



Discussion of Issues



Part D explores the issues emerging from the material in Part C and raised through community input to the investigation processes. This part of the Discussion Paper covers chapters 18 and 19.

18 Views from the Community

This chapter provides a summary of the major issues and proposals submitted to VEAC for consideration in preparing the Discussion Paper for the Investigation.

THE SUBMISSIONS

The submission process is one of the key methods for VEAC to seek community views on issues and values. VEAC received more than 500 submissions following the publication of the Notice of Investigation indicating the strong public association with, and interest in, river red gum public lands and their future. Submissions were received from a wide variety of locations, particularly from the local community within the study area but also from Melbourne and further afield. Nearly 50 percent of submissions came from within or near the study area. Appendix 3 lists the submissions received.

Many of the submissions were from people who live or have lived in the area, people who work or have worked in the forests, people who have camped in the forests regularly since they were young, and also people who are infrequent visitors to the region but still feel it is special. Submissions were contributed by community groups, businesses, scientists, consultants, property owners and recreational users. The varied backgrounds and interests of contributors resulted in the coverage of a wide range of topics including interest in particular sites or areas, recreational activities and industries. Many submissions called for an increase in the size of the conservation reserve system while many others proposed that the present industries such as timber harvesting, grazing, apiculture and tourism be maintained at a similar level to today.

The number and nature of submissions illustrate the enthusiasm and passion people have for the study area. The submissions contained not only proposals for public land, but also a large amount of valuable and useful information to assist VEAC in carrying out its Investigation.

In addition to this phase, VEAC has also received input from the Community Reference Group (Figure 18.1) it has established specifically for this Investigation (see Appendix 2 for membership of the Group), from other Government and semi-government agencies (Victorian, interstate and Commonwealth) and from meetings with representative interest groups.

THE ISSUES

Below is a summary of the major issues raised in the initial consultation process for the Investigation. This chapter focuses on the major and more general issues and does not endeavour to cover issues relevant only to restricted areas or raised only infrequently. Where appropriate, comments have also been made on the issues raised in the context of the broader background outlined in earlier chapters of this report. These comments do not attempt to resolve issues—but are

Figure 18.1 Members of the Community Reference Group at a meeting in Echuca.



intended to help clarify related matters or the approaches VEAC will need to consider in developing a position on an issue in future stages of the Investigation.

Different stakeholders often maintain strongly divergent views on the importance of different issues and the time that should be devoted to them. At this early stage of the Investigation, VEAC will give fair and balanced consideration to all matters raised by stakeholders.

INVESTIGATION PROCESS

Many submissions discussed VEAC's role and the process for undertaking the Investigation, specifically the approach, scope and information sources that Council uses in developing recommendations. The consultation process itself was also raised, and a number of contributors were concerned that their submissions may not be fully considered or that the information, experience and views held by contributors would not be fully utilised.

Public consultation is a central part of VEAC's investigations. Council has given, and will continue to give, thorough and equal consideration to all groups and people who have an interest in the Investigation. The methods used to inform and consult different groups will be regularly reviewed for their effectiveness as the Investigation proceeds.

There are three submission periods throughout the course of the Investigation and a number of additional opportunities during which the public can discuss issues with the Council. As the Investigation progresses, VEAC will hold widely-publicised public forums throughout the study area and meet with stakeholders. Following each stage of the Investigation, a newsletter will be distributed to all contacts on VEAC's register of interest. There are currently approximately 8,000 groups and individuals on the register of interest for the River Red Gum Forest Investigation.

INDIGENOUS ISSUES

A large proportion of contributors felt that Indigenous communities should be partners in joint management of any new or expanded parks and reserves. A considerable percentage of these submissions specified Barmah forest and Gunbower Island as areas where this type of management should be established.



Many people felt that the Yorta Yorta people, in particular, should have responsibility for—and a much greater role in the management of—public land with which they have a strong and long association. This increased responsibility and management was proposed as a means to acknowledge and strengthen the special relationship that many Indigenous people have with their traditional lands, given that for many people this relationship has generally been poorly recognised and supported within the broader community. Some contributors called for greater consultation and involvement in decision-making with Traditional Owners while others would like to see more opportunities for Indigenous employment as guides or rangers in protected areas or on other public land.

Full consideration of Indigenous issues associated with public land in the study area by VEAC is required under the Terms of Reference of the Investigation, particularly Indigenous involvement in public land management and the Yorta Yorta Co-operative Management Agreement. VEAC has retained a specialist consultant to seek input from Indigenous groups and individuals with interest in the Investigation.

PRIMARY INDUSTRIES

As part of its Terms of Reference, VEAC is required to assess appropriate access for commercial ventures including timber extraction, grazing, apiaries and other resource-based industries. These matters were widely addressed in a large number of submissions.

Timber

Views on timber harvesting ranged along a continuum from abolishing all harvesting and firewood collection in some or all areas, to developing plantations on private land, to allowing environmental thinning, through to continuing with the present regimes. There was

substantial support for retaining timber harvesting both within the study area in general and at specific locations (such as Barmah State Forest, Gunbower State Forest, and Nyah State Forest among other areas). These proposals generally put the position that the major benefit of timber harvesting was the economic and social advantages brought to small towns and surrounding communities. These submissions also raised the issue of the contribution to skill levels from the manufacture of high-end products such as fine furniture, and the cultural heritage of this industry. Many of these submissions were also of the view that the forests as they exist today have not been harmed by 150 years of harvesting and may actually have been 'enhanced'.

Many of those opposed to timber harvesting in river red gum forests saw an incompatibility between biodiversity conservation and such practices. Some also argued that it was inconsistent to spend significant resources on environmental water to improve the health of the river red gums if many of these trees were subsequently harvested.

Numerous submissions that came from the study area saw continued access for firewood collection as important, especially in rural towns with no opportunity to substitute cheaper natural gas for heating and cooking.

The utilisation of river red gum forests on public land for timber extraction is a complex subject outlined in more detail in chapter 14. Current patterns of forest use have been shaped by past extraction practices and water management strategies. Future productivity of the forests is dependent on a wide range of variable factors including climate change. Further consideration of the complex social, economic and environmental issues surrounding timber extraction will be given in chapter 19.

Grazing

Public land grazing by domestic stock was a major issue and prompted numerous proposals across a broad spectrum of views. Many submissions wanted to see stock grazing retained, particularly in the Barmah and Gunbower areas (although there is currently no grazing in Gunbower, there is provision for agistment). Some argued that public land grazing makes a significant contribution to the viability of their farms and that public land is only grazed when sufficient feed is available on that land. In addition, many maintained that grazing is a positive management regime for conservation in that it reduces fire risk and weeds. Some submissions stated that fence maintenance on public land on the floodplain was costly and extremely difficult (due to flood damage) and thus it is difficult to confine stock to certain areas.

In contrast, many other submissions stated that grazing on public land causes significant environmental damage in spreading weeds, increasing erosion, pugging the ground, and affecting native animals. Many of these submissions proposed a complete cessation of public land grazing in particular areas or in the whole study area. Some submissions proposed that grazing should be excluded from public land in particularly sensitive environments such as riparian zones, wetlands and cypress-pine sand hills.

Some submissions sought an independent study into the relationship between grazed and ungrazed areas and the extent of pest plants and frequency and intensity of wildfires. It was argued that such a study could go some way to resolve the divergence of views described above. Grazing on public land presents a challenging combination of cultural, social, economic and environmental priorities which will also be addressed further in chapter 19.



Apiculture

A number of submissions proposed that access should be maintained for the apiculture industry, and emphasised the need for a healthy forest to ensure a steady rate of honey production. Also highlighted was the need for flooding to ensure forest health. Some felt that a healthy forest would be best achieved by establishing a national park that allowed access to the beekeeping industry. Some submissions stressed the importance of the knowledge held by apiarists regarding

both the historic and present ecology of the forest. A number of submissions also put the position that the beekeeping industry is vital for agricultural production through pollination of crops and pastures, and that continued access to public land was vital to the viability of the industry.

While some submissions asserted that the apiary industry does not affect biodiversity and in fact aids biodiversity by increasing pollination, others argued there was a conflict between introduced bees and native flora and fauna. They maintained that there is competition for nectar and also from introduced feral bees competing with native species, such as birds and mammals, for use of hollows. Resolution of conflicting arguments about the impact of European bees in native forests is difficult due to the paucity of scientific evidence on bee impact and the logistical difficulty of obtaining that information.

Other Primary Industries

Relatively few submissions were received on other primary industries either currently or potentially in the area such as mining and stone extraction, perhaps because of the small scale of these industries in the study area. Despite their size, these industries can still be important locally - and perhaps more broadly - and will be fully considered by VEAC as the Investigation proceeds.

TOURISM

The tourism industry was an important consideration in many submissions. For many of the towns in and around the study area, tourism contributes substantially to their economies and is vital to the livelihood of many local business owners. Some submissions wanted to ensure that tourism in their area was maintained at current levels, while others would like to see tourism developed further in an "eco-friendly" manner. There was a mix of views on whether the development of, say a new national park, would be beneficial or detrimental to the tourism industry. Some submissions suggested that the creation of a new park would remove (for example) hunters and some other user groups and would therefore be bad for tourism; others suggested that a new park would attract more visitors and therefore be good for tourism. VEAC has responded to this need for further information on the economic value of environmental protection by commissioning a socio-economic research study to shed light on some of these issues.

BIODIVERSITY CONSERVATION

Numerous submissions included proposals to improve the conservation of biodiversity. These proposals included measures to protect flora and fauna particularly threatened species and communities and habitats such as wetlands and Moira grass plains, and specific habitat elements e.g. hollow-bearing trees. Generally, protection was sought through additions or enlargements to the conservation reserve system. Numerous specific areas were identified in this context, and many contributors passionately advocated national park status for Barmah State Park and State Forest. A number pointed out that reserve system additions should follow the comprehensive, adequate and representative

(CAR) reserve system criteria and should link to the system of reserves and management priorities in New South Wales and South Australia.

Some contributors sought improvements in biodiversity conservation through changes to management practices. Timber harvesting and grazing were commonly regarded as the greatest threats to biodiversity conservation and some contributors recommended they be phased out or ended immediately. Many also sought improved water management for biodiversity conservation (see below). Pest plant and animal control was seen as an important issue in many submissions from all sides of the biodiversity debate. These submissions emphasised the necessity for adequate resourcing of control programs on public land.

While very few submissions were opposed to protection of biodiversity values, many put the view strongly that biodiversity conservation was compatible with some, most, or all other activities as currently practised or with minor modification. These submissions argued in favour of minimal change or what was termed a multiple-use approach. Achieving a balanced use of resources across Victoria, including biodiversity conservation, is one of VEACs founding principles and emerges as one of the major themes in chapter 19.

WATER ISSUES AND THE HEALTH OF THE FORESTS AND FLOODPLAINS

Many submissions raised issues regarding water and particularly how this related to the health of the river red gum forests and other ecosystems along the length of the River Murray and the other rivers in the study area. Virtually all water-related submissions supported enhanced environmental river flows to improve the health of the forests along the rivers and on the

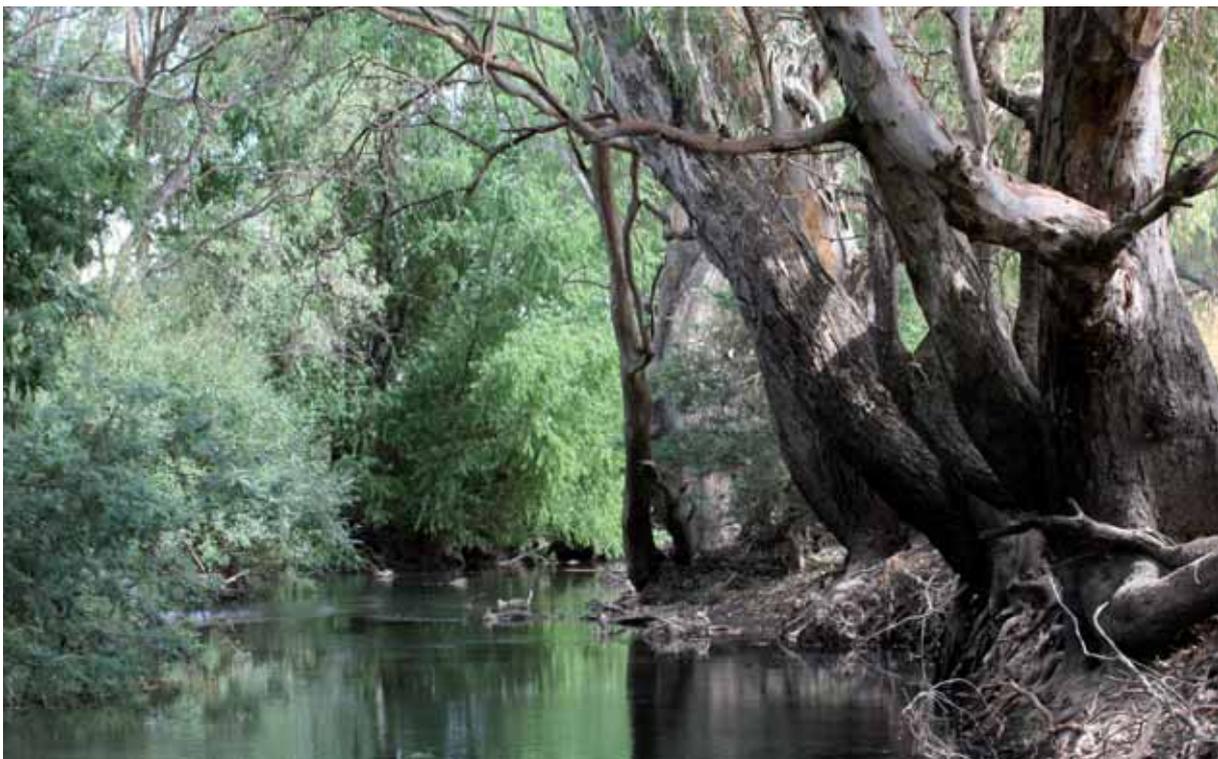
floodplains. The lack of regular flooding in some areas was seen as a major issue while in other areas excess flooding or flooding at the wrong time of the year were seen as the major problems.

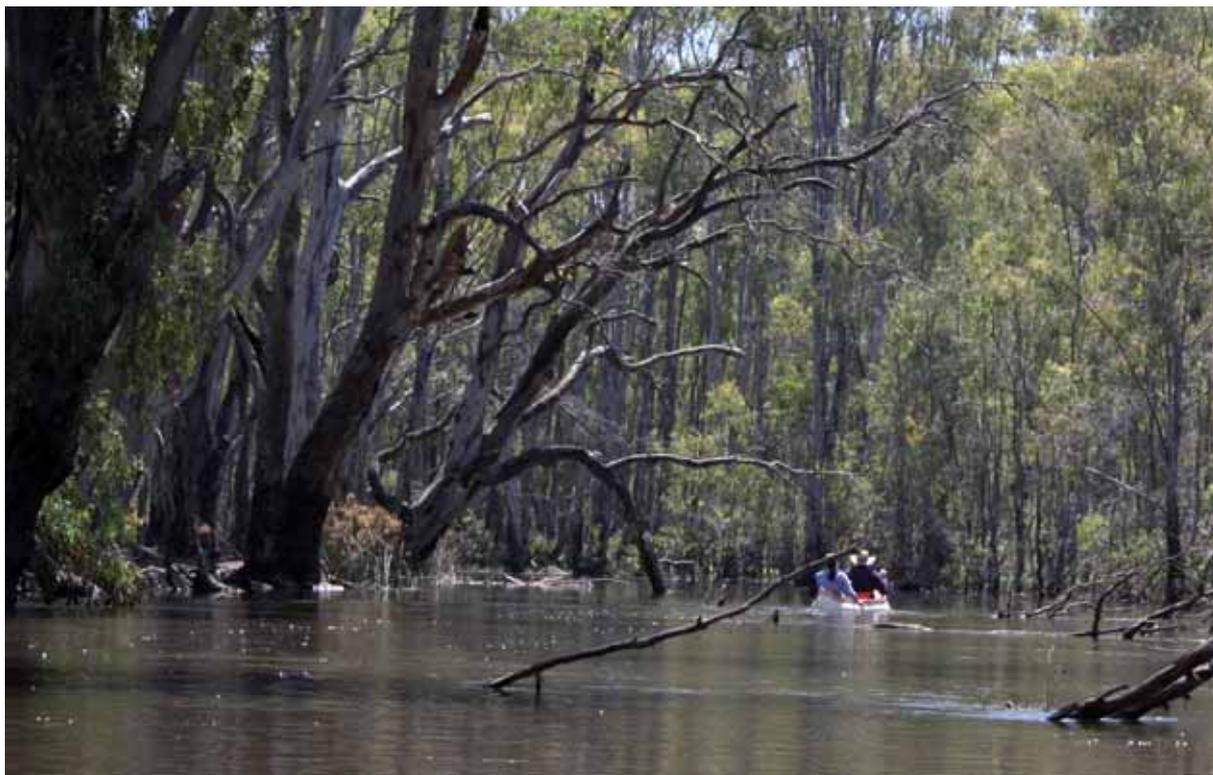
Some submissions argued that water was such an overriding issue that worrying about things such as timber harvesting and grazing was a waste of time if the water issues were not resolved. Many contributors argued that 75 percent of the river red gum trees along the River Murray are dead or nearly dead while others argued that this figure is simply not correct and that the forests are very healthy. A recent study (Brett Lane & Associates Pty Ltd 2005) showed that in 2004 about 75 percent of the trees on the sampled sites were dead, nearly dead or stressed (i.e. in decline). All the Victorian sites sampled in this research were downstream of Swan Hill and also off the main watercourses. It is regrettable that these results were commonly and incorrectly reported in the media as applying to all river red gums in the River Murray catchment. However, the survey results confirm and document a major problem with tree health in the lower reaches of the River Murray in Victoria.

In previous investigations, the Land Conservation Council (LCC) did not investigate environmental water management in detail. VEAC recognises that this is an important issue for the health of the river red gum forests and will give the matter full consideration.

SOCIAL AND ECONOMIC ISSUES

Many submissions emphasised the effects of any change in land category, and particularly changes that led to the cessation of current activities, on the local community. Some submissions asserted that any new national park would reduce employment in timber and grazing industries while others maintained that new parks would bring economic benefits through increased tourism.





A popular proposal was that a comprehensive assessment be undertaken and published regarding the positive and negative impacts of VEAC's recommendations on the social and economic attributes of the study area.

VEAC recognises that the social and economic implications of possible changes are extremely important and need detailed consideration. Accordingly, chapter 8 profiles the existing socio-economic characteristics of the local government statistical areas associated with the study area. VEAC will commission a study into the importance of existing activities for both the Draft Proposals Paper and Final Report.

RECREATIONAL ACCESS

A large number of submissions emphasised that much of the study area is popular for a wide range of recreational activities. These include camping, horse riding, bush walking, fishing, boating, birdwatching and other nature study, 4WD and general car touring, trail bike riding, dog walking, and hunting. Many submissions urged VEAC to maintain access for one or more or all of these activities, or strongly supported the principle of multiple-use land categories more generally.

Camping is an increasingly popular leisure interest in many parts of the study area. Several submissions discussed camping and many do not want to see further restrictions - particularly those perceived to be imposed by national park status. Many submissions expressed the view that any alteration to the existing public land use category may result in heavily restricted use or poor management regimes. Camping was seen largely as a family-based activity undertaken by locals and other tourists who understand the need for sustainable forest



use, and thus behave accordingly. In addition, some submissions sought an education campaign for campers to minimise environmental damage. Rather than have any areas closed off to recreational users, those who regularly visit the study area would prefer to be better informed about sustainable use.

Several contributors also called for the continuation of access for horse riding, particularly in the Gunbower and Barmah areas. Riders would like to continue using the public tracks that are already available to them in all public land use categories, and some would like to see improved maintenance of these tracks.

A number of submissions proposed more control at public land access points on the basis that heavy use leads to wetland degradation, erosion and increased illegal activities. In addition, some sought greater

control of recreational use of public land, such as improved management of camping areas and stricter penalties for the improper use of four wheel drives, and to reduce erosion from ski and wake-board boats.

It is clear that the study area is greatly valued for recreational use and that this use has significantly increased in many areas over the last decade. VEAC will incorporate both the region's popularity and the need to effectively manage increased pressures resulting from this popularity into its recommendations.

LAND MANAGEMENT

Land management was widely addressed in submissions. Fire, community education and funding issues were considered important, as were appropriate joint arrangements with interstate bodies, an increase in local involvement in land management, pest plant and animal programs, and the suggestion to undertake more research to evaluate a greater range of management options.

Fire Management

A significant number of submissions argued that any creation of new parks would greatly increase the fuel load within the park as a result of poor management practices including a lack of fuel reduction (by burning, cutting or grazing). Conversely a small number did not want to see any more fuel reduction burns taking place, especially in river red gum forests. Some submissions simply called for the appropriate fire regimes to be applied in the relevant areas.

Although there were a significant number of submissions linking wildfire frequency and national park status, no strong evidence was provided to support this

position. DSE has clear responsibility for fire related matters across all public land whether it is in state forest or in a national or other park or reserve.

Education Programs

A number of contributors mentioned the development of community education programs to inform locals and visitors of the best ways to contribute to the protection and management of the forests, reserves and parks. It was felt that with a greater knowledge of the area and the environment in general, people would have more insight into environmentally sensitive practices when visiting river red gum forests.

Funding for Public Land Management

Current land management was widely criticised for a lack of funding and the consequent failure to produce positive outcomes in particular areas. A number of contributors wanted sufficient funding to be made available to ensure adequate ongoing management of public land and implementation of VEAC's recommendations.

It is important to note that VEAC does not recommend funding for the implementation of its recommendations. This is a function of Government and its State Budget processes. However, in previous investigations, VEAC has stressed the need for adequate funding to cover the costs of any additional management requirements.

SUMMARY

An extremely wide range of viewpoints regarding the most appropriate uses of public land was presented in the submissions. VEAC will take all these views—as well as those in submissions to this Discussion Paper—into full consideration when developing its Draft Proposals.



19 Emerging themes

This Discussion Paper describes the values, resources, uses and categories of public land in the study area, as well as summarising community views and exploring key themes and issues. This chapter explores the major themes and issues emerging in submissions and identified during the research and consultation undertaken for the development of this Discussion Paper. VEAC is keen to receive submissions that add to, clarify, correct, and comment on these things. Ultimately, however, the next stage of the Investigation - leading up to the Draft Proposals Paper - will be primarily focused on developing a suitable pattern of public land use for the study area. This chapter is intended to promote discussion and encourage contributions on appropriate public land use within the study area.

Previous chapters have described the environmental, social and economic setting of the study area and the current uses of public land in relation to Victoria's public land use category system. Chapter 18 summarised the views of the community as presented to VEAC during the first public consultation period for the Investigation. This chapter discusses in greater detail the key public land themes and issues that seem to be emerging from the consultation and research. These are broadly grouped as follows: efficiency and effectiveness of environmental water flows; resource utilisation including both timber harvesting and grazing and models of public land management (including indigenous management models, biodiversity protection, fire management long-term planning for population growth and climate change). The purpose of chapter 18 and this chapter is to promote discussion on issues and emerging themes. References are not generally cited in this discussion. Where relevant, the chapters in previous parts of the Discussion Paper which provide detailed referenced information on a topic are cross-referenced.

EFFICIENCY AND EFFECTIVENESS OF ENVIRONMENTAL WATER FLOWS

Water is central to this Investigation. It underpins all uses of public land within the study area as well as many land use activities on surrounding private land. However, the requirements of different water users and uses can be in conflict. Agriculture, recreation and tourism require predictable, stable and secure water supply regimes. In contrast, the environment requires seasonal and yearly irregularities, particularly in the extent of flooding and temperature variations. Regulation of the River Murray system and the resulting changes to its natural flood regime have caused major damage to the river red gum forests and their associated ecosystems across the study area. Put simply, without more water in the right seasons, the river red gum forests as we now know them are likely to reduce, further degrade and in places disappear entirely.

Historically, the requirements of irrigation and other offstream uses have taken precedence over the more

intangible and non-economic outcomes of water for the environment. Today, this imbalance is changing with a range of strategies and programs being implemented, including the contribution of significant volumes of water from the irrigation industry, to address environmental outcomes (see chapter 15).

VEAC's scope to make recommendations on water management issues is limited. Although many states have rights to utilise the River Murray and its waters, legal jurisdiction of the river falls to NSW. The entire Murray catchment is managed by a complex set of cross-jurisdictional institutional arrangements, involving the Murray-Darling Basin Ministerial Council and Murray-Darling Basin Commission (MDBC) as well as the Queensland, New South Wales, South Australia, Australian Capital Territory and Commonwealth governments.

Two major water-related issues are central to this VEAC Investigation. The first is the volume of water and timing of its delivery for environmental outcomes and the second is how such water allocations are to be delivered across public land.

Water Requirements for Environmental Outcomes

Understanding the different water requirements and their timing across the study area is crucial for sustaining the river red gum forests. Chapter 15 describes the arrangements for achieving an average of 500 GL/year of recovered water after 5 years under the First Step Decision of the Living Murray Initiative. This water is intended for the six significant ecological asset sites along the River Murray. Other sites and areas with nature conservation values within the study area receive less consideration when determining environmental water allocations. Against this background some groups believe that an additional 1500 GL/year of water over 10 years (making a total of 2000 GL/year) is a more realistic amount to ensure the viability of the river red gum forests and their associated ecosystems.

The proposal for 2000 GL/year of water is not without its limitations. To date, there has been limited research conducted into the optimal amount of water required to support the forests and their associated ecosystems along the entire river system and variations across the study area. Current water allocations for environmental outcomes may not therefore reflect the necessary amounts of water. It is possible that improvements in irrigation practices could increase water available for the environment; however, this would require a concerted effort and active management.

Water requirements for environmental outcomes are also related to the range and/or scale of the managed floods and the timing of those floods. For example, a flood that mimics a natural one-in-ten-year flood, with its extensive floodplain coverage, requires a greater volume of water over a longer time than a smaller eight-in-ten-year flood. Further, the timing of these managed floods should ideally coincide with naturally-occurring flooding patterns, typically in late winter to early spring. However, this timing would in many cases compete with the water requirements of irrigators who require high water flows during late spring, summer and early autumn.

Water requirements to achieve successful environmental outcomes are also influenced by the diversity of the physical characteristics of the river system itself. By way of illustration, the Barmah Choke acts as a physical constraint, limiting the volume of water able to flow through the Choke. Once the capacity of the Choke is reached the water is forced down alternative routes such as the Edwards River or over the immediate river flats forming the wetland systems. Any large scale environmental flow event downstream of the Barmah Choke (or major irrigation use) is therefore dependent on either a massive amount of water coming down the river or alternatively is dependent on sufficient additional water flows coming down the Goulburn River.

Water allocation accounting systems also influence the amount of water available for environmental outcomes. Water flows for environmental outcomes, once allocated and used, are regarded on paper as “used” water; however, once it flows out of the forests and returns to the river it becomes available for reuse by “secondary” downstream users. Hence the environment is not the sole user of this water allocation even though on paper the water assigned to it is seen as being “consumed” and lost from the system. It is estimated that 80% of environmental flows into the Barmah Forest are returned to the river system. While irrigation and other uses may also return a component of their allocation to groundwater and drains and ultimately, the river, the proportion is likely to be reduced by the distance from the river. Work is currently being undertaken to develop more sophisticated models to simulate this movement of water flows. Acknowledging the capacity for “double” uses of this environmental water could result in greater effectiveness for the environment than is currently the case.



Efficient and Effective Delivery of Water for Environmental Outcomes

With such intense competition for water it is crucial that water allocated to the environment is delivered in an efficient and effective manner to achieve the best environmental outcome for the minimum amount of water. This also holds for water allocated to irrigation and other offstream uses.

Currently, decisions on how water is delivered to the environment are made using best available information and the volumes of water available, at a particular point in time. This often results in decisions on the delivery of environmental flow being made on the run. This decision process reflects the unpredictability of rainfall and floods and the limited ability of environmental flow managers to use available water within the current water management arrangements. It also reflects the relative infancy, especially on such a broad scale, of environmental flows as a management tool. To some extent these concerns are being addressed by agencies such as Department of Sustainability and Environment, Catchment Management Authorities and the Murray-Darling Basin Commission, who are undertaking various research, monitoring and evaluation activities for each environmental flow event. To maintain public confidence, the information on which decisions are based, and the process by which decisions are made, need to be open, transparent and readily available.

The ability to deliver water for environmental outcomes is also affected by the existing water infrastructure, an infrastructure that is relatively inflexible due to its original purpose of providing flood mitigation services and water for irrigation. For example, the infrastructure supporting river regulation is extensive and highly capital intensive in its construction. However environmental flows may be more effectively delivered through small scale, less capital intensive structures and more interchangeable structures.

Chapter 15 discusses the factors influencing how water can be delivered for environmental outcomes. One factor of significance is the operating rules and protocols associated with the Murray-Darling Basin Agreement for water management across the River Murray basin. These operating rules and protocols have evolved from the original arrangement with its focus on water allocation for irrigators and other offstream users. Today, these arrangements have been modified to better serve environmental interests but it has been suggested that these still restrict the ability of environmental flow managers to deliver water in the most efficient and effective way into areas needing environmental flows.

Currently, the ability to efficiently and effectively deliver water for the environment is strongly influenced by the water flow patterns required to meet the demands of other water users. For example, the natural wetland systems associated with Barmah are adapted to late winter early spring flood patterns. However, irrigators require relatively high river flows during late spring through to early autumn. Where these irrigation flows are in the system and there are rains the water flows reach the Barmah Choke and are forced out onto the wetland areas. In this regard, irrigator demands make it difficult to deliver and manage environmental flows in

an efficient and effective way to achieve environmental outcomes. There are many who believe that this mismatch between demands of irrigation and other offstream uses and the environment will need to be seriously addressed if the river red gum forests are to be sustained into the future.

Future Considerations

Environmental outcomes on public land would appear to require an integrated approach by water managers and natural resource managers. Given the current system, this will need high levels of intervention, some which will be energy and resource intensive, e.g. the use of pumping as a water delivery method. With the current concerns around energy consumption and greenhouse gas emission there may be questions concerning the feasibility of some methods for delivering environmental flows.

A further consideration is that climate change will compound the current situation and may ultimately contribute to the decline of the river red gum forests and associated ecosystems in the future. Climate change is predicted to decrease the amount of water available for economic and community uses, placing considerable pressure on water allocation systems to maintain adequate water for environmental flows. This issue is raised in the Victorian Government's White Paper on Water which states that if the absolute amount of the water volume decreases due to climate change, both the environment and consumptive users will be reduced in the same proportions. Further, where there is increasing competition amongst users for an ever decreasing quantity of water, public accountability regarding when, where and how environmental flows are to be allocated across the entire River Murray system relative to other users is vital.

RESOURCE UTILISATION ON PUBLIC LAND

It was noted in chapter 18 that the community has expressed a lot of interest in resource utilisation from public land. In particular, a wide range of views were put to VEAC about timber harvesting and domestic stock grazing in the river red gum forests of the study area.

Forest Management and Wood Products

Forest practices have changed greatly since the uncontrolled cutting of the early 1900s when about 190,000 sleepers per year were harvested. Forest management was focused primarily on wood production until at least the 1970s. The structure of the forest today is a product of these past practices, rather than current uses. Timber harvesting, and particularly its effects on the natural environment, has been a controversial issue in many public land debates in Victoria and around the world. The following discussion is divided into the major themes of this issue, drawing significantly on background information about forest management and wood products in chapter 14, and the relevant threats to biodiversity specifically in chapter 5.

Sustainability and monitoring

Silvicultural sustainability (harvesting trees at or below the rate at which they are replaced by the growth of retained trees and regrowth) and ecological sustainability are fundamental to public confidence in timber harvesting on public land. However, sustainability can be difficult and expensive to determine. In addition, river red gum forests are generally uneven-aged and sensitive to unpredictable changes in flooding regime—additional difficulties compared to most other forest types. Accordingly, the sustainability of river red gum forestry is currently based on the professional judgement of forest managers and resource estimates that acknowledge the inadequacy of the data on which they are based. Ideally, sustainability would be based on a clearly-documented formal process of explicit, ongoing, transparent monitoring and auditing, the results of which would be continuously used to revise and improve the data and analysis on which harvest volumes are based and the actual volumes harvested.

In other parts of Victoria, sustainable yield calculations have been based on analysis of data such as the Statewide Forest Resource Inventory (SFRI, see chapter 14 Forest Management and Wood Products), but such analysis has not been completed for the river red gum forests. In recent years the state government has undertaken a number of initiatives intended to improve both the sustainability and the public accountability of wood product harvesting*. However, the emphasis has mostly been at the statewide level or in the coastal and mountain forests of eastern Victoria where much larger volumes of timber are harvested than elsewhere.

Some of these initiatives have direct application to river red gum forests, but specific issues arise relating to the nature of these forests and the industries using them. The relevant Estimates of Sawlog Resources are based on inadequate data, for example, and there are no estimates of the resource availability of the other products that make up the overwhelming bulk of wood volume harvested. Although considerable data have been collected for the Continuous Forest Inventory, SFRI and other programs (see chapter 14 Forest Management and Wood Products) these data have not been fully utilised or backed up with ongoing sampling. Environmental Protection Authority auditing is a transparent process but is restricted to auditing compliance with the Code of Forest Practice for Timber Harvesting. It is not the function of the audit process to assess the Code itself, but there is a question about whether the prescriptions contained in the Code (developed more for clear-felling in mountain and coastal forests) are applicable to selectively-harvested river red gum forests. Although audit findings are documented and reported to the public, the process does not provide for penalties to be imposed for breaches, nor is there a requirement to report on any remedial actions that are undertaken in response to recommendations of the audit.

* including, under the 'Our Forests, Our Future' Program, *Monitoring Annual Harvesting Performance*, and *Estimates of Sawlog Resources*; but also *Environment Protection Authority (EPA) auditing*, the *Sustainability Charter*, *State of the Forests Reporting*, the *Sustainable Forests (Timber) Act 2004*, and *Environmental Management Systems*

Issues associated with silvicultural sustainability also relate to assessments of the ecological sustainability of wood product harvesting. Ecological sustainability includes the maintenance of ecosystems, their components and the services they provide. Hence, silvicultural sustainability—harvesting trees at or below the replacement rate—is necessary for achieving ecological sustainability. Forest structure is an integral component of ecological sustainability in river red gum forests harvested for timber. This involves maintaining a range of tree age classes and leaving some trees to die naturally. In some cases, the current forest may require greater structural diversity and accomplishing this may involve re-assessing the volume of timber harvested. There is little systematic monitoring and assessment of the short and long-term effects of timber harvesting on plant and animal species, communities and their habitats to determine whether or not operations are ecologically sustainable.

Confidence in sustainability is a significant issue for VEAC as, when developing its draft proposals, Council will be seeking to ensure that the implications of various options for wood product availability have a reliable basis.

Silvicultural Treatment

One of the fundamental tenets of forest management in the study area (as in many other places) is that larger trees can be more rapidly produced from artificially or naturally dense regrowth by removing competing trees (i.e. thinning) so that the retained trees grow larger more quickly. The resultant larger trees, it is reasoned, provide timber production and biodiversity benefits. However, a number of concerns have been raised about this management and these are considered below.

Although there have been no published studies in river red gum, all thinning experiments in other eucalypt species have shown that releasing trees from competition leads to increased growth on the remaining stems. Observations that trees in dense regrowth are frequently much smaller than trees of similar age in more open stands, provides some anecdotal support for this in river red gum forests. It is unclear whether confounding factors—such as the tendency for cut red gums to coppice, leaving the roots to continue to compete with retained trees for moisture and nutrients—have an impact on the silvicultural utility of thinning in practice.

While a seemingly minor detail, the size of the trees cut in thinning operations may also be relevant in river red gum forests. In recent decades with the absence of cheap labour and significant reductions in staff employed to do such works, this cutting is now nearly all done as part of firewood harvesting operations (by commercial cutters or contractors to generate wood for domestic permit collection areas). The rationale for this approach is that firewood can be produced from relatively small trees (compared to those preferred or required for sawlogs or sleepers, for example) and the thinning treatment can be achieved through firewood harvesting. However, in nearly all stands requiring thinning, the highest priority trees for removal—that is, the smallest trees—are too small to harvest for firewood (or any other product) and so are not cut. Furthermore, of those trees that are large enough to supply firewood, the largest trees are more economically attractive as a

source of firewood. That is, thinning through harvesting for firewood may lead to the harvesting of the larger rather than smaller small trees with the result that in the longer term fewer trees grow on into the larger size classes. The same problem can also operate at the coupe selection level: ecologically, the highest priority areas for thinning are those with the greatest density of small stems. However, these areas may have few or no stems suitable even as firewood and so are left untreated.

As with the silvicultural benefits, the presumed ecological benefits remain unsubstantiated and may be doubtful if larger small trees are cut. The issue of thinning highlights the number of complex and sometimes competing goals that must be met in managing river red gum forests. For example, while habitat objectives and prescriptions would lead to retention of crooked, hollow, low-branching trees, silvicultural objectives would favour retention of straight, solid, high-branching trees.

Finally, thinning does not automatically produce more large old trees—it causes small trees to grow faster. If the retained trees are subsequently harvested for sawlogs or sleepers before they reach ecological maturity, the biodiversity benefits may not be fully realised.

Maximising the Value of Harvested Wood

Chapter 14 discusses the major products sourced from public forests in the study area: sawn timbers for furniture, bridges and wharves, building features and construction, sleepers, landscaping, and fence posts; lower grade logs, thinning residues and off-cuts for firewood; and by-products for garden wood chips and sawdust. Many operators take pride in their ability to generate a product from virtually all of the wood taken from the forest.

While the range of products possible from small logs and offcuts is more limited, virtually all products can be made from large logs. Larger logs are generally a more cost-effective source for most uses, even small products such as firewood, as they have less handling time per unit volume of product generated and leave less waste. Of course, there is also 'competition' for large trees because of the values that they provide when left standing in the forest (habitat, landscape etc). A tree that is currently feasible as a sleeper log still has the potential, if left for a further 10–20 years, to become a more valuable sawlog tree.

For logs of all sizes—but especially the rarer and in-demand large logs—there are clear advantages in extracting the maximum value from the wood harvested, and value adding has become a major objective in many industries (especially the timber industry) in recent decades. In the river red gum industry, value adding is exemplified in kiln drying of large timbers and the production of furniture, which is sold at a considerably higher price than other products. In general, the benefits of value adding flow to local communities through direct and indirect local employment. That is, value-added products are generally more labour intensive and thus create more jobs than non-value-added products such as sleepers. Increased employment leads to many social advantages especially for small towns (see chapter 8). The higher price of value-added

goods equates to greater economic value, which again can be especially important to relatively small regional economies. Value-adding can also be seen as benefiting nature conservation in that fewer trees—especially the large trees—are removed for the same level of employment and economic value.



However, the advantages of value adding do not necessarily bring about a shift in the industry to more value-added products. Firstly, a higher commercial value for a product does not necessarily mean higher profitability. For example, fine furniture is clearly a higher value product than, say, sleepers but it also costs considerably more to produce. If the difference in the cost of production is so great that sleepers are more profitable, the incentive for businesses may be to shift from the higher to the lower value product rather than the other way around, all other things being equal.

Secondly, repositioning a business to produce greater volumes of value-added products usually requires significant capital investment and identification of new markets. Value-added products need to be marketed and developed carefully to ensure that they have a long-term future. Some businesses may use more profitable lower value product to fund such capital investment. The significant costs are only likely to be borne if timber supply can be guaranteed in the medium to long term.

Thirdly, some businesses are likely to be reluctant to abandon lower-value products altogether, preferring to maintain a certain level of diversity to protect against short-term fluctuations in particular product markets. Successful sawmills require a range of order mix to gain the maximum value from a log and each log has to be looked at on its individual merits to see how the most commercial value can be gained from it.

Finally, economic factors may confound shifts to higher value products—for example, if many operators shifted to a high value product, the increased supply may lower

prices, while the reverse could apply to the lower value, now less available, products from which they have shifted. The combination of these factors may act as an impediment to the industry moving to a greater proportion of value-added products, even though there is widespread support for the concept.

Market demand may also shift the trend away from value-added products. Two decades ago, Victoria's Timber Industry Strategy raised the concern that extending residual wood harvesting for firewood would generate its own momentum and become the force driving timber harvesting in localised areas to a 'firewood-driven' industry, rather than the more desirable (from a value-added point of view) 'sawlog-driven' industry. This has eventuated in the Mildura Forest Management Area where no sawlogs or sleepers are currently produced from public land but where there is pressure for it to re-commence in order to continue to supply firewood. The potential for change (including through processes such as this Investigation) further complicates the planning difficulties facing businesses in the timber industry.

Firewood and sleepers

Firewood is favoured by many people, locally and in Melbourne, for household heating and sometimes cooking because it can be comparatively economical (especially for people with no access to mains gas), it may be expensive to change to an alternative heating system and because open fires offer a unique ambience. Firewood is also sought for some commercial uses such as to power paddle steamers. In addition, a considerable amount of firewood is consumed in recreational campfires (see 'Recreation and Tourism' in this chapter).

A potentially positive aspect of firewood use is that, if produced sustainably and used efficiently (see discussion of 'Climate Change' in this chapter), it may generate fewer greenhouse emissions than most alternatives. However, firewood harvesting greatly reduces the amount of fallen timber (coarse wood debris) in red gum forests, upon which many species depend. Firewood combustion is also a major source of fine particle emissions in woodsmoke, often exceeding air quality thresholds in main towns and cities and contributing to health problems such as asthma. In some particularly affected areas (e.g. Launceston, see chapter 14), successful programs are in place to accelerate the conversion from wood heaters to other forms of heating and to educate those still with woodheaters about how to reduce woodsmoke (see chapter 14). Woodsmoke pollution is likely to be a much smaller problem in rural areas and smaller, more dispersed towns. These problems may negate some of the benefits of wood products such as lower greenhouse gas emissions (see 'Sustainability and Monitoring' above).

The level of firewood consumption and woodsmoke emissions is influenced by the type and dryness of firewood and the efficiency of heater and house design (see chapter 14). Firewood consumption is expected to decrease as the efficiency of these designs continues to improve, the natural gas network expands, the price of firewood increases and as wood heaters and stoves are gradually replaced or upgraded as old appliances wear out.

The long-term trend of decreasing firewood demand is likely to continue, although the rate of decline may decrease. The implications of rising oil prices for domestic heating in rural areas is also unknown.

The effects on pricing of measures to maintain commercial firewood production at or near current levels when the demand is declining is unclear. It is also unclear how any changes to firewood production from Victorian red gum public lands—which supply around 20 percent of total Victorian firewood use and a considerably higher percentage locally in the study area—would influence the overall market. Potential for change may be limited to approaches such as assisting the early establishment of a supply from plantations.



The issues arising from the production and use of sleepers for railways are similar to those in firewood production and use. For example, red gum sleeper production and use is—in many contexts—less expensive in the short-term than concrete sleepers and would generally be expected to produce lower greenhouse gas emissions than concrete sleepers if produced sustainably. Red gum sleeper production is a ‘traditional’ industry, which is likely to experience reduced long-term demand as improvements in concrete sleeper design occur, with all new lines currently being built with concrete sleepers. In addition, red gum sleepers are largely derived from sources other than Victorian public land (much comes from NSW public and private land—see chapter 14). In the short term however demand may remain high, and there may be an ongoing demand for specialised products e.g. larger section sleepers which have traditionally been sourced from Victorian logs.

Domestic Stock Grazing on Public Land

Domestic stock grazing on public land (see chapter 13) engenders considerable debate. Grazing on public land occurs along the length of the River Red Gum Forests study area and is authorised and managed in three ways: Crown land licences (over 1600 licences, 65 percent of which are less than 10 ha in area), agistment permits (Barmah forest and, until recently, parts of Gunbower forest) and commercial contracts. The key issue for this Investigation about public land grazing is whether the benefits of grazing on public land outweigh the costs associated with the environmental and management impacts of cattle grazing.

Grazing on public land has a long tradition. Practices that have evolved over time, including the annual Barmah muster, mean that grazing is seen as an important part of the heritage of the area. Grazing also enables private landholders to develop farm management plans that are more flexible and responsive to seasonal variations through the use of external feed sources. In doing so, landholders are able to supplement their incomes over and above those derived solely from on-farm practices. It is also argued that cattle grazing has benefits for public land managers, by providing an extra level of vigilance on public land that limited management resources may not otherwise provide for, such as reporting weed outbreaks or damage to fencing or irrigation regulators. Grazing is also thought by some to control weeds, including Paterson’s curse, and reduce fuel loads and hence reduce the risk of wildfire.

However, others have raised a number of concerns about the use of public land for cattle grazing—particularly in environmentally sensitive locations such as water frontages and riverine forests and floodplains. Intensive grazing has been identified as a major cause of biodiversity loss through selective loss of the most palatable plant species, loss of vegetation structure and impacts on habitat values, particularly in riparian landscapes. Studies have shown that such grazing reduces the capacity of riparian zone vegetation to act as a nutrient filter, by compacting the soil and increasing erosion, and therefore allowing greater sediment input into waterways. Environmental health of water frontages and downstream water quality have been found to improve when cattle are excluded from riparian zones. In contrast, low intensity grazing (usually with sheep) for short time periods is beneficial for some non-riparian vegetation communities, such as grasslands where it may serve as a surrogate for displaced native herbivores (see chapter 5).

Although domestic stock grazing is said to reduce weed infestations, livestock can introduce weeds in their dung and, following severe soil disturbance and reduction of native vegetation cover by heavy grazing, weed species are often able to re-colonise rapidly and out-compete native species. Thus when grazing is initially removed, an obvious flourish of weeds may give the impression that grazing reduces weeds, but some argue that it is more likely that the weeds—particularly annuals—have always been present but simply become more visible.

Livestock grazing is viewed by some as a management tool for reducing fuel load and providing protection against wildfires. There is little information about which fuel types contribute to wildfire fuel loads in these riverine environments. In alpine and sub-alpine areas, cattle may reduce some of the fine fuels, but do not eat the most flammable fuel types (Williams et al. in press). The Alpine Grazing Taskforce found that fire severity in the 2003 alpine fires was not determined by whether an area had been grazed or not (Alpine Grazing Taskforce 2005). While the alpine research demonstrates that grazing cannot be assumed to reduce fuel load, specific research is required in the very different ecosystems of the riverine forests to provide evidence to support or refute a hypothesis about grazing reducing wildfire fuel loads. Currently there is no available scientific evidence either way.

Effective management and protection of areas where grazing is excluded (e.g. sensitive ecological sites, Indigenous sites of significance and reference areas) is dependent on adequate fencing. Fences on the floodplain are often damaged by floodwaters and coarse woody debris that is transported by floods. This may require labour-intensive repairs or expensive repair bills, and breaches of the fence allow livestock into prohibited areas. In addition to the damage to the protected assets, breaches allowing livestock into non-grazing areas mean that the integrity of the "non-grazed" site is violated, limiting the ability to assess the impacts of grazing. However, fenced Aboriginal archaeological and cultural sites in Barmah forest demonstrate the potential for successful fencing on the floodplain.

Improved administrative processes for public land grazing have the potential to improve consistency and accountability. For example, currently the length of tenure can vary significantly, valuations are conducted using different methodologies and, in some places, the administrative instrument licensing grazing is not the correct one.

Given the range of environmental concerns, public land grazing arrangements have been questioned by some groups and individuals, particularly where conservation is a primary objective of the public land use category (e.g. Barmah State Park, Goulburn River Heritage River Area, River Murray Reserve, Ramsar wetlands). Public agistment costs (around \$14.10 per head (steer) for the six month summer term at Barmah forest) are well below the commercial market price of \$100 to \$200 per head or higher for six months, although the higher cost of management for stock owners may need to be considered in this pricing comparison. This situation provides graziers with access to public land for grazing with a competitive advantage over those graziers without access to public land for grazing. Licence fees are charged per area of land and do not appear to fully cost the use of the public land resource. There are also costs to the broader Victorian community for maintaining access to public land for grazing including administration, monitoring, compliance as well as on-ground works.

In addition to these direct economic issues, there are equity issues relating to allocation of licences. While public land water frontages and unused roads are usually licensed to the adjoining land owner, as it is not feasible to license this public land to anyone else, access to many state forest areas is usually a result of an historical implied right or default allocation. Allocation of agistment permits may be by a tender process or exclusively assigned to membership of an organisation (e.g. Barmah and Yielima forests graziers' associations).

Consideration of the cultural, historical and economic benefits of public land grazing requires careful consideration against the environmental and economic costs to those public lands and to the public purse. This Investigation signals the first stage of an ongoing consultation process to establish current community demands and expectations in relation to these issues.



PUBLIC LAND MANAGEMENT

Many issues have been raised by the community in relation to the management of public land. These include specific matters such as recreational access, resource allocation, fire management, biodiversity protection, administration (including community participation) and impacts from and on neighbouring land-holders. In the broadest sense, these issues relate to the ability of public land management agencies to meet community expectations about how public land should be managed. Embedded within these expectations is a wide spectrum of interests that need to be balanced: economic, political, social, historical and environmental. In some cases community concerns are based upon particular circumstances or events, while others represent overall unease or dissatisfaction with current arrangements that may or may not be based on factual information.

The adequacy of resourcing for public land management is a particular concern for many people. Given that the area of public land managed does not increase or decrease as a result of changes to the land category, these concerns can be categorised as (i) an overall impression that resourcing is inadequate across the whole public land estate; (ii) that the resources allocated for each park or reserve do not meet community expectations; or (iii) as a disagreement with the land category assigned.

The community's ability to participate meaningfully in land management decision-making has been raised as an important issue. In part, this issue arises because multiple agencies have different land management arrangements and objectives for public land management across the state, as well as different consultation and engagement processes. Public land managers may need to demonstrate a willingness to inform and engage public land users prior to decision-making and implementation, and to provide greater transparency and accountability in their planning processes. There is, however, also an obligation on public land users to inform themselves about their responsibilities and obligations for the places they visit

and the activities undertaken.

The interface between public and private land is of particular concern for adjoining landholders. Pest plant and animal control as well as water and fire management are important issues in this regard and attract considerable funding from government. The land management practices of private landholders also impinge significantly upon public land. For example, in heavily irrigated areas groundwater changes have caused significant salinity problems on public land and these effects cannot be restricted or controlled by land tenure boundaries.

Cross-Border Administrative Arrangements

The state border between New South Wales (NSW) and Victoria is defined by the high water mark on the southern bank of the River Murray as it flowed in the 1850s (see chapter 9). In practical terms, the state border isolates a portion of NSW land on the southern side of the River Murray when the water level is below high water mark. In other places, meanders have changed the course of the main river channel and several hectares of both NSW and Victoria occur as enclaves within the adjoining state.

Co-ordination of administration for both land and water, while desirable, can be difficult in practice. For example, solid fuel fires are banned under NSW state forest summer restrictions, including on the southern banks of the River Murray which are nominally in NSW. However these areas are contiguous with state forest and the River Murray Reserve within Victoria where no such ban is in place. Similarly an angler may be standing on the top of the southern bank in Victoria catching fish from the River Murray in NSW, for which a NSW fishing licence is required. Agreements have been reached between the responsible departments for each state to share responsibilities for administering recreational fishing in the lakes formed by damming of the river. As a result, NSW fishing rules and regulations apply to Lake Mulwala and Victorian fishing rules and regulations apply to Lake Hume. In 2001, legislation was passed in both Victoria and NSW providing the NSW Waterway Authority and the Victoria Police with the powers to enforce both NSW and Victorian marine safety legislation on these lakes where the state border is unclear. Boating licence and registrations within each state are acknowledged in waters of both states, although some additional safety equipment may be required in NSW waters.

Coordinated management arrangements—similar to those adopted for recreational fishing and boating—would seem to be desirable for managers of public land and waters adjoining the state border.

As part of its Terms of Reference, VEAC must take into consideration opportunities for a joint management regime with the New South Wales Government for the Murray River and public land on its floodplains.

Indigenous Involvement in Public Land Management

The associations of Indigenous communities with the study area, developed over thousands of years, are profound and deeply spiritual. Chapter 6 describes the

special relationship that traditional owners have with Country and the current levels of Indigenous community land ownership and management—including management models—both within Victoria and throughout Australia.

Indigenous communities have in many places called for the return of ownership of traditional lands. Return of land has occurred to varying degrees throughout Australia, largely where lease-back arrangements have been negotiated through Indigenous Land Use Agreement (ILUA) processes or under specific legislation for each jurisdiction. These agreements are largely focussed on pre-existing national parks or historic reserves. In some places, the lease revenue and enterprise opportunities—predominantly for iconic national parks—have generated sufficient funding to support natural resource and land management. In other areas that do not have a high visitor or tourism potential or agricultural opportunities, there is likely to be insufficient funds to supplement the lease revenue and resource land management. In such cases there may be limited capacity for Indigenous communities to manage land in isolation from government, or from additional financial support in some form.

Co-management offers the Indigenous community the support of government structures and economies of scale whilst, in some models, including traditional owners equally in decision-making processes. Indeed traditional owner groups have a majority on some land management boards or councils. This model of land management tends to provide good outcomes where low economic returns are expected, but may lack the appeal of Indigenous owned land or joint management (hand-back, lease-back) for some communities. Holding a majority on a joint government - traditional owner management body allows Indigenous communities to pursue employment strategies and capacity building by aligning the organisation's structure and service delivery to Indigenous decision-making processes.

In most joint management examples the land use is closely prescribed. For example, the land must continue to be managed as a national park, or land will be returned to Indigenous ownership or the government and the lease void if certain conditions are not met.

If Indigenous managed land is to be considered in Victoria, new land tenure arrangements would need to be established. The existing public land use framework provides for committees of management to be appointed under the *Crown Land (Reserves) Act 1978* and the *Forests Act 1958*, but there is no existing provision under the *National Parks Act 1975* for either joint or co-management arrangements. Amendments may also be required to municipal planning schemes, earth and mineral resource provisions.

Progress towards reconciliation and land ownership or land justice has been slower in Victoria than in other states with a larger surviving Indigenous community (i.e. South Australia, Northern Territory, Queensland). Recently in Victoria however there has been considerable publicity over the signing of the Yorta Yorta Co-operative Management Agreement and the ILUA with traditional owners for parts of the Wimmera region (see

chapter 6).

It does not appear that the government funded Yorta Yorta Joint Management body established as an intermediary between Government land management agencies and traditional owners has so far provided an effective mechanism for consultation and communication. This may be because there was no previously established dialogue or consultation mechanism between the traditional owners and government regarding land management, and therefore no existing capacity or established relationships upon which to build on the formal agreement.

The challenge for future agreements to be negotiated between government and traditional owners groups is to create a framework that can withstand such factors and move ahead in a positive way. It also appears likely that the absence of previous capacity and/or working relationships, specifically those designed for land management decision-making, has limited the initial progress of the Agreement. The expended funding is likely to have supported Indigenous community capacity building, but has not yet generated the outcomes intended under the agreement.

Water has a profound and spiritual value to many Indigenous groups and beliefs are particularly entwined with the Murray River itself. Native title rights to water have been granted in some cases, and largely reflect access for continuation of traditional practices and customs. Some traditional owner groups have expressed a desire for a water allocation for cultural flows, as well as for economic purposes. This allocation may be utilised to exercise custodial responsibilities for the care of river systems, and would be allocated to each traditional owner group for environmental flows or to create an economic resource for their people (Farley Consulting Group 2003). Arguments for compensation for industry users in relation to such cultural flows are often countered by arguments for compensation for Indigenous communities over their loss of access to water and their associated traditional values.

Consultation undertaken by other government bodies or previous studies reflect a consistent message from traditional owner groups with an interest in natural resource management: that Indigenous cultural heritage and spirituality must be incorporated with environmental values in management and decision-making. These concerns could be addressed by increasing the representation of Indigenous people in natural resource management and decision-making processes. In addition, cultural heritage management and custodial responsibilities could be reflected in land management and be the responsibility of traditional owners in partnership with government. Reflection and acknowledgment of the cultural significance of many places within the study area—such as dual naming of streams or places—and recognition of related dreaming or creation stories, may provide a vehicle for reconciliation.

Greater Indigenous community involvement in public land and natural resource management assumes Indigenous communities having the capacity to set agendas for, participate in, and implement management

activities and make decisions. Capacity at a general level may be broadly described as having responsibility for, authority over, access to and control of resources, or knowledge and skills and capability to perform tasks.

Despite considerable effort to build capacity by both Indigenous communities and government, there are perceptions that these exercises have had limited success or have failed. Clearly the measure of capacity and success is highly relative and subjective. Indigenous community collective and consensus decision-making processes contrast sharply with rigid government planning and consultation cycles. Greater flexibility is required in delivery of capacity building exercises so that all participants have a role in setting priorities, and the ability to modify expectations and outcomes.

Many Indigenous land management models mirror the levels of empowerment and ownership of decision-making described above. Underlying tenure also plays a role in self-esteem of Indigenous communities. However, some management agreements, despite the language of 'partnership' implying equality and mutuality, in reality operate with the Indigenous organisations essentially being a service provider to government.

One specific way of improving Indigenous capacity for involvement in natural resource management and public land management particularly in the long term is through recruitment and employment strategies within which Indigenous people work within agencies responsible for managing public land, such as Parks Victoria and DSE. Many government agencies have made progress towards addressing the under-representation of Indigenous people within their workforces and have created employment opportunities (i.e. Wur-cum barra: DNRE 2002). There is also progress towards greater involvement of Indigenous people in government agency boards e.g. Victorian Catchment Management Council. Opportunities are also available for Indigenous employment in private enterprise particularly in the fields of recreation and tourism, teaching natural and cultural heritage, and in forestry enterprises.

Aboriginal people have strongly indicated a desire to gain employment on Country. This arrangement enables the spiritual connection to their land to be maintained, provides local environmental knowledge as well as enabling individuals to maintain their relationships with family and their broader community. Flexibility to provide on-Country employment is an important component if these strategies are to be successful and would desirably include a range of employment opportunities (e.g. direct on-ground land management, strategic planning, resource use, tourism).

Management Models for Biodiversity Conservation

Many threatening processes have led to widespread and continuing declines in biodiversity, from which the study area is not exempt (see chapter 5). One of the main approaches to conserving biodiversity in Victoria and throughout the world is through the protected area network or conservation reserve system (see chapter 10), although there are many additional or complementary conservation approaches.

Protecting areas for biodiversity conservation has strong support from many sectors of the community. However, some argue that it is more cost-effective to manage multiple-use land categories, such as state forest, for conservation than to expand strictly protected parks. This debate depends on many factors, particularly understanding what level of protection, and cost, is acceptable to both local and broader communities. Achieving a balance between environmental protection and other uses for public land has given rise to the current reserve and public land-use system in Victoria with its continuum of protection and use from a few fully protected wilderness areas to broader multi-use forests allowing varying levels of resource extraction and recreation.

Protecting areas (or *in-situ* conservation) is the most cost-effective means of protecting the widest range of species and ecosystems when compared to *ex-situ* conservation measures such as captive breeding (see chapter 10). International studies have found that countries with a high proportion of protected areas have a lower proportion of threatened species. Such reserves also have a significant unknown potential value, in the form of species or processes that might contribute greatly to our future well-being but which have not yet been identified.

Contrary to common perceptions, parks benefit from a high level of maintenance and management in order to achieve their conservation goals. Many parks require rehabilitation from past activities and the artificial replication of natural processes such as flooding, fire and pollination. Animal and plant pests require active management in parks. It is sometimes argued that pest plants and animals are more abundant in conservation reserves than surrounding private land. However, the vast majority of Australia's plant and animal pests are pests of farmland, pasture and disturbed habitat. Intact native ecosystems, without disturbance or intrusion by humans, are strongly resistant to pest invasion, with only a few possible exceptions. Weed and pest infestation in reserves is often worst on the edge of private land due to disturbance and dispersal into the park. Pest and weed invasion is generally greatest on public land with the highest amount of use, particularly use which causes high levels of disturbance.

As an example, it is frequently argued that fox numbers are higher in parks than on private land or in state forest because recreational hunting is not permitted in parks. There is no evidence, however, that fox numbers are higher in parks than on private land, and research in eastern Australia has found a correlation with distance from private land in that foxes are most abundant in forests that are closest to freehold land and are absent in forests furthest from freehold land (Catling and Burt, 1995). Furthermore, recreational hunting alone does not reduce fox populations sufficiently, over a wide enough area to result in a general population decline (Saunders et al. 1995). Analysis of the results of a fox bounty trial in Victoria indicated that it did not provide for large-scale fox population reduction (DSE 2003c). Increases in mortality (such as those resulting from an increase in hunting) are countered as fewer animals compete for the same resources and social groups are disrupted,

resulting in an increase in reproductive rates the following season. The absence of hunting may, however, make foxes more visible in parks than on private land, just as it does in urban areas.

Despite the extinction of many mammal and bird species in the last two hundred years from radical land use change, modern conservation methods do appear to have prevented further extinctions in recent years. This has led some to argue that additional biodiversity conservation is unnecessary. However, a great many species, such as the superb parrot, regent honeyeater and spotted bowerbird, have continued to decline in numbers and distribution over recent decades and years. The platypus, and many possums and gliders also show reduced reporting rates from a contracted range despite increased survey intensity. Many species survive in such small areas and in such low numbers that a single catastrophic event (such as a large-scale forest fire) or a slight change in climate, could wipe them out. A great many species are so poorly studied that it is difficult to tell whether their population is sustainable. Some ecosystems and species face such a high risk of extinction that only the highest level of protection offers them any chance of survival at all. Protected areas complement other strategies and form part of the overall package of biodiversity conservation measures. Reserves alone, however, may not be enough for highly endangered species, which require a high level of intervention (as outlined in endangered species recovery plans).



Fire Management

Fire is an important issue for most people, particularly those in fire-prone rural communities. The occurrence of catastrophic wildfires, while part of the Australian landscape, can threaten lives, livelihoods and property. Although fire is a natural part of the Australian landscape, it can also potentially threaten aspects of the environment, depending on timing and intensity. Details of the occurrence, effects on biodiversity and management of fire within the River Red Gum Forests study area are provided in chapters 4, 5 and 9 respectively. There are three issues commonly raised regarding fire on public land.

Many sections of the community believe that the risk of wildfire is greater in national parks than on private land and even in state forests. National parks are thought to accumulate large fuel loads through inadequate management and/or conservation objectives that favour 'letting nature take its course'. Prescribed burning for fuel reduction in parks, however, also comes under attack, due to the perception that prescribed burns often escape. Evidence does not support this, however, with only a small proportion of fires originating from controlled burns on public land (see chapter 4). Although some fires are started naturally from lightning, the vast majority of fires are started from humans. Proximity to humans is thus the greatest risk of wildfire either deliberately or accidentally (through campfires and machinery). Factors which may increase the risk of fires in some national parks include higher fuel loads than cleared land, less accessible terrain, greater public access in high use areas and lower reporting rates in low use areas. Factors which may decrease the risk of fires in some national parks are most notably controls on campfires and machinery, reduced fuel loads through controlled and ecological burning and reduced exposure in some areas to the main cause of fires: humans. By comparison, fires in state forest may be increased by broader public access and machinery, but are also more readily brought under control by those same factors.

Fire severity is also an important factor in assessing fire risk. While fires are more commonly started near human habitation, they are also more rapidly reported and extinguished, making them lower in severity. Fires in national parks which are started by thunderstorms, however, often have multiple points of origin from a number of lightning strikes, are reported late and are difficult to access, all of which make them difficult to control. A large fire in a national park, however, may have less social or economic impact than a similar fire in an inhabited area. These complexities probably explain why there is currently no clear evidence for meaningful differences in fire risk or severity between parks, state forests and private land. Many fire authorities believe that any potential difference in fire patterns is not a result of land tenure alone but is due to a combination of the many factors listed above.

Fuel reduction burns are often argued to be environmentally appropriate for river red gum forests. However, there have been few major wildfires within river red gum floodplain forests, and those that have occurred are typically of limited extent. Fire distribution and frequency over the last 30 to 40 years indicates that river red gum forests are not highly prone to wildfire, partly due to their position on a floodplain, although there have been a small number of fires up to 50 ha in size within the region (see chapter 3). Although fire ecology has not been studied in detail for river red gum floodplain forests, these forests seem to respond differently to fires depending on season, flood characteristics both before and after the fire, longer term climatic conditions (e.g. drought) and fire characteristics (such as intensity, rate of spread and heat). River red gum forest species do not have the typical features of fire-dependent flora to promote regeneration after fire, suggesting that fire does not naturally play a major role

in this ecosystem. Increased fuel reduction burns, which are often requested for public land to protect rural communities, are likely to impact negatively on these environments.

Domestic stock grazing is sometimes suggested as a preferable alternative for reducing fuel loads and fire risk (see the 'Domestic Stock Grazing on Public Land' issue, above). However, heavy grazing in the high country prior to the 1939 fires had little preventative effect (Esplin 2003). Grazing is also unlikely to affect the accumulation of larger fuels that contribute more towards fire intensity. The Victorian Bushfire Inquiry, established as a result of the 2002-03 alpine fires, concluded that there is currently no scientific support for the view that 'grazing prevents blazing' in the high country and it is reasonable to extend this finding to other forested ecosystems throughout Victoria (Esplin 2003).

In the summer of 2004-05, the number of wildfires in NSW riverine forests was substantially less than in Victoria, suggesting that the NSW campfire ban over the summer fire season has been effective in reducing wildfire occurrence (see chapter 4). Reducing the origins of many fires may be a more effective means of protecting both the environment and surrounding communities, than reducing fuel loads.

LONGER TERM PLANNING

During its consultation so far in the Investigation, VEAC has heard concerns about the pressures of increasing population and increasing visitation to public land in the study area. The impacts of climate change are also increasingly important considerations for public land use planning.

Recreation and Tourism

The River Red Gum Forests study area is popular with visitors for many reasons. These include its sunny climate, accessible bodies of water bodies and opportunities for isolation and tranquillity in aesthetically attractive and biologically-rich open forests. The area is well suited to low cost, unstructured recreation. As a result, the study area is a major focus for a range of activities including camping, fishing, swimming, boating, water skiing, horse riding and four-wheel driving (see chapter 11 for details). In addition, new activities—such as wake-boarding—have become popular in recent years, and undoubtedly there are other recreational and tourism opportunities that are currently not extensively utilised and have considerable potential for expansion.

The study area is characterised by a long-term trend of increasing popularity for recreation, tourism and related developments both in, and away, from regional towns. This has led to an influx of retirees and so-called 'tree-changers', and an expansion of facilities and infrastructure, particularly accommodation and related service industries. This has, in turn, brought considerable social and economic benefits to these towns but, in several places, these developments and recreational uses are placing pressures on public land, and some activities appear to be close to capacity—for example, camping on riverbank during holiday periods.

Recreation is one of the major uses of public land. As population and visitation increase, however, increasing use can lead to unacceptable negative impacts on natural, cultural and other recreational values. For example, the popularity of both wake-boarding and the Southern 80 water ski race has increased considerably despite increased river bank erosion. Similarly, tourism development along the shores of Lake Mulwala and the related recreational activities have resulted in strong local opposition to variations in the lake level that could assist in improving environmental water conditions in Barmah forest (see 'Water and Environmental Flows', above). In addition, intensive camping can result in permanent loss of native ground vegetation through trampling, total removal of fallen timber and cutting of live and dead standing trees for firewood. Other major problems caused by intensive use include waste management, particularly the difficulty of human waste disposal in areas that flood (see chapter 11 for further examples). These impacts are undesirable in their own right and, if severe enough, can reduce the recreational value itself over considerable areas—particularly when the recreational values people are seeking include 'peace and quiet', isolation or a relatively unconstrained camping experience in a natural setting. This problem can be compounded when activities that are not compatible occur in close proximity, for example, hunting with firearms near campsites used by families or those seeking tranquillity.



At present, there appears to be no long-term overall planning or clear direction for recreation, tourism and related developments, unlike that set out for coastal areas under the Victorian Coastal Strategy, for example. It is probable that with good planning the region could accommodate more visitors while providing an improved visitor experience with fewer impacts. An associated advantage of wider-scale planning is that it often results in the compilation of comprehensive information and analyses covering broad areas. In the River Red Gum Forests study area, a need for research on current and predicted visitor use of public land has been identified, as well as an assessment of the capacity and impacts on various areas for particular uses. Ideally, such planning

would cover relevant areas in Victoria and New South Wales as a single region. Broad-scale planning could maximise the recreational opportunities and related tourism benefits of public land in a sustainable manner without undermining the recreational resource itself, either directly or through the loss of natural or cultural values. Such an approach might address issues such as the long-term trends in various forms of recreation and tourism, the appropriate mix of recreational activities across the region, and the location of various activity or development nodes.

Strategic planning, which leads to a more structured approach to the allocation of areas for particular recreational uses or development of facilities, may compromise the relatively unstructured and unconstrained feel of recreation in river red gum forests. However, regardless of changes to public land status, the need for more planning for and management of increasing tourism and recreational use seems inevitable if river red gum forests are to be sustainable in the future.

Impact of Climate Change

As detailed in chapter 4 Climate and Hydrological Systems, climate change is likely to significantly reduce consistent rainfall patterns, river flows and run-off, and increase average temperatures and extreme weather events. Despite debate about the extent and causes of climate change, there is widespread scientific agreement that climate change is occurring and that these changes are likely to adversely affect a number of natural resources. Reduced water availability and reliability is likely to directly alter habitats and increase wildfire and pests. Indirectly, reduced water availability is likely to degrade wetlands, stress or kill trees, lower timber yields, and lower nectar yields for apiculture and nectar-feeding native animals. Water management infrastructure such as regulators and levees are also likely to require significant modification. On the other hand, climate change may reduce dryland salinity by lowering the water tables in some areas, although reduced water availability would limit options for salinity management.

Climate change effects within the study area are predicted to be significant. For example, annual stream flows across the Murray-Darling Basin are predicted to decrease by 1100 to 4000 GL by 2020 (twice as much as the 500 GL sought in the Living Murray First Step Decision annual environmental flows). Scarcity of water, exacerbated by climate change, is likely to be the most significant challenge facing natural resource managers in the study area and a number of useful approaches will need to be considered.

Other things being equal, those values and uses that inevitably rely more heavily on public land than other parts of the landscape would generally have high priority in VEAC's deliberations, especially where they are susceptible to climate change. For example, although public land occupies only around 20 percent of the study area, it supports around 60 percent of the remaining native vegetation—much of it fronting water bodies. As a result, public land is particularly important for biodiversity conservation, apiculture, wood products, and recreation and tourism. The first two of these in

particular are susceptible to the effects of climate change and could be under long term threat in the study area if greatly diminished on public land. The supply of wood products from the study area is also susceptible to climate change but—although currently largely sourced from public land—is more likely to be able to shift to private land than biodiversity conservation and apiculture.

Even maintaining the status quo for many uses and values will require greater capacity and flexibility, solely to overcome the uncertainty and costs resulting from climate change. In order to maintain existing public land timber production volumes, for example, it may be necessary to increase either the intensity of harvesting (assuming it is currently below the sustainable level) or the area available for harvesting in order to offset any effects of climate change in reducing tree growth and survival rates. The key point here is to ensure that the effects of climate change are factored into any assessments of the effects of VEAC's recommendations on the viability of various values and uses.

Under conditions of limited resources to assist a large array of competing demands, it may be necessary to adopt the triage approach used in medical emergencies. Essentially advanced triage provides for the decision not to provide for some demands in some areas in order to be more confident those values and uses that are catered for will endure in the long term. Certainly planning for climate change requires that short term benefits are properly balanced against likely long term benefits and impacts. In the River Red Gum Forest study area, significant ecological assets sites are likely to be allocated water resources in preference to areas with lower conservation values.

Particular attention may need to be given to the long term security of environmental flows, and especially to existing and potential arrangements that determine the extent to which shortfalls in water resources—including as a result of climate change—are borne by other users of water relative to the environment.

There are a number of specific impacts of climate change that, once recognised, can be addressed through specific measures. For example, plant or animal species that are rare, have a restricted distribution, narrow climatic tolerances or sensitivity to environmental change could be targeted for protection in relatively unfragmented areas of consolidated habitat linking to secure areas with different climates. In general, greater emphasis could be given to securing 'biolinks' that connect habitats spanning long continuous climatic gradients.

As well as the consequences of climate change, the human-induced causes of climate change may also be relevant factors for consideration. For example, in theory at least, sustainably-produced firewood, timber railway sleepers and some sawlog products generate fewer greenhouse gases than most alternatives. On the other hand, relying on pumping water as a long-term solution to sustaining wetlands and riverine forests in some areas will produce additional greenhouse emissions (assuming pumps are powered by fossil fuels).

DEVELOPING DRAFT PROPOSALS

VEAC's public land use planning process under the *Victorian Environmental Assessment Council Act 2001* requires the Council to take into account the matters listed in Section 18 of the VEAC Act, and the additional matters listed in the River Red Gum Forests Investigation terms of reference. As part of its Investigation VEAC describes all relevant values, resources and uses, gathers information on present and predictable future needs for resources, uses and services and seeks information and views from individuals and the community by comprehensive consultation.

In particular, VEAC is required to quantify the status of several key factors, including biodiversity conservation, timber, minerals, stone, honey, grazing and other resources, and various recreational uses. Social and economic appraisals describe the current situation and explore the implications of proposals, to inform VEAC's development of recommendations. VEAC combines data from relevant key sources, including public submissions, and sets broad targets for main public land uses, taking into account major uses, the impacts of each use on other values or uses, and the appropriateness of each use in certain land use categories.

Initial working plans will be developed by combining key conservation sites, resource areas for timber, minerals, stone, grazing, other resource uses, key recreation areas, and the framework of 'given' uses, with land use proposals arising from submissions and other consultation. Many areas will fall into place without land use category conflict. Other locations where there are likely areas of competing uses to be resolved are highlighted, and gaps to be filled by more detailed work are evident. Localised data from submissions and further research will refine the plan.

Key Factors

Biodiversity conservation is best quantified at a strategic planning scale using ecological vegetation class (EVC) mapping and data analysis. This describes the conservation status of each EVC and its current representation in protected areas in the context of its pre-1750 extent. Amongst other things, VEAC is required under its Act to have regard to the need to conserve and protect biological diversity and the need to provide for a comprehensive, adequate and representative system of parks and reserves. Possible protected areas will be identified from sites of significance (or high conservation value) data, records of threatened flora and fauna species, Flora & Fauna Guarantee Action Statement objectives for threatened species, large old tree mapping, biologically intact sites, and data on biological values and other important habitat elements. Areas previously identified in FMA Plan Special Protection Zones and Special Management Zones will contribute to this stage.

Under its Act VEAC is required to have regard to any existing or proposed use of the environment or natural resources, and the potential environmental, social and economic consequences of implementing its proposed recommendations.

Timber resource quality data, location of mills, processing, value-adding and sales outlets, and other timber resource information—together, serving to identify key timber resource areas—is obtained from DSE and industry. Existing Forest Management Area plans show the current forest availability and zoning. As any proposed land use changes are considered, estimated future yields and associated implications will be assessed.

Mineral resource data from DPI locates existing and possible mining and processing sites, and any other mineral resource issues.

Stone resource and extraction site data—to the extent they are relevant to the River Red Gum Forests Study area—will be assessed.

Public land grazing is notable for its large number of small licensed areas, as well as Barmah forest grazing under permit. Relevant information will be considered in this process.

Apiculture will be addressed through the collation on available data on nectar sources.

Recreation represents a spectrum of activities that will all be considered by Council in making its recommendations.

Given Uses

A set of given uses provides a partial framework for the working plan:

- existing national and state parks
- community facilities—recreation reserves, parklands & gardens, schools, other educational institutions, public halls, education areas, recreation trails and shooting ranges
- various services and utilities—roads, railways (if in use), bridges, locks, airports, communications facilities, hospitals, public offices, courts, police stations, gaols, Defence land, other Commonwealth land, survey points etc
- water infrastructure for urban and irrigation—weirs, reservoirs and town water towers
- water distribution infrastructure—water supply channels, pipelines, drains and floodways (unless disused and open to alternative uses)
- public land infrastructure—caravan parks, boat ramps, piers and related structures
- public authority freehold land, committed to a range of purposes (unless surplus), and
- other 'given' uses described in submissions.

As well as the above, VEAC also considers user access, and practicality for land management activities—recreation facilities, fire management, pest plant and animal control and so on