

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 gigalitres every five years; 800 gigalitres 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.