# C

# Implications

# 4 Social, economic and environmental implications of the final recommendations

This chapter summarises and discusses the implications of the recommended land use changes that are contained in the preceding two chapters. The recommendations are examined overall and for each major public land use in the investigation area. Under the *Victorian Environmental Assessment Council Act 2001*, VEAC must address the potential environmental, social and economic consequences of implementing its recommendations. In addition, the final recommendations have also been subjected to further economic analysis since the Draft Proposals Paper. A team of consultants led by Gillespie Economics was commissioned by VEAC to independently assess the social and economic implications of VEAC's final recommendations (see appendix 1 for their report).

The consultants had two main tasks. The first task was to measure the benefits and costs to the Victorian economy of VEAC's final recommendations for each of the key uses of public land in the investigation area. The second task was to use regional impact analysis to identify places in the investigation area that may be adversely affected. These tasks involved reviewing, refining and updating the data and socio-economic report prepared for the Draft Proposals Paper, and taking account of relevant information from public consultation and submissions. Importantly, this review incorporated the changes made by VEAC to the draft proposals, as presented in previous chapters.

The social and economic effects of the final recommendations are quantified in the benefit-cost analysis as the net economic contribution to the state economy, and in the regional analysis as the economic activity and employment effects in and adjoining the River Red Gum Forests Investigation area.

The Gillespie Economics benefit-cost analysis for this investigation uses material from a separate study commissioned by VEAC and undertaken by URS (Australia) in 2006 which quantifies in financial terms various non-market values of public land (including non-use values such as the existence, bequest and option values of biodiversity now, and in the future). This choice modelling study surveyed samples of Victorians on the values they place on environmental protection, using the River Red Gum forests and wetlands of northern Victoria as a study site. Consequently, the values used in the benefit-cost analysis are those currently expressed by Victorian people for the River Red Gum forests explicitly rather than values extrapolated from past studies interstate or overseas. The result is a more robust, relevant and reliable quantification of the values expressed by people for different uses of public land in the analysis of VEAC's recommendations.

Identifying the economic value of land uses such as recreation or conservation provides a comparable unit of measurement with other land uses with more obvious economic values (such as forestry, for example). The economic values, in themselves, have not driven VEAC's deliberations. Rather, in developing its recommendations, VEAC has taken economic values into account, while seeking to balance social, economic and environmental benefits in a broad sense. The following discussion of the implications of the recommendations refers to the results of the economic and social analyses where appropriate, and also describes the environmental consequences of implementing the recommendations.

## Overview

In order to identify and value the benefits and costs of VEAC's recommendations, the consultants made certain assumptions and placed a number of caveats on their results. These are documented in detail in their full report (appendix 1).

The most significant factor in the assessment was the estimated environmental benefits from VEAC's recommendations. The next largest component, while not quantified, is likely to be the cost of providing adequate environmental water for identified natural assets—in particular, flood-dependent ecosystems and threatened species. Additional environmental benefits will be realised with adequate environmental water. Rather than indicating a volume of water required for overbank environmental flows—as in the Draft Proposals Paper—the final recommendations focus on identifying these flood-dependent natural values and what water regimes they require.

Assessing the costs—in terms of water resources —of providing additional environmental benefits is obviously very important. However, environmental water for the Murray Darling Basin is the subject of rapidly developing policies and programs involving three other state governments and the Commonwealth government. Delivering additional environmental water would provide benefits to other states and carry interstate costs. Accordingly it was beyond the scope of the benefit-cost analysis and regional impact analysis carried out by VEAC's social and economic consultants.

The consultants compared two scenarios reflecting VEAC's recommended public land use changes with and without adequate environmental water, against Scenario One—the base case without land use changes. These are explained further below. The consultants' analysis determined that the recommendations would result in the implied increases in economic value to Victoria as summarised in the following table.

| Benefit Cost Analysis outcomes | Scenario 2 – VEAC's changes but no additional environmental water $M/yr | | | Scenario 3 – VEAC's changes and adequate environmental water $M/yr | | |
|---|---|---|---|---|---|---|
| **Environmental benefits and costs**[1] | **Low** | **Average** | **High** | **Low** | **Average** | **High** |
| Environmental, wetland and riparian protection, and tourism and recreation benefits | 19.0 | **41.7** | 64.4 | 48.8 | **111.3** | 173.7 |
| Costs for timber, grazing, hunting, riparian areas, park management and maintaining rural communities | 4.8 | **4.8** | 4.8 | 4.7 | **4.7** | 4.7 |
| Net economic benefit to Victoria (excluding the cost of environmental water) | 14.2 | **36.9** | 59.6 | 44.2 | **106.6** | 169.1 |
| Cost of additional environmental water | 0 | **0** | 0 | Not quantified | **Not quantified** | Not quantified |

Note: (1) The low and high results reflect the statistical 95 percent confidence limits placed on the environmental valuations.

The table illustrates that environmental benefits can be demonstrated under both scenarios. The environmental benefits would accrue to Victorians as a whole, and to future generations of Victorians. They are calculated on a 'per household' basis and largely correspond to the distribution of Victoria's population. Accordingly large centres including Melbourne and regional cities outside the investigation area can be attributed major environmental benefits. The cities of Mildura, Shepparton, Wodonga, Swan Hill, Wangaratta and Echuca, which are entirely or partly within the investigation area, can also be attributed significant environmental benefits, and additional expected benefits from tourism, recreation and protection of wetlands and riparian areas.

The costs of the recommendations would be largely borne in the areas near where public land timber harvesting and grazing are focussed. The small communities of Cohuna, Koondrook, Nathalia and Picola are likely to be most sensitive to the effects of cessation of timber harvesting, as small towns have relatively little flexibility to accommodate change, particularly in the context of economic difficulties these areas have experienced in recent years. VEAC has recommended that assistance be given to individuals or local communities adversely affected as a result of the implementation of the recommendations (see recommendation R4). An example of such assistance was the industry restructuring carried out as part of the implementation of the Environment Conservation Council's Box–Ironbark recommendations in 2003.

## Ecosystem protection

Biodiversity includes the genetic diversity, species diversity and ecosystem diversity of all lifeforms and their interactions with each other and the physical environment. As many species are poorly known or undescribed, conservation planning has focused on establishing dedicated reserve systems (where biodiversity protection is paramount) that are comprehensive, adequate and representative. The establishment of such a reserve system in the River Red Gum Forests Investigation area is central to VEAC's recommendations. Indeed the reserve system is a key component of the terms of reference given to VEAC by the government for the investigation and, under VEAC's legislation, the need to provide for such a system must be taken into account in all its investigations.

In developing its recommendations, VEAC has used ecological vegetation classes (EVCs) as surrogates for ecosystems, and the nationally agreed criteria for establishing the comprehensive, adequate and representative reserve system (also known as the 'JANIS criteria'). EVCs and the JANIS criteria are described in more detail in the River Red Gum Forests Investigation Discussion Paper. The key elements of the JANIS criteria are that targets should be met for representation of ecosystems in reserves. The targets are: 100 percent of the current extent of rare or endangered EVCs; 60 percent of the remaining extent of vulnerable EVCs; and at least 15 percent of the pre-1750 (that is, pre-European) extent of all other EVCs. There was a particular emphasis on achieving comprehensiveness, adequacy and representativeness in the four main bioregions in the investigation area—Murray Fans, Murray Scroll Belt, Victorian Riverina and Robinvale Plains (see appendix 9 for reservation status in the investigation area, and the VEAC website— www.veac.vic.gov.au —for representation across the bioregions).

Appendix 9 shows that VEAC's recommendations more than double the total area of EVCs in permanent reserves from 68,388 hectares to 169,950 hectares. Appendix 9 also shows that VEAC's proposed new dedicated reserves satisfy the JANIS targets for the majority of EVCs. Key EVCs for which protected area representation is recommended to increase significantly include:

**Murray Fans Bioregion**

- Riverine Grassy Woodland
- Grassy Riverine Forest
- Riverine Chenopod Woodland
- Plains Woodland
- Riverine Swamp Forest
- Riverine Swampy Woodland
- Lignum Swampy Woodland
- Grassy Riverine Forest/Riverine Swamp Forest Complex
- Sedgy Riverine Forest/Riverine Swamp Forest Complex

**Murray Scroll Belt Bioregion**

- Semi-arid Chenopod Woodland
- Low Chenopod Shrubland
- Riverine Chenopod Woodland
- Lignum Shrubland
- Shrubby Riverine Woodland
- Lignum Swampy Woodland

**Robinvale Plains Bioregion**

- Lignum Swampy Woodland
- Shrubby Riverine Woodland

**Victorian Riverina Bioregion**

- Plains Grassland
- Riverine Grassy Woodland
- Sedgy Riverine Forest
- Lake Bed Herbland
- Lignum Swampy Woodland
- Floodplain Riparian Woodland.

For some EVCs, such as Plains Grassy Woodland and Plains Savannah, the recommended protected area system does not satisfy the JANIS targets. For many such EVCs, much of the remaining extent occurs on private land, particularly in the Victorian Riverina bioregion. Other EVCs which do not meet reservation targets occur in thin strips or small sections of the Murray River Park or in public land water frontages which are not considered to be protected areas. However VEAC considers the increased emphasis on management for conservation within these land use categories would provide an appropriate balance. Subsequent management planning in the Murray River Park can assist in protection of areas of threatened or endangered EVCs.

VEAC has been particularly conscious of creating large and well connected protected areas, where feasible, to ensure reserves are viable in the long term and allow for species movement across the landscape. In addition, other values such as sites of Aboriginal cultural heritage, sites of historic significance and scenic landscapes have also been incorporated into the recommended protected area system.

The economic value of biodiversity protection has been estimated from the results of a non-market valuation study in order to ensure that non-marketed environmental benefits can be considered alongside the more readily established economic value of uses where products are exchanged in markets (e.g. commercial timber, grazing). For this investigation, the economic value of biodiversity protection is measured in terms of the financial values that people are willing to pay to gain additional biodiversity protection. See appendix 1 for a full discussion of this work including the assumptions involved in these estimates. The Gillespie Economics team applied the non-use values from this 2006 study to estimate the values derived from protecting environmental attributes. They estimated that Victorians are willing to pay an average of approximately $111 million per year over 20 years to secure the environmental benefits that will come from VEAC's recommendations (see the table on the previous page). The estimate differs slightly from that in the Draft Proposals Paper because of changes to the recommendations since then, the use of newly available ABS 2006 Census data, and new information on flood-dependent natural values and the potential impacts of climate change.

## Threatened species

A comprehensive, adequate and representative reserve system is designed to provide optimal protection for biodiversity, including protecting ecosystems and the habitat of species for which we currently have little or no information. However, where we have specific knowledge relating to particular species or processes, we can also make more precisely targeted provisions within the reserve system. For example, the inclusion of threatened species habitats within permanent conservation reserves is a high priority. Appendix 10 outlines the representation of key threatened species in the recommended reserve system.

The populations of many threatened plant species are limited by land clearing, exotic plants, overgrazing and soil disturbance associated with cropping. The extended protected area system in the Victorian Riverina bioregion will significantly improve the protection for many of these species. The removal of grazing in Barmah forest will significantly improve conditions for species such as the endangered Mueller Daisy. Improved water regimes should reduce the encroachment of River Red Gums and Giant Rush on Moira Grass plains. Many ground dwelling, riverine species such as Inland Carpet Pythons rely on coarse woody debris on the ground for refuge from predators and as breeding habitat. VEAC is recommending measures to retain coarse woody debris, which would otherwise be collected for firewood. Prohibiting commercial and domestic firewood collection in the Murray River Park (except in designated domestic firewood collection zones) should also increase this vital habitat element.

Some threatened species, particularly birds, are recorded over a wide geographic range but only breed in very limited locations under certain conditions. For example, the Superb Parrot only breeds in Victoria in the hollows of old trees near water, but which are also close to feeding grounds in open country. Regent Parrots, like Superb Parrots, require hollows in mature or dead trees close to their mallee feeding grounds. In order to protect these species, we need to protect trees with hollows and allow younger trees to mature into this age class. Similarly, egrets will only breed in Victoria in living trees surrounded by water for many months. Protecting these specific habitat elements is vital for the conservation of these species in Victoria.

## Sites of geological and geomorphological significance

VEAC commissioned a study of sites of geological or geomorphological significance, which were previously poorly documented in the investigation area. The study revealed many outstanding sites relating to river and floodplain geomorphology in the investigation area (see Discussion Paper). Of the 21 sites of high significance, most are on public land and two thirds have been included in conservation reserves (see appendix 10). Notably, three sites of national significance (Barmah forest, Hattah lakes and Lindsay Island) are in recommended or existing national parks. Two sites of state significance are also proposed for inclusion in the conservation reserve system: palaeolake Kanyapella area and Wallpolla Island.

## Environmental water

Delivery of adequate environmental water to flood-dependent riverine ecosystems will be required to fully realise the objectives sought through VEAC's recommendations for parks, conservation reserves and state forest to be achieved. A healthy floodplain, with a high degree of floodplain connectivity and protection of flood-dependent ecosystems, depends upon the delivery of sufficient water for the environment.

Since the publication of the Draft Proposals Paper, there has been wide debate on the health of the Murray–Darling system, specifically regarding the need for significantly more environmental water. The Federal Government has announced that it will spend $3 billion purchasing water to return 1500 gigalitres to the environment. As well as the established environmental water entitlements from existing programs of 500 gigalitres per annum for the Living Murray Icon sites and 127 gigalitres for Barmah and Millewa Forests and from other Victorian environmental allocations, the Victorian government has announced water savings from its FoodBowl modernisation project from which Stage One will return 75 gigalitres to the environment and the foreshadowed Stage Two will potentially return a further 100 gigalitres. Ultimately, the cost of providing water for the environment additional to these commitments, will require considerable resources and the cooperation of state and Commonwealth governments if the riverine forests and their associated ecosystems are to be protected and survive into the future.

In assessing the implications of VEAC's recommendations for environmental water the social and economic consultants developed three scenarios to gain a better understanding of the role of environmental water and how particular scenarios will affect wellbeing for the people of Victoria:

**Scenario 1 (Base Case):** This scenario is what would eventuate with no changes to existing public land use and established environmental water allocations (part of the environmental water allocations referred to above). Note that the FoodBowl Stage One 75 gigalitres and FoodBowl Stage Two were not included in Scenario One when this economic analysis was carried out.

**Scenario 2:** The implementation of VEAC's recommendations including new protected areas, with the established environmental water commitments as for Scenario One but without additional environmental water. This scenario provides a benchmark for assessing the benefits of the recommendations without additional water.

**Scenario 3:** The implementation of VEAC's recommendations including new protected areas, but with adequate additional environmental water to sustain the flood-dependent ecosystems of the floodplain.

In both Scenarios Two and Three the values of the benefits and likely value of the costs associated with environmental water exceed the total benefits and costs of other uses combined. Excluding the cost of environmental water, the net benefits of the recommendations with existing environmental water amount to an average $36.9 million per annum (Scenario Two—see appendix 1 and the table on page 97), and the benefits with adequate additional environmental water to sustain the flood-dependent ecosystems of the floodplain are $106.6 million per annum.

Regional impacts of providing adequate environmental water are much more difficult to predict. Irrigated agriculture (where the effects are most likely to manifest) has changed considerably in recent decades and continues to change as a result of water trading, salinity, increasing water prices and the profitability of different enterprises. Further constraints on water are likely to impact most heavily in the least profitable areas, industries and uses. Where the cost of water becomes too high for irrigators, they may sell their water, use less water more efficiently, shift to dryland agriculture or ultimately sell both their land and water. These changes in land and water use patterns are already occurring through water trading within and across regions in the Kerang–Swan Hill area. Similar trends are likely to be seen throughout the irrigation districts of Victoria as well as New South Wales and South Australia following the changes already occurring as a result of the prolonged drought, climate change and current Commonwealth and state initiatives.

The requirements for environmental water for the riverine forests and wetlands will require a shift towards greater security of environmental flow allocations, relative to other water user needs, and this may result in some dislocation for users. However, there would also be some consumptive use benefits, including for recreational fishing and hunting, apiculture, increased timber productivity and maintenance of the forests' aesthetic attributes for recreation and camping uses more generally.

Ultimately, adequate environmental watering requires an acknowledgement that a significant volume of water is required. For the Murray Darling Basin broadly, this is already acknowledged in recent Commonwealth government announcements. The benefit-cost analysis of VEAC's recommendations indicates that there is considerable scope to redefine the current water sharing rules and/or purchase water to achieve environmental flows, ensuring the long-term protection of the riverine forests and their associated ecosystems on public land in the investigation area.

## Indigenous involvement

VEAC considered a number of issues when developing recommendations for enhancing the role of Aboriginal people in public land management (see chapter 2). While Aboriginal community aspirations broadly include increased involvement in public land management, there is a clear need for a flexible range of options for the involvement of Traditional Owners. Adequate resources are required to support such increased involvement including capacity building, training, provisions for group decision making and administrative support.

VEAC considers that there is a need for increased involvement of Aboriginal people generally and Traditional Owners specifically in public land management in the investigation area. The recommendations provide for greater involvement by Aboriginal people in public land management, whilst acknowledging that institutional and legislative change is also required to accommodate the existing capacity and aspirations of each Traditional Owner group. In order to facilitate greater and more meaningful involvement in public land management, progress needs to be made towards Traditional Owner identification and registration. However progress can only be made within established internal decision making processes and informed consent protocols.

VEAC's recommendations for shared management of two specified parks, with management boards which have majority Aboriginal membership, is a major change in the way national parks and other public land are managed in Victoria. Such a management framework should facilitate the active engagement of the relevant Aboriginal groups in park management and decision making. VEAC is also recommending legislative change to establish the framework for joint management of parks in Victoria. Without such a statutory framework, progress towards joint management will stall.

Traditional cultural practice is one of the key ways that Aboriginal people can keep their culture alive and teach younger generations. VEAC considers that ensuring Traditional Owners have a genuine role in decision making about contemporary cultural practice is extremely important. VEAC's recommendations allow for traditional cultural practice on public land across the investigation area and provide opportunities for Aboriginal people to build capacity and training. The recommendations support the renewal of Traditional Owners' cultural ties with their traditional Country through the practice of and shared responsibilities for management, decision making and planning.

In a broader sense, the recommendations will address some of the social and economic inequities that exist between Aboriginal and non-Aboriginal people in the investigation area and more widely, as well as furthering the Victorian government's efforts towards reconciliation. However, it must be acknowledged that the legacy of the past cannot be rectified either quickly or easily, and that support and leadership from both within and beyond Aboriginal groups will be required to achieve the best outcomes. Working on Country and supporting Aboriginal responsibilities to care for Country has the potential to provide real social benefits for Aboriginal people.

The investigation process has utilised and extended existing relationships between public land managers and Aboriginal people or groups, but VEAC acknowledges that its consultation is limited in both scope and timeframe. The building of long term relationships and trust between government and Aboriginal people is critical to the success of any future land management arrangements particularly those under shared governance structures. The amount of time and resources to achieve positive social, economic and cultural outcomes should be realistically estimated and genuinely accommodated. VEAC believes that the recommendations provide a range of positive opportunities for Aboriginal people and the wider Victorian community. Ultimately, however, the way in which these recommendations are implemented will be critical to their success and indeed measuring such outcomes may be highly subjective.

The social and economic assessment of VEAC's recommendations for increasing Aboriginal involvement in public land management (appendix 1) concluded that there was no increased contribution or cost to the Victorian economy, nor additional employment beyond that required for additional management costs.

## Recreation and tourism

Recreation and tourism contribute significantly to the economy of the investigation area and environs, with around five million visitor days and $870 million being spent each year in Tourism Victoria's Murray Region. Camping and associated activities along the River Murray and its tributaries are major attractions for visitors to the region, drawing around 241,000 visitors a year to specific parks. Camping holidays, particularly along the river frontages, play a significant social role in visitors' lives with many families visiting the same site for many years.

In its Draft Proposals Paper, VEAC took the view that the recommendations would have a neutral effect on tourism and recreation in the investigation area. After considering submissions, reviewing visitor data and amending various recommendations relevant to camping, VEAC now considers that the recommendations will significantly increase the number of tourist visits and campers to the recommended national parks.

VEAC has acknowledged that the majority of campers prefer dispersed camping along the river frontages at sites of their choosing, and with few amenities. This use is recommended as the main form of camping across all land categories. As a result of this recommendation, there will be little change to access for dispersed camping activities. A camping and recreation strategy, to be

developed by land managers in consultation with the community, will look broadly at all recreational uses and define sites where other styles of camping may be developed (see chapter 2). The strategy will also need to develop solutions to address the environmental degradation of the river frontages and the negative social aspects that occur when large numbers of people camp in close proximity during peak holiday periods and major events.

In general, dogs are not allowed in national parks in Victoria, as these areas are primarily established to protect native flora and fauna. Dogs are allowed in state forests, regional parks and many other categories of public land. VEAC's recommendations for new national parks and nature conservation reserves have consequently reduced the areas available for dog walking and camping with dogs and this will affect some people. Visitors will not be able to camp with their dogs in the recommended new national parks and additions to national parks. However, it is VEAC's intention that people should be able to camp at nearby locations with their dogs. Thus, dogs will be allowed in the extensive Murray River Park, the proposed Kings Billabong, Murray–Kulkyne, Gadsen Bend and Nyah–Vinifera Parks, state forests and regional parks. The Murray River Park has been enlarged since the Draft Proposals Paper to provide additional areas for camping with dogs—along the River Murray adjoining Wallpolla Island and the southern (Torrumbarry Weir) part of Gunbower National Park, and to take in Barmah Island. In addition the proposed Lower Goulburn River National Park has been reduced and Shepparton Regional Park enlarged, for similar purposes. The overall impact of reduced areas for camping with dogs is relatively minor in terms of total area—the Murray River Park and other regional parks represents approximately 75 percent of the River Murray frontage between the South Australian border and Wodonga. National parks and nature conservation reserves represent approximately 23 percent of the River Murray frontage.

As Victoria has recently experienced a series of significant bushfire seasons, bushfires are at the forefront of people's minds. Escaped campfires are the largest single source of bushfires in the investigation area over the summer period according to DSE data. VEAC proposes that Victoria align with parts of New South Wales and South Australia and ban solid fuel fires on public land over the high fire danger period. Campers will be able to cook with gas or liquid fuel stoves on all but total fire ban days. The number of campfire escapes should decrease (based on New South Wales experience), increasing the safety for campers and adjoining property holders. The amount of wood on the ground should also increase providing essential habitat for many ground-dwelling species which are presently affected by firewood collection.

It is estimated that approximately five percent of all tourist visitors to the region actually visit the River Red Gum parks and forests. A change in status from state forest or state park to national park is likely to increase recreation and tourism visits. Based on the recorded increased visitation following creation of the Grampians, Murray–Sunset and Yarra Ranges National Parks, the consultants have conservatively predicted a 20 percent increase in visitors to Barmah, Leaghur–Koorangie, Gunbower, Lower Goulburn River and Warby Range–Ovens River National Parks, and smaller increases for other parks. This indicates considerable scope for product development, marketing and park interpretation programs to increase the numbers of people visiting the investigation area once the parks are created.

VEAC's park recommendations will ensure greater diversity and sustainability of the recreational and tourism experience and facilitate growth in park visitors. As a result of analyses undertaken by the consultants, the increases in net economic values for tourism that potentially arise as a result of VEAC's recommendations for the national parks in the investigation area are estimated to be approximately $0.87 million per year.

VEAC's recommendations to include a number of wildlife reserves (state game reserves) in the conservation reserve system will reduce the number and area of wetlands available for duck hunting. In a wet year, around 4390 duck hunters use these wetlands on the opening weekend of the hunting season. A reduction in duck hunters in the investigation area may cost Victoria $0.49 million and up to 15 direct and flow-on jobs in the region (e.g. Kerang) from reduced demand for fuel, accommodation and other services. Many of these duck hunters will be able to access other areas for duck hunting both within and outside the investigation area, reducing these to local impacts. VEAC anticipates that improved environmental water regimes for a number of wetlands in the region will improve hunting opportunities on many wetlands that continue to be available for hunting but have been dry for a number of years.

The public lands of the investigation area are popular for a wide range of other recreational activities such as fishing, horseriding, trailbike riding, four wheel driving, car touring and picnicking. These activities would not be affected by VEAC's recommendations, except that camping with horses would not be permitted in the recommended new national parks and horses would not be permitted in nature conservation reserves. Camping with horses is permitted in recommended state forests and regional parks, including the recommended Murray River Park. Horseriding is permitted in national parks, regional parks and state forests on formed roads and tracks.

## Domestic stock grazing

The investigation area includes important areas of intensive primary production industry, notably both dryland and irrigated crops or pasture. Agricultural activities are largely undertaken on private land, however the use of water for irrigation has a major effect on the natural values of public land in the investigation area, and on uses (such as grazing and forestry) which depend on environmental values. The implications of VEAC's recommendations relating to provision of adequate environmental water are explained earlier in this chapter.

There are currently some 88,300 hectares of public land licensed for domestic stock grazing in the investigation area, mostly in state forest, public land water frontage and the River Murray Reserve. There are approximately 2930 licenses and permits issued that authorise grazing, held by 1084 licensees and permit holders. Public land grazing is closely aligned with original European settlement in the region, but has declined in economic importance as private land enterprise has expanded. Domestic stock grazing on public land in the investigation area results in an estimated economic contribution of $0.9 million per annum (appendix 1).

While domestic stock grazing can be an effective tool to address specific land management problems at particular locations and times, scientific evidence indicates that, in general, grazing damages natural values especially biodiversity, water quality and soil condition. Accordingly, VEAC proposes a major shift in public land management priorities and recommends that domestic stock grazing be generally excluded from public land in the investigation area, with the exception of unused road licences (about 4600 hectares). The recommendations provide for limited future use of grazing as a targeted management tool, to address particular environmental or management problems, such as controlling particular weed infestations or maintaining a specific grassy habitat structure.

Some 1725 licences are recommended to be cancelled over an area of approximately 54,040 hectares worth approximately $0.76 million economic contribution and five fulltime equivalent total jobs. VEAC recommends phasing out domestic stock grazing over five years from public land water frontages (1260 licences over about 9280 hectares), while grazing in other areas (e.g. national parks and nature conservation reserves) is recommended to cease immediately (about 44,760 hectares). In addition, removal of grazing from Barmah forest will affect 38 permit holders over 29,600 hectares at an estimated economic cost of $0.14 million and one fulltime equivalent job. Although not a large economic value from a regional perspective, the recommended grazing and timber changes are more likely to have an impact on small towns such as Nathalia, Picola and Barmah.

Excluding stock grazing from public land water frontages is likely to require considerable fencing and, over time, the installation of offstream water points. These, and pest control, will cost an estimated $0.9 million per year. Access to water points across public land water frontages remains an important use of public land and water resources. Many adjoining landowners have undertaken streamside rehabilitation activities supported by catchment management authorities. The recommendations encourage the continuation of these projects, accelerated to exclude grazing from all public land water frontages within five years. Those licences held over unused roads within largely cleared freehold land, which are cleared of native vegetation, may continue. Where significant ecological values have been identified on unused roads adjoining larger public land blocks, these have been recommended for inclusion in conservation land categories.

As a cultural activity, domestic stock grazing is celebrated at the annual Barmah muster. The Barmah muster yards are a site of cultural heritage significance. With the exclusion of commercial grazing from the Barmah National Park (recommendation A7), the muster yards will no longer have a functional use. VEAC has recommended an area encompassing both the muster yards and the Dharnya cultural centre as a community use area (recommendation I6) to provide for a range of activities not generally permitted in a national park. This may include camping with horses and dogs and commercial activities, and could potentially allow for the annual Barmah muster to continue in a modified form as a community cultural event.

## Timber harvesting

The River Red Gum forests of the investigation area sustain a diverse timber industry with products ranging from sawlogs, fine furniture to firewood and sawdust. Nearly all production comes from the largest forests—Gunbower and Barmah but also Cobrawonga and along the lower Goulburn. Commercially harvested sawlogs go to mills in Koondrook, Echuca and Benalla, as well as a number of smaller producers mostly based in the areas surrounding Gunbower and Barmah forests. Riverine forests across the investigation area also supply domestic firewood to many local and regionally based permitholders. Firewood is also supplied commercially to Melbourne.

VEAC's recommendations would significantly reduce the total area of state forest in the investigation area and, in particular, would reduce available area of merchantable forest from 37,390 hectares to 9880 hectares (see appendix 6). This will greatly decrease the volume of wood produced and, consequently, the size of the timber industry. Increased wood volumes could be expected in the future as a result of additional silvicultural thinning in state forests (R42) and additional environmental water that would increase flooding of the remaining state forests and thereby increase current timber growth rates.

The net result of these changes would be to reduce the harvest of sawlogs from the current allocation of 6072 cubic metres per year (2006–07 licence volume) to a sustainable harvest figure of 1366 cubic metres per year, or 22.5 percent of its current size (see appendix 6 or 'C State forests' in chapter 3 for details). However, the sustainable harvest level would fall to 4294 cubic metres per year, or 71 percent of its current size, without implementation of any VEAC recommendations as a result of several factors, notably lower growth rates caused by reduced forest flooding in recent years. This assumes delivery of existing environmental water commitments. Reasons for the changes in these volume estimates since the Draft Proposals Paper are outlined in chapter 3.

In addition to sawlogs, some 4428 cubic metres of standard logs and 10,983 cubic metres of residual logs and firewood were licensed commercially in 2006–07 (domestic firewood is considered separately below). Sustainable harvest volumes are even more difficult to determine for these than for sawlogs. However, given that the same biological factors (growth rates and so on) operate over the same areas, the changes in sawlog availability are likely to be reflected in availability changes for other products over the long term.

In financial terms, VEAC's recommendations would reduce the net economic contribution of the timber industry to the Victorian economy from $2.6 million per annum (assuming 6702 cubic metres of sawlogs are cut) or $1.83 million (assuming existing environmental water delivery) to $0.6 million per annum. Employment in the industry, including multiplier or flow on effects would reduce from current employment of up to 102 fulltime equivalent jobs to an estimated average of up to 23 fulltime equivalent jobs. Further details of the analysis behind these figures, as well as the impact on several other social and economic indicators, are provided in the consultants' full report in appendix 1. Approximately 38 percent of the employment effects will occur even without implementation

of VEAC's recommendations, as harvest is reduced to a sustainable level based on the revised timber resource assessments outlined in chapter 3 and appendix 6.

While these impacts are relatively small in the regional context—the sector represents 0.08 percent of the regional economy—the impact will be felt disproportionately in a few local towns. The larger towns of Echuca and Benalla have substantial economies unrelated to the timber industry and are unlikely to be significantly affected. The town of Koondrook is more likely to be adversely affected. This is a small town where the contribution of the sawmill and its ancillary services plays a significant part in the economy. Similarly, the many smallscale producers located close to Barmah and Gunbower forests form a more substantial part of the local economy than in other parts of the investigation area.

However, it not possible to be regionally specific about the effects of the recommendations because operators, including the three sawmills, may not be equally affected. Rationalisation of the industry may reduce the impacts in some areas and increase it in others. The government and the Department of Sustainability and Environment decide on detailed matters such as future sawlog and other licence allocations, industry restructure or refocus, alternative supplies and measures to assist the industry to deal with VEAC's recommended changes.

## Domestic firewood

Domestic firewood harvesting will be affected by the recommendations. Current harvesting amounts to about 10,000 cubic metres per year. As with the commercial timber industry, location is a key factor in assessing the impact of the recommendations on domestic firewood harvesting. Key local factors include the availability of affordable alternatives, particularly reticulated natural gas and the travel distance to forest areas to obtain firewood.

There are several population centres with limited or no access to the reticulated gas network and where domestic firewood use is currently high. The Department of Sustainability and Environment will need to develop a firewood management strategy that provides a wood supply to dependent local communities (recommendation R44). The management of firewood supply will require close attention by the land managers to ensure that the following areas recommended by VEAC for this purpose make a significant contribution to the strategy (recommendation R40):

- Kerang, Koondrook and Cohuna areas from the recommended Gunbower, Benwell and Guttram State Forests
- Mildura and Robinvale from firewood zones in the recommended Murray River Park
- Nathalia, Picola and Barmah from firewood zones in the recommended Murray River Park
- Towns around Shepparton and Wangaratta from firewood zones in the recommended Shepparton Regional Park and Murray River Park.

The Department has implemented successful strategies for firewood management in other areas similarly affected (e.g. in northeast Victoria and Bendigo as part of implementation of the ECC Box–Ironbark recommendations). Such strategies have included five year firewood plans for specific localities, revised licensing procedures, encouragement of firewood plantations and farm woodlots, and establishment of regional firewood implementation committees (see recommendation R43).

## Apiculture

The investigation area plays an important role in the Victorian apiculture industry contributing around one million dollars to the economy and supporting about 30 fulltime equivalent jobs. Apiculture is generally proposed to continue as a resource use in the investigation area and at existing apiary sites in recommended national parks. In other places where currently permitted, apiculture can continue to operate and is unaffected by VEAC's recommendations. Overall, the recommendations are not expected to have any effects on the apiculture industry. However, the viability of apiculture is inseparable from the health of the River Red Gum forests and additional environmental water to the floodplain forests will significantly benefit production for this industry.

## Earth resources

The extractive and mining resources industries produced material with an average combined annual value of $12.78 million in the investigation area from 2003 to 2005. Almost the entire value—more than 98 percent— was derived from extractive industries producing crushed rock, sand, gravel and clay used in construction and roadmaking industries. Such resources need to be close to where they are used, as transport is expensive and can make up to 25 percent of production costs.

A number of stone reserves in the investigation area are no longer in use and have been proposed for rehabilitation and inclusion in other public land use categories. Where stone reserves and extractive industries are currently operating on public land, these areas have been recommended as earth resource extraction areas (recommendations K1–2) where this is the primary use. VEAC encourages the extractive industry to improve land management practices in line with the recommended principles and guidelines similar in intent to those currently applicable to mining operations.

The mining industry is of relatively low economic value in the investigation area, and consists largely of the industrial minerals salt and gypsum. There are a number of exploration permits including those for mineral sands, gold, base metals and potential for brown coal in the future. Existing permits will continue under current provisions.

## Other social, economic and environmental implications

### Increased cost of management of new parks

DSE currently manages most public land in the investigation area, through regional and statewide programs with existing state budget allocations. For the River Red Gum Investigation area, the social and economic consultants needed to estimate the additional cost to the Victorian economy of managing this public land in accordance with VEAC's recommendations. Primarily this recognises that

providing more rangers and visitor services for the extra visitors attracted to national parks is an additional cost. All other costs of managing, regulating and administering these public land areas—such as for existing DSE, DPI and PV employees, and for fire protection, pest plant and animal control, and road construction and maintenance—will continue to be paid from budget allocations and so are not new costs. Any reductions in management costs resulting from timber harvesting and grazing ceasing are removed. The consultants have estimated that the additional management costs for the new national parks would be $1.0 million per year.

Many submissions put the view that existing parks are already under-resourced and expressed the concern that adding to the area of parks may exacerbate this perceived problem. However recent examples of park implementation demonstrate a different outcome. Funding allocated to implementing the Environment Conservation Council (ECC) recommended Box–Ironbark parks and reserves was $20.8 million over four years. This funding provided for industry adjustment and a range of programs for park and reserve management, formal implementation, recreation and firewood supply. Funding for implementation of VEAC's Angahook–Otway recommendations was $13.1 million over four years and $3.4 million ongoing. The marine national parks system and associated elements from the ECC's Marine, Coastal & Estuarine Areas recommendations were also implemented with a comprehensive funding package. Expenditure by DSE and PV on park management increased substantially in real terms over the 12 years from 1995/96 to 2006/07.

Note that these figures are total budget allocations, and are not comparable with net contributions to the state economy. The Box–Ironbark funding included financial adjustment packages for displaced timber cutters, which are 'transfer payments' from one group in the economy to another and not included in benefit cost analyses as they cause no net change in contributions to the economy. Various overhead costs—substantial components of budget allocations—are 'sunk costs' and are similarly excluded from benefit-cost analyses. Capital changes and depreciation do not represent on-ground expenditure.

**Protecting riparian areas**

VEAC's recommendation to remove stream frontage grazing has both a cost in terms of fencing, provision of water points and pest control, and substantial benefits. Allowing grazing of frontages and stock access to streams has consequences for river condition, the health of riverside vegetation, water quality, populations of native fish, and native waterbird and animal species numbers. These values are difficult to quantify directly, however the consultants have included an estimated benefit for frontage fencing, derived from a valuation of healthy vegetation on stream banks in a choice modelling study carried out for DSE in 2006 for rivers including the Goulburn.

**Protecting small communities**

The rural sector across Australia has had to continually adjust to changing economic conditions. Populations in rural areas have declined. Services provided to rural areas (and rural populations) have become more concentrated in larger rural centres and the fortunes of many small towns have waned. In 1911, 43 percent of Australia's population was located in rural areas. By 1976 that figure was 14 percent, and in the mid-1990s it began to fall again. The rural communities facing the reality or prospect of decline are largely those dependent on primary production.

There is some evidence that the broader Australian society would like to avoid a continuation of this decline in the viability of rural communities. Commonwealth and state governments have implemented specific policies to support rural communities.

Responding to such concerns in public consultations and submissions, the consultants have obtained values from several studies addressing precisely this issue. They assessed society's willingness to pay to maintain viable rural communities. The average valuation from relevant studies—$161,000 per annum—has been applied to small towns in the investigation area and included as a cost in the benefit cost analysis.

## Strategic planning

Land use planning is currently fragmented and area or site specific, and lacks co-ordination across the entire River Murray region. Fifteen local government areas, four catchment management authorities, nine wholesale and retail water authorities and several regional and central offices of the Department of Sustainability and Environment, Parks Victoria and other state government departments and agencies all contribute to planning for public land and development on adjacent private land. Adding to the complexity are the multiple agencies with planning responsibilities on the other side of the River Murray, and the fact that the river itself is within the jurisdiction of New South Wales. VEAC considers it essential that long term, strategic planning for conservation, recreation, tourism, and a range of economic uses is applied to public and private land along the River Murray corridor as a whole and has recommended a River Murray Strategy be undertaken by the government (recommendation R37). This will enable areas for development and high and low intensity of use to be planned and coordinated at the landscape scale, similar to planning for the Victorian coastal strip.

# Acronyms

| | |
|---|---|
| **AAV** | Aboriginal Affairs Victoria, a division of the Department of Planning and Community Development |
| **ABS** | Australian Bureau of Statistics |
| **CAMBA** | China-Australia Migratory Bird Agreement |
| **CAR** | Comprehensive, Adequate and Representative |
| **CD** | Census Collection District |
| **CMA** | Catchment Management Authority |
| **COAG** | Council of Australian Governments |
| **CRG** | Community Reference Group for VEAC's River Red Gum Forests Investigation |
| **DPI** | Department of Primary Industries |
| **DSE** | Department of Sustainability and Environment |
| **ECC** | Environment Conservation Council |
| **EVC** | Ecological Vegetation Class |
| **FFG** | Flora and Fauna Guarantee |
| **FMA** | Forest Management Area |
| **GB CMA** | Goulburn Broken Catchment Management Authority |
| **GCG** | Government Contact Group for VEAC's River Red Gum Forests Investigation |
| **GL** | Gigalitres |
| **GMW** | Goulburn Murray Water |
| **ISC** | Indigenous Steering Committee for VEAC's River Red Gum Forests Investigation |
| **IUCN** | International Union for Conservation of Nature |
| **JAMBA** | Japan-Australia Migratory Bird Agreement |
| **JANIS** | Joint ANZECC/MCFFA National Forest Policy Statement Implementation Sub-committee |
| **LCC** | Land Conservation Council |
| **LGA** | Local Government Area |
| **MALLEE CMA** | Mallee Catchment Management Authority |
| **MDBC** | Murray Darling Basin Commission |
| **ML** | Megalitres |
| **MLDRIN** | Murray-Lower Darling Rivers Indigenous Nations |
| **NC CMA** | North Central Catchment Management Authority |
| **NE CMA** | North East Catchment Management Authority |
| **NSW** | New South Wales |
| **RCS** | Regional Catchment Strategy |
| **ROKAMBA** | Republic of Korea-Australia Migratory Bird Agreement |
| **SA** | South Australia |
| **SMZ** | Special Management Zone in state forest |
| **SPZ** | Special Protection Zone in state forest |
| **RFA** | Regional Forest Agreement |
| **TFN** | Trust For Nature (Victoria) |
| **QLD** | Queensland |
| **VEAC** | Victorian Environmental Assessment Council |

# Glossary

**Adaptive management.** Land management practices are periodically reviewed and refined based on new information and research.

**Benefit–cost analysis (BCA).** Assessment of the net economic gains or losses that may arise as a consequence of changed public land management. The BCA in appendix 1 is Statewide—benefits and costs are considered from the viewpoint of all Victorians—while the separate regional impact analysis is confined to VEAC's investigation area and uses different methodology.

**Advisory committee (Aboriginal).** A formally appointed committee consisting of Aboriginal Traditional Owners or Aboriginal people more generally that provides the land manager with advice on one or more aspects of public land management.

**Bioregion.** A geographic region characterised by a combination of physical and biological features such as terrain, climate and ecological communities.

**CAR reserve system.** A system of forest reserves established by agreement between Commonwealth, state and territory governments to provide for biodiversity protection. The system is based on the principles of comprehensiveness, adequacy and representativeness.

**Catchment management authority (CMA).** Regional statutory authority established under the *Land and Catchment Protection Act 1994* responsible for strategic planning and coordination of natural resources; including land, water and biodiversity within its catchment region. Catchment management authorities also have floodplain management functions under the *Water Act 1989*.

**Choice modelling.** A stated preference non-market valuation technique involving a sample of people being asked to make a sequence of choices between different management strategies described in terms of their impacts on particular attributes. This technique works best where the study area, attributes and responses are complex. In the study commissioned by VEAC, respondents were asked to make a series of choices between scenarios with different levels of protection for several attributes, including status quo, and for different annual payments including $0. The analysis allows respondents' trade-offs between various attributes to be identified, rather than just broadly indicating support for 'the environment' or the status quo.

**Coarse woody debris.** Fallen wood, branches, and logs often collected as campfire wood. Many ground-dwelling native animals are dependent on coarse woody debris for habitat.

**Community Reference Group (CRG).** A group of community representatives established under s.13 of the *VEAC Act 2001* for a VEAC investigation with the purpose of providing advice to Council. The group should have representatives with a broad range of interest as described in s.13.

**Co-management (Aboriginal).** Land management issues and decisions between Aboriginal groups and government are shared to varying extents in this model in accordance with a formal co-management agreement. Management decisions are made through a board or committee of management comprising a majority of Aboriginal Traditional Owner group/s representatives.

**Country (Traditional country).** Aboriginal people regularly refer to the land and natural resources of an area as 'Country'. The land and waters of Australia have sustained Aboriginal people for thousands of years and this long occupation has resulted in a profound cultural and spiritual relationship between Aboriginal people and Country.

**Declared water supply catchment areas.** Under the *Catchment and Land Protection Act 1994*, water catchments can be declared as 'special water supply catchment areas'—a mechanism that identifies the importance of the area for water supply. 'Special area plans' can be prepared for such areas to guide land use.

**Dedicated reserve.** A term used in the CAR reserve system to describe reserves that are equivalent to the IUCN Protected Area Management Categories I, II, III or IV as defined by the International Commission for National Parks and Protected Areas (IUCN 1994) and have secure tenure that requires, for example, action by a Parliament to be revoked. In practice such reserves include natural feature reserves (such as bushland areas and streamside areas), and some regional parks, as well as national, state and wilderness parks, reference areas and nature conservation reserves.

**Dispersed camping.** Camping at a site of one's choosing, which is accessible by vehicle and where there are generally no toilets, drinking water, or fireplaces. It may include the ability to have an open fire and obtain firewood.

**Ecological vegetation classes (EVCs).** Components of a vegetation classification system derived from groupings of vegetation communities based on floristic, structural and ecological features.

**Ecosystem services.** The public good services from natural ecosystems, and the species of those ecosystems, which provide benefits to humans. Included are provision of clean air and water, biodiversity services and sequestration of carbon.

**Ecological thinning.** The practice of managing forest establishment, composition and growth, to achieve specified ecological objectives such as restoring a particular forest structure.

**EVC complex.** A vegetation unit where two or more EVCs are unable to be distinguished in an area but are known to exist discretely elsewhere.

**EVC mosaic.** A vegetation unit consisting of two or more discrete EVCs, which were unable to be distinguished in mapping because of the scale used.

**Exempt Crown land.** Crown land which, under the *Mineral Resources (Sustainable Development) Act 1990*, is in a public land-use category in which exploration or mining is not permitted. Exempt Crown land includes national, state and wilderness parks, and reference areas. Exceptions to allow mining exist under Section 40 of the *National Parks Act 1975* which provides for the continuance of an exploration or mining licence current at the time the land is declared in one of those public land-use categories.

**Fire protection plans.** Plans prepared within the context of the Code of Practice for Fire Management on Public Land. They define fire protection strategies adopted to achieve those objectives. Each Fire Protection Plan has four main strategies: wildfire prevention, wildfire preparedness, wildfire suppression and wildfire recovery.

**Flora and Fauna Guarantee (FFG) Action Statements.** Documents prepared for selected species, ecological communities and potentially threatening processes listed under the *Flora and Fauna Guarantee Act 1988*.

**Forest management area (FMA) plan.** A plan developed to address the full range of values and uses in state forest, including nature conservation and timber production. There are 14 forest management areas in Victoria, and a plan is produced for each FMA.

**Formed roads and tracks.** Under existing legislation, four wheel driving/motor car driving and trail bike riding are restricted to formed roadways on public land. The *Road Management Act 2004* describes a public road or roadway as the area of the public road that is open to or used by members of the public and is developed by a road authority for the driving or riding of motor vehicles. In some places, walking or bridle trails have been constructed. The use of motor vehicles on these trails is not permitted. The term track is generally applied to a constructed roadway of lower class (C or D) such as a narrow earth road on which speed is severely restricted by grades, curves or surface conditions. The term track should not be applied to an area that is shaped by off-road use. Off-road riding or driving on Victoria's public land is illegal. Some 36,000 km of legal roads and tracks have been constructed for the passage of vehicles on public land with limited restrictions or closures typically due to seasonal weather effects, erosion or safety reasons.

**Fuel reduction burning (FRB).** The use of low intensity fires as a management tool to remove more flammable fuel from parts of forests and parks, with the purpose of reducing flame height, decreasing intensity and slowing spreading patterns of any potential bushfire and making firefighting easier.

**Gigalitre (GL).** One billion litres (1,000,000,000 L).

**Habitat links.** Areas of often linear remnant or planted vegetation that connect two or more patches of vegetation. These links may be continuous or discontinuous strips and patches of vegetation. Often also referred to as corridors.

**Hand back-lease back.** Also known as 'joint management', this land management model applies where the land title is transferred to an Aboriginal group/s and then leased back to the state for a specified period and typically as a park or protected area. The role that Aboriginal people have in management of the area is decided as part of an agreement forming the basis for the lease and any associated settlement.

**Heritage Rivers.** Rivers or reaches of rivers designated under the *Heritage Rivers Act 1992*, managed primarily to protect their significant nature conservation, recreation, scenic or cultural heritage values.

**High fire danger period.** What VEAC has called the High Fire Danger Period is called the Fire Danger Period by the CFA and the Prohibited Period by DSE. Fires in the open air are subject to legal restrictions when the CFA Fire Danger Period is declared for a particular municipality and restrictions remain in place until 1 May, unless revoked earlier due to seasonal conditions. No fires can be lit or be allowed to remain alight on Total Fire Ban days.

**Indigenous steering committee (ISC).** The Indigenous Steering Committee was established under s.12 of the *VEAC Act 2001* for the River Red Gum Forests Investigation to advise Council and the consultant appointed to undertake Indigenous community consultation on methods and procedures for such consultation.

**Indigenous vegetation.** Vegetation native to a particular location.

**IUCN.** The IUCN was created in 1948. It is the world's largest conservation-related organisation and brings together 76 states, 111 government agencies as well as a large number of non-government organisations, and some 10 000 scientists and experts, from 181 countries. Through various programs it supports the conservation of natural heritage—for instance the work of the IUCN World Commission on Protected Areas aims to promote the establishment and effective management of a worldwide, representative network of terrestrial and marine protected areas.

**JANIS criteria.** Criteria defined by the Joint ANZECC/ MCFFA National Forest Policy Statement Implementation Sub-committee for the establishment of the CAR system of forest reserves.

**Joint management.** See hand back-lease back.

**Living Murray icon sites.** Also known as 'significant ecological assets', these six sites were selected by the Murray-Darling Basin Commission for their regional, national and international ecological importance. These sites are: Barmah-Millewa forest; Gunbower and Koondrook-Perricoota forest; Hattah lakes; Chowilla floodplain including Lindsay and Wallpolla Islands; Murray River mouth, Coorong and lower lakes; and the River Murray channel.

**Non-market benefits.** Those benefits that are not directly transacted in markets, and where values can not be estimated directly from market transactions. Non-use benefits are a key subset of non-market benefits. Other non-market benefits include some direct use values (e.g. recreation) as well as indirect use benefits (water filtration, carbon sequestration).

**Northern Region Sustainable Water Strategy.** A discussion paper outlining the options for water resource use over a planning period of 50 years in the Northern Region of Victoria was released in early 2008. A draft strategy is due for release in mid 2008 and the final strategy in early 2009.

**Pre-1750 EVC.** The extent of an ecological vegetation class (EVC) prior to the year 1750 as defined by existing vegetation supplemented by predictions and modelling of vegetation that has been cleared since European settlement.

**Public land.** Under the *Victorian Environmental Assessment Council Act 2001* public land refers to (a) any unalienated land of the Crown, including land temporarily or permanently reserved under the *Crown Land (Reserves) Act 1978*; (b) state forest within the meaning of the *Forests Act 1958*; (c) park, within the meaning of the *National Parks Act 1975*; (d) land under the ownership or control of Melbourne Parks and Waterways, established under the *Water Industry Act 1994*; (e) land vested in any public authority, other than – (i) a municipal council; or (ii) an Authority under the *Water Act 1989*, to the extent that the land vested in the Authority is within a sewerage district listed in column 3 of Schedule 12 of that Act.

**Ramsar Convention.** Treaty for protection of wetlands of international importance. For a wetland to be placed on the register certain criteria have to be fulfilled such as being important to the survival of migratory birds or endangered animals and plant species.

**Regional impact analysis (formerly regional assessment).** This impact analysis provides estimates of the impacts on local and regional community employment and incomes, including both direct and flow-on effects. This method uses an input-output model but does not determine whether the people of Victoria are likely to incur a net economic gain or loss as a result of changed management.

**Regional Forest Agreement (RFA).** An agreement between the Commonwealth and a state government, for the long-term management and use of forests in a particular region.

**Regional water authorities.** Statutory authorities responsible for supplying water, primarily to urban consumers, and the disposal of waste-water from towns.

**Regulated river/stream.** Controlled flows within a river system resulting from the influence of a regulating structure such as a weir or dam.

**Residual logs.** Produced as a by-product of sawlog harvesting and regrowth management operations. Comprises logs too small to meet sawlog or sleeper specifications or may meet sawlog specifications for size but with greater than 50 percent defect. Residual logs may be harvested under annual licence or tender from areas not required for production of commercial and domestic firewood.

**Restricted Crown land.** Land owned by the Crown upon which, under the *Mineral Resources (Sustainable Development) Act 1990*, any exploration or mining requires the consent of the Minister for Environment and Climate Change; includes nature conservation reserves, regional parks and natural features and other reserves.

**Riparian.** The area of land along the bank of a river or watercourse.

**Roads and tracks (formed).** See 'formed roads and tracks'.

**Sawlog.** Any length of log of merchantable species which is of suitable quality for producing sawn timber.

**Site quality.** A measure of the growth potential of a forest site (as determined by soils and climate). Often expressed in terms of the dominant height of trees at a particular age.

**Sustainable yield**. Rate of harvest of timber that can be maintained for a defined period. This figure may increase in the future if the condition of the forest is improved but should not decrease except in the case of a catastrophic event such as fire (*cf* long-term sustainable yield).

**Silvicultural thinning.** The practice of managing forest establishment, composition and growth, to achieve specified forestry objectives.

**Solid fuel fire ban.** A prohibition on the use of solid fuel fires—established using wood, logs, sticks, coal etc for a specified period.

**Special Management Zone (in FMA plans).** Delineates an area that is managed to maintain specified values, such as flora and fauna habitat or catchment values, while catering for timber production under certain conditions.

**Special Protection Zone (in FMA plans).** Delineates an area that is managed for the conservation of natural or cultural values and where timber harvesting is excluded. It forms part of a network designed to link and complement conservation reserves. An informal reserve.

**State border (Victoria and New South Wales).** The Surveyor-General defines the state border as a boundary line running along the top of the southern or left bank (looking downstream) of the River Murray. The top of the bank is not always easily identified. The whole River Murray watercourse is within New South Wales. The ordinary common law principles of erosion and accretion apply including undercutting by water abrasion and subsequent landslip, but the border is not altered by rapid changes in course such as avulsion (e.g. meander cut-off).

**Traditional Owner (groups).** Aboriginal people and groups who have established over hundreds of generations a spiritual tie with specific tracts of land or traditional Country.

**Unrestricted Crown land.** Land owned by the Crown that, under the *Mineral Resources (Sustainable Development) Act 1990*, can generally be prospected, explored or mined, but over which conditions may apply.

**Visitor days.** Accumulated number of visits to a site including overnight stays.

**Water entitlement.** The volume of water authorised to be taken and used by an irrigator or water authority. Water entitlements include bulk entitlements, environmental entitlements, water rights, sales water, surface water and ground water licences.

**Yorta Yorta Co-Management Agreement.** A formal agreement between Yorta Yorta Nation Aboriginal Corporation and the State of Victoria relating to management of Crown land and waters over a total area of approximately 50,000 ha in northern Victoria.