowledge of the Reserve's wildlife and habitats as well as the impacts upon them.
- Grass slashing operations will be monitored to determine any impacts on flora and fauna distribution within the Reserve and slashing programs will be adjusted where necessary.
- Hunting, fishing, trapping or other taking of wildlife is prohibited, unless approved for research purposes or unless undertaken by Aboriginals as part of traditional hunting and gathering practices in accordance with the *Territory Parks and Wildlife Conservation Act* and its By-laws and Regulations.
- **The use of nets, traps and firearms** will be prohibited within the Protected Area. In accordance with the *Territory Parks and Wildlife Conservation Act* signs will be placed in the Reserve, notifying visitors of these restrictions within the Protected Area.
- Management will liaise with the relevant Aboriginal clans which are able to harvest resources from the Reserve to develop sustainable use levels and discuss with the community any management changes required.

3.9 ABORIGINAL USE AND CULTURAL RESOURCES

Larrakia Aboriginal people claim traditional responsibility for the Knuckey Lagoons area. In 1980 an area of land adjacent to the Reserve was granted to the Aboriginal Development Foundation to provide hostel type accommodation for Aboriginal people.

Knuckey Lagoons are known to Aboriginal people as 'Muddie', meaning barramundi and the area is referred to as Barramundi Dreaming (Valadian, 1974). Presently, no sacred sites have been recorded or registered with the Aboriginal Areas Protection Authority for Knuckey Lagoons Conservation Reserve.

Any Aboriginal artefacts within the Reserve are protected as 'Prescribed Archaeological Objects' under the *Heritage Conservation Act*. Sacred Sites are protected under *Northern Territory Sacred Sites Act* whether or not they are recorded.

Under Section 122 of the *Territory Parks and Wildlife Conservation Act* the right to hunt, fish and collect for traditional purposes has been secured for Aboriginal people who have traditionally hunted in the Reserve.

Along with other impacts unsustainable harvesting practices can lead to a reduction of numbers or the localised disappearance of wildlife species from a habitat. This is not a desirable outcome for either Aboriginal people or the Parks and Wildlife Commission.

Management Guidelines

- Aboriginal cultural resources will be managed in accordance with the *Northern Territory Sacred Sites Act* and the *Heritage Conservation Act*.
- The PWCNT will consult with relevant Aboriginal people and authorities regarding the significance, conservation and management of Aboriginal cultural resources in the Reserve.
- Aboriginal hunting and gathering is permitted in the Reserve in accordance with the *Territory Parks and Wildlife Conservation Act*.
- Relevant Aboriginal people and their representative organisations will be consulted regarding the appropriate use and treatment of material on Aboriginal cultural and spiritual beliefs in the Reserve's interpretive program.
- Liaison with the relevant Aboriginal community regarding harvesting of the Reserve's flora and fauna will allow monitoring of harvested species and development of appropriate sustainable harvesting practices.

4.6 VISITOR SAFETY

Management Guidelines

- The Parks and Wildlife Commission will liaise with Aboriginal people with a traditional right to hunt in the Reserve to ensure that hunting and harvesting techniques do not present a safety risk to visitors.

(Source: "Knuckey Lagoons Conservation Reserve Management Plan", Parks and Wildlife Commission NT, September 2000.)

Case Study 3

Aboriginal owned Biamanga National Park Lease to the Minister for the Environment (NSW)

13.8. Reservation of Yuin people's Rights to Use

1. The parties acknowledge that Aboriginal Owners, and other Yuin people, have the following rights, which will operate subject to the directions or decisions of the Board with respect to health, safety or privacy -
 - (i) the right to enter upon the Lands and use the Lands to the extent that the entry, use or occupation is in accordance with tradition;
 - (ii) the right to engage in the traditional use of any area of the Lands for hunting or food gathering in accordance with this Lease; and
 - (iii) the right to engage in the traditional use of any area of the Lands for ceremonial purposes.
2. The Land Councils reserves the right to request the Minister to sub-let any reasonable part of the Lands for Community Development purposes.
3. The Minister will not unreasonably refuse to grant such a sub-lease where it is in accordance with the Act and the Plan.

This sets out the rights of Aboriginal Owners to go on to and use the National Park in accordance with Aboriginal tradition but that this entry and use of the National Park has to be in accordance with the rules and laws governing the National Park.

13.9. Acknowledgment of hunting fishing and gathering rights

1. The parties acknowledge that the Aboriginal Owners of the Lands, and any other Aboriginal people who have the consent of the Aboriginal Owner Board members, are entitled (subject to s. 71AO(2) of the Act), and to other provisions of the Act, to any other Act applying to the Lands and to the Plan, to enter and use the Lands for hunting or fishing for, or the gathering of, traditional foods for domestic purposes and for ceremonial and cultural purposes to the extent that that entry or use is in accordance with the tradition of the Yuin People.
2. For the purpose of this clause, firearms will not be used.

This clause acknowledges Yuin hunting and gathering rights of foods for domestic purposes and for ceremonial and cultural purposes. The Aboriginal Negotiating Panel decided that guns were not to be used in the Park for hunting by Traditional Owners.

13.10. Board to control cultural activities including hunting and gathering

1. The Board has the function of considering proposals for the carrying out, by Aboriginal Owners or other Aboriginal people, of cultural activities (including but not confined to hunting and gathering) within the Lands and of approving (including the setting of conditions for such approvals), or refusing to approve, the carrying out of such activities.

This clause means that the Board will set the rules for Yuin hunting and gathering on the National Park.

(Source: "Merrimans Local Aboriginal Land Council and Bega Local Aboriginal Land Council Lease to The Minister for the Environment for Biamanga National Park - December 2005," pages 49 and 50.)

Case Study 4 - Bare Hill (Bunda Bidandji) Conservation Park Management Statement (Qld)

5.3. Indigenous culture

Bare Hill or, as it is known by the Traditional Owners, Bunda Bibandji, is a distinctive cultural landscape providing an important link to the history and use of the area by the Traditional Owners. The Traditional Owners are actively involved in planning processes and day-to-day management assisting in the preservation and protection of scar trees, historical walking pads (tracks), rock art and cultural stories.

Status and opportunities 2006	Desired outcomes 2016	Actions and guidelines
<p>Natural processes such as weathering, lichen growth and salt deposit have damaged and obscured the ochre rock images.</p> <p>The frequency and intensity of fire could be better understood especially to protect cultural values.</p> <p>Pest pigs and change in land management practices have also disturbed items such as scar trees.</p> <p>The physical and spiritual items associated with the BHCP are inadequately documented.</p> <p>The cultural, historical, social and economic significance of the area is well understood.</p>	<p>I1. Cultural values are protected and preserved in accordance with Traditional Owner customs and best practice management principles.</p>	<p>I1a. Assist Traditional Owners in undertaking cultural heritage values assessment, mapping and monitoring programs to develop and implement a Site Conservation and Heritage Plan.</p> <p>I1b. Develop protocols and procedures in collaboration with Traditional Owners that maintain the confidentiality and integrity of cultural places, material and information.</p> <p>I1c. Register places, artefacts and stories in accordance with Traditional Owner wishes and relevant legislation, and where possible list them on state and national heritage registers.</p> <p>I1d. In partnership with Traditional Owners develop a Fire Management Plan that protects areas of cultural significance as well as the natural integrity of the area.</p> <p>I1e. In partnership with Traditional Owners review management practices where evidence of on-going damage to places of cultural significance is identified.</p> <p>I1f. Maintain Indigenous cultural practices by restricting general community access from time to time.</p>

5.7. Community Partnerships

Status and opportunities 2006	Desired outcomes 2016	Actions and guidelines
<p>Limited opportunities are available for the involvement of Traditional Owners in natural resource and visitor management.</p>	<p>P1. Traditional Owners are involved in planning processes and natural resource management practices.</p>	<p>P1a. Investigate options for more formal partnership arrangements with Traditional Owners, including but not restricted to a joint trustee agreement.</p> <p>P1b. Support Traditional Owners in gaining skills through the availability of relevant and accredited training programs.</p> <p>P1c. Develop an Infrastructure Maintenance Plan for the area.</p> <p>P1d. Provide opportunities for Traditional Owners to minimise potential impacts to Indigenous cultural values.</p> <p>P1e. Ensure a collaborative approach is adopted to implement the strategies outlined under the Wet Tropics Regional Agreement.</p> <p>P1f. Develop a Cultural Practices Agreement in association with QPWS to determine appropriate practices (taking of wildlife, fire), group size and location for indigenous cultural events.</p>
<p>Protected areas in Queensland are owned and managed by the State Government.</p>	<p>P2. The Traditional Owners own and manage an ecologically sustainable tourism business on Bare Hill Conservation Park.</p>	<p>P2a. A whole-of-government approach is used to support the Traditional Owners' interests in economic development and the transmission of traditional values. P2b. Encourage the sharing of information between major stakeholders, thereby allowing a consistent approach to decision making in tourism/promotion ventures and day-to-day management obligations.</p>
<p>Information supplied by various stakeholders is not always accurate, such as old contact details for Traditional Owners.</p>	<p>P3. Communication pathways with all stakeholders are appropriate and accurate.</p>	<p>P3a. Assist Traditional Owners to develop and maintain relationships with other stakeholders.</p>

Review of Consultation Processes involving Indigenous Stakeholders

Consultation processes which engage Indigenous stakeholders have a number of factors influencing the level and quality of participation by members of this segment of the Australian population. These factors include, but are not limited to the following:

- a) Financial capacity of individuals to travel to/from locations where workshops were held. To overcome this, it is suggested that consideration be given to reimbursing participant fuel costs.
- b) Availability of participants to attend workshops convened on weekdays and on weekends. This is always problematic as most Indigenous people have work commitments during the day and family commitments on weekends – similar to other non-Indigenous people in the community but with less flexibility in many instances.
- c) Level of interest in the topic or subject matter being discussed. In many instances, Indigenous people have relied on a single person or family group to participate in these processes and then report back to them.

Associated with this issue is the lack of confidence individuals may have about their literacy and communication skills combined with many years where they have not been invited to participate in consultation processes in their community. That is – they may have been marginalised by leaders in their community and, where they have been involved in past activities, not encouraged by the person facilitating the process to contribute to the discussions.

- d) Limited options for receiving communications about consultation processes that are occurring. In this instance, access to telephones, mobile phones or a computer connected to the internet. The end result of this is a reliance on information received in the mail (if they are on a mailing list) or advice received from someone they know who has been informed about what is happening.
- e) Connecting with the wrong person in a community or organisation who may not have a desire to pass on information to others interested in a particular issue. This is not an easy issue to resolve unless the person facilitating the process has extensive networks to draw upon for advice about who to speak with in a community.

It can be expected that VEAC will seek out the views of Indigenous people when they conduct future investigations on public land use in other parts of Victoria – in particular those of Traditional Owners. Consultants engaged to facilitate the Indigenous community consultations of the River Red Gum Forests Investigation agreed with VEAC that it was essential to establish an Indigenous Steering Committee as part of this Investigation.

It is strongly suggested that VEAC consider the merits of forming Indigenous Steering Committees at the start of each investigation it undertakes where input from Indigenous stakeholders is sought. As part of this process, a 'Terms of Reference' document should be prepared and a list of potential Steering Committee members be drawn up with input from identified Indigenous agencies – such as Native Title Services Victoria. A separate budget should also be assigned to meet the participation costs of Indigenous Steering Committee members which covers sitting fees, travel, meals and accommodation expenses (where required).

While it is understood that there are limitations impacting on the level of engagement at this level with Indigenous stakeholders, it is also critical to understand that Victorian Traditional Owner Groups are becoming more active and assertive with government to ensure that their interests are taken into account in any planning, decision-making or management activities. This can often limit the scope and capacity of interactions with Indigenous community members who are not from the area where a consultation process is taking place.

It is also important to understand that the budgets for Indigenous consultation processes needs to take into consideration that Indigenous 'informed consent' processes may be preferable in some instances as this will influence how many people from a particular group decide to participate in consultation. That is, providing an amount directly to a group so they can meet their participant costs to attend a consultation meeting – which may often involve travel, accommodation and meals.

Comments from Indigenous Steering Committee Members

VEAC established an Indigenous Steering Committee to provide advice and direction to the consultations with Indigenous stakeholders located in the River Red Gum Forests Investigation area. The following comments were made by members of the Indigenous Steering Committee about the consultation process undertaken for this study.

Wayne Webster (Co-Chair)

"I thought the VEAC consultation process was excellent as it provided Indigenous people in the study area with a real opportunity to have our thoughts and comments to be heard directly. More government agencies need to follow VEAC's example by ensuring support is provided for Indigenous stakeholders to be actively consulted about what is happening on their Traditional country.

I would also like to thank all the Indigenous people who were community members for making the time and the personal effort to contribute to and comment on the process as well as sharing their views, thoughts and feelings in relation to cultural connections with land in the Investigation area.

We look forward to building stronger relations with VEAC and other connected agencies as well as the Government taking up the (final) recommendations handed down by VEAC."

Uncle Henry Atkinson

"Even though we did not want to be involved in the consultation process when it first started, we were very pleased with how it progressed and that we were encouraged and supported to be a part of the process once it commenced. We were also very pleased that our views were taken on board even though we did not really understand what VEAC were trying to do. From our perspective, the recommendations were very good and we will be keeping a very close eye on how the government responds to support the VEAC Indigenous recommendations in particular those that impact on the Yorta Yorta people and other Traditional Owner groups located in the study area.

We would also like to see the Victorian government taking more positive action to support the human rights of Traditional Owners who have very strong links with land in Victoria. We are very keen to ensure our knowledge and skills as Traditional Owners are utilised to better care for country so future generations have a healthy environment. We have given the government something to take notice of in relation to global warming and having a clean environment. I hope they listen to what we have put forward and I am glad that Yorta Yorta people participated in the consultation process.

On a final note, we were very pleased with how inclusive VEAC were in seeking out the views of Indigenous people. VEAC and the consultants they engaged did an excellent job – well done!"

Aunty Rose Kirby

"I thought the consultation workshops were very informative and gave people an opportunity to have a say. It was good having the workshops in our community but it's a pity more Indigenous people were not involved in these. I think the recommendations reflected what people said in the workshops and they build on the good relationships we already have in our community."

Kevin Atkinson

"Setting up an Indigenous specific Steering Committee was a good idea and having Indigenous facilitators do the workshops was great. Even though the recommendations are good, I still have some concerns that some Traditional Owner groups such as the Bangerang will not be acknowledged or be a part of the implementation processes when they occur. I look forward to being involved in future consultations when they happen."

Doug Nicholls

"There was a lot of negative media about what VEAC were doing and a lot of misinformation being put out about the process. Despite this, our group continued to have support from a number of key groups based on our strong alliances with people we have worked with over the past 15 years.

From our perspective, we were very pleased with the consultation VEAC did and how they actively sought out the views of our people about how to improve opportunities for Indigenous involvement in public land planning, management and decision-making. We look forward to more consultations when the recommendations are implemented."

Involvement of NRM Indigenous staff and Indigenous agencies

In undertaking consultations with Indigenous stakeholders in the Investigation area, the active involvement and views of Indigenous specific staff working in state Government Natural Resource Management (NRM) agencies was important. The main reasons for seeking input and advice from these agency staff included the following:

- a) Indigenous specific staff working in government agencies are often actively involved/engaging with local Indigenous stakeholders in their regional areas and tend to have up-to-date knowledge about which local people should be consulted about specific issues;
- b) Indigenous specific staff usually have primary responsibility for developing and implementing new and existing policies, programs and strategies which target the interests of Indigenous people and, as such, they are able to provide current advice about outcomes being achieved as a result of the financial and other support being provided by their agency;
- c) Indigenous specific staff will have current knowledge about local, regional and statewide issues in relation to their areas of responsibility and can thus provide informed advice about past, current and future issues that may need to be taken into consideration where a consultation process is to occur with Indigenous stakeholders; and
- d) Indigenous specific staff at a head office level can utilise their local/regional staffing resources to assist with networking with relevant Indigenous stakeholders at a local/regional level.

The following people are thanked for their input, advice and assistance with this project:

- Mr Brett Ahmat - Manager, Indigenous Partnerships, Department of Sustainability & Environment
- Mr Earl Cleaver - Coordinator Indigenous Facilitators, Land & Fire Management, Department of Sustainability & Environment
- Mr Marlon Parsons - Indigenous Facilitator, Mallee Catchment Management Authority
- Mr Ken Stewart - Indigenous Facilitator, Mallee Catchment Management Authority

At the same time, it is of importance to seek advice, input and assistance from staff of Indigenous focussed agencies that have existing relationships with Indigenous stakeholders. More specifically, the assistance of staff from Native Title Services Victoria (NTSV) provided invaluable support by distributing workshop notices and other information directly to Traditional Owners in the Investigation area.

Ongoing Consultation Processes

Although Indigenous people only constitute a small percentage of the Victorian population, they are often called upon to participate in consultation sessions for a range of issues. In many instances, the same people are involved in multiple processes as a responsibility given by members of their family, community or organisation.

In terms of this project, consideration needs to be given to including on-going consultation process with Indigenous stakeholders after the project has concluded. A communications strategy outlining how this may occur could be developed which includes regular updates about what is happening – even if this only occurs twice a year. Indigenous people who participated in VEAC's consultation may be able to generate increased interest in other locations.

Finally, it is critical that Indigenous bureaucrats are actively involved in future processes as they are often actively involved in contact with Indigenous stakeholders in most communities in Victoria. They also have access to on-ground personnel who may be in a position to assist with raising awareness about a specific issue as well as identify which people in each location should be contacted.

Conclusions

There was very strong support expressed by a significant majority of people who participated in the Indigenous Consultation Workshops for VEAC to finalise the draft recommendations with no changes. In many instances, Indigenous people consulted were of the view that the Victorian government should have taken action before now to implement changes which leads to greater opportunities for Indigenous Traditional Owner Groups to be actively involved in public land management, planning and decision-making processes.

From an economic perspective, the creation of more training and employment options for Indigenous people living in communities located in the Investigation area would be a very positive outcome. It was also confirmed that the active and on-going involvement of Indigenous people directly in public land management tasks would of itself provide a greater incentive for members of each family to remain in the area as they would have access to employment activities which also mirror their interest in maintaining and improving public land areas on traditional country.

It is clear more action needs to be taken by government to educate, inform and empower Indigenous stakeholders about issues associated with becoming active participants on proposed co-management boards and advisory committees. This area lacks available information about public land policies, planning and decision-making.

To date, members of the Indigenous community in the River Red Gum Forest Investigation appeared to rely on a small number of individuals to be the contact point and conduit of advice about maintaining the integrity of land areas. It is essential that government consider supporting the recommendations which focus on increasing the capacity of Indigenous communities so they can actively participate as equal partners in future activities linked with improving public land use in the Investigation area.

At the same time, consideration needs to be given to ensure that Indigenous stakeholder groups have the financial capacity to undertake informed consent processes which can contribute positively to any management, planning and decision-making processes on public land areas in the Investigation area. Advice received from various departmental staff confirmed that a number of new initiatives were being implemented at the time of this Investigation and that a number of these would benefit from action taken to support the VEAC recommendations.

Workshop participants were also clear that more examples needed to be provided in the final report produced by VEAC to ensure there is no misunderstanding about how the recommendations are interpreted by government. Requests were also made to expand one recommendation and to insert a new recommendation as follows:

Rec No.	Action Recommended
R25	It was suggested that VEAC consider expanding this recommendation to include the establishment of advisory committees for the <u>Hattah and Murray-Kulkyne Parks</u> as well as for <u>Gunbower Island</u> .
New	That the Dharnya Centre be handed back to the total control of Yorta Yorta Nations as part of the Hand-back/Lease-back arrangements.

It is critical that Indigenous stakeholders in the Investigation area are kept informed about what action is being taken by government to implement each recommendation in the VEAC final report. Where possible, Indigenous stakeholders in the River Red Gum Forest Investigation area should be invited to actively participate in and contribute to any discussions that take place about how each recommendation will be implemented. This will ensure that the views of Indigenous stakeholders is reflected accurately in the changes made, that respect is being shown for the views of Indigenous people who also have an interest in progressing actions and that a two-way learning process occurs whereby Indigenous and non-Indigenous stakeholders improve their individual and professional capacities to contribute to the creation and development of new policies, procedures and processes.

Finally, we would like to thank all workshop participants for their contributions to this process and ensuring that robust discussions occurred to inform the VEAC decision-making process. We would also like to thank members of the Indigenous Steering Committee for their advice and support. The contribution made by VEAC staff in this process must also be acknowledged along with the time given by the VEAC Councillors to actively participate in the Indigenous consultation process.

Appendices

Appendix 1 – Shepparton Indigenous Workshop (1 September 2007)

General Comments

- We would like the two Traditional Owner Groups (Yorta Yorta and Bangerang) to work together on the land area to generate funds and employment and economic opportunities for all Aboriginal people who live on the lands that both family groups represent.
- We have issues with AAV's RAP application process and forms that need to be completed. This includes the number of people government want Aboriginal people to talk to before getting their applications processed and approved.
- The main issue with VEAC's Draft Recommendations is that the suggested changes outlined don't say which parcels of public land, water areas or parks, etc that will be applicable or not applicable.
- Agree with all the recommendations except R24. Don't agree with making the Barmah Forest a National park. *'No to closing the Barmah forest for good'*. We don't want Indigenous people to be held responsible by other non-Indigenous interests as the reason for the closure.

Rec No.	Comments
R18	Increasing Indigenous Community Capacity
	We want to build partnerships with other interested groups (farmers, graziers, etc). It's the way you approach people and the interest groups that is the key to effective outcomes.
R19	Enhancing Indigenous Involvement
	Government need to consider the Reconciliation Australia's Road Map to Reconciliation in relation to human rights and the rights of Aboriginal people to effectively participate in this recommendation, particularly part c(i).
R19 (iii)	The pipeline proposed to go from Yea to Melbourne suggests that 75,000 megalitres of water will be pumped from Lake Eildon to Melbourne. They have not consulted with Taumarong about this. Any benefits should be spread out across the community (ie. The Murray River – it doesn't matter whose land it is – all Indigenous people need to work collectively together to manage the river system).
R20	Joint Management Provisions for national parks
	If this recommendation is to be supported it should be made clearer for Indigenous groups to fully comprehend and understand when the final report is published.
R21	Co-management Provisions for parks and reserves
c (iii)	Most important recommendation and this should be highlighted as such in the final report.
c (iv)	Need to recognise Aboriginal 'Dreaming' more in this recommendation so everyone understands the importance of why this recommendation has been suggested.
d	Needs to have an example provided – ie. Lake Mokoan – all Traditional Owner groups would have a say in the management if all groups have an interest.
R22	This recommendation is supported.
R23	Aboriginal Advisory Committees
	The Advisory Committees term used needs to have the reasons for why 'advisory' is used and to explain the differences in the roles of advisory committees as compared to the suggested co-management board.
R24	Co-management for specific parks
	Need to include the maps for suggested changes in this section – that is, cross reference in the report and to the recommendation/s.
R25	Specific Aboriginal Advisory Committees
	This recommendation is supported.
R26	Aboriginal Traditional Cultural Practice
	This recommendation is ok. Always need to suggest that any management agreements have it stated that all interested Indigenous people need to be consulted.
R27	If someone takes bark off the tree but has to get permission to take the bark from a Traditional Owner Group that has been agreed upon through this new system proposed, then a letter of understanding should come from the Minister and the Traditional Owner Groups.

Appendix 2 – Melbourne Indigenous Workshop (2 September 2007)

General Comments

- That input should be sought from Canberra.
- This workshop is more about getting my mob into gear so they can do these things if and when the recommendations are endorsed by government.
- All the draft recommendations are good but they need to be deliverable (examples of how, what, when, who and the resources that will be available). The consultation process is really good to provide comments and discuss any issues. It is really good to see that no cultural centres and buildings are being recommended.

Rec No.	Comments
R18	This recommendation is supported.
R19	This recommendation is supported.
R20	Good Luck with getting this approved. Really need National Parks and support for Hand-back/Lease-back opportunities and discussions.
R21	This recommendation is supported.
R22	This recommendation is supported.
R23	<p>We need to have 'true Elders' on the advisory committees. Some Elders have the same ideas as the bureaucracy. Traditional Owners need to be there to explain and present the story telling and make sure it is sustainable for the future. The Traditional Owners and the State Government are becoming the same at the moment because they are bound by the rules and legislation of the State Government.</p> <p>A Terms of Reference should be developed for the advisory committees and distributed to the Elders and the Traditional Owners for comment.</p> <p>Elders need to be acknowledged by putting them on these advisory committees. Need the language changed so that Elders know and understand what is going on. The best people should be on these advisory committees.</p> <p>There is no real selection criteria determined in Recommendation R23. Maybe these comments could be included under Recommendation R23 (c) or as a footnote in the final report.</p> <p>We need to get everyone's opinion and not just the opinion of one person.</p>
R24	This recommendation is supported.
R25	This recommendation is supported.
R26	This recommendation is supported.
R27	This recommendation is supported.

Appendix 3 – Robinvale Indigenous Workshop (8 September 2007)

General Comments

- Concern was raised about membership on the VEAC Indigenous Steering Committee and how it was established and confirmed. An issue of concern was that one member of the Steering Committee had been opposed to the VEAC proposals paper through statements made in public forums held in Mildura that were reported in the local paper. (The Indigenous Steering Committee establishment process was outlined and all queries raised were answered).

Rec No.	Comments
R18	As long as the process undertaken and what is proposed is properly resourced then there is support for this recommendation particularly for overlapping boundaries with Traditional Owners and Native Title as that is still an issue to be resolved between the three Traditional Owner groups. Representatives to be proposed for these structures need to be in town for a few days on a couple of occasions – no 'blow ins' will be accepted.
R18 (g)	Non-Indigenous people would need to get a permit but not Indigenous people.
R19	Any resourcing agreed to needs to be adequate to Indigenous representatives and participants. Aunties and Uncle's can't just wait around for contracts to become available. Need to make it worth the Elders' while.
R20	This recommendation is supported because Government will need to change the legislation for the changes to be implemented.
R21	This recommendation is supported but adequate resourcing is required to meet the Traditional Owners and groups needs for proper participation on advisory committees and boards.
R22	This recommendation is supported but adequate resourcing is required to meet the Traditional Owners and groups needs for proper participation on advisory committees and boards.
R23	This recommendation is supported but adequate resourcing is required to meet the Traditional Owners and groups needs for proper participation on advisory committees and boards.
R24	A lot of discussion has occurred around the changes to public land use areas suggested by VEAC in particular, public access to areas. These suggested changes will need to include the exact public land use areas and be made clear to Indigenous people.
R25	This recommendation is supported. Consider including Advisory Committees for Hattah-Kulkyne National Park and Murray-Kulkyne Park.
R26	This recommendation is OK. Always need to suggest that any management agreements have included all interested Indigenous people to be consulted.
R27	Participants did not support a whole blanket permit system but suggested a permit system for some areas to ensure areas and species of cultural significance are protected and sustained for in the future. Participants provided and discussed the following case study example about not having a permit system in place: <ul style="list-style-type: none"> Permits for contractors to remove sand, soil, etc is needed. One contractor went to a burial ground and removed sand and disturbed our burial site. Local Council gave permission to the contractor for this to happen. Local contractors don't know what they are to look out for re. Indigenous interests and issues. It was suggested that earth removers should be trained for what to look out for and get a certificate of confirmation and understanding from Traditional Owners to approve this knowledge and understanding by the contractor. They then can't claim ignorance like they do now when they damage cultural sites. The Sandy Hills (high ground) is where we buried our Indigenous people. These contractors go to NSW DPI and get permission to do this and the royalties the contractors get goes back to the NSW DPI. We need to be able to say 'this track' goes over a midden so they don't have access to remove the sand or soil that is in that area. The areas we are referring to are Gadsen Bend, Lake Powell and all around Robinvale. Need to be able to restrict NSW access to Victorian side of the Murray River. Cross border arrangements has been with Traditional Owners on the NSW side and Robinvale side.

Appendix 4 – Gunbower Island Indigenous Workshop (9 September 2007)

General Comments

- Bararapa Traditional Owners need to meet as a group after today and discuss the proposals paper and recommendations in detail so we can make a more detailed response to VEAC. Bararapa asked for an extension to the current submission date and would like VEAC to consider providing assistance for the participants to reconvene to develop their submission.
- VEAC to provide participants with copies of proposed public land use maps for Kerang area and surrounds; Gunbower Island National Park; Murray-Sunset National Park; Barmah area and surrounds; Mildura area and surrounds.

Rec No.	Comments
R18	Issues were raised in relation to the 'identification' recommendation in the proposals paper. This recommendation should include whether or not it means 'identification as an individual or Traditional Owner group'. The word identification should be changed to 'recognition'. This recommendation is ok for now. We would need more examples provided explaining how the recommendations would look in practice rather than in theory.
R19	Gunbower Island is only located on Bararapa Country and no other Traditional Owner group can claim this Island. If the Traditional Owners propose and implement Hand Back/Lease Back government would need to make the public land freehold first before it can be considered. How would this be achieved by Government?
R20	Some Traditional Owner groups are not as up to speed as the Yorta Yorta as they have not been resourced in the past to be involved in processes to discuss and negotiate public land management.
R21	This recommendation is supported.
R22	This recommendation is supported. There are too many logging groups in the forests and parks cutting down our scarred trees.
R23	Advisory committees are supported but we need more detail re. representation and how they would operate over what period of time and who with (ie. government, business, etc).
R24	We would like a copy of all the maps on the wall sent to participants. Issues and discussions focused on needing to have campfires and smoking ceremonies to occur in the parks and at Gunbower Island. We don't want government to manipulate our traditional and contemporary cultural practices. <i>I don't want to be told we can't go down to the river and light a fire when I need to do this. I need to be able to go and do this so I can think clearly about things and my culture, etc.</i>
R25	This recommendation is supported. Gunbower Island should be put into this recommendation and that an advisory committee be established for this area.
R26	This recommendation is ok. Always need to suggest that any management agreements have included all interested Indigenous people to be consulted.
R27	There were many issues raised under this recommendation. <ul style="list-style-type: none"> • Should not be restrictions on areas along the whole river for access by Indigenous people. We should just have a permit for Milverton Bend only. We camped and traversed along the river within our traditional boundaries and this should be recognised. • Fishing – we don't fish and take a lot of fish at once and go home and put it in our freezers because it doesn't taste fresh or like we just caught the fish that day. We only hunt and fish when needed and eat and use the fish at the time of catching the fish. We just chuck it straight on the 'nickie' (the ashes) we don't use frying pans or white fella stuff. • One male Elder was getting flux and his food was not going down properly. He went to 3 health specialists who said it was the cooking on gas that was causing his health problem. He went back up the bush and went back to cooking his food on the open fire and then his health improved and the flux disappeared. Cooking on gas is bad for blackfellas.

Appendix 5 – Echuca YYNAC Indigenous Workshop (15 September 2007)

General Comments

- *"The environment is our culture". How do VEAC's recommendations impact on the Cultural Heritage and Native Title processes in place?*
- *"We can't currently see any separation between natural and cultural resources from a holistic point of view. The holistic view of land management and care for the land and the Indigenous view that the land is one".*
- *Partnership arrangements need to be negotiated regarding management if Barmah Forest becomes a National Park then it has to be a joint management approach with 'no more rubbish' attached to it. An agreement also needs to be treated legally and put through legislation. This is the last biggest chance to get something for our younger generations and resolve something that has been stolen in the past to get back in Yorta Yorta hands now so it can become our future.*
- Need to be able to gain more information about the VEAC Red River Gum Forest Investigation and the Draft Proposals Paper and its recommendations. We need to keep looking back over the years and the struggle we had for land justice and our rights.
- Looking back at the ILC years there has only been one page written on Indigenous issues and our concerns. This time VEAC has done more and I am pleased to see there is a chance to discuss more about Hand Back/Lease back and the work done to date.
- A lot of listening and learning. Needing to cement and get the words for the need for government, proposals forward. This is true capacity building, stakeholder and to engagement, recognised a sanctuary to enhance our future generations.
- Concern was raised about the current negative media campaign against the VEAC Draft Proposals Paper. *"There is a need for VEAC to be standing up to the plate about all the negative media publicity".*
 - There was concern that Yorta Yorta members are being threatened about the VEAC recommendations.
- Concern was raised that VEAC needed to provide some sort of protection to Yorta Yorta people in relation to how to handle the negative publicity and feedback from interested parties involved in opposing the VEAC process.
- It was pointed out that the McPherson media website owns 10 media outlets along the Murray River region and that they control the whole media agenda for the region that the VEAC study area covers. To counter balance this, it was suggested that VEAC has a role through its own media campaign to counteract what has been happening by McPherson media. *"It only whips up fear, misconception of VEAC and negative publicity".*
- It was further stated that the final VEAC recommendations need to consider the guidelines of the Ethics Committee with the Australia Press Council as they were the ones who stepped in on the Bridge Issue documented and reported on in the Riverine Herald.
- Participants stated that VEAC needs to bring it back to the attention of the Shepparton News as the negativity is being shown and heard on the television all the time. *"It needs to be a hard hitting advertisement by VEAC like the campaign against the Riverine Herald advert".* VEAC advised that they have actively tried to get as much information as possible out in the community.
- Participants stated that no one listens to the Yorta Yorta point of view on knowledge – what is the view on the scientific knowledge. That is - the steering committee and the reference group, as the discussion paper's scientific focus is only one element of this knowledge.
- Participants stated that all of the self interest groups have the financial backing behind them to oppose such measures and the recommendations.
- Hand Back/Lease Back issues were raised and explained.

Rec No.	Comments
R18	<p>It was agreed that government should be resourcing the registered Traditional Owner Groups. Has to be a way to take things forward. Yorta Yorta is a registered and identified Traditional Owner group by government which was endorsed through the Yorta Yorta Nations Co-operative Management Agreement in 2004. This Agreement determines the boundaries and the consultation process for areas within that boundary, and to be able to negotiate for those on the edges of the boundary line (ie. other Traditional Owner groups).</p> <p>VEAC still need to consider cultural heritage legislation. Still at the same time recognise the stance that Yorta Yorta has taken to get to its formal recognition.</p>
R18 (g)	<p>There needs to be resourced research to Yorta Yorta Nations whenever Yorta Yorta is engaged by non-Indigenous groups and businesses. That is - if Yorta Yorta are engaged and have a non-Indigenous consultant to do scientific report on country, then Yorta Yorta should be resourced to do their own research and scientific reports.</p>
R19 (v)	<p>Need to see where the Dharnya Centre will be included and to provide this training. The Dharnya Centre provides an important facility for the Cultural Awareness Training to occur – it is the ‘Jewel in the Crown’ for a Bush University concept. There needs to be a campaign to keep the Dharnya Centre going as it rose from the LCC study done in 1983. Government then came to Yorta Yorta and agreed to build the Dharnya Centre with \$1.2M from the Commonwealth to create economic and employment outcomes. Families go there and spend time and keep culture going and strong.</p> <p>The Dharnya Centre is vital in this process. Bush University concept (does this need a separate recommendation in the final report or does the existing written text just need to be strengthened more?)</p> <p>Bring the Dharnya Centre recommendation to the Indigenous recommendations I5 Barmah Forest Community Use Area– cross reference. The Dharnya Centre is important to deliver the cultural awareness training on country. Yenbena is also an important centre. It has the middens, trees for canoes, etc.</p> <p>Everyone discussed the Dharnya Centre written material on page 60 of the proposals paper under Community Use Areas Recommendation. There are problems with mixing the Dharnya Centre with the Muster Yards. Only area for specific Yorta Yorta use is under the co-operative management board proposed in part of the Barmah Forest. The Muster Yards can't be jointly considered with the Dharnya Centre.</p> <p>The development of cultural awareness needs to be done, which recognises and acknowledges the Traditional Owners and the land from where it is delivered. Recognition of prior and existing ownership of the land by Yorta Yorta ancestors and existing people. Recognition why it is being done. Cultural awareness that occurs in this part of the VEAC study areas must be delivered by Yorta Yorta people.</p> <p>The government's land managers have known about the white ants since 1996 (11 years ago). This was highlighted in the original submission but not in the final report. The government needs to put its hand in its pocket to repair the white ant damage.</p>
I5	<p><u>Recommendation: That the Dharnya Centre be handed back to the total control of Yorta Yorta Nations as part of a Hand Back/Lease Back arrangements.</u></p>
R20, 21 and 22	<p>Need to ensure that the Traditional Owners are recognised in all negotiating processes. Government is also increasing Indigenous community capacity building through other mechanisms and all of these commonalities need to come back to each other and to be complementary. <i>“It is all inclusive”</i>.</p>
R23, 24 and 25	<p>Agreement that there are advisory committee structures and co-management boards in place and that Barmah Forest is recommended as a National Park.</p>
R26 and 27	<p>The wording in these recommendations needs to be tightened up more in relation to hunting, gathering and fishing -needs to include resources to do these cultural practices and to include natural resources for cultural practices before the dot points.</p> <p>Examples could also include: bark trees, ochre, gypsum, etc. Need to be able to collect wood for cultural practices to make boomerangs, artefacts, etc.</p>

Discussion on the VEAC Draft Proposals Paper Indigenous Community Involvement Recommendations

- One main issue raised was the terminology used in the social and economic assessment of the VEAC Draft Proposals Paper. VEAC staff advised that the term was used by the non-Indigenous economic consultants "Intergenerational welfare dependency" was taken from the social welfare reports.
- Even though this is targeting non-Indigenous people it has impacts on their reaction to Indigenous people. Need to edit this out of the final report determined. Worse case scenario.
- Show where duck hunting is a job. Can't just say this when failing to consider a range of implications – benefits to properties, paid out royalties/commissions, etc.
- National Park – Can have employment and education for our young ones re. not be denied the right to take the kids into the bush and light a cooking fire?
- VEAC advised that the economic assessment consultants didn't separate the Indigenous employment vs. non-Indigenous employment outcomes.
- There was also lots of discussion about the AAV RAP process and the Cultural Heritage Council and native title but of course this VEAC process doesn't directly have an impact on these issues although it was seriously noted. One issue raised in relation to this process is that under the Cultural Heritage Council RAP process Traditional Owners might not have control over their traditional land/country.

"The forest is our culture and is everything to us" – Uncle Henry Atkinson.

Next Steps for Yorta Yorta and VEAC

A follow up meeting to discuss the Yorta Yorta Co-operative Management Agreement was requested.

APPENDIX 4

Timeframe and community consultation process for River Red Gum Forests Investigation



APPENDIX 5

Species names used in the Final Report

Fauna

English Name	Scientific Name
Australasian Darter	<i>Anhinga novaehollandiae</i>
Australasian Shoveler	<i>Anas rhynchos</i>
Australian Little Bittern	<i>Ixobrychus dubius</i>
Australian Painted Snipe	<i>Rostratula australis</i>
Australian Shelduck	<i>Tadorna tadornoides</i>
Barking Owl	<i>Ninox connivens</i>
Beaked Gecko	<i>Rhynchoedura ornata</i>
Blue-billed Duck	<i>Oxyura australis</i>
Broad-shelled Turtle	<i>Chelodina expansa</i>
Brolga	<i>Grus rubicunda</i>
Brown Treecreeper	<i>Climacteris picumnus</i>
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>
Bush Stone-curlew	<i>Burhinus grallarius</i>
Curl Snake	<i>Suta suta</i>
De Vis' Banded Snake	<i>Denisonia devisi</i>
Diamond Firetail	<i>Stagonopleura guttata</i>
Eastern Great Egret	<i>Ardea modesta</i>
Eurasian Coot	<i>Fulica atra</i>
Flat-headed Galaxias	<i>Galaxias rostratus</i>
Freckled Duck	<i>Stictonetta naevosa</i>
Freshwater Catfish	<i>Tandanus tandanus</i>
Giant Bullfrog	<i>Limnodynastes interioris</i>
Golden Perch	<i>Macquaria ambigua</i>
Greater Long-eared Bat	<i>Nyctophilus timoriensis</i>
Grey Teal	<i>Anas gracilis</i>
Grey-crowned Babbler	<i>Pomatostomus temporalis</i>
Growling Grass Frog	<i>Litoria raniformis</i>
Hardhead	<i>Aythya australis</i>
Hooded Robin	<i>Melanodryas cucullata</i>
Hooded Scaly-foot	<i>Pygopus schraderi</i>
Inland Carpet Python	<i>Morelia spilota metcalfei</i>
Intermediate Egret	<i>Ardea intermedia</i>
Little Egret	<i>Egretta garzetta</i>
Mallee Emu-wren	<i>Stipiturus mallee</i>
Murray Cod	<i>Maccullochella peelii peelii</i>
Murray Hardyhead	<i>Craterocephalus fluviatilis</i>
Murray Spiny Cray	<i>Euastacus armatus</i>
Musk Duck	<i>Biziura lobata</i>
Painted Honeyeater	<i>Grantiella picta</i>
Pink-eared Duck	<i>Malacorhynchus membranaceus</i>
Plains-wanderer	<i>Pedionomus torquatus</i>
Red-naped Snake	<i>Furina diadema</i>
Regent Parrot	<i>Polytelis anthopeplus</i>
Royal Spoonbill	<i>Platalea regia</i>
Silver Perch	<i>Bidyanus bidyanus</i>
Southern Myotis	<i>Myotis macropus</i>
Squirrel Glider	<i>Petaurus norfolcensis</i>
Superb Parrot	<i>Polytelis swainsonii</i>
Tree Goanna	<i>Varanus varius</i>
Trout Cod	<i>Maccullochella macquariensis</i>

English Name	Scientific Name
Unspecked Hardyhead	<i>Craterocephalus stercusmuscarum fulvus</i>
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>
Yellow-footed Antechinus	<i>Antechinus flavipes</i>

Flora

English Name	Scientific Name
Black Box	<i>Eucalyptus largiflorens</i>
Bladder Saltbush	<i>Atriplex vesicaria</i>
Bluish Raspwort	<i>Haloragis glauca</i> f. <i>glauca</i>
Branching Groundsel	<i>Senecio</i> sp. aff. <i>cunninghamii</i> (north-west)
Broombush	<i>Melaleuca uncinata</i>
Buloke	<i>Allocasuarina luehmannii</i>
Buloke Mistletoe	<i>Amyema linophylla</i> subsp. <i>orientale</i>
Bush Minuria	<i>Minuria cunninghamii</i>
Cane Grass	<i>Eragrostis australasica</i>
Chariot Wheels	<i>Maireana cheelii</i>
Chenopod	<i>Chenopodiaceae</i> spp.
Club-hair New Holland Daisy	<i>Vittadinia condyloides</i>
Common Spike-sedge	<i>Eleocharis acuta</i>
Curly Flat-sedge	<i>Cyperus rigidellus</i>
Desert Lantern	<i>Abutilon otocarpum</i>
Dwarf Swainson-pea	<i>Swainsona phacoides</i>
Eucalypt	<i>Eucalyptus</i> spp.
Giant Rush	<i>Juncus ingens</i>
Grey Billy-buttons	<i>Craspedia canens</i>
Grey Box	<i>Eucalyptus microcarpa</i>
Grey Scurf-pea	<i>Cullen discolor</i>
Hairy Tails	<i>Ptilotus erubescens</i>
Inland Pomaderris	<i>Pomaderris paniculosa</i> subsp. <i>paniculosa</i>
Jericho Wire-grass	<i>Aristida jerichoensis</i> var. <i>subspinulifera</i>
Leafless Bluebush	<i>Maireana aphylla</i>
Lignum	<i>Muehlenbeckia</i> spp.
Long Eryngium	<i>Eryngium paludosum</i>
Mealy Saltbush	<i>Atriplex pseudocampanulata</i>
Mueller Daisy	<i>Brachyscome muelleroides</i>
Native Couch	<i>Cynodon dactylon</i> var. <i>pulchellus</i>
Northern Golden Moths	<i>Diuris protena</i>
Paddle Saltbush	<i>Atriplex turbinata</i>
Pale Flax-lily	<i>Dianella longifolia</i> s.l.
Pale Spike-sedge	<i>Eleocharis pallens</i>
Purple Diuris	<i>Diuris punctata</i> var. <i>punctata</i>
Red Swainson-pea	<i>Swainsona plagiotropis</i>
River Bottlebrush	<i>Callistemon sieberi</i>
River Red Gum	<i>Eucalyptus camaldulensis</i>
Riverina Bitter-cress	<i>Cardamine moirensis</i>
Riverine Flax-lily	<i>Dianella porracea</i>
Rough-barked Honey-myrtle	<i>Melaleuca parvistaminea</i>
Rounded Noon-flower	<i>Disphyma crassifolium</i> subsp. <i>clavellatum</i>
Saltbush	<i>Atriplex</i> spp.
Sand Sida	<i>Sida ammophila</i>
Shining Glasswort	<i>Halosarcia nitida</i>
Silky Glycine	<i>Glycine canescens</i>
Silky Swainson-pea	<i>Swainsona sericea</i>
Silky Umbrella-grass	<i>Digitaria ammophila</i>
Silver Tails	<i>Ptilotus obovatus</i> var. <i>obovatus</i>
Silver Wattle	<i>Acacia dealbata</i>
Slender Darling-pea	<i>Swainsona murrayana</i>
Slender Love-grass	<i>Eragrostis exigua</i>

English Name	Scientific Name
Small Scurf-pea	<i>Cullen parvum</i>
Smooth Minuria	<i>Minuria integerrima</i>
Southern Cane-grass	<i>Eragrostis infecunda</i>
Spiny Lignum	<i>Muehlenbeckia horrida</i> subsp. <i>horrida</i>
Spiny Mud-grass (Moir grass)	<i>Pseudoraphis spinescens</i>
Spiny Rice-flower	<i>Pimelea spinescens</i>
Spiny-fruit Saltbush	<i>Atriplex spinibractea</i>
Spotted Emu-bush	<i>Eremophila maculata</i> var. <i>maculata</i>
Spreading Emu-bush	<i>Eremophila divaricata</i> subsp. <i>divaricata</i>
Spreading Scurf-pea	<i>Cullen patens</i>
Swamp Buttercup	<i>Ranunculus undosus</i>
Swamp Wallaby-grass	<i>Amphibromus</i> spp.
Tall Kerosene Grass	<i>Aristida holathera</i> var. <i>holathera</i>
Tangled Lignum	<i>Muehlenbeckia florulenta</i>
Terete Culm-sedge	<i>Carex tereticaulis</i>
Three-wing Bluebush	<i>Maireana triptera</i>
Tough Scurf-pea	<i>Cullen tenax</i>
Twin-leaf Bedstraw	<i>Asperula gemella</i>
Umbrella Wattle	<i>Acacia oswaldii</i>
Warrego Summer-grass	<i>Paspalidium jubiflorum</i>
Waterbush	<i>Myoporum montanum</i>
Wedderburn Wattle	<i>Acacia euthycarpa</i> subsp. <i>oblanceolata</i>
Wedge Diuris	<i>Diuris dendrobioides</i>
Western Silver Wattle	<i>Acacia decora</i>
Western Water-starwort	<i>Callitriche cyclocarpa</i>
White Box	<i>Eucalyptus albens</i>
Winged New Holland Daisy	<i>Vittadinia pterochaeta</i>
Winged Peppergrass	<i>Lepidium monoplacoides</i>
Woolly Scurf-pea	<i>Cullen pallidum</i>
Yakka Grass	<i>Sporobolus caroli</i>
Yellow Box	<i>Eucalyptus melliodora</i>
Yellow Tails	<i>Ptilotus nobilis</i> var. <i>nobilis</i>

APPENDIX 6

Revised forest growth rates, state forest areas and sustainable sawlog volume estimates

Forest Location and Site Quality	Growth Rates (cubic metres/ha/yr)		Available Areas (ha)		Sustainable Sawlog Volumes (cubic metres/year)			
	Original (frequent flooding)	Recent (reduced flooding)	Current	Recommended (by VEAC)	Current Area & Original Growth Rates	Current Area & Recent Growth Rates	Recommended Area & Original Growth Rates	Recommended Area & Recent Growth Rates
Barmah High SQ	0.38	0.23	6089	0	1582	965	0	0
Barmah Low SQ	0.17	0.10	12,052	0	1388	836	0	0
Goulburn High SQ	0.30	0.25	2749	0	412	355	0	0
Goulburn Low SQ	0.20	0.16	2637	0	265	211	0	0
Murray Forests Low SQ	0.20	0.16	2406	0	242	193	0	0
Gunbower High SQ	0.27	0.16	5604	4900	1025	612	899	537
Gunbower Low SQ	0.14	0.08	5854	4984	548	325	467	277
Totals:			37,391	9884	5462	3497	1366	814
Percent of 2006-07 sawlog licence volumes:					90%	58%	22.5%	13%
Percent of 5462 cubic metres/yr:					100%	64%	25%	15%
Percent of 3497 cubic metres/yr:						100%	39%	23%

Notes

Incorporates River Red Gum Forest in the General & Special Management Zones, new site quality data and Murray Forests (Lower Owens to Tocumwal) in the analysis. Refer to State Forests in Chapter 3 for an explanation of the changes since the Draft Proposals Paper.

Revised Site Quality data and CFI data were provided by the Department of Sustainability and Environment.

Assumes that growth rates will return to original values if adequate environmental water is provided.

APPENDIX 7

Recommendations for natural features reserves

Recommendations for Natural Features Reserves – Bushland Areas

Rec No.	Name	Area (ha)	Parcel Number List*
G1	Wargan-Mallee Bushland Area	1441.1	P000189, P000182, P000221, P000181, P000180, P000223, P000202, and parts of P003436, P000202 and P000224
G2	Carwarp Bushland Area	6.0	P000321, P000322
G3	Piangil Bushland Area	0.2	P006157, P006156
G4	Nyah Bushland Area	155.3	P003015, P002996, P002994, P372745, P372743, P372744
G5	Lake Kelly Bushland Area	3.4	P004347
G6	McMillans Lake Bushland Area	32.5	P120122, P123963
G7	Spences Lake Bushland Area Note: salt extraction activities can continue in this Bushland Area	40.9	P121808, P121807
G8	Cranes Lake Bushland Area Note: Salt extraction activities can continue in this Bushland Area	34.1	P121844
G9	Beauchamp Salt Lake Bushland Area	18.6	P120056
G10	Beauchamp Bushland Area	5.1	P123295, P120020
G11	Lake Lookout Bushland Area	69.5	P120058
G12	Sandhill Lake Bushland Area	165.2	P120053, P120054, P120067, P120068, P368494
G13	Quambatook Bushland Area	9.5	P123487
G14	Narrewillock Bushland Area	1.1	P122211, P123338
G15	Barrakee Bushland Area	15.8	P128295, P128293, P121350, P121351, P128294
G16	Lake Boort Bushland Area	477.8	P120807, P120797, P120800, P120801, P120798
G17	Boort Bushland Area	2.8	P125408, P364867
G18	Dry Lake Bushland Area	144.6	Dry Lake south of Kerang
G19	Salter Bushland Area	3.8	P122156, P122157
G20	Myall Bushland Area	32.1	P134423, P125285, P125286
G21	Murrabit Bushland Area	17.3	P122149, P125270
G22	Cohuna Bushland Area	1.9	P121580
G23	Wee Wee Rup Bushland Area	6.9	P122411,
G24	Leitchville Bushland Area	9.3	P122420, P122419
G25	Pyramid Hill Bushland Area	3.1	P124729
G26	Blind Creek Bushland Area	3.6	P129452
G27	Mologa Wetland Bushland Area	1.1	P127123
G28	Mologa Triangle Bushland Area	2.6	P132441
G29	Mologa Bushland Area	2.9	P132803
G30	Dingee Bushland Area	10.0	P121911, P121900, P121912
G31	Terrick Terrick North Bushland Area	1.5	P131378, P131379, P131380, P133775
G32	McIntyre Rd Grassland Bushland Area	1.1	P124491, P124492, P124490
G33	Dullard Waterhole Bushland Area	0.8	P124457
G34	Elmore-Cohuna Railway Bushland Area	31.7	Section of unused rail reserve between Kotta and McColl
G35	Lockington Bushland Area	3.7	P370727, P370725, P370724, P370726, P130029
G36	Turrumberry North Bushland Area	7.0	P124493
G37	Wharparilla Bushland Area	9.8	P131652, P131653, P131654, P131666, P131655, P131656, P131657, P131658, P131659, P131660, P131661, P131662, P131663, P131664, P131665, P125466, P131641, P131642, P131643, P131645, P131646, P131647, P131648, P131649, P131650, P131651
G38	Echuca West Bushland Area	10.2	P125462
G39	Piper Bushland Area	12.5	P124697
G40	Beattie Depression Bushland Area Note: This Bushland Area can continue to be used as a floodway. Southern sections of this area should be revegetated.	398.0	Beattie Depression floodway east of Echuca
G41	Nanneella Bushland Area	28.0	P160556, P161253, P161252

Rec No.	Name	Area (ha)	Parcel Number List*
G42	Rushworth-Colbinabbin Rail Line Bushland Area	15.6	P125135, P372106 and sections of disused railway line near Karook
G43	Moira Bushland Area	8.0	P160557
G44	Lower Moira Bushland Area	3.1	P160558, part road reserve
G45	Narioka Bushland Area	2.2	P160560
G46	Brooms Bushland Area	9.9	P160567
G47	Barwo Bushland Area	6.5	P160568
G48	McLellands Bushland Area	35.8	P160571, P160570
G49	Kotupna Bushland Area	3.7	P160569
G50	Kotupna School Bushland Area	2.6	P368704
G51	St Germain's Bushland Area	0.4	P162682
G52	Undera Bushland Area	1.3	P162693
G53	Strathmerton Bushland Area	38.0	P16057, P160579, P160577, P160576 and part adjoining rail land
G54	Horseshoe Lagoon Bushland Area	9.5	P204458
G55	Kaluna Park Bushland Area	23.2	P204519, P204488
G56	Ovens Billabong Bushland Area	2.2	P206888
G57	Oxley Bushland Area Note: This Bushland Area should be revegetated	7.3	P200133, P200131, P200132, P200124, P200134
G58	Wodonga Bushland Area	4.9	P205761
G59	Bonegilla Wetland Bushland Area	0.4	P200095

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Recommendations for Natural Features Reserves – Streamside Areas

Rec No.	Name	Area (ha)	Parcel Number List*
G60	Mosquito Creek Streamside Area	179.5	P123484, P123483, P123481
G61	Capels Crossing Streamside Area	292.2	P133045, P125353, P121817, P121836, P123007, and parts of P123008, P124683, P125339 P123006, P121816 and adjoining public land
G62	Kinypanial Streamside Area	22.0	P123174, part P123175
G63	Hayanmi Streamside Area	24.0	P122562, P122564, P122563, P122559, P122560, P122561
G64	Strathallan Streamside Area	21.2	P375442
G65	Bandella Streamside Area	21.4	P126735
G66	Bonn Streamside Area	6.7	P120728, P120729
G67	Runnymede Streamside Area	13.7	P123695, P123696
G68	English Bridge Streamside Area	34.4	P120912, P120910, P120908, P120911, P120913, P120909, P123450
G69	Wakiti Creek Streamside Area	313.5	P161635, P161636 and part P161634
G70	Deep Creek Streamside Area	5.3	P161614
G71	Skeleton Creek Streamside Area	105.1	P161632, P161637, P161638, P161639, P161640, P161598, P161599, P161600, P161601, P161606, P161607, P372699, P372700, P372701
G72	Arcadia Streamside Area	1048.5	P163921, P163905, P163904, P125269, P163900, P163899, P163901, P163902, P162805, P163914, P163925, P164293, P163927, P163909, P163881, P163912, P163913, P163880, P163879, P163910, P163923, P163908, P163911, P163878, P163877, P163480, P163479, P163867, P163922, and parts of P163835, P163921, P163924, P363614, P163898, P163903, P161588, P162806
G73	Dargalong Streamside Area	1.3	P163956
G74	Wahring Streamside Area	2.8	P163436
G75	Oxley Streamside Area	1.1	P201780
G76	Tarrowingee Streamside Area	24.7	P203477, P201614, P201613
G77	Whorouly Streamside Area	12.3	P201892, P203087, P201900
G78	Eurobin Streamside Area	2.0	P202212
G79	Kergunyah Streamside Area	1.8	P204160
G80	Gundowring Streamside Area	4.8	P200890, P204201, P200891
G81	Dederang Streamside Area	7.0	P204637

Recommendations for Natural Features Reserves – Wildlife Areas (State Game Reserves)

Rec No.	Name	Area (ha)	Parcel Number List*
G82	Heywood Lake Wildlife Area	566.6	P007053, P007052, P007054
G83	Lake Mannaor Wildlife Area	86.6	P004284, P366448, P004283
G84	Tutchewop Wildlife Area	514.6	P004298, P004297, P004296, P004295, P131950, P131951, P131952
G85	Cullens Lake Wildlife Area	748.7	P134443, P121805, P121850, P120044, P121849, P120046
G86	Duck Lake North Wildlife Area	296.2	Part of P121848
G87	Little Lake Charm Wildlife Area	61.3	P370260, P370259
G88	Stevenson Swamp Wildlife Area	92.6	P121811
G89	Lake Murphy Wildlife Area	223.4	P126661, P126664, P126662, P126663
G90	Great Spectacle Lake Complex Wildlife Area	150.8	P123213, P131971, P131972, P126695, P131973, P131970 P134448
G91	Lake Lyndger Wildlife Area	331.8	P120790
G92	Two Mile Swamp Wildlife Area	143.6	P124510, P124511
G93	Westblades Swamp Wildlife Area	69.7	P125346, P134667, P134404, P125345
G94	Harts Swamp Wildlife Area	44.9	P125276
G95	McDonald Swamp Wildlife Area	215.2	P122147
G96	Hird Swamp Wildlife Area	456.6	P133719, P134582, P126218, P126219, P133273, P133276, P126218, P122136, P126221, P126214 and part P126190
G97	Baillieu Lagoon Wildlife Area	191.0	P124468
G98	Murphy Swamp Wildlife Area	84.9	P124486, P133403, P133402
G99	Corop Wildlife Area	12.1	P132828, P132827, P132826, P128705, P128706, P128707
G100	Gaynor Swamp Wildlife Area	451.6	P134171, P122129, P134173, P132958, P122137, P134172, P122135, P134174
G101	Mansfield Swamp Wildlife Area	490.4	P133706, P133705, P133712, P133713, P133711, P133714, P133718, P133717, P133958
G102	Murchison Lagoon Wildlife Area	5.9	P163198
G103	Reedy Swamp Wildlife Area	225.5	P364187, P372762 part, P163238, P160527 part from top of eastern bank of the Goulburn River
G104	Big Reedy Lagoon Wildlife Area	274.0	P163638, P364151, P371783, P371784

Recommendations for Natural Features Reserves – Public Land Water Frontage Areas

Rec No.	Name	Area (ha)
G105	Avoca River Reserve	1424.4
G106	Loddon River Reserve	1697.2
G107	Campaspe River Reserve	631.9
G108	Goulburn River Reserve	236.1
G109	Ovens River Reserve	1537.9
G110	King River Reserve	621.9
G111	Kiewa River Reserve	1178.0
G112	Various other public land water frontage areas as indicated on Map A.	8547.8

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APPENDIX 8

Uncategorised public land parcels recommended for revegetation

Parcel Number	Area (ha)
P000188	1.93
P000190	2.35
Part of P000202	28
P000222	4.82
P003030	4.33
P004282	9.18
P120019	0.42
P120062	7.96
P120456	2.23
P122448	2.17
P122723	3.77
P122725	1.62
P122803	2.06
P124431	6.7
P124483	7.77
P124549	2.04
P124565	26.04
P124769	5.08
P124858	4.31
P124919	0.69
P124928	1.7
P125133	3.98
P125404	4.77
P125693	1.98
P127127	2.12
P128363	2.22
P128367	3.06
P128368	0.33
Part of P128370	8.55
Part of P131383	14.52
P131384	2.88
P131818	1.04
P132615	2.4
P132616	9.55
P133036	1.94
P369595	5.78
P370261	4.65
P370262	1.59
P370871	6.42

Note: Crown Land areas have in the past been described using a Crown Allotment (CA), Section (Sec) and Parish (P) or Township (T). More recently Crown land has been attributed a unique identifier known as a Crown parcel number, or P number. The P number is provided above for Crown land parcels. Maps of these parcels can be generated by the Catchment Information Mapper website (<http://nremap-sc.nre.vic.gov.au/MapShare.v2/imf.jsp?site=cim>) or go to the DSE website www.dse.vic.gov.au and select the following links: 'Property, Titles & Maps', then 'Maps, Imagery and Data', then 'Maps', then 'MapShare', then 'Catchment Information Mapper') or can be provided by VEAC upon request.

APPENDIX 9

Reservation Status of Ecological Vegetation Classes (EVCs)

The following representation table provides details on the extent of Ecological Vegetation Classes (EVCs) in the recommended dedicated reserve system across the investigation area. A representation table of EVCs in each bioregion within the investigation area is available on the VEAC website (www.veac.vic.gov.au) or by request from VEAC. Descriptions of vegetation communities, EVCs, mapping, bioregional conservation status methodologies and definitions are provided in the Discussion Paper and summarised below.

Flood-dependent EVCs—identified in column 15—have been determined as part of Council's mapping of flood dependent natural assets project across the floodplain of the Murray, Goulburn and Ovens Rivers (appendix 11).

Definitions and Key

Ecological Vegetation Classes (EVCs) are groups of one or more vegetation communities which exist under a common regime of ecological processes and which are linked to broad landscape features. Any variability of communities within an EVC are due to geographical separation rather than major ecological differences.

It is possible to map EVCs distributions with individual site data; aerial photographs; maps of the main environmental determinants of vegetation distribution (such as soils, rainfall, topography); any pre-existing vegetation mapping; and extensive field work to identify boundaries and ground-check EVCs mapping.

As well as the standard EVCs, the process of mapping generates two variations—mosaics and complexes. A mosaic consists of two or more discrete EVCs that cannot be mapped separately due to the mapping scale. A complex occurs where two or more EVCs are unable to be distinguished in an area but are known to exist discretely elsewhere. Some EVCs occur only in mosaics. These types and units are referred to simply as 'EVCs'.

The extent to which vegetation has been depleted—that is, cleared as a result of European settlement—is a key consideration in the establishment of conservation reserve systems and used in conjunction with measures to protect threatened species. Assessing EVC depletion requires mapping of both EVC extent prior to European settlement (pre-1750 mapping), as well as current distribution. Modelling and prediction of original pre-1750 vegetation is used for areas of non-indigenous vegetation or cleared land. For the purposes of establishing targets for reservation, conservation status at the bioregional level is used. Bioregional conservation status of each EVC is presented for the four main bioregions occurring in the study area: Murray Fans, Victorian Riverina, Robinvale Plains and Murray Scroll Belt. Smaller areas of other bioregions also occur within the study area. The representation table of EVCs in each bioregion is available on the VEAC website (www.veac.vic.gov.au) or by request from VEAC. Data in the representation table were derived by GIS analysis, overlaying on computer, maps of:

- the pre-1750 extent of EVCs;
- current extent of EVCs; and
- current and recommended public land-use categories.

DSE released a new geospatial dataset for the extent of native vegetation in early 2008 to accompany the *Net Gain Accounting – First Approximation Report*. At the time of VEAC reanalysing EVC reservation status for the final recommendation, this dataset was not in an appropriate form for use by VEAC. As such the EVC datasets used previously for this investigation were again used for the final recommendations. The recently released DSE mapping, increased the likely distribution of a number of grassy ecosystems, mostly on private land, and has little impact on the previously mapped distribution of EVCs on public land in the investigation area or the conservation status of those EVCs. Some figures may vary slightly from those in the Draft Proposals Paper due to improved data validation. Many small public land units are not picked up in the public land GIS layer. For example, none of these figures include roads and roadsides, for which no estimate of extent exists. The area of public land in the investigation area is greater than in this representation table because several thousand hectares of public land that have been cleared are not included in the calculations. The following is a detailed key for the column headings and symbols used in the representation table.

Columns 1 and 2: Ecological Vegetation Classes (EVC) number and name

Names and identification numbers of EVCs mapped in the investigation area, including complexes and mosaics.

Column 3: Pre-1750 Extent

Total area in hectares estimated to have been occupied by each EVC prior to European settlement.

Column 4: Current extent (public and private land)

Total area in hectares currently occupied by each EVC – that is, that part of the pre-1750 distribution where indigenous vegetation is currently present.

Column 5: Percent Remaining

Percentage of current extent (column 4) of each EVC compared to pre-1750 extent (column 3).

Column 6: Current Dedicated Reserve

Total area in hectares of each EVC in **existing** public land-use categories that comprise the conservation reserve system.

Column 7: Recommended Dedicated Reserve

Total area in hectares of each EVC in **recommended** public land-use categories that comprise the conservation reserve system.

Column 8: Recommended Other public land

Total area in hectares of each EVC in all recommended public land-use categories outside the dedicated reserve system.

Column 9: Recommended Dedicated Reserves as % of Pre-1750 Extent

Percentage of each EVC in recommended dedicated reserves (column 7) compared to pre-1750 extent (column 3).

Column 10: Recommended Dedicated Reserves as % of Current Extent

Percentage of each EVC in recommended dedicated reserves (column 7) compared to current extent (column 4).

Columns 11-14: Bioregional Conservation Status

Bioregional conservation status of each EVC occurring in the four main bioregions:

MF = Murray Fans
MSB = Murray Scroll Belt
RP = Robinvale Plains
VR = Victorian Riverina

The assessments refer to EVC distributions in the investigation area or in bioregions within the investigation area. The percent remaining (column 5) is a key factor in assigning EVCs to status categories:

E = endangered
V = vulnerable
D = depleted
LC = Least Concern
na = not applicable

Other criteria include degradation, current threats, rarity and naturally restricted occurrence. Bioregional Conservation Status is based on latest advice from DSE (November 2007)

Column 15: Flood-dependent EVCs

Flood-dependent EVCs have been determined as part of the mapping of flood-dependent natural assets across the floodplain of the Murray, Goulburn, King and Ovens Rivers (appendix 11).

Y = flood-dependent
N = not flood-dependent
V = potentially flood-dependent in some areas

Column 16: Critical flood interval

The maximum interval (in years) at which flood-dependent EVCs require a flood in order to sustain the EVC in a healthy and viable condition.

		Area in hectares				Area in hectares				Bioregional conservation status for main bioregions					
EVC No.	Ecological vegetation classes (EVCs)	Pre-1750 extent	Current extent	Percent remaining	Current dedicated reserve	Proposed dedicated reserve	Proposed other public land	Proposed dedicated reserves as % of pre-1750 extent	Proposed dedicated reserves as % of current extent	MF	MSB	RP	VR	Flood dependent	Critical flood interval
806	Alluvial Plains Semi-arid Grassland	3,520	3,517	99.9	1,568	3,052	64	86.7	86.8	V	V			Y	25
81	Alluvial Terraces Herb-rich Woodland/ Creekline Grassy Woodland Mosaic	15	9	61.6	0	0	5	0.0	0.0				V	N	
653	Aquatic Herbland	139	139	100.0	0	139	0	99.8	99.8	D				Y	2
1043	Aquatic Herbland/ Floodplain Grassy Wetland Mosaic	59	59	100.0	0	59	0	100.0	100.0	E				Y	2
1044	Aquatic Herbland/Floodway Pond Herbland	1	1	100.0	0	1	0	100.0	100.0	D				Y	2
1045	Aquatic Herbland/ Riverine Swamp Forest Mosaic	1	1	100.0	0	1	0	100.0	100.0	D				Y	2
1047	Aquatic Herbland/Tall Marsh Mosaic	68	68	100.0	0	68	0	100.0	100.0	D				Y	2
993	Bare Rock/Ground	1,160	1,160	100.0	525	691	357	59.5	59.5	na	na			V	
334	Billabong Wetland Aggregate	1,317	1,096	83.2	17	337	300	25.6	30.8	D			V	Y	2
297	Billabong Wetland Aggregate/ Red Gum Swamp Mosaic	21	1	7.1	0	0	0	0.0	0.0	V			E	Y	2
61	Box Ironbark Forest	61	17	27.3	0	1	2	1.9	7.1				V	N	
636	Brackish Lake Aggregate	1,959	1,884	96.2	0	0	1,843	0.0	0.0				E	N	
291	Cane Grass Wetland	46	7	16.3	0	0	0	0.0	0.0				V	Y	5
829	Chenopod Grassland	108,008	17,461	16.2	279	413	407	0.4	2.4	E			E	N	
158	Chenopod Mallee	4,508	2,986	66.2	233	1,998	97	44.3	66.9	V	V	V	V	N	
68	Creekline Grassy Woodland	2,390	938	39.2	4	4	93	0.2	0.5	E			E	N	
807	Disused Floodway Shrubby Herbland	23	23	100.0	13	23	0	100.0	100.0		E			Y	25
168	Drainage-line Aggregate	3,668	2,522	68.8	25	683	645	18.6	27.1	V			E	Y	2
1022	Drainage-line Aggregate/ Riverine Swamp Forest Mosaic	116	116	100.0	0	113	0	97.4	97.4	V			V	Y	3
1023	Drainage-line Aggregate/ Sedgy Riverine Forest Mosaic	23	23	100.0	0	23	0	100.0	100.0	V				Y	5
1025	Drainage-line Aggregate/Tall Marsh Mosaic	3	3	100.0	0	3	0	100.0	100.0	V				Y	2

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108	Drainage-line Grassy Woodland/ Lake Bed Herbland Mosaic	765	0	0.0	0	0	0	0.0	0.0	V				Y	5
809	Floodplain Grassy Wetland	581	577	99.2	0	513	56	88.3	89.0	E	E	E		Y	2
1049	Floodplain Grassy Wetland/ Floodway Pond Herbland Mosaic	6	6	100.0	0	6	0	100.0	100.0	E				Y	2
1051	Floodplain Grassy Wetland/ Riverine Swamp Forest Mosaic	101	101	100.0	0	101	0	100.0	100.0	E				Y	2
1052	Floodplain Grassy Wetland/ Riverine Swampy Woodland Mosaic	9	5	54.5	0	1	0	16.2	29.7	E		E		Y	2
1054	Floodplain Grassy Wetland/ Spike-sedge Wetland Mosaic	22	22	100.0	0	22	0	100.0	100.0	E				Y	2
1055	Floodplain Grassy Wetland/Tall Marsh Mosaic	21	21	100.0	0	21	0	100.0	100.0	E				Y	2
56	Floodplain Riparian Woodland	22,252	15,593	70.1	57	3,763	4,583	16.9	24.1	D			V	Y	7
1033	Floodplain Riparian Woodland/ Floodway Pond Herbland Mosaic	3	3	96.5	0	2	0	82.4	85.5	D				Y	3
1031	Floodplain Riparian Woodland/ Grassy Riverine Forest Mosaic	34	34	100.0	0	6	16	16.3	16.3	D				Y	4
1032	Floodplain Riparian Woodland/ Riverine Grassy Woodland Mosaic	27	18	68.1	0	6	5	21.0	30.9	V			E	Y	7
1034	Floodplain Riparian Woodland/ Riverine Swamp Forest Mosaic	237	55	23.3	0	2	48	0.7	3.2	D			V	Y	3
1035	Floodplain Riparian Woodland/ Sedgy Riverine Forest Mosaic	210	205	97.6	0	3	138	1.3	1.3	D			V	Y	5
1037	Floodplain Riparian Woodland/ Tall Marsh Mosaic	1	1	100.0	0	1	0	100.0	100.0	D				Y	2
172	Floodplain Wetland Aggregate	1,161	912	78.6	3	147	221	12.7	16.2	D			V	Y	2
810	Floodway Pond Herbland	1,166	1,156	99.2	183	606	454	52.0	52.4	D	D	D	V	Y	3
945	Floodway Pond Herbland/ Riverine Swamp Forest Complex	2,523	2,523	100.0	0	750	1,768	29.7	29.7	D				Y	3
1058	Floodway Pond Herbland/ Riverine Swamp Forest Mosaic	89	32	36.3	0	1	6	1.1	3.0	D				Y	3

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1060	Floodway Pond Herbland/Tall Marsh Mosaic	7	7	100.0	0	7	0	100.0	100.0	D				Y	3
718	Freshwater Lake Aggregate	4,220	4,203	99.6	1	170	3,988	4.0	4.0				V	N	
22	Grassy Dry Forest	676	266	39.4	0	0	18	0.0	0.0				D	N	
106	Grassy Riverine Forest	9,458	8,929	94.4	1,725	3,451	4,688	36.5	38.7	D	D	D	D	Y	4
1015	Grassy Riverine Forest/ Drainage-line Aggregate Mosaic	3	3	100.0	0	3	0	100.0	100.0	D				Y	4
811	Grassy Riverine Forest/ Floodway Pond Herbland Complex	1,141	1,127	98.8	268	456	599	40.0	40.5	D	D	D		Y	4
1029	Grassy Riverine Forest/ Floodway Pond Herbland Mosaic	5	5	100.0	0	5	0	100.0	100.0	D				Y	4
1017	Grassy Riverine Forest/ Riverine Grassy Woodland Mosaic	23	23	100.0	0	23	0	100.0	100.0	V				Y	4
812	Grassy Riverine Forest/ Riverine Swamp Forest Complex	8,323	6,367	76.5	0	2,217	2,331	26.6	34.8	D			D	Y	3
1030	Grassy Riverine Forest/ Riverine Swamp Forest Mosaic	67	67	100.0	0	67	0	99.5	99.5	D				Y	3
1062	Grassy Riverine Forest/ Riverine Swampy Woodland Mosaic	1	1	100.0	0	1	0	100.0	100.0	V				Y	4
1063	Grassy Riverine Forest/ Sedgy Riverine Forest Mosaic	344	344	100.0	0	344	0	100.0	100.0	D			V	Y	4
1065	Grassy Riverine Forest/Tall Marsh Mosaic	2	2	100.0	0	2	0	100.0	100.0	D				Y	2
175	Grassy Woodland	3,933	714	18.2	47	67	63	1.7	9.4	E			E	N	
251	Grassy Woodland/Valley Grassy Forest Mosaic	64	5	7.6	0	0	0	0.0	0.0				E	N	
20	Heathy Dry Forest	6	5	88.2	0	0	0	0.0	0.0				LC	N	
23	Herb-rich Foothill Forest	195	114	58.6	0	4	12	2.2	3.8				D	N	
813	Intermittent Swampy Woodland	9,204	9,157	99.5	5,750	7,040	1,377	76.5	76.9	D	D	D	D	Y	7
107	Lake Bed Herbland	3,695	3,649	98.8	1,850	2,908	392	78.7	79.7	V	V	D	D	Y	5
808	Lignum Shrubland	16,673	16,045	96.2	5,655	9,843	2,103	59.0	61.4	V	LC	LC		Y	15

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104	Lignum Swamp	51,414	17,101	33.3		1,938	2,636	1,473	5.1	15.4	V	V	V	V	Y	15
823	Lignum Swampy Woodland	69,543	41,331	59.4		5,723	13,435	9,510	19.3	32.5	V	D	D	V	Y	15
942	Lignum Swampy Woodland/ Lake Bed Herbland Mosaic	125	64	51.2		0	0	35	0.0	0.0				V	Y	2–5
943	Lignum Swampy Woodland/ Plains Grassland Mosaic	12,638	1,352	10.7		9	9	20	0.1	0.7				E	Y	15
91	Loamy Sands Mallee	1,399	1,384	99.0		1,336	1,344	2	96.1	97.1	LC	LC			N	
102	Low Chenopod Shrubland	40,848	38,819	95.0		5,972	10,897	522	26.7	28.1	D	D	D		N	
66	Low Rises Woodland	3,013	716	23.8		54	309	60	10.2	43.1	E		E		N	
1038	Low Rises Woodland/ Riverine Swampy Woodland Mosaic	2	2	100.0		0	2	0	100.0	100.0	E				Y	5
652	Lunette Woodland	1,581	131	8.3		0	0	34	0.0	0.0	E		E		N	
1048	Mosaic of Aquatic Herbland/Floodway Pond Herbland-Riverine Swamp Forest Complex	2	2	100.0		0	2	0	100.0	100.0	D				Y	2
1046	Mosaic of Aquatic Herbland/Sedgy Riverine Forest-Riverine Swamp Forest Complex	0	0	100.0		0	0	0	100.0	100.0	D				Y	2
1039	Mosaic of Drainage-line Aggregate/Floodway Pond Herbland-Riverine Swamp Forest Complex	1	1	100.0		0	1	0	100.0	100.0	V				Y	3
1021	Mosaic of Drainage-line Aggregate/Grassy Riverine Forest-Riverine Swamp Forest Complex	146	146	100.0		0	146	0	100.0	100.0	V				Y	3
1024	Mosaic of Drainage-line Aggregate/Sedgy Riverine Forest-Riverine Swamp Forest Complex	66	67	100.2		0	19	0	28.7	28.7	V			V	Y	3
1056	Mosaic of Floodplain Grassy Wetland/Floodway Pond Herbland-Riverine Swamp Forest Complex	1	1	100.0		0	1	0	100.0	100.0	E				Y	2
1053	Mosaic of Floodplain Grassy Wetland/Sedgy Riverine Forest-Riverine Swamp Forest Complex	2	2	100.0		0	2	0	100.0	100.0	E				Y	2
1050	Mosaic of Floodplain Grassy Wetland/Grassy Riverine Forest-Riverine Swamp Forest Complex	23	23	100.0		0	6	16	28.5	28.5	E				Y	2
1036	Mosaic of Floodplain Riparian Woodland/Sedgy Riverine Forest-Riverine Swamp Forest Complex	0	0	104.1		0	0	0	30.2	29.1	na				Y	3

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1057	Mosaic of Floodway Pond Herbland/Grassy Riverine Forest-Riverine Swamp Forest Complex	4	4	100.0	0	4	0	100.0	100.0	D				Y	3
1059	Mosaic of Floodway Pond Herbland/Sedgy Riverine Forest-Riverine Swamp Forest Complex	8	8	100.0	0	8	0	100.0	100.0	D				Y	3
1020	Mosaic of Grassy Riverine Forest/Floodway Pond Herbland-Riverine Swamp Forest Complex	379	379	100.0	0	379	0	100.0	100.0	D				Y	3
1016	Mosaic of Grassy Riverine Forest/Plains Grassy Woodland-Grassy Woodland Complex	0	0	100.0	0	0	0	100.0	100.0	E				Y	4
1019	Mosaic of Grassy Riverine Forest/Sedgy Riverine Forest-Riverine Swamp Forest Complex	76	76	100.0	0	76	0	100.0	100.0	D				Y	4
1061	Mosaic of Grassy Riverine Forest-Riverine Swamp Forest Complex/Riverine Swamp Forest	239	239	100.0	0	231	7	96.9	96.9	D				Y	3
1042	Mosaic of Riverine Grassy Woodland/Floodway Pond Herbland-Riverine Swamp Forest Complex	1	1	100.0	0	1	0	100.0	100.0	V				Y	3
1072	Mosaic of Riverine Swamp Forest/Floodway Pond Herbland-Riverine Swamp Forest Complex	882	882	100.0	0	881	0	99.9	99.9	D				Y	3
1074	Mosaic of Riverine Swampy Woodland/Sedgy Riverine Forest-Riverine Swamp Forest Complex	32	32	100.0	0	32	0	100.0	100.0	V				Y	3
1078	Mosaic of Sedgy Riverine Forest/Floodway Pond Herbland-Riverine Swamp Forest Complex	31	31	100.1	0	31	0	99.4	99.3	D				Y	3
1075	Mosaic of Sedgy Riverine Forest/Sedgy Riverine Forest-Riverine Swamp Forest Complex	1,253	1,231	98.2	0	1,134	0	90.5	92.1	D				Y	3
1080	Mosaic of Sedgy Riverine Forest-Riverine Swamp Forest Complex/Floodway Pond Herbland-Riverine Swamp Forest Complex	65	65	100.0	0	65	0	100.0	100.0	D				Y	3
1079	Mosaic of Sedgy Riverine Forest-Riverine Swamp Forest Complex/Tall Marsh	7	7	100.0	0	7	0	100.0	100.0	D				Y	3
1083	Mosaic of Tall Marsh/Floodway Pond Herbland-Riverine Swamp Forest Complex	83	83	100.5	0	83	0	100.0	99.5	D				Y	3
1085	Mountain Valley Riparian Woodland	1,325	892	67.3	0	4	553	0.3	0.4				V	N	
132	Plains Grassland	251,009	37,784	15.1	1,969	2,554	598	1.0	6.8	E	E	E	E	N	

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267	Plains Grassland/Plains Grassy Woodland/ Gilgai Wetland Mosaic	13,066	1,391	10.6	19	37	318	0.3	2.6	E			E	N	
125	Plains Grassy Wetland	2,172	645	29.7	121	145	0	6.7	22.5	E			E	Y	3
55	Plains Grassy Woodland	14,954	1,532	10.2	3	6	134	0.0	0.4				E	N	
238	Plains Grassy Woodland/ Creekline Grassy Woodland/ Floodplain Riparian Woodland Mosaic	1,288	80	6.2	0	0	0	0.0	0.0				E	Y	7
240	Plains Grassy Woodland/Creekline Grassy Woodland/Wetland Formation Mosaic	0	0	96.6	0	0	0	0.0	0.0				E	V	
259	Plains Grassy Woodland/Gilgai Wetland Mosaic	6	1	10.7	0	0	0	0.0	0.0	E			E	N	
187	Plains Grassy Woodland/ Grassy Woodland Complex	95	30	31.2	0	0	6	0.0	0.0				E	N	
188	Plains Grassy Woodland/Valley Grassy Forest Complex	13	1	3.9	0	0	0	0.0	0.0				E	N	
190	Plains Grassy Woodland/Valley Grassy Forest/ Grassy Woodland Complex	194	15	7.6	0	0	4	0.0	0.0				E	N	
888	Plains Saltmarsh	298	266	89.3	3	0	260	0.0	0.0				E	N	
826	Plains Savannah	14,082	2,257	16.0	12	38	43	0.3	1.7	E			E	N	
803	Plains Woodland	137,036	22,055	16.1	313	3,453	1,805	2.5	15.7	E		E	E	N	
235	Plains Woodland/ Herb-rich Gilgai Wetland Mosaic	1,733	186	10.7	0	0	23	0.0	0.0				E	N	
855	Plains Woodland/Lignum Swamp Mosaic	1,250	137	11.0	0	0	0	0.0	0.0				E	Y	15
273	Plains Woodland/Plains Grassland/ Gilgai Wetland Mosaic	6	2	27.6	0	0	0	0.0	0.0				E	N	
856	Plains Woodland/Red Gum Swamp Mosaic	1,034	169	16.4	0	0	4	0.0	0.0				E	Y	3
292	Red Gum Swamp	1,706	1,600	93.8	45	831	564	48.7	51.9	V			V	Y	3
333	Red Gum Swamp/Plains Grassy Wetland Mosaic	718	398	55.4	1	79	122	11.1	20.0	E			E	Y	3
96	Ridged Plains Mallee	1,819	463	25.5	112	121	93	6.7	26.1	E		E	E	N	

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18	Riparian Forest	399	319	80.0	0	5	252	1.2	1.4			D	N		
237	Riparian Forest/Swampy Riparian Woodland Mosaic	9	34	384.9	0	0	5	5.5	1.4			D	N		
84	Riparian Forest/Swampy Riparian Woodland/Riparian Shrubland/Riverine Escarpment Scrub Mosaic	1	1	100.0	0	0	1	0.0	0.0			na	N		
103	Riverine Chenopod Woodland	140,325	60,556	43.2	13,412	23,674	7,492	16.9	39.1	E	D	D	V	Y	30–50
321	Riverine Chenopod Woodland/Lignum Swamp Mosaic	24	13	54.5	0	0	0	0.0	0.0	E		V	V	Y	15
110	Riverine Chenopod Woodland/Plains Grassland Mosaic	1,113	266	23.9	0	0	15	0.0	0.0			E	Y	Y	30–50
975	Riverine Ephemeral Wetland	1	1	100.0	0	1	0	100.0	100.0	V				N	
1088	Riverine Grassland	65	62	95.4	0	61	0	95.0	99.5	E				N	
295	Riverine Grassy Woodland	56,348	28,684	50.9	3,376	10,940	5,725	19.4	38.1	V	D	D	V	Y	7
1027	Riverine Grassy Woodland/Grassy Riverine Forest-Riverine Swamp Forest Complex	0	0	100.0	0	0	0	100.0	100.0	V				Y	3
870	Riverine Grassy Woodland/Plains Woodland Complex	1,355	283	20.9	0	0	42	0.0	0.0	E				Y	7
871	Riverine Grassy Woodland/Plains Woodland/Gilgai Wetland Complex	829	146	17.6	0	5	1	0.6	3.3	E		E		Y	7
872	Riverine Grassy Woodland/Plains Woodland/Riverine Chenopod Woodland Complex	1,131	280	24.8	0	0	1	0.0	0.0	E		na		Y	30–50
873	Riverine Grassy Woodland/Riverine Chenopod Woodland/Wetland Mosaic	50	9	18.5	0	0	0	0.0	0.0	V				Y	7
1028	Riverine Grassy Woodland/Riverine Swamp Forest Mosaic	14	14	100.0	0	14	0	100.0	100.0	V				Y	3
1040	Riverine Grassy Woodland/Riverine Swampy Woodland Mosaic	14,061	4,250	30.2	12	540	545	3.8	12.7	V		E		Y	5
1041	Riverine Grassy Woodland/Sedgy Riverine Forest Mosaic	594	566	95.3	0	215	320	36.2	37.9	V		V		Y	5

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814	Riverine Swamp Forest	12,630	12,043	95.4	34	4,894	6,395	38.8	40.6	D			D	Y	3
1067	Riverine Swamp Forest/ Riverine Swampy Woodland Mosaic	55	55	100.0	0	30	21	54.9	54.9	V				Y	3
1068	Riverine Swamp Forest/ Sedgy Riverine Forest Mosaic	475	396	83.3	13	54	224	11.4	13.7	D			V	Y	3
1069	Riverine Swamp Forest/Sedgy Riverine Forest-Riverine Swamp Forest Complex	1,325	1,218	91.9	0	1,127	34	85.1	92.5	D				Y	3
1070	Riverine Swamp Forest/ Spike-sedge Wetland Mosaic	6	6	100.0	0	6	0	100.0	100.0	V				Y	4
1071	Riverine Swamp Forest/Tall Marsh Mosaic	573	573	100.0	0	573	0	100.0	100.0	D				Y	2
815	Riverine Swampy Woodland	8,943	6,182	69.1	48	2,667	933	29.8	43.1	V	V		V	Y	5
946	Riverine Swampy Woodland/ Lignum Swamp Mosaic	5,824	2,231	38.3	8	86	132	1.5	3.9				V	Y	15
1099	Riverine Swampy Woodland/ Plains Grassy Wetland Mosaic	308	30	9.7	1	1	0	0.3	3.0	E				Y	3
1073	Riverine Swampy Woodland/ Sedgy Riverine Forest Mosaic	348	345	99.2	0	17	304	4.9	5.0	V				Y	5
28	Rocky Outcrop Shrubland	138	43	31.2	0	1	0	0.5	1.7				V	N	
804	Rushy Riverine Swamp	293	206	70.4	0	144	58	49.3	70.0	D			D	Y	2
717	Saline Lake Aggregate	182	181	99.0	35	176	0	96.4	97.3				LC	N	
101	Samphire Shrubland	1,351	1,266	93.7	307	202	916	15.0	16.0	LC			LC	N	
264	Sand Ridge Woodland	1,845	727	39.4	1	59	80	3.2	8.1	E			E	N	
694	Sandstone Ridge Shrubland/ Low Rises Woodland Mosaic	147	8	5.3	0	0	0	0.0	0.0				E	N	
985	Sandy Beach	73	64	87.7	0	5	28	6.5	7.4	na			na	N	
816	Sedgy Riverine Forest	17,441	16,534	94.8	203	9,566	4,711	54.9	57.9	D	D	V	V	Y	5
817	Sedgy Riverine Forest/ Riverine Swamp Forest Complex	3,875	3,831	98.9	0	3,591	146	92.7	93.7	D				Y	3
1076	Sedgy Riverine Forest/ Spike-sedge Wetland Mosaic	0	0	100.0	0	0	0	100.0	100.0	V				Y	4

		Area in hectares				Area in hectares				Bioregional conservation status for main bioregions					
EVC No.	Ecological vegetation classes (EVCs)	Pre-1750 extent	Current extent	Percent remaining	Current dedicated reserve	Proposed dedicated reserve	Proposed other public land	Proposed dedicated reserves pre-1750 extent	Proposed dedicated reserves as % of current extent	MF	MSB	RP	VR	Flood dependent	Critical flood interval
1077	Sedgy Riverine Forest/Tall Marsh Mosaic	2	2	100.0	0	2	0	100.0	100.0	D				Y	2
98	Semi-arid Chenopod Woodland	33,717	20,148	59.8	1,977	8,557	1,022	25.4	42.5	E	D	V	E	N	
828	Semi-arid Parilla Woodland	1,839	482	26.2	18	166	84	9.0	34.5			V		N	
97	Semi-arid Woodland	18,415	12,337	67.0	7,137	10,100	261	54.9	81.9	V	V	V	E	N	
200	Shallow Freshwater Marsh	619	618	99.9	43	307	308	49.7	49.7	V	V	V		Y	3
21	Shrubby Dry Forest	9	8	84.1	0	0	0	0.0	0.0				V	N	
818	Shrubby Riverine Woodland	7,957	7,950	99.9	2,373	4,891	2,470	61.5	61.5	LC	LC	LC		Y	7
819	Spike-sedge Wetland	790	726	91.9	78	380	308	48.2	52.4	V	V	V	V	Y	4
1081	Spike-sedge Wetland/Tall Marsh Mosaic	59	59	100.0	50	59	0	99.8	99.8	V		V	V	Y	2
820	Sub-saline Depression Shrubland	1,011	932	92.1	113	668	109	66.1	71.7		V	D		Y	25
83	Swampy Riparian Woodland	7	3	47.6	0	0	1	0.0	0.0				E	N	
937	Swampy Woodland	9,882	1,712	17.3	0	8	396	0.1	0.5				E	N	
821	Tall Marsh	1,435	1,411	98.3	53	885	471	61.7	62.7	LC		D	D	Y	2
1087	Tall Marsh/Aquatic Herbland Mosaic	7	7	100.0	0	0	7	0.0	0.0				V	Y	2
1084	Tall Marsh/Non-Vegetation Mosaic	16	16	100.0	0	16	0	100.0	100.0	D				Y	2
1090	Tall Marsh/Open Water Mosaic	185	184	99.7	0	0	156	0.0	0.0	LC			D	Y	2
1082	Tall Marsh/Riverine Swamp Forest Mosaic	3	3	100.0	0	3	0	100.0	100.0	D				Y	2
47	Valley Grassy Forest	1,634	214	13.1	0	2	26	0.2	1.1				V	N	
265	Valley Grassy Forest/Grassy Dry Forest Mosaic	3	1	35.7	0	0	0	0.0	0.0				V	N	
998	Water Body - Natural or man made	5,419	6,646	122.6	307	2,470	2,286	45.6	37.2	na	na	na	na	V	
74	Wetland Formation	11,897	3,625	30.5	24	208	74	1.8	5.7	E			E	V	
824	Woorinen Mallee	2,450	1,393	56.9	668	1,116	29	45.5	80.1	V	V	V	V	N	
86	Woorinen Sands Mallee	2,662	2,450	92.0	2,265	2,281	25	85.7	93.1	D	D	D		N	
	TOTAL	1,214,191	480,762	39.6	68,388	169,950	79,300	14.0	35.4						

In addition to the representation of EVCs in the public land dedicated reserve system shown above, the following EVCs are also represented in Private Protected Areas owned by the Trust for Nature (Vic) and accredited under the National Reserve System (note: not all these reserves are entirely contained within the study area)—

Alluvial Plains Semi-arid Grassland	291 ha
Chenopod Grassland	79 ha
Chenopod Mallee	161 ha
Floodplain Grassy Wetland	1 ha
Floodway Pond Herbland	12 ha
Grassy Riverine Forest	0 ha
Grassy Riverine Forest/ Floodway Pond Herbland Complex	13 ha
Intermittent Swampy Woodland	118 ha
Lignum Shrubland	753 ha
Lignum Swamp	86 ha
Lignum Swampy Woodland	497 ha
Low Chenopod Shrubland	18,921 ha
Plains Grassland	350 ha
Riverine Chenopod Woodland	969 ha
Semi-arid Chenopod Woodland	4,899 ha
Semi-arid Woodland	69 ha
Shrubby Riverine Woodland	275 ha
Total	27,495 ha

APPENDIX 10

Representation of key values in the current and recommended reserve system

Key threatened species

English name (see Appendix 5 for scientific name)	Victorian conservation status	Total number of records in investigation area	Number of records in current permanent reserves (and percent of total)	Number of recommended permanent reserve additions	Number of records in recommended permanent reserves (and percent of total)	Number of records in other public land	Number of records in freehold land
Animals							
De Vis' Banded Snake	v	12	0 (0)	9	9 (75)	3	0
Broad-shelled Turtle	e, L	22	2 (9)	8	9 (41)	12	1
Inland Carpet Python	e, L	84	15 (18)	16	31 (34)	35	18
Curl Snake	v	34	21 (62)	8	29 (85)	3	2
Grey-crowned Babbler	e, L	347	6 (2)	11	17 (5)	21	298
Murray Cod	e, L	214	13 (6)	60	73 (34)	72	69
Regent Parrot	v, L	284	168 (59)	22	190 (67)	87	7
Silver Perch	ce, L	68	20 (29)	11	31 (46)	37	0
Squirrel Glider	e, L	77	8 (10)	18	26 (34)	45	6
Superb Parrot	e, L	185	12 (6)	120	132 (71)	41	12
Plants							
Mueller Daisy	e, L	8	5 (0)	1	6 (75)	1	1
Slender Love-grass	e	6	1 (0)	5	6 (100)	0	0
Western Water-starwort	v	9	0 (0)	2	2 (22)	7	0
Winged Peppergrass	e, L	30	21 (70)	5	26 (87)	0	4
Small Scurf-pea	e, L	55	14 (25)	12	26 (47)	12	17
Spiny Mud-grass (Moir grass)	–	149	20 (13)	46	66 (44)	44	39

The above data are from the Department of Sustainability and Environment's Flora Information System and Atlas of Victorian Wildlife (updated May 2007). See the River Red Gum Forests Investigation Discussion Paper for further details of conservation status. Note that only post-1980 records with a 1 minute or greater level of accuracy were included.

Sites of high geological or geomorphological significance

Significance	No. of sites*	No. sites partly or wholly in conservation reserves (and % of total)	No. sites in VEAC conservation reserve additions	No. of sites in recommended conservation reserves (and % of total)	No. of sites in other public land	No. of sites mostly of wholly in Freehold land
International	0	0	0	0	0	0
National	5	2 (40)	2	4 (80)	1	0
State	16	4 (25)	4	8 (50)	5	3

* Three international and two state significance sites located outside the investigation area were listed in the Discussion Paper to provide context are and not included in the calculation above.

APPENDIX 11

Flood-dependent natural assets project

Background

Although some areas such as the Barmah forest are very well known, there have been few comprehensive inventories of important natural values along the Murray floodplains. For this project, VEAC has sought out and compiled data on flood requirements for all flood-dependent ecological vegetation classes (EVCs) and threatened species along the Murray, Goulburn, Ovens and King Rivers.

Past environmental water allocations have targeted a variety of different natural assets (e.g. stressed red gum trees, colonial nesting waterbirds, various fish species), but consideration of the water requirements of the full suite of floodplain ecosystems and significant species has been limited. By considering the water requirements of the full range of natural assets, the effectiveness of water delivery for biodiversity can be maximised. This approach highlights the species and ecosystems most in need of water.

The process aims to build on the icon sites approach to view the Murray floodplain forests as an interconnected system. This project also identifies for the first time the flood-frequency and duration requirements for the full suite of floodplain ecosystems and significant species.

The analyses cover the riverine forests, woodlands and wetlands along the Murray, Goulburn, Ovens and King Rivers. The project does not include the Kerang Lakes and floodplains of the Avoca, Loddon and Campaspe Rivers.

Description of the project

A more detailed description of the project is available on the VEAC website www.veac.vic.gov.au.

Identification of minimum flooding water requirements for EVCs (i.e. minimum requirements to stay healthy) was undertaken by botanists experienced in the floodplain ecosystems of the River Murray. Flooding requirements for threatened flora and fauna species were also determined through discussions with experts in the respective fields, as well as reviews of published literature. In the majority of cases, the flooding requirements for a species were assigned by applying the water requirements of the EVC/s that comprise its preferred habitat. However, for other species, such as egrets and other colonial nesting waterbirds, it was possible to use more specific information about watering requirements and the location of sites.

Localities for species were derived primarily from DSE's Victorian Fauna Display (Atlas of Victorian Wildlife) and Flora Information System and supplemented by Birds Australia Atlas data and recent ecological survey reports where applicable. Records were excluded if they were old or if there was uncertainty about the location data. Priorities for rare and threatened plant and animal species were also assigned based on their threat status at a national and state level and an assessment of the proportion of the state or national population occurring in the floodplain ecosystems under consideration.

The significant species are listed in tables 1 and 2 below and the floodplain EVCs in appendix 9. The flood frequency requirements for EVCs and threatened species are presented visually in maps D and E (in the back pocket of this report).

A number of taxa have yet to be incorporated into this analysis, including threatened fish and threatened invertebrates. As improved knowledge of their flooding requirements is gained, these too can be incorporated into the analysis.

Application of the project

This project provides information that will assist in determining the likely ecological benefits of various environmental watering options. It factors in a range of rare and threatened species and ecosystems that currently receive little attention, including a number of nationally-listed threatened species and ecological communities.

Importantly, the information derived from this project is equally applicable to current and to likely 'new' environmental water allocations.

This project is the most comprehensive identification of water requirements for natural values on the floodplain to date, and is able to be used immediately to guide prioritisation of environmental watering. As more information on floodplain EVCs and species becomes available, the water requirements and distribution of values can be refined by ecologists and land and water managers. Thus it is an adaptive process allowing for the incorporation of monitoring and feedback over time. The project makes it possible to transparently and easily communicate the extent to which manipulated or natural flows benefit various natural values. Quantitative and visual outputs such as maps will enable environmental managers and the public to easily see which values do and do not receive water. Example maps from the Robinvale area are presented below.

Future work

The project to date should be seen as an initial step towards a more comprehensive and ongoing analysis that is continually updated and refined as new data and results become available. Immediate priorities not included in the project currently include the incorporation of significant fish and invertebrate species, and potential recovery or re-establishment sites (as opposed to just sites of recent occurrence). Most importantly there is a need to review the conservation status of species and EVCs in light of the threat posed by insufficient flooding. The analysis undertaken for this project to date would provide the basis for such a review which would, in turn, feed back into future analyses.

Tables 1 and 2 identify a number of species which are flood-dependent or utilise flood-dependent EVCs but have too few accurate or recent records to include in the analysis at this point in time. Further surveys for these and other species may be required. Again, this information can be built into future iterations of the database by ecologists and land and water managers.

Table 1. Rare and threatened flood-dependent flora considered or included in analyses

Common Name	Scientific Name	Mapped	Not Mapped*
Native Scurf-pea	<i>Cullen australasicum</i>		•
Hoary Scurf-pea	<i>Cullen cinereum</i>	•	
Small Scurf-pea	<i>Cullen parvum</i>	•	
Annual Flat-sedge	<i>Cyperus nervulosus</i>		•
Slender Love-grass	<i>Eragrostis exigua</i>	•	
Grey Billy-buttons	<i>Craspedia canens</i>		•
Keeled Goosefoot	<i>Chenopodium carinatum</i>		•
Jerry-jerry	<i>Ammannia multiflora</i>	•	
Small Water-fire	<i>Bergia trimera</i>	•	
Mueller Daisy	<i>Brachyscome muelleroides</i>	•	
Water-shield	<i>Brasenia schreberi</i>		•
Western Water-starwort	<i>Callitriche cyclocarpa</i>	•	
Lax Flat-sedge	<i>Cyperus flaccidus</i>		•
Dwarf Flat-sedge	<i>Cyperus pygmaeus</i>	•	
Bearded Flat-sedge	<i>Cyperus squarrosus</i>	•	
Button Rush	<i>Lipocarpa microcephala</i>	•	
Lagoon Spurge	<i>Phyllanthus lacunarius</i>	•	
Glistening Dock	<i>Rumex crystallinus</i> s.s.		•
Yellow Pea-bush	<i>Sesbania cannabina</i> var. <i>cannabina</i>		•
Lagoon Nightshade	<i>Solanum lacunarium</i>	•	
Wavy Marshwort	<i>Nymphoides crenata</i>	•	
Twin-leaf Bedstraw	<i>Asperula gemella</i>	•	
Reader's Daisy	<i>Brachyscome readeri</i>	•	
Cotton Sneezeweed	<i>Centipeda nidiformis</i>	•	
Veiled Fringe-sedge	<i>Fimbristylis velata</i>		•
Dwarf Brooklime	<i>Gratiola pumilo</i>		•
Hydrilla	<i>Hydrilla verticillata</i>		•
Brown Beetle-grass	<i>Leptochloa fusca</i> subsp. <i>fusca</i>		•
Small Monkey-flower	<i>Mimulus prostratus</i>		•
Mallee Cucumber	<i>Mukia micrantha</i>	•	
Water Nymph	<i>Najas tenuifolia</i>		•
Sandhill Spurge	<i>Phyllanthus lacunellus</i>	•	
Dwarf Bitter-cress	<i>Rorippa eustylis</i>	•	
Floodplain Fireweed	<i>Senecio glandulosus</i>		•
Yakka Grass	<i>Sporobolus caroli</i>	•	
Sweet Fenugreek	<i>Trigonella suavissima</i>	•	
Common Joyweed	<i>Alternanthera nodiflora</i>	•	
Common Hornwort	<i>Ceratophyllum demersum</i>		•
Native Couch	<i>Cynodon dactylon</i> var. <i>pulchellus</i>	•	
Yelka	<i>Cyperus victoriensis</i>		•
Tall Cup-grass	<i>Eriochloa crebra</i>		•
Summer Fringe-sedge	<i>Fimbristylis aestivalis</i>	•	
Native Peppercress	<i>Lepidium pseudohyssopifolium</i>	•	
Indian Chickweed	<i>Mollugo verticillata</i>		•
Velvet Knotweed	<i>Persicaria attenuata</i>		•
Tongue Dock	<i>Rumex stenoglottis</i>		•
Smooth Blue-rod	<i>Stemodia glabella</i> s.s.		•
Perfoliate Pondweed	<i>Potamogeton perfoliatus</i> s.l.		•
River Swamp Wallaby-grass	<i>Amphibromus fluitans</i>	•	
Umbrella Grass	<i>Digitaria divaricatissima</i>		•
Cane Grass	<i>Eragrostis australasica</i>	•	
Ridged Water-milfoil	<i>Myriophyllum porcatum</i>		•
Small-flower Tobacco	<i>Nicotiana goodspeedii</i>		•
Slender Water-ribbons	<i>Triglochin dubia</i>		•

Common Name	Scientific Name	Mapped	Not Mapped*
Plains Billy-buttons	<i>Craspedia haplorrhiza</i>		•
Pale Spike-sedge	<i>Eleocharis pallens</i>	•	
Hypsela	<i>Hypsela tridens</i>		•
Slender Bitter-cress	<i>Cardamine tenuifolia</i>		•
Straggly Lantern-bush	<i>Abutilon oxycarpum</i> var. <i>malvaefolium</i>	•	
Silky-heads	<i>Cymbopogon obtectus</i>		•
Winged Peppercress	<i>Lepidium monoplacoides</i>	•	
Fat Spectacles	<i>Menkea crassa</i>		•
Yellow Tails	<i>Ptilotus nobilis</i> var. <i>nobilis</i>	•	
Woolly Copperburr	<i>Sclerolaena lanicuspis</i>		•
Salt Copperburr	<i>Sclerolaena ventricosa</i>		•
Violet Swainson-pea	<i>Swainsona adenophylla</i>		•
Hairy Darling-pea	<i>Swainsona greyana</i>	•	
Spreading Saltbush	<i>Atriplex limbata</i>	•	
Billabong Daisy	<i>Brachyscome</i> aff. <i>gracilis</i> (Kings Billabong)	•	
Yellow Garland-lily	<i>Calostemma luteum</i>		•
Darling Lily	<i>Crinum flaccidum</i>		•
Riverine Flax-lily	<i>Dianella porracea</i>	•	
Pale Flax-lily	<i>Dianella</i> sp. aff. <i>longifolia</i> (Riverina)	•	
Flycatcher	<i>Drosera indica</i>		•
Tall Nut-heads	<i>Epaltes cunninghamii</i>		•
Bignonia Emu-bush	<i>Eremophila bignoniiflora</i>	•	
Poverty Bush	<i>Sclerolaena intricata</i>	•	
Pale Swamp Everlasting	<i>Helichrysum</i> aff. <i>rutidolepis</i> (Lowland Swamps)	•	
Dwarf Old-man Saltbush	<i>Atriplex nummularia</i> subsp. <i>omissa</i>		•
Garland Lily	<i>Calostemma purpureum</i> s.l.	•	
Riverina Bitter-cress	<i>Cardamine moirensis</i>	•	
Spreading Emu-bush	<i>Eremophila divaricata</i> subsp. <i>divaricata</i>	•	
Spotted Emu-bush	<i>Eremophila maculata</i> var. <i>maculata</i>	•	
Woolly Minuria	<i>Minuria denticulata</i>		•
Squat Picris	<i>Picris squarrosa</i>	•	
Bundled Peppercress	<i>Lepidium fasciculatum</i>	•	
Warty Peppercress	<i>Lepidium papillosum</i>	•	
Tangled Copperburr	<i>Sclerolaena divaricata</i>	•	
Bluish Raspwort	<i>Haloragis glauca</i> f. <i>glauca</i>	•	
Weeping Myall	<i>Acacia pendula</i>	•	
Soda Bush	<i>Neobassia proceriflora</i>	•	
Small-leaf Bluebush	<i>Maireana microphylla</i>	•	
Pale Plover-daisy	<i>Leiocarpa leptolepis</i>	•	
Desert Lantern	<i>Abutilon otocarpum</i>	•	
Yarran	<i>Acacia melvillei</i>	•	
Dwarf Amaranth	<i>Amaranthus macrocarpus</i> var. <i>macrocarpus</i>	•	
Silver Saltbush	<i>Atriplex rhagodioides</i>	•	
Purple Love-grass	<i>Eragrostis lacunaria</i>	•	
Spear-fruit Copperburr	<i>Sclerolaena patentiscuspis</i>	•	
Annual Bitter-cress	<i>Cardamine paucijuga</i> s.s.		•
Mealy Saltbush	<i>Atriplex pseudocampanulata</i>	•	
Prickly Bottlebrush	<i>Callistemon brachyandrus</i>	•	
Blue Burr-daisy	<i>Calotis cuneifolia</i>	•	
Finger Grass	<i>Dactyloctenium radulans</i>		•
Goat Head	<i>Malacocera tricornis</i>	•	
Smooth Minuria	<i>Minuria integerrima</i>	•	
Mallee Annual-bluebell	<i>Wahlenbergia tumidifructa</i>		•
Wimmera Woodruff	<i>Asperula wimmerana</i>		•
Spiny Lignum	<i>Muehlenbeckia horrida</i> subsp. <i>horrida</i>	•	
Flat-top Saltbush	<i>Atriplex lindleyi</i> subsp. <i>lindleyi</i>		•
Bladder Saltbush	<i>Atriplex vesicaria</i> subsp. <i>minor</i>		•

Common Name	Scientific Name	Mapped	Not Mapped*
Ferny Small-flower Buttercup	<i>Ranunculus pumilio</i> var. <i>politus</i>		•
Austral Trefoil	<i>Lotus australis</i> var. <i>australis</i>		•
Desert Spinach	<i>Tetragonia eremaea</i> s.s.	•	
Annual Spinach	<i>Tetragonia moorei</i>	•	
Native Madder	<i>Synaptantha tilleacea</i> var. <i>tilleacea</i>		•
Long Eryngium	<i>Eryngium paladosum</i>	•	
Swamp Buttercup	<i>Ranunculus undosus</i>	•	

* Considered flood-dependent (or reliant or utilises flood-dependent EVCs) and known from the investigation area but too few recent records with reliable location data.

Table 2. Threatened flood-dependent fauna considered or included in analyses

Common Name	Scientific Name	Mapped	Not Mapped*
Brown Quail	<i>Coturnix ypsilophora</i>	•	
Blue-billed Duck	<i>Oxyura australis</i>	•	
Musk Duck	<i>Biziura lobata</i>	•	
Freckled Duck	<i>Stictonetta naevosa</i>	•	
Australasian Shoveler	<i>Anas rhynchotis</i>	•	
Hardhead	<i>Aythya australis</i>	•	
Pied Cormorant	<i>Phalacrocorax varius</i>	•	
Little Egret	<i>Egretta garzetta</i>	•	
Eastern Great Egret	<i>Ardea modesta</i>	•	
Intermediate Egret	<i>Ardea intermedia</i>	•	
Nankeen Night Heron	<i>Nycticorax caledonicus</i>	•	
Australian Little Bittern	<i>Ixobrychus minutus</i>	•	
Australasian Bittern	<i>Botaurus poiciloptilus</i>	•	
Glossy Ibis	<i>Plegadis falcinellus</i>	•	
Royal Spoonbill	<i>Platalea regia</i>	•	
Square-tailed Kite	<i>Lophoictinia isura</i>		•
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	•	
Grey Falcon	<i>Falco hypoleucos</i>		•
Red-chested Button-quail	<i>Turnix pyrrhothorax</i>	•	
Brolga	<i>Grus rubicunda</i>	•	
Baillon's Crake	<i>Porzana pusilla</i>	•	
Latham's Snipe	<i>Gallinago hardwickii</i>	•	
Australian Painted Snipe	<i>Rostratula australis</i>	•	
Bush Stone-curlew	<i>Burhinus grallarius</i>	•	
Gull-billed Tern	<i>Gelochelidon nilotica</i>	•	
Caspian Tern	<i>Hydroprogne caspia</i>	•	
Whiskered Tern	<i>Chlidonias hybridus</i>	•	
Diamond Dove	<i>Geopelia cuneata</i>	•	
Swift Parrot	<i>Lathamus discolor</i>		•
Superb Parrot	<i>Polytelis swainsonii</i>	•	
Regent Parrot	<i>Polytelis anthopeplus</i>	•	
Azure Kingfisher	<i>Alcedo azurea</i>		•
Red-backed Kingfisher	<i>Todiramphus pyrrhopygia</i>		•
Powerful Owl	<i>Ninox strenua</i>		•
Barking Owl	<i>Ninox connivens</i>		•
Black-eared Cuckoo	<i>Chrysococcyx osculans</i>		•
Black-chinned Honeyeater	<i>Melithreptus gularis</i>	•	
Painted Honeyeater	<i>Grantiella picta</i>	•	
Hooded Robin	<i>Melanodryas cucullata</i>	•	
Grey-crowned Babbler	<i>Pomatostomus temporalis</i>	•	
Ground Cuckoo-shrike	<i>Coracina maxima</i>	•	
Apostlebird	<i>Struthidea cinerea</i>	•	
Diamond Firetail	<i>Stagonopleura guttata</i>	•	
Giles' Planigale	<i>Planigale gilesi</i>	•	

Common Name	Scientific Name	Mapped	Not Mapped*
Squirrel Glider	<i>Petaurus norfolcensis</i>	•	
Southern Myotis	<i>Myotis macropus</i>	•	
Broad-shelled Turtle	<i>Macrochelodina expansa</i>	•	
Murray River Turtle	<i>Emydura macquarii</i>	•	
Eastern Bearded Dragon	<i>Pogona barbata</i>	•	
Lined Earless Dragon	<i>Tympanocryptis lineata lineata</i>		•
Tree Goanna	<i>Varanus varius</i>	•	
Samphire Skink	<i>Morethia adelaidensis</i>	•	
Eastern Water Skink	<i>Eulamprus quoyii</i>	•	
Beaked Gecko	<i>Rhynchoedura ornata</i>	•	
Inland Carpet Python	<i>Morelia spilota metcalfei</i>	•	
Common Death Adder	<i>Acanthophs antarcticus</i>		•
De Vis' Banded Snake	<i>Denisonia devisi</i>	•	
Red-naped Snake	<i>Furina diadema</i>	•	
Giant Bullfrog	<i>Limnodynastes interioris</i>	•	
Brown Toadlet	<i>Pseudophryne bibronii</i>	•	
Rugose Toadlet	<i>Uperoleia rugosa</i>		•
Growling Grass Frog	<i>Litoria raniformis</i>	•	

* Considered flood-dependent (or reliant or utilises flood-dependent EVCs) and known from the investigation area but too few recent records with reliable location data.

Example of natural values mapping and analysis

Purpose: The figures below provide an example of how VEAC's comprehensive mapping of natural values can be used to compare different environmental watering options. It is not intended to represent actual outcomes of applying these amounts of environmental water (see notes below).

Application: The three maps show the extent of flooding for three different-sized floods along a sample reach of the River Murray floodplain east of Robinvale, resulting from three different flow rates along the channel: 20, 81 and 159 gegalitres per day. The varying shades denote the required flood frequency to maintain specific natural values that are flooded by floods of these sizes. Red shades indicate areas that are flooded, while grey shades indicate areas that are not flooded. These maps can highlight priority areas on the floodplain that may not receive water from natural or artificial flood events. It may also serve to highlight areas that could benefit from works (such as levees, regulators or pumping) to enable watering.

Outputs: Table 3 shows a sample of analysis from the maps, including the area of flood-dependent EVCs and habitat for significant species and the percentage of these areas inundated by the various flood levels. For example less than five percent of almost all values are inundated by a very small flood whereas over three-quarters of Floodplain Grassy Wetland EVC, half the Regent Parrot habitat and 100 percent of Silver Saltbush habitat is inundated in a large flood.

Notes:

1. The primary purpose of these maps is to help people understand how VEAC's natural asset mapping approach can be applied. Many important but complicating factors have therefore not been incorporated. These factors include flood duration, timing, the significance of assets including in comparison with priorities in other areas and the difference between the longest possible period without inundation ('critical interval') and average frequency of flooding. These maps and resultant tables are best considered in the context of a period of several years with knowledge of prior flood events in order to prioritise sites most requiring water at any given point in time. While the maps shown overleaf are a combination of the natural values, they can be also be usefully generated for individual EVCs or species.
2. The flooding extents shown in red are based on outputs from CSIRO'S River Murray Floodplain Inundation Model (RiM-FIM) which is derived from satellite imagery of actual floods. While the RiM-FIM provides inundation extents for a range of river flows, these are not necessarily derived from actual floods (i.e. the inundation extent for a particular flow may be inferred from satellite images of floods of other sizes) and should be considered as indicative only. In particular, flow in the River Murray of 159 gegalitres per day may flood a greater area than that shown here. For comparison, the typical flow in this part of the River Murray in September is around 9 gegalitres per day. Flood extent data was provided by the Department of Sustainability and Environment.

Examples of coverage of flood-dependent natural values for various flood scenarios – Robinvale area

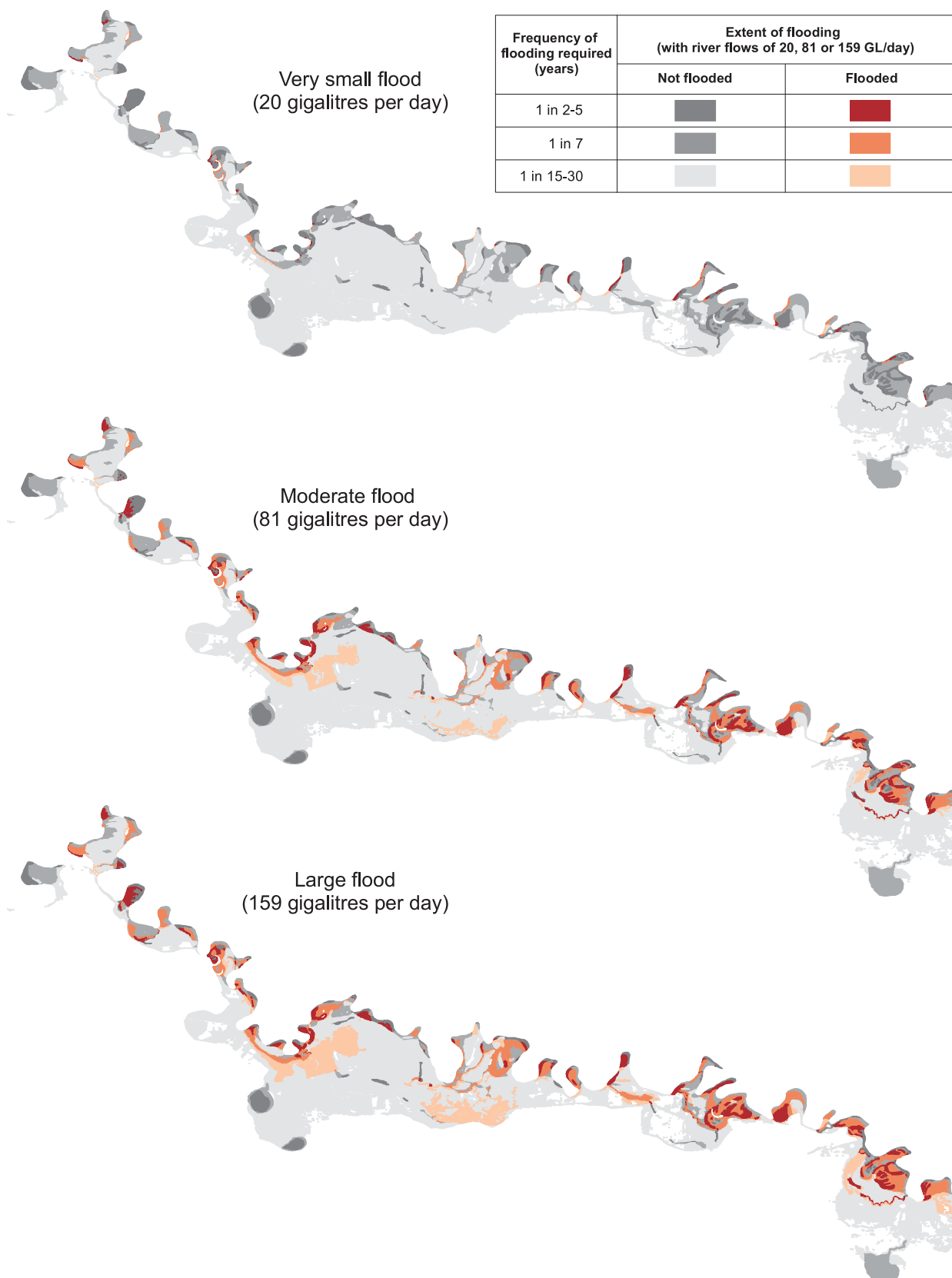


Table 3. Area and percentage of natural values in the Robinvale area inundated by various environmental water volumes

		Percent of EVC or habitat covered by various flood extents		
	Area (ha)	Very small	Moderate	Large
Ecological Vegetation Class				
Floodplain Grassy Wetland	63	3	71	77
Floodway Pond Herbland	370	1	37	47
Grassy Riverine Forest	678	2	27	35
Grassy Riverine Forest/Floodway Pond Herbland Complex	567	2	22	28
Intermittent Swampy Woodland	1,433	1	27	38
Lake Bed Herbland	130	0	0	0
Lignum Shrubland	3,550	0	5	12
Lignum Swamp	562	0	2	7
Lignum Swampy Woodland	5,488	0	5	11
Riverine Chenopod Woodland	5,035	0	5	8
Riverine Grassy Woodland	980	0	4	9
Shallow Freshwater Marsh	394	0	42	51
Shrubby Riverine Woodland	1,972	1	24	37
Spike-sedge Wetland	17	0	62	71
Sub-saline Depression Shrubland	82	0	0	0
Tall Marsh	42	0	9	21
Threatened Fauna				
Apostlebird	6,746	0	3	7
Blue-billed Duck	434	0	0	0
Brown Quail	35	0	0	0
Inland Carpet Python	16,452	0	12	19
Diamond Dove	168	0	0	0
Diamond Firetail	121	0	2	6
Freckled Duck	2,700	0	2	3
Grey-crowned Babbler	215	0	0	0
Hardhead	592	0	0	0
Musk Duck	592	0	0	0
Nankeen Night-Heron	1,690	0	4	6
White-bellied Sea-Eagle	550	0	0	0
Regent Parrot	321	1	29	49
Rare or threatened Flora				
Annual Spinach	89	0	2	3
Bluish Raspwort	249	0	13	20
Common Joyweed	259	0	0	0
Cotton Sneezeweed	88	0	42	65
Desert Lantern	84	0	0	3
Desert Spinach	43	0	4	11
Dwarf Bitter-cress	77	0	0	0
Goat Head	559	0	2	4
Hoary Scurf-pea	81	0	10	15
Mealy Saltbush	42	0	0	0
Native Couch	729	1	22	35
Native Peppergrass	518	1	9	13
Pale Plover-daisy	41	2	5	7
Pale Spike-sedge	26	0	0	0
Purple Love-grass	182	0	0	0
Reader's Daisy	380	0	2	7
Riverina Bitter-cress	132	1	25	39
Riverine Flax-lily	69	0	0	0
Silver Saltbush	23	8	79	100
Smooth Minuria	38	0	0	0

Rare or threatened Flora (continued)	Area (ha)	Percent of EVC or habitat covered by various flood extents		
		Very small	Moderate	Large
Spear-fruit Copperburr	432	0	6	13
Spiny Lignum	71	0	0	0
Spotted Emu-bush	236	0	2	3
Spreading Emu-bush	776	2	14	18
Squat Picris	509	2	33	55
Summer Fringe-sedge	381	0	1	5
Sweet Fenugreek	86	0	0	0
Tangled Copperburr	127	0	5	14
Twinleaf Bedstraw	1376	1	5	9
Warty Peppergrass	150	0	6	9
Yakka Grass	189	0	1	4
Yarran	367	1	5	7

