

Statewide Assessment of Public Land Discussion Paper FOR PUBLIC COMMENT



August 2016

VICTORIAN ENVIRONMENTAL ASSESSMENT COUNCIL

The Victorian Environmental Assessment Council (VEAC) was established in 2001 under the *Victorian Environmental Assessment Council Act 2001*. It provides the State government of Victoria with independent advice on protection and management of the environment and natural resources of public land.

The five Council members are:

Hon. Phil Honeywood (Chairperson)
Ms Joanne Duncan
Ms Anna Kilborn
Dr Charles Meredith
Dr Geoffrey Wescott

Community Reference Group

The Community Reference Group for VEAC's Statewide Assessment of Public Land is independently chaired by Mr Don Saunders.

Membership consists of:

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Mr Michael Coldham	Four Wheel Drive Victoria
Ms Megan Davison	Minerals Council of Australia, Victoria
Mr Alex Green	Municipal Association of Victoria
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Mr Russell Costello	Victorian National Parks Association
Mr Barnaby McIlrath	Victorian Planning and Environmental Law Association
Ms Dianne Smith	Victorian Tourism Industry Council

WRITTEN SUBMISSIONS ARE INVITED ON THIS DISCUSSION PAPER.

The closing date for submissions is
Monday 7 November 2016.

Please note that VEAC is receiving written submissions on the Draft Proposals Paper for this investigation concurrently with submissions on this Discussion Paper. Your submissions on either or both of these reports are welcome.

You may make an online submission via VEAC's website at www.veac.vic.gov.au or send your written submission by post or by email (see contact details). Only submissions sent directly to VEAC will be treated as submissions.

There is no required format for submissions, except that you must provide your name and your contact details, including an email address if you have one. All submissions will be treated as public documents and will be published on VEAC's website. The name of each submitter will be identified as part of each published submission, but personal contact details will be removed before publishing. Confidential submissions are discouraged. If there are exceptional circumstances that require confidentiality, please contact VEAC before making your submission.

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Discussion Paper
FOR PUBLIC COMMENT



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Foreword



Council members (left to right): Geoffrey Wescott, Anna Kilborn, Phil Honeywood (Chairperson), Joanne Duncan and Charles Meredith

The Victorian Environmental Assessment Council (VEAC) has welcomed the opportunity to conduct this major assessment of public land in Victoria. When completed in 2017, the Council is confident it will be a valuable resource for government and the community.

Public land is an asset for all Victorians, and for the wider Australian and global communities. Public land provides places for cultural and social identity, community and recreational uses, resource uses, and provision of government services. In addition, this assessment has established that 70 per cent of the areas supporting the highest terrestrial biodiversity values in the state are on public land.

Unlike other jurisdictions, Victoria has benefited from all public land in the state being systematically studied and reviewed since the early 1970s by VEAC and its predecessors the Environment Conservation Council and the Land Conservation Council (LCC). The sound framework for public land management in Victoria established over successive governments as a result of their consideration of the recommendations of VEAC and its predecessors is something of which the state can be proud.

However there have been major changes since 1988, when the LCC conducted the last statewide assessment of public land, which make a stocktake timely. These include: recognition of Aboriginal rights and interests in land, awareness of climate change, continued fragmentation and deterioration of native vegetation, the digital revolution in information and mapping, social and economic changes leading to changes in how public land is used and valued, and changes in public administration including the corporatisation or privatisation of public utilities.

This investigation is a collaborative exercise, depending on the cooperation and support of government departments and agencies. The Council extends its appreciation to the individuals and organisations who have assisted VEAC by

providing and updating information, checking drafts and contributing advice and valuable discussion. The views expressed or any errors are of course the responsibility of VEAC. The Council has also been assisted throughout the investigation so far by the advice of an active and engaged Community Reference Group (CRG) representing a wide range of interests in public land.

Many of the analyses conducted for the investigation—especially those related to assessing the implementation of recommendations—are detailed and time-consuming. These analyses will continue for the remainder of the investigation, and information will be updated in the final report.

This discussion paper is being released for public comment together with a draft proposals paper containing draft recommendations. The material contained in the interim report on the first of the three specific topics in the terms of reference—public land classification—provided to the Minister in September 2015 has also been included or summarised in this discussion paper. The Council hopes that the joint release of the discussion paper and the draft proposals paper will facilitate the preparation of submissions on both the information and analyses contained in the discussion paper and Council's draft recommendations that aim to address the issues arising from the assessment. An extended period for public comment has been provided to 7 November 2016 to encourage submissions on either or both of these papers. The Council looks forward to your input during this consultation period.

Phil Honeywood
Chairperson

Acknowledgment of Country

The Victorian Environmental Assessment Council acknowledges and pays its respects to Victoria's Native Title Holders and Traditional Owners, and the rich cultural and intrinsic connection they have to Country. The Council also recognises and acknowledges the contribution and interest of other Aboriginal peoples and organisations in the management of land and natural resources.



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Introduction

1.1 Background to the investigation

The policy framework for the classification and management of Victoria's public land is provided through the public land use recommendations of the Victorian Environmental Assessment Council (VEAC) and its predecessors - the Land Conservation Council (LCC) and the Environment Conservation Council (ECC) which replaced the LCC in 1997.

The LCC, established in 1971, and its successors (the ECC and VEAC) were established to carry out studies or investigations of public land throughout Victoria and make recommendations to government on the appropriate use of that land. Since the LCC made its first recommendations to government in 1973 for the use of public land in the South-Western Area District 1, these organisations have systematically and comprehensively examined and made recommendations on the use of most public land in Victoria. Forty-three separate regional studies, reviews and statewide or special investigations have resulted in thousands of individual land use recommendations, the vast majority of which have been accepted by government.

To enable the orderly investigation of public land, the LCC divided Victoria into 17 study areas. By 1988, all 17 areas had been studied at least once, and the LCC published a stocktake of its work, the *Statewide Assessment of Public Land Use*. This report aimed to provide a measure of the effectiveness of the LCC in attempting to balance competing aspirations for the various values of public land. The report had several other aims, among which were to provide an overview of the environmental values and economic resources on public land and the extent to which they were protected and utilised respectively, and to review the extent to which land managers had implemented those LCC recommendations that were accepted by government.

It is now more than 25 years since that report and it is considered timely for VEAC to revisit aspects of the 1988 assessment in order to provide updated information for public land policy and management.

1.2 Terms of reference for the investigation

On 17 September 2014, the then Minister for Environment and Climate Change, Hon Ryan Smith MP, requested that VEAC carry out a Statewide Assessment of Public Land. A business plan and budget was prepared for the investigation as required under the *Victorian Environmental Assessment Council Act 2001* (VEAC Act) and submitted to the then Minister on 16 October 2014. Resources were approved by the then Minister on 27 October 2014. On 2 April 2015, the request was amended by the then Minister for Environment, Climate Change and Water, Hon Lisa Neville MP. The amended terms of reference (overleaf) were tabled in Parliament on 15 April 2015.



Terms of reference

Pursuant to section 15 of the *Victorian Environmental Assessment Council Act 2001*, the Minister for Environment, Climate Change and Water requests the Victorian Environmental Assessment Council to carry out an investigation into public land in Victoria.

It is more than 25 years since the Land Conservation Council's Statewide Assessment of Public Land Use was published and it is timely to consider revisiting aspects of that assessment in order to provide updated information for public land management. National parks are recognised internationally as the core element of nature conservation and protection. Victoria's protected area estate is significant but remains fragmented and incomplete.

The purpose of the investigation is to carry out a statewide assessment of public land in Victoria which considers the recommendations of the council and its predecessors and the appropriateness of the current system of public land use categories established as a result. The focus of the investigation is to provide information and recommendations to assist management effectiveness and is not intended to change the current levels of protection underpinning Victoria's protected area system.

In particular, the council is requested to investigate and provide:

1. an assessment of the current system of public land use categories, including identification and evaluation of approaches adopted in other jurisdictions nationally and internationally, and consideration of options for changing or consolidating the existing categories to result in a system of categories that is simple and clear and that supports effective and efficient public land management;
2. an assessment of the current reservation status of public land, including areas where land use has changed since government accepted a recommendation; and
3. an inventory of the types of values on public land.

The council is requested to provide an interim report on the first term of reference that includes options for the consolidation of the existing public land categories by September 2015. To ensure there is an opportunity for public comment, the council is requested to publish information to assist in the making of submissions on this term of reference in the notice of investigation.

The council must prepare a discussion paper and a draft proposals paper.

The council must report on the completed investigation by February 2017.

1.3 The interim report

The terms of reference specify the preparation of a discussion paper and a draft proposals paper, both of which must be advertised and public submissions sought. For this investigation an interim report was also required on the first of the three specific terms of reference and was submitted to the then Minister on 30 September 2015. The focus of the interim report was on the recommendations of VEAC and its predecessors and the current system of public land use categories established as a result. The interim report considered options for making the public land classification system simpler to improve management and administration. It did not seek to re-open previous land-use decisions made by successive governments.

The interim report was an additional requirement to preparation of the discussion paper and the draft

proposals paper. Formal public comment was not sought on the interim report. However, the Council decided to make the interim report available to the public as an online document on the VEAC website.

The contents of the interim report have been revised, updated (with some material summarised) and included in this discussion paper in chapters 1, 2 and 3.

1.4 This discussion paper

This discussion paper addresses all three specific terms of reference. Submissions are welcome on any aspect of this report.

1.5 Victorian Environmental Assessment Council

The *Victorian Environmental Assessment Council Act 2001* came into effect on 31 December 2001. This Act repealed the *Environment Conservation Council Act 1997* and established the Victorian Environmental Assessment Council to conduct investigations and make recommendations relating to the protection and ecologically sustainable management of the environment and natural resources of public land. VEAC is a successor organisation to the Land Conservation Council, established in 1971, and the Environment Conservation Council, which replaced the LCC in 1997.

Public land is defined in the VEAC Act and includes Crown land and land owned by state government public authorities. It excludes private freehold land, land owned by local councils and Commonwealth land. VEAC does not make recommendations for private land, local councils' freehold land or Commonwealth land. However, VEAC reports include information on all land, where relevant, in order to provide a context for consideration of public land.

The current five members appointed to VEAC are Hon Phil Honeywood (Chairperson), Ms Joanne Duncan, Ms Anna Kilborn, Dr Charles Meredith and Dr Geoffrey Wescott. During the course of this investigation the terms of three members expired: Mr Ian Harris, Mr Ian Munro PSM and Ms Angela Reidy. The current Council thanks these past members for their contribution to this investigation and, in particular, to the development of the interim report submitted to the then Minister in September 2015. A brief biography of each of the current Council members can be found on VEAC's website at www.veac.vic.gov.au. The Council is supported by a small research, policy and administrative secretariat. The VEAC Act requires the Council to consult with departments and public authorities, and requires departments and public authorities to give practicable assistance to the Council in carrying out investigations. VEAC papers and reports are prepared independently.

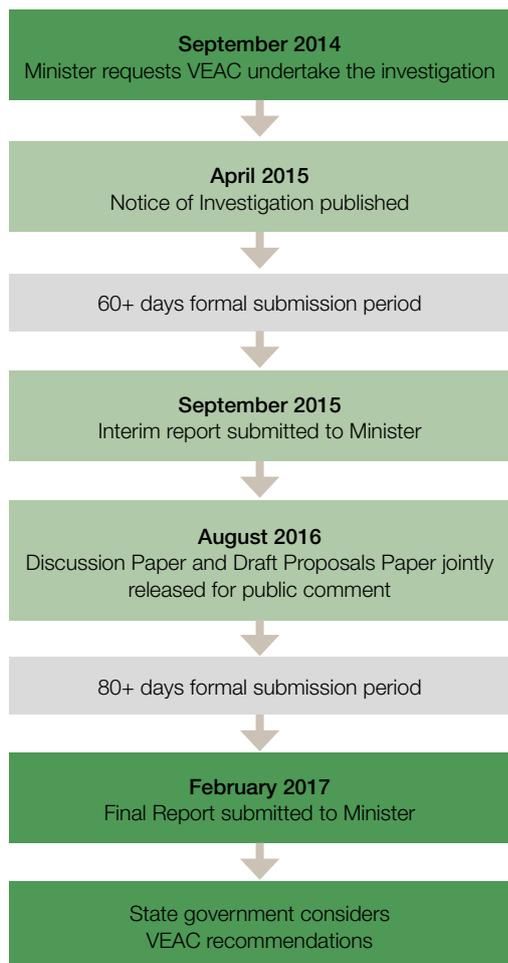
The Council conducts its affairs in accordance with the VEAC Act. In particular, section 18 specifies that 'Council must have regard to the following considerations in carrying out an investigation and in making recommendations to the Minister –

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

1.6 The investigation process

The process for this investigation was undertaken as specified in the VEAC Act and the terms of reference for the investigation. The process and timelines are shown in figure 1.1 below.

Figure 1.1
Investigation process and timelines



1.7 Policy context

There are many state government policies and strategies that inform this investigation. Several of the key policies currently being developed and of particular relevance to the terms of reference of this investigation are described briefly below.

Biodiversity Plan

In late 2016 a new biodiversity strategy, *Protecting Victoria's Environment – Biodiversity 2036*, will be finalised. It is a twenty-year plan aiming to stop the decline of Victoria's biodiversity. The plan is based around five key themes:

- ✦ a healthy environment for healthy Victorians
- ✦ linking our society and economy to the environment
- ✦ investing together to protect our environment
- ✦ better, smarter management of our biodiversity
- ✦ biodiversity leadership across government.

The plan is intended to assist Victorians to recognise the multiple values that biodiversity provides, and to identify the tools, tasks and roles needed to ensure that Victoria's natural environment is healthy and positioned to cope with the effects of future population growth and climate change. A consultation draft was released earlier this year.

Victorian Water Plan

Climate change, population growth and changing community expectations challenge the way the water cycle is managed. The *Victorian Water Plan* is part of a long-term approach by the Victorian government to overcome these challenges while ensuring that it supports all Victorians. A discussion paper has been released recently and input from the community and stakeholders will be incorporated into the final plan.

Review of the native vegetation clearing regulations

Victoria's native vegetation clearing regulations outline whether native vegetation can be cleared for development or other land uses and, if it is able to be cleared, the requirements that need to be followed. The quantity and the quality of native vegetation in Victoria influences the overall health of the natural environment by providing habitat for species, and it is connected to Victoria's water and soil quality. A review of the native vegetation clearing regulations is currently underway and will inform important changes to the present system.

New Marine and Coastal Act and improved management and oversight arrangements

The Victorian government is developing a new Marine and Coastal Act, and improving management and oversight arrangements for Victoria's marine and coastal environment. The changes are to ensure that legislation is in place to support a healthy coast and marine environment in the future. Key issues and threats, such as climate change, population growth, and development pressures are being considered. Improved community and Traditional Owner involvement is also being explored. The new Act aims to provide a more streamlined approach ensuring that there is less complexity and fragmentation in the laws applicable to our coasts and sea.

Review of the Flora and Fauna Guarantee Act

The *Flora and Fauna Guarantee Act 1988* (FFG Act) is Victoria's key biodiversity protection legislation. It establishes objectives for the conservation of all flora and fauna, a biodiversity planning framework, and regulatory controls for threatened fish and protected flora. The FFG Act is currently being reviewed to ensure that it is both modern and effective and conserves Victoria's biodiversity into the future. The review is closely linked to the development of a statewide plan for managing Victoria's biodiversity, *Protecting Victoria's Environment - Biodiversity 2036*.

1.8 Community consultation

For every investigation, the VEAC Act requires VEAC to publish a notice of investigation and receive submissions for a minimum period of 60 days (if the Minister does not specify a time).

In addition to the formal submission period, consultation so far has included advice from a Community Reference Group, targeted consultation with local government, as well as meetings and discussions with public land managers across Victoria.

1.8.1 Written submissions

Written submissions are one of the key processes used by VEAC to seek community views on issues associated with public land. The first submission period for this investigation commenced with the advertisement of the notice of investigation on 18 April 2015 and closed on 22 June 2015.

The terms of reference for this investigation requested the Council provide an interim report on the first term of reference that includes options for the consolidation of the existing public land categories by September 2015. In order for the interim report to be informed by public comments, the Council was requested to publish information to assist in the making of submissions on this

term of reference in the notice of investigation. Maps and fact sheets were published on VEAC's website for this purpose.

VEAC received 51 submissions following publication of the notice of investigation, 13 from individuals and the remainder from organisations including environment groups, community organisations, friends and landcare groups, local government, industry groups, and Victorian government agencies and entities. See appendix 1 for a list of the submissions received. Submissions can be viewed at www.veac.vic.gov.au.

Submissions covered matters related to the full scope of the investigation. Some addressed a single term of reference, others addressed multiple terms of reference. In summary, 39 submissions expressed views on public land classification, 32 addressed the reservation status of public land and 32 commented on values on public land.

1.8.2 Community Reference Group

VEAC established a Community Reference Group (CRG) for this investigation in accordance with section 13 of the VEAC Act. Members of this group represent a broad range of interests related to the investigation. The CRG members are listed on the inside front cover of this report. The CRG has met four times to date during the investigation: in June 2015, August 2015, April 2016 and in June 2016.

1.8.3 Consultation with local government

VEAC engaged The Public Land Consultancy (TPLC) to undertake detailed consultation with a sample of nine local councils on their use and management of Crown land reserves. All other local councils in Victoria were invited to comment on the consultation report. Twenty-two additional local councils provided input to VEAC in response to this invitation. The report is available on the VEAC website at www.veac.vic.gov.au.

1.8.4 Overview of input to date

The following sections contain a summary of input received from the public, the Community Reference Group, public land managers and local councils, organised under the three topics in the terms of reference. Only input that falls within the scope of the three specific terms of reference has been included. The summaries below communicate the views of those that have made submissions and provided feedback, and this input will be taken into account by VEAC in the preparation of its reports.



Public land categories

Written submissions

The written submissions provided a range of valuable comments on the current public land use categories. Several submissions referred to the current system being confusing to the community, some arguing that any changes should be aimed at improving understanding of permitted uses, and others commenting that aligning categories with legislation and management was important. Support was expressed in several submissions for rationalising categories as long as there was no loss of protection. Others warned against over-simplification.

Several submissions put the view that land legislation should be reviewed, particularly the *Land Act 1958* and the *Crown Land (Reserves) Act 1978* with respect to reserve purposes. There was a desire expressed in some submissions to see significance rankings (national, state, regional, local) reflected in public land categories. It was noted that the recognition of Traditional Owner rights has changed substantially since the public land use categories were established. There are new forms of title which are of relevance to the conceptualisation of public land use categories. The improved understanding and awareness of Aboriginal cultural heritage could also be reflected in descriptions of the objectives and values associated with public land use categories.

Several submissions noted the desirability of aligning protected area categories with IUCN categories where possible.

A number of specific suggestions and comments were made including the following:

- ✦ merge regional and metropolitan parks into recreation parks
- ✦ include nature conservation reserves and some other protected area categories in the National Parks Act
- ✦ improved recognition of the importance of linear reserves such as water frontages and roads for connectivity is needed
- ✦ forest categories do not reflect contemporary forest values, which have shifted from hardwood production and plantations.

Community Reference Group

Advice from the Community Reference Group included:

- ✦ the need to describe how the public land use categories are given effect
- ✦ agreement that the public have been confused by land uses varying within a single category type based on past political decisions (e.g. grazing in national parks)
- ✦ the opportunity for more effective communication of public land use (e.g. improved signage) including the suggestion that public land category names reflect the permitted uses and values in a meaningful way, as well as the potential for a communication tool that clearly outlines the permitted uses of specific sites to the public (e.g. a mobile phone app)
- ✦ the opportunity to reflect changes in Aboriginal land tenure and joint management arrangements into future public land categorisation
- ✦ agreement that land use categories that overlapped or were confused with each other are coastal reserve/coastal park, and state park/state forest/forest park
- ✦ input from apiarists, four wheel drivers, outdoor education sector, and the minerals and timber industries about their use of public land
- ✦ the opportunity to review the comprehensiveness, adequacy and representativeness of the land use categories that make up the protected area system.

Public land managers

Input from meetings with public land managers included observations that the public have a generally low level of understanding of the current system of classifying public land. In particular, State forest, State park, forest park, wildlife reserve and natural features reserve appeared to cause confusion. While there is general agreement that there is scope to revise and consolidate the public land categories, public land managers were of the opinion that the public were most interested in being able to access accurate information about permitted activities in specific locations rather than gaining a conceptual understanding of public land categories. The difficulties in precisely mapping areas of public land available in Victoria for deer hunting and recreational prospecting, for example, are well known.

The divergence between the categories established through government-accepted recommendations of VEAC and its predecessors, and the legislated public land categories was cited by land managers as a source of confusion.

Public land managers also expressed an interest in understanding if and how Aboriginal joint management of parks and reserves would affect the system of categories.

Local government

Local councils made the following comments relating to public land categories:

- ✦ State government agencies are almost exclusively focused on Crown land whereas local councils are concerned with a mixture of Crown and municipal freehold land
- ✦ agreement that user groups and the broader community do not distinguish Crown land from freehold land and find the complexities of governance of little interest.

The following additional comments were received from local councils invited to comment on TPLC consultation report:

- ✦ some described an inequity across community facilities depending on whether the facility is on freehold or Crown land with a number of councils reporting a reluctance to invest in infrastructure if it is on Crown land
- ✦ feedback that 'rate capping' may necessitate councils selling freehold reserves or rationalising, which they have not considered in the past
- ✦ a reluctance to take on additional Crown land due to inadequate resourcing.

Reservation status of public land

Written submissions

The written submissions provided valuable feedback on the reservation status of public land as well as a number of recommendations to improve the current system. Several submissions described the need for a specific site's reservation status to be changed in recognition of cultural or natural values. Other submissions commented on the need for a review of protection levels to take climate change into account. The formation of corridors and biolinks between existing parks and reserves was suggested to allow species movement and improved resilience to climate change.

Several submissions suggested that better protection is needed for Ramsar wetlands and marine areas in general, especially with respect to protecting birds. It was suggested that VEAC review the reservation status of Victoria's Ramsar listed wetlands to ensure management for conservation. Special protection zones in state forests were also said to be inadequately reserved for protection. Another expressed the importance of identifying bioregions where the conservation estate is insufficient and suggested moving existing public land into the conservation estate where possible (e.g. riparian land).

Other comments and suggestions from the written submissions included:

- ✦ land where the previous use no longer applies be re-reserved with the appropriate use
- ✦ restricted Crown land grants should be reviewed
- ✦ there should not be any unreserved Crown land
- ✦ locally significant land should be given to local councils as freehold
- ✦ 13 submissions raised site specific issues.

Community Reference Group

Advice from the Community Reference Group included:

- ✦ feedback that the National Parks Act processes are simpler for reservation, regulation and administration
- ✦ the need for better data management systems for internal and external use
- ✦ the need for zoning to protect native vegetation offsets including the suggestion of a conservation zone in the planning scheme and better online tools to search for and identify current offsets
- ✦ the need to clarify status of HVP Plantations land
- ✦ a range of opinions as to whether priority should be given to legislative reform and consistency, or better management with a focus on on-ground issues.

Public land managers

Meetings with public land managers suggest that there is widespread support for a simplification and modernisation of the legislative framework to better enable efficient public land management. For example, at present, two areas of public land with similar uses and management regimes can be subject to different regulations and legislative protections as a result of reservation under different Acts e.g. regional parks. It was also noted that the actual use of an area of public land can differ from the reserve purpose impacting on the availability of enforcement options if an infringement occurs.

Resourcing limitations were reported to impact on the ability of public land managers to implement government-accepted recommendations and formally reserve land. This results in problems with unreserved or incorrectly reserved public land which impedes effective management and leads to enforcement issues. Simplifying the reservation process would benefit public land management. Similarly, changes to categories and reservation purposes should ensure the administrative arrangements, especially for licences, leases and consents, are simplified.

It was proposed that the significance level of a site should determine the appropriate land manager (e.g. small local playgrounds are being managed by the Department of Environment, Land, Water and Planning (DELWP) when they would be more appropriately managed by the local council). It was also suggested that operational government land should be owned and managed by the relevant department (e.g. hospitals by the Department of Health and Human Services). The need for the government databases to be updated, improved and linked, and for all land managers to be provided access to the databases was also reported.

Local government

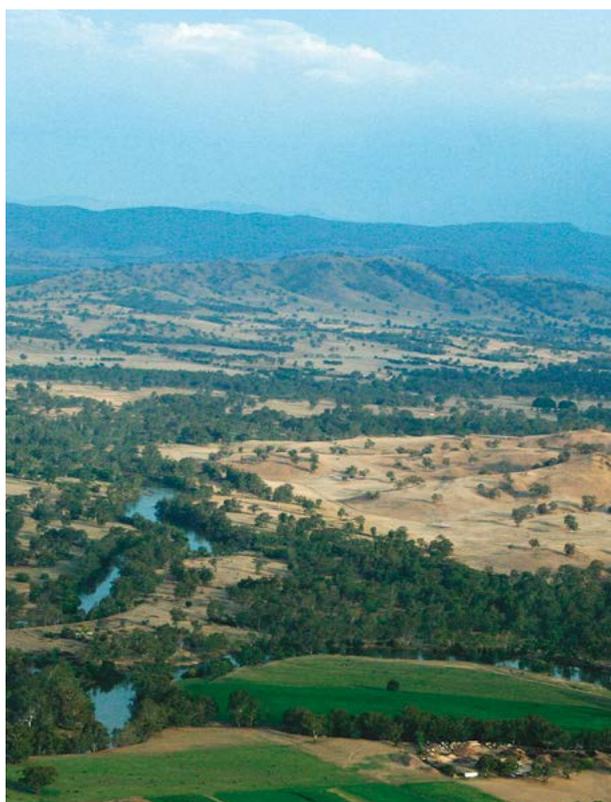
Feedback from local councils included:

- ✦ the need for consolidation of the Crown land and municipal freehold governance systems to reduce confusion and administrative tasks
- ✦ many councils cited cases of facilities occupying a mix of Crown land and freehold municipal land
- ✦ the opportunity for the Crown Land (Reserves) Act and associated governance system to be updated to meet contemporary needs
- ✦ discussion of the limitations of the Crown Land (Reserves) Act, such as the Act predating modern approaches to land use decision making, balancing conservation and commercialisation, the making and enforcement of regulations, and accountability

- ✦ agreement on other perceived deficiencies of the Crown Land (Reserves) Act, such as inappropriate or overly-restrictive gazetted reserve purposes, overly complex approval processes for works and tenures, and the survival of archaic regulations
- ✦ agreement that the portfolio of Crown land reserves does not reflect current population distribution and is not responsive to changing community values and activity patterns
- ✦ some local councils, already apprehensive about rate capping, fear that the investigation may result in further Crown land being transferred to them without appropriate resourcing.

The following additional comments were received from local councils invited to comment on TPLC consultation report:

- ✦ the administrative requirement to obtain 'grant and purpose' consent for leasing and licensing was identified as a major issue of Crown land administration
- ✦ the ability to raise revenue is sometimes restricted by the land management reservation type and the associated regulations
- ✦ Crown land reserves may not be being managed by the most appropriate land manager
- ✦ public land data needs to be regularly updated to ensure councils and other organisations have access to accurate and up to date information.



Values of public land

Written submissions

A number of submissions indicated support for an inventory of values based on criteria including ecosystem services, water catchments, riparian strips, wetlands, estuaries and tidal flats, transport corridors, forest produce (timber, apiary), business function, biodiversity, heritage, social, recreational, tourism, economic and urban cooling. It was suggested that this inventory be updated and maintained with easy access for the public to the relevant information.

The retention and protection of public land for open space was discussed in several submissions, and the associated values were emphasised. One submission raised concerns about the reliability of assessments of existing values on public land. Concerns were also raised about the decision-making processes for deeming public land to be surplus and available for sale. A recommendation was made that a statewide register of all present, potential and former parcels of public land be created, together with the history and values of each site. Many emphasised the protection and management of coastal land, floodways and catchment land. A number commented on the undervaluing of riparian habitat and the under-representation of freshwater ecosystems in the reserve system. Climate change was mentioned frequently, including the importance of native forests in mitigating climate change. It was also proposed that climate change be considered as part of an inventory of current types of values on public land. Park boundaries were identified as needing to be reviewed to reflect changes in extractive and timber industry uses.

The importance of Aboriginal culture and values on public land was highlighted by several submissions. Concerns were also expressed over the quality of the documentation of national and world heritage values.

Other suggestions and comments made include the following:

- ✦ public land with environmental values should only be sold with restrictive covenants
- ✦ public land should not be used for private purposes (such as grazing)
- ✦ there should be no further development on coastal land and inappropriate development should be removed
- ✦ concern for land use changes due to fire regimes (e.g. fuel reduction burning on public land)
- ✦ extraction of natural resources and conservation are incompatible
- ✦ review public land in the context of current Ecological Vegetation Class representation to identify potential areas for protection

- ✦ marine sanctuaries should be expanded
- ✦ Crown land water frontages should be reviewed
- ✦ flora and fauna surveys should be required for all public land development proposals including extractive industries
- ✦ a whole of government approach should be taken to maximise benefits on public land (such as improved liveability)
- ✦ there is a lack of resourcing for maintaining public land values, including pest plant and animal control
- ✦ importance of forest timber on public land
- ✦ coal mining and coal seam gas licences should cease
- ✦ the value of public land for threatened species
- ✦ concern for fragmentation of public land by developers
- ✦ the importance of pollination for food security and the associated role of bees.

Community Reference Group

Advice from the Community Reference Group included:

- ✦ the need for changes in community values since the 1988 LCC report to be taken into account (e.g. climate change, corridors)
- ✦ a recommendation that a long-term perspective is taken to public land management, taking population growth into account and exploring the benefits derived from public land and multiple uses
- ✦ the potential for offsetting native vegetation clearing on Crown land.

Public land managers

Input from meetings with public land managers included support for the development of a process that describes how to identify values and their respective significance, and the use of this information in the categorisation process.

Another area of discussion was the relationship between the *Traditional Owner Settlement Act 2010* land legislation.

Sea level rise and the associated loss of coastal land was discussed, and the need to deal with encroachment and diminishment of the public estate was highlighted.

Local government

Consultation with local councils resulted in the following feedback:

- ✦ agreement that the relationship between councils and their communities, insofar as it affects public land governance and management, needs to be reviewed
- ✦ the significant involvement of volunteers in Crown land management and the opportunity to reflect on management regimes and whether these remain appropriate for both the reserve and volunteers
- ✦ reports from a number of local councils that their attempts to improve efficiencies through the closure or amalgamation of redundant facilities has been met with opposition from the local community.

The following additional comments were received from local councils invited to comment on TPLC consultation report:

- ✦ the need for upskilling of volunteers with formal training in relation to administration, governance and management of multiple uses
- ✦ the need for a land management model which allows equitable management of the various community values at the individual reserve level and the council portfolio-wide level.

Background on public land in Victoria



Key points at a glance

- Estimates of the total area of Victoria and the area of public land in the state vary from source to source, and have been recalculated for the purposes of the investigation.
- The total area of Victoria, including the marine environment, is 23.8 million hectares with the terrestrial component making up 22.8 million hectares (including islands).
- Public land (including marine areas) is 9.4 million hectares or 39.7 per cent of the total area of the state.
- Public land, as defined in the VEAC Act, includes all Crown land including marine areas and land held in freehold title by Victorian government entities, but does not include freehold land owned by local councils.
- The LCC, established in 1971, and its successors (the ECC and VEAC) were established to carry out studies on public land throughout Victoria and make recommendations to government on the appropriate use of that land.
- The recommendations, as accepted by government, form the framework for the way in which public land is used and managed in Victoria.
- Government-accepted LCC/ECC/VEAC recommendations are binding on government departments and public authorities. The recommendations govern how the public land is used and managed, regardless of the underlying legal status.
- Four primary land Acts currently govern the use of Crown land in Victoria and determine the legal basis for its control and management: the *Land Act 1958*, the *Forests Act 1958*, the *Crown Land (Reserves) Act 1978* and the *National Parks Act 1975*.
- The four primary Acts are supplemented by several other Acts which establish public land use overlays or which govern particular reservation types or uses.
- Public land use overlays established in legislation include reference areas, wilderness zones, remote and natural areas, heritage rivers, natural catchment areas and fisheries reserves.
- Legislation governing specific types of Crown land reserves includes the *Wildlife Act 1975* and the *Alpine Resorts Act 1983*.
- Public land with special forms of ownership or other unusual features include public authority land under freehold title, Aboriginal title, restricted Crown grant, Crown land under perpetual licence for plantation purposes, subterranean land and submerged land.

2.1 Public land in Victoria

Victoria's public land occupies almost 37 per cent of the total land area of the state (excluding marine areas), the smallest proportion of public land in any Australian state or territory. There are various figures cited as the total area of Victoria depending on the particular baseline used, whether or not the coastal waters of Victoria (submerged land) are included and how the islands, bays and inlets are calculated. The total area cited as public land also varies from source to source.

The LCC's 1988 Statewide Assessment of Public Land Use provided figures only for the terrestrial areas of Victoria, with the land area of Victoria quoted as 22,760,000 hectares and public land as 8,802,000 hectares.

For the purposes of this investigation VEAC has recalculated all these areas (table 2.1). The total area of Victoria is 23,753,750 hectares (including submerged land) with the terrestrial component making up 22,752,350 hectares (including islands). Submerged land includes bays, major inlets and coastal waters to the state limit of three nautical miles from the territorial sea baseline. Appendix 2 provides the data sources for these calculations.

Table 2.1
Area of Victoria

Feature type	hectares
Mainland ¹	22,708,200
Islands	44,150
Total terrestrial component	22,752,350
Waters ²	1,001,400
TOTAL	23,753,750

¹ Mainland includes all terrestrial land, lakes (including Gippsland Lakes), rivers and water storages.

² Waters includes bays, major inlets and coastal waters within Victoria's jurisdiction.

Figure 2.1
Public land in Victoria*



*includes Trust for Nature freehold land (e.g. Neds Corner Station) and licensed HVP Plantations land

Table 2.2
Composition of Victoria's public land

Category	hectares ¹
National park	2,897,021
State park	159,767
Wilderness park	200,686
National heritage park	7,583
Other park (conservation)	65,675
Regional park	101,591
Nature conservation reserve ²	299,063
Coastal reserve	21,392
Historic and cultural features reserve	42,546
Natural features reserve	379,855
Water production	97,980
Community use area	44,516
Alpine resort	10,033
Forest park	48,124
State forest	3,148,800
Plantation ³	163,240
Earth resources	19,187
Services and utilities area ⁴	659,265
Uncategorised public land	23,337
Cores and Links Agreement area ⁵	8,048

Marine

Marine national park	52,293
Marine sanctuary	841
Multiple-use marine protected area	67,831
Coastal waters	880,436
Total	9,399,110

Overlays

Reference area	111,106
Wilderness zone	640,786
Remote and natural area	267,266
Heritage river	159,457
Natural catchment area	141,180
Aquaculture zone	55
Total	1,319,850

¹ Some figures may not correspond to those cited in chapter 4.

² Includes Trust for Nature protected area

³ Includes licensed HVP Plantations land – see section 2.4.2

⁴ Includes road reserves

⁵ See section 2.4.2

The distribution of Victoria's public land is shown in figure 2.1. Table 2.2 provides a summary of the composition of the public land estate (also see Map A *Victoria's public land* in the back pocket of this discussion paper).

Public land including the Victorian waters has been recalculated as 9,399,110 hectares making up approximately 39.6 per cent of the total area of the state.

As described in section 1.5, public land has a specific definition in the VEAC Act. As well as Crown land, public land includes land owned in freehold title by state government public authorities and entities, but does not include freehold land owned by local councils. While there is as yet no readily available inventory of freehold state government-owned land across the state, the extent of this land is not negligible. For example, VEAC's Metropolitan Melbourne Investigation completed in 2011 estimated that government-owned land comprised 35 per cent of the public land in the 29 municipalities studied.



2.2 Role of the Land Conservation Council and successors

2.2.1 Origin of the Land Conservation Council

The following brief summary of the origin and operation of the LCC is drawn from Danielle Clode's 2006 history of the Land Conservation and Environment Conservation Councils *As if for a thousand years* and the LCC's 1988 *Statewide Assessment of Public Land Use*. Prior to the establishment of the LCC the Land Utilization Advisory Council, although focused on soil conservation, was the forum in the 1950s and 1960s for interdepartmental discussion (and disputes) about public land use.

The LCC was established by the Bolte government in 1971, in an attempt to defuse the controversy over the government's scheme to subdivide public land for agricultural settlement in the ecologically fragile Little Desert. The Little Desert dispute galvanised public opinion and provided an opportunity after the 1970 state election to introduce a systematic approach to resolving public land issues that was at arm's length from politics. Premier Bolte went to the election promising that the government 'would have a full study made of Crown Lands in Victoria with the object of setting aside and permanently reserving substantial areas for National Parks, Wildlife Reserves and Forests Parks. This should ensure that at least 5 per cent of the State is preserved forever'. At the time just over one per cent of Victoria was protected in national parks or wildlife reserves.

The purpose of the LCC was to 'balance' the use of land in Victoria through the recommendations it made over public land. Almost all of Victoria's prime agricultural land had already been alienated. The functions of the Council as set down in its legislation clearly outline its responsibilities to protect the natural environment from further destruction. The LCC also needed to balance the needs of existing production from public land – e.g. timber, minerals, stone, honey – and recreational uses. It was to make its recommendations after careful scientific assessment and transparent public consultation processes, both enshrined in legislation. The legislation also enshrined the independence of the Council, providing for the appointment of a chairperson from outside the public service.

Its primary task, its processes and its independence remained largely unchanged through the replacement of the LCC with the ECC in 1997 and then with VEAC in 2001. However Council composition and governance changed substantially reflecting changes in the public service, and the wording of its role has changed, with

VEAC's function now being on 'matters relating to the protection and ecologically sustainable management of the environment and natural resources of public land'.

Figure 2.2 shows the geographic boundaries of the LCC, ECC and VEAC investigation areas.

An interactive map showing a summary of previous LCC/ECC/VEAC investigations is available at www.veac.vic.gov.au

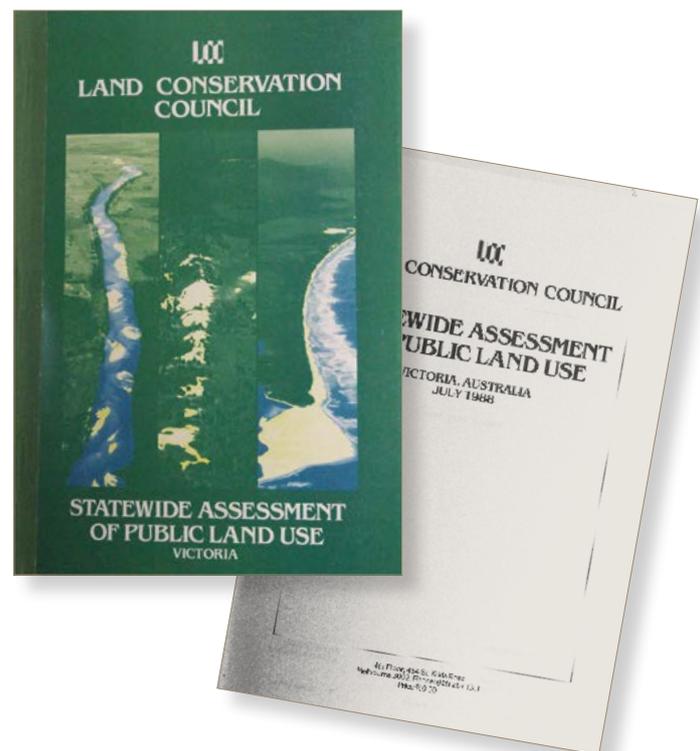


Figure 2.2
LCC, ECC and VEAC investigation areas

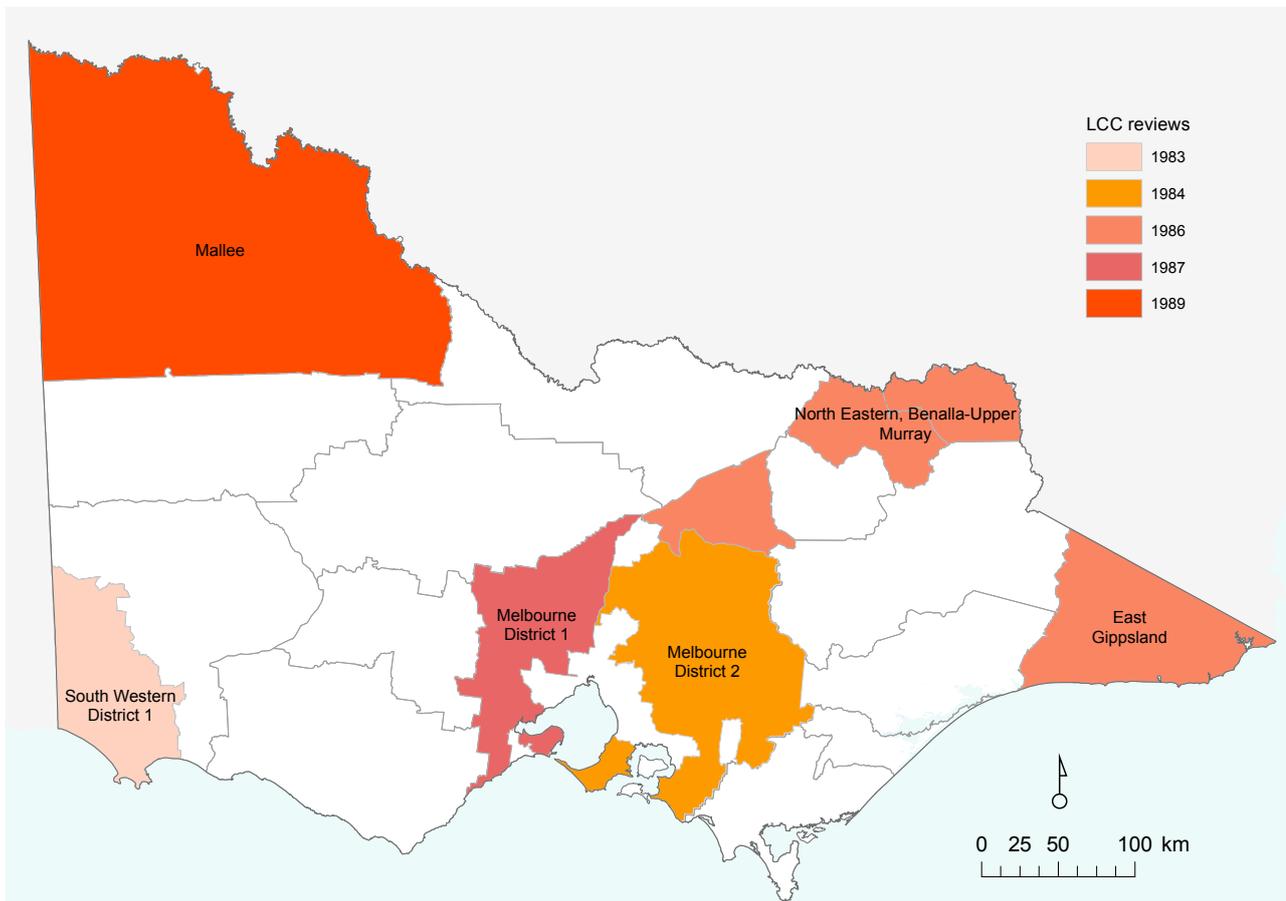
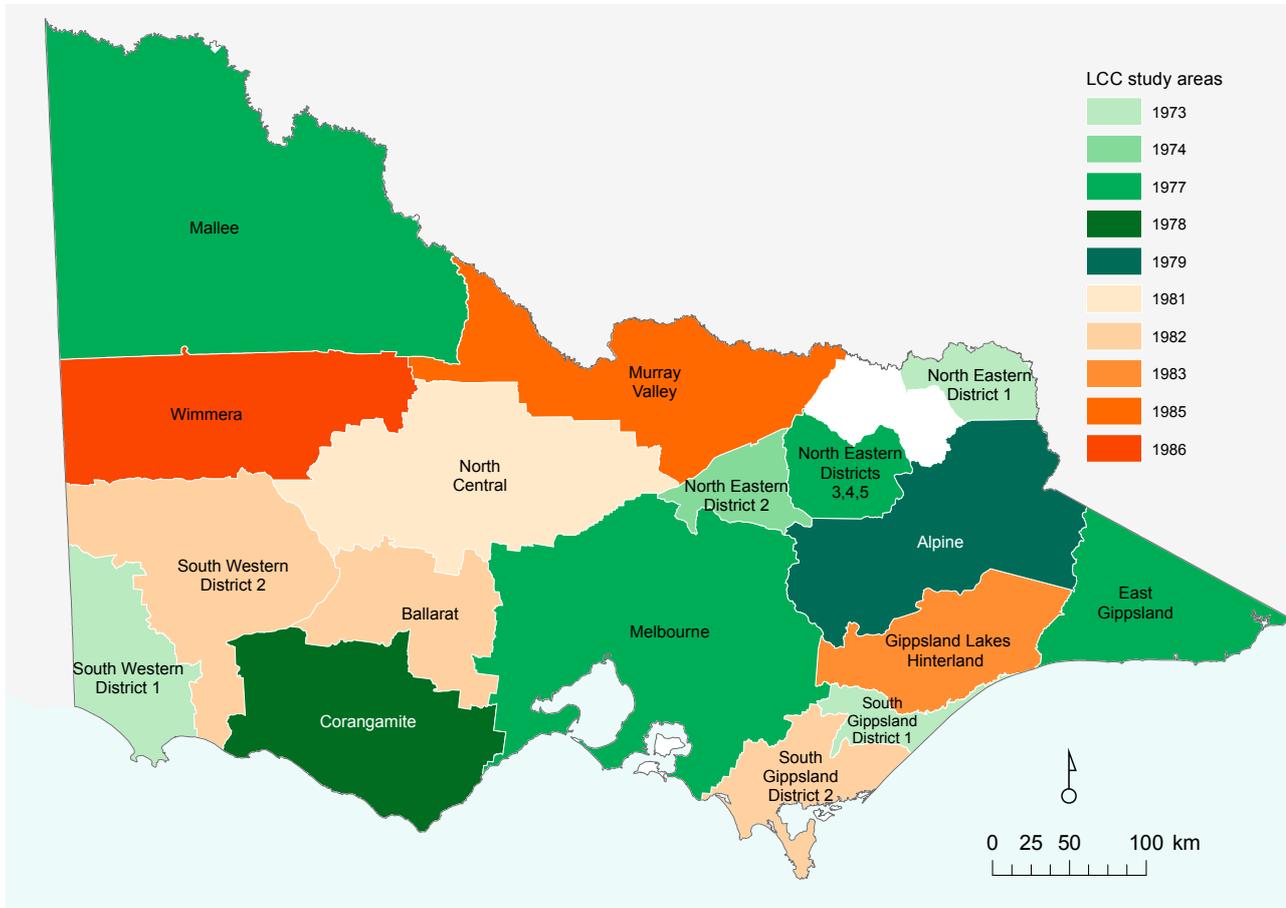
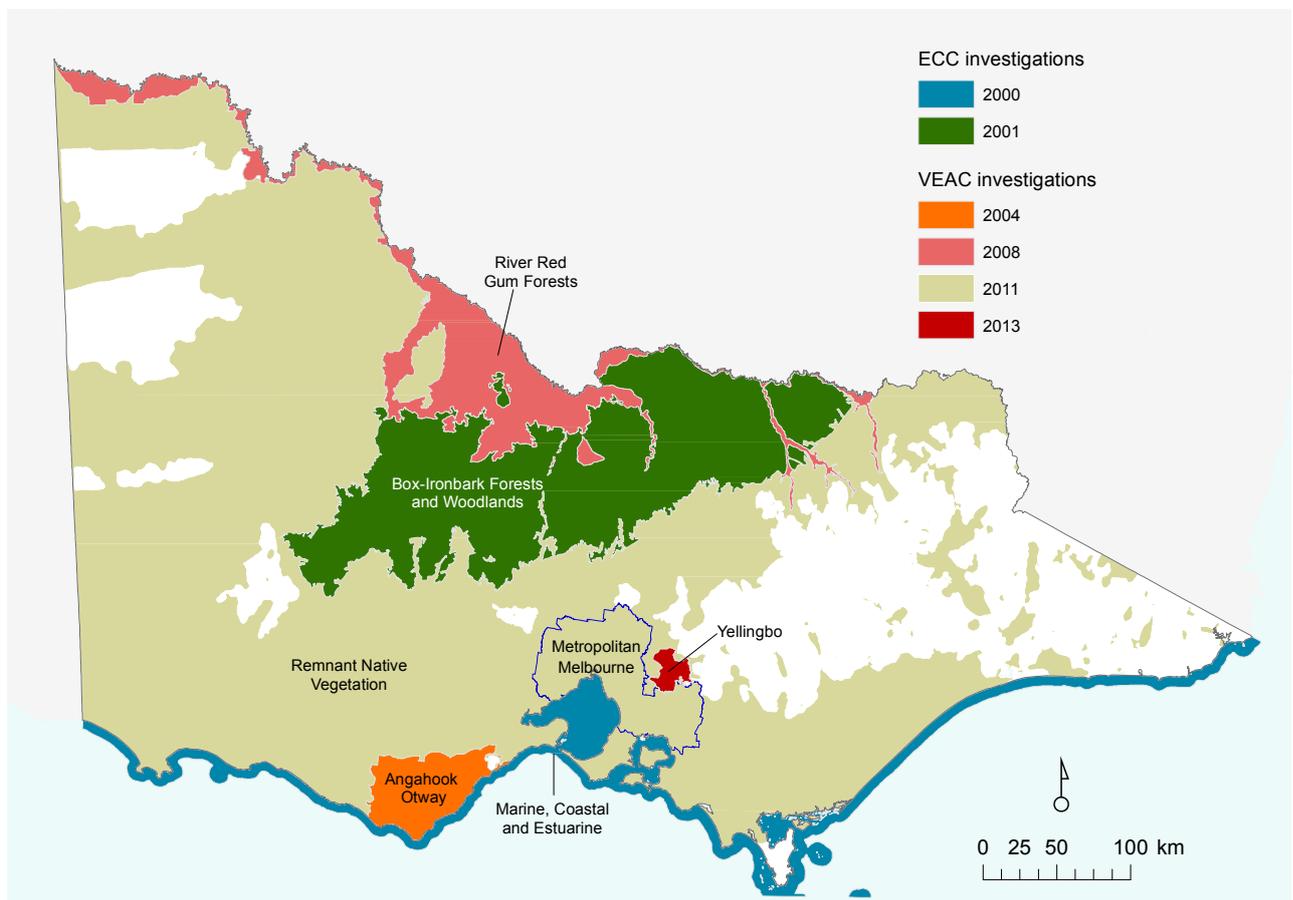
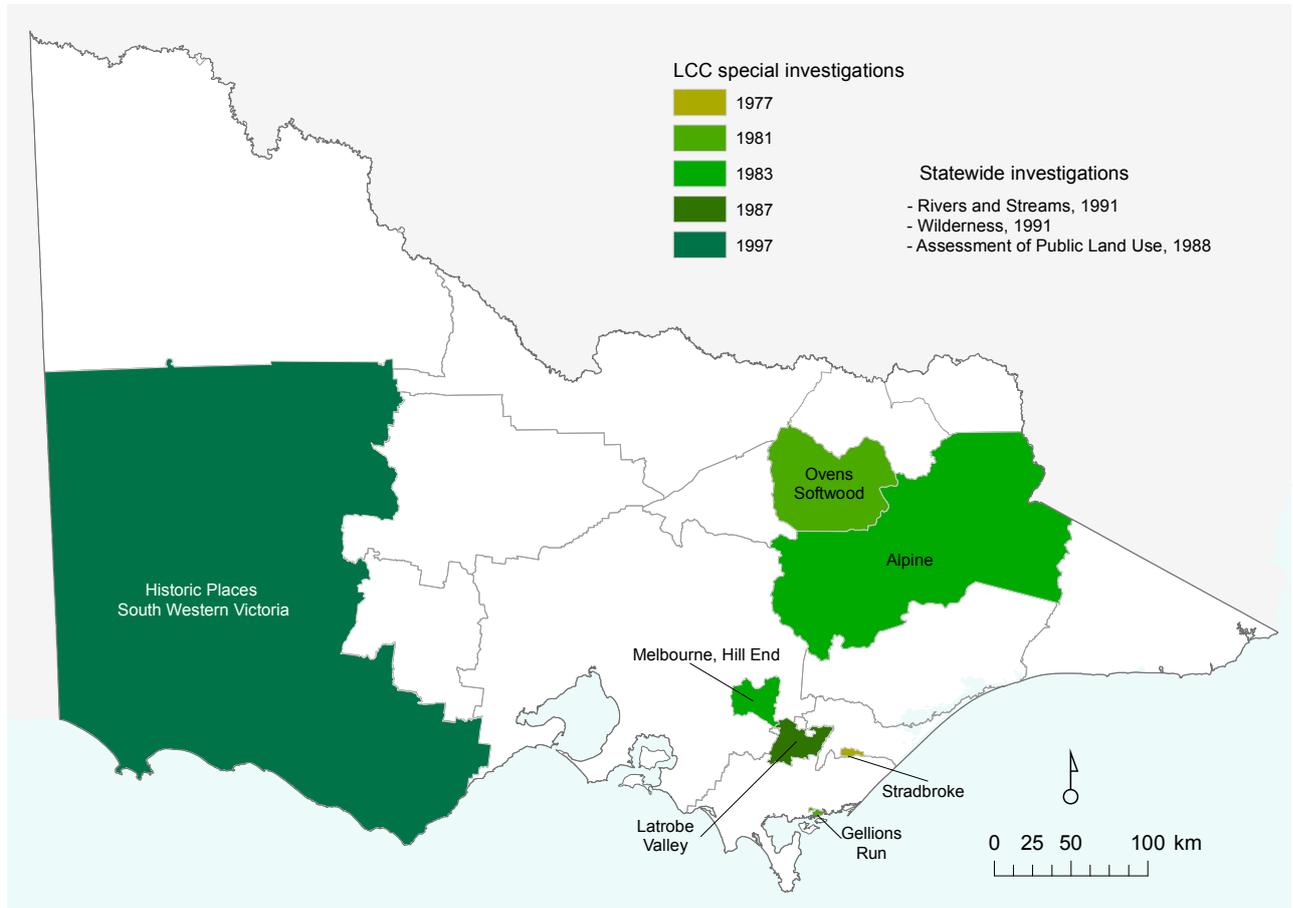


Figure 2.2 (continued)

LCC, ECC and VEAC investigation areas



2.2.2 Legal status of accepted recommendations

The area-specific recommendations of the Councils identify land use categories and, for each category:

- ✦ specify its purpose
- ✦ nominate the suitable uses
- ✦ list the inappropriate uses that are not permitted there
- ✦ may include policies that explain or interpret its basic purposes
- ✦ may refer to principles and/or guidelines to be put into effect in more detailed management plans or site-specific proposals
- ✦ specify the form of reservation.

The public land use categories erected by the LCC and its successors are described in detail in section 3.2.1.

Section 10(3) of the *Land Conservation Act 1970* provided that, once recommendations have been accepted by the Minister, following notice to affected government departments and public authorities, an Order in Council requires departments or public authorities to use 'all diligence and dispatch to give effect to any recommendation' so far as it affects any land vested in or controlled by such departments and authorities. Government-accepted LCC recommendations also require an Order in Council to be amended or revoked.

Section 26 of the VEAC Act provides that, if the statement of the government response to a report specifies that the government wholly or partly accepts a recommendation, the government must ensure that appropriate actions are taken to implement the recommendation to the extent that it has been accepted.

The *Environment Conservation Council Act 1997* was silent with respect to the government response to recommendations of the Environment Conservation Council (ECC). The VEAC Act, however, includes provisions that deem recommendations of the ECC to be recommendations of VEAC to which the VEAC Act applies.

Legal status is also conferred on recommendations of the LCC, ECC and VEAC through references in Acts such as the *National Parks Act 1975*, the *Crown Land (Reserves) Act 1978*, the *Forests Act 1958*, the *Wildlife Act 1975* and earth resources legislation. The *Forests Act* and the *Wildlife Act* provide, for example, for the Secretary to give effect to a recommendation where land is subject to a notice under section 10(3) of the *Land Conservation Act* (referred to above) even if the recommendation conflicts with the purpose for which the land is reserved.

Restricted Crown land (land where special permissions must be obtained for mining and/or exploration) is defined in Schedule 3 of the *Mineral Resources (Sustainable Development) Act 1990* (MRSDA), for example, by

reference to VEAC recommendations and public land use categories. The MRSDA also provides for the Minister to exempt land from being subject to a licence under the Act in order to implement LCC and VEAC recommendations.

2.3 Legislation reserving Crown land

The following account of Victoria's first public land reservations is drawn from a report prepared in 2014 by Robyn Ballinger for VEAC's Historic Places Investigation.

After the first white settlement of the Port Phillip District in the mid-1830s, public land sites were given statutory protection to ensure the supply of natural resources for future populations. In 1839, surveyor Robert Hoddle marked out public purpose reserves in and around Melbourne for quarrying, brickmaking and lime production, and in 1848 an Order in Council put aside land for towns and villages, Aboriginal reserves, water reserves, inns, mineral reserves and timber reserves. On 1 July 1851 the Port Phillip District separated from New South Wales to become the colony of Victoria.

By 1853, there were nine timber reserves and 185 water reserves gazetted in Victoria, and by 1859 there were nearly 3,000 acres of public purposes reserves. The first Land Act passed by the Victorian Parliament (the *Sale of Crown Lands Act 1860*) made further provisions for the reservation of lands for a wide variety of public purposes, including cemeteries, courthouses, public halls, recreation reserves, hospitals, schools, roads, jetties, and railway infrastructure. By 1884, two million acres of land had been set aside for what was termed 'the public interest'.

2.3.1 Primary land legislation

Four primary land Acts now govern the use of Crown land in Victoria and determine the legal basis for its control and management – the *Land Act 1958*, the *Forests Act 1958*, the *Crown Land (Reserves) Act 1978* and the *National Parks Act 1975*. The following information has been sourced from DELWP.

The first three of these Acts have their origins more than 100-150 years ago and still contain provisions from that time, including the two 1958 Acts which simply consolidated earlier Acts.

The four Acts are supplemented by several 'overlay' Acts which govern particular reservation types or uses or, in a narrow range of circumstances, reserve land (see section 2.3.2).

The current legal status of Crown land reflects the use of these Acts and their predecessors over a period of more than 150 years, broadly reflecting:

- ✦ historic decisions to reserve land for particular purposes
- ✦ decisions made since the 1970s to implement LCC/

ECC/VEAC recommendations through reservation processes to reflect approved land uses

- ✦ other decisions of governments and/or parliaments which depart from LCC/ECC/VEAC recommendations.

Consequently the legal status of some land is up to date and reflects government-accepted LCC/ECC/VEAC land categories, while the legal status of other areas is out of date or even obsolete.

Appendix 3 tabulates the current Victorian land use categories, their legislative basis and legislated purposes.

Land Act 1958

The major focus of this Act is on the sale, leasing and licensing of Crown land and preventing unauthorised occupations. Its provisions date back to the 1800s.

Over time, land moved from being administered under the Land Act to other Acts. However, for unreserved Crown land, the provisions of the Land Act apply.

Crown Land (Reserves) Act 1978

This Act provides for the reservation, use and management of Crown land, either temporarily or permanently, for public purposes including for conservation, recreation, services and utilities. Before this Act was proclaimed in 1978, the legal basis for reserving Crown land was part of the Land Act. The Act also provides for the appointment of committees of management to manage reserves.

There are 33 public purposes for which reserves may be established, singly or in combination.

Forests Act 1958

The Act provides for State forest (reserved forest and protected forest) and the management of forest produce on State forest. It also provides for the control and management of reserved forest by the Secretary. Other than for forest produce and fire, protected forest is administered under the Land Act.

The Forests Act also provides for the management of fire in the fire protected area (State forest, National Parks Act parks and land declared as protected public land).

National Parks Act 1975

The Act provides for the protection, use and management of national, state, wilderness and other parks and marine national parks and marine sanctuaries and provides for their management and control by the Secretary.

2.3.2 Other legislation governing specific reservation types or uses of Crown land

The four primary Acts are supplemented by several 'overlay' Acts which establish public land use overlays or which govern particular reservation types or uses. In addition, there are also the Acts such as the *Flora and Fauna Guarantee Act 1988*, the *Mineral Resources (Sustainable Development) Act 1990* and the *Water Act 1989* which generally apply to public land.

Public land 'overlays' established in legislation

Designations under the *Reference Areas Act 1978* and the *Heritage Rivers Act 1992* can apply to any public land, while wilderness zones and remote and natural areas are only applied to national parks. Fisheries reserves may be declared over any Crown land, except for land under the National Parks Act.

Reference areas are relatively small areas of public land containing viable samples of one or more land types that are relatively undisturbed. Reference areas recommended by LCC/ECC/VEAC and accepted by government are proclaimed under the Reference Areas Act to maintain natural systems as a scientific reference to enable comparative study of modified and unmodified lands. There are 144 reference areas in Victoria.

Victoria's 18 **heritage river areas** are rivers with outstanding values for current and future generations, and are protected under the Heritage Rivers Act. The LCC's Rivers and Streams Special Investigation (1991) systematically studied the biodiversity, recreational, cultural heritage and scenic values of Victoria's rivers. Heritage rivers were nominated by the LCC as those rivers, or river reaches, that had at least four values of state or greater significance. **Natural catchment areas** are also protected under the Heritage Rivers Act which requires that the area is maintained in an essentially natural condition. There are 26 natural catchment areas in Victoria.

Wilderness areas and remote and natural areas

were established in Victoria largely as a result of the LCC's Wilderness Special Investigation (1991) into the identification, reservation and use of wilderness areas and other areas of high wilderness quality in Victoria. The LCC also identified 24 other areas with remote and natural attributes. The LCC's recommendations, varied by government, were implemented through amendments to the National Parks Act. In addition to creating one new wilderness park and adding to the two existing wilderness parks, new schedules creating 20 wilderness zones and 22 remote and natural areas in national parks were added to the Act along with new provisions to provide a clear basis for the protection and management

An interactive map showing the Victorian public land use overlays is available on the VEAC website.

Fisheries reserves may be declared for various purposes, including aquaculture, under the *Fisheries Act 1995* over reserved or unreserved Crown land except for land under the National Parks Act.

Legislation governing specific types of Crown land reserves

The *Wildlife Act 1975*, the *Alpine Resorts Act 1983* and the *Alpine Resorts (Management) Act 1997*, the *Royal Botanic Gardens Act 1991* and the *Zoological Parks and Gardens Act 1995* deal with specific types of reserves under the Crown Land (Reserves) Act.

For example, section 14 of the Wildlife Act sets up a management framework for areas reserved for wildlife purposes under section 4(1)(o) of the Crown Land (Reserves) Act, names them as State Wildlife Reserves and provides for their further classification and management as State Game Reserves, State Game Refuges, State Faunal Reserves and so on. A management framework was also established and remains under the Wildlife Act for 'Nature Reserves' applying to some areas of public land recommended by the LCC to be managed for specific purposes by the former Fisheries and Wildlife Service. The Wildlife Act also provides for the declaration and management of areas of public and private land as wildlife management co-operative areas and wildlife sanctuaries.

2.3.3 Relevant Commonwealth legislation

The Commonwealth's jurisdiction over environmental matters comes from the Australian Constitution. The central piece of Commonwealth legislation is the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) which specifies the matters for which the Commonwealth has regulatory responsibility, and is derived from the 1992 Intergovernmental Agreement on the Environment and the 1997 Council of Australian Governments Heads of Agreement. The Heads of Agreement provided that the Commonwealth would apply its assessment and approval processes to meet its obligations on matters of national environmental significance (NES) which are:

- ✦ World Heritage properties
- ✦ declared Ramsar wetlands
- ✦ national heritage places
- ✦ nationally threatened species and communities
- ✦ migratory species and cetaceans
- ✦ nuclear actions
- ✦ the marine environment
- ✦ the Great Barrier Reef Marine Park
- ✦ a water resource, in relation to coal seam gas development and large coal mining development.

Victoria's single World Heritage property (the Royal Exhibition Building and Carlton Gardens), its 11 Ramsar wetlands, and 18 of its 24 national heritage places are on, or mostly on, public land.

The EPBC Act establishes the National Heritage List, which includes natural, Indigenous and historic places that are of outstanding heritage value to the nation. The EPBC Act specifies that the regulations must prescribe principles for managing national heritage places. The national heritage management principles as set out in schedule 5B of the Environment Protection and Biodiversity Conservation Regulations 2000 (EPBC regulations) should be used when preparing and implementing management plans and management arrangements for a national heritage place.

2.3.4 International designations

Australia participates in development and implementation of many international agreements dealing with the environmental and biodiversity conservation and sustainable use, including global and regional conventions and treaties and bilateral agreements such as the World Heritage Convention and the Ramsar Convention on Wetlands.

All of these international conventions create obligations for Australia to act in some manner to prevent or minimise harm to the environment or to act to restore degraded landscapes. However, very few of these agreements require Australia to implement these obligations in a particular manner and Australia's implementation of these obligations can be through non-legislative mechanisms.

Ramsar wetlands

The Convention on Wetlands of International Importance (the Ramsar Convention) was signed in Ramsar, Iran in 1971.

The Ramsar Convention aims to halt the worldwide loss of wetlands and to conserve, through wise use and management, those that remain. The convention encourages member countries to nominate sites containing representative, rare or unique wetlands, or that are important for conserving biological diversity, to the List of Wetlands of International Importance (Ramsar List). Australia's has 65 Ramsar sites, 11 in Victoria. The Victorian Ramsar sites cover more than 300,000 hectares of mostly public land.

The implementation of the Ramsar Convention in Australia is supported by the Commonwealth EPBC Act. No Victorian legislation specifically refers to Ramsar sites. The EPBC Act establishes a framework for managing Ramsar listed wetlands through the Australian Ramsar Management Principles under the EPBC regulations.

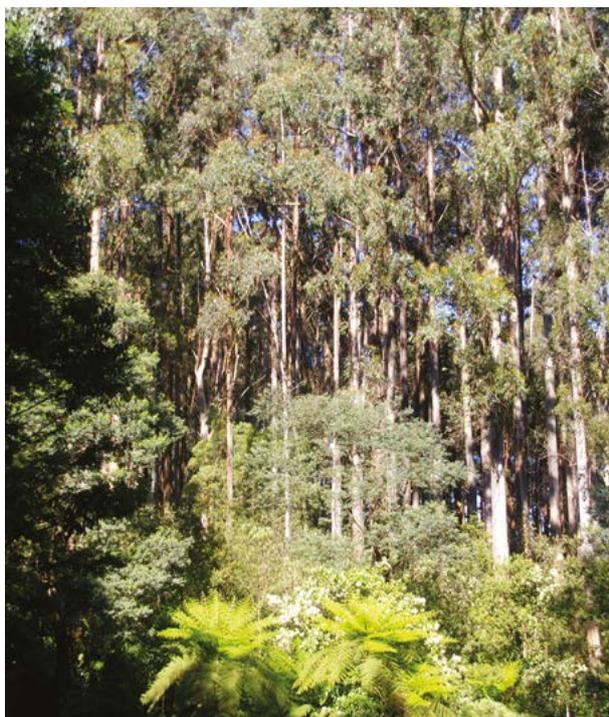
Ramsar wetlands are a matter of national environmental significance that are protected under the EPBC Act.

The Act regulates actions that will or are likely to have a significant impact on the ecological character of a Ramsar wetland. The Commonwealth *Water Act 2007* establishes a range of mechanisms which support sustainable management of water resources, particularly in the Murray-Darling Basin, including a requirement for the Basin Plan to give effect to the Ramsar Convention and a number of other international environmental agreements, and to promote the wise use of all the Basin water resources and the conservation of declared Ramsar wetlands.

Biosphere reserves

'Biosphere Reserve' is an international designation made by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) on the basis of nominations submitted by countries participating in the Man and the Biosphere Programme (MAB). MAB was launched in 1971 to promote a greater understanding and provision of knowledge and skills to support sustainable relationships between people and their environment. A biosphere reserve which includes one or more protected areas, and surrounding lands that are managed to combine both conservation and sustainable use of natural resources.

Australia currently has 14 biosphere reserves, four in Victoria. The EPBC Act includes provisions for the development of cooperative arrangements between the Commonwealth, states and territories in the development of biosphere reserves. Management principles for the management of Australian biosphere reserves are set out in the EPBC regulations.



2.4 Special forms of public land

2.4.1 Public authority land in freehold title

Under the VEAC Act, 'public land' is defined as including 'land vested in any public authority' (other than municipal councils and water authorities where the land is in a sewerage district). 'Vested' is not defined in the Act but has been interpreted broadly to mean 'held by'. Accordingly, it includes land held by public authorities under freehold title, and Crown land that authorities hold under licence or other arrangement.

Public authorities include: water authorities; various public bodies in the portfolios of transport (VicRoads, VicTrack), education (schools), health (hospitals, community facilities) and justice (police stations, courts; and emergency services. Some land used by private energy utilities is public land.

It is estimated by Land Victoria that there are approximately 142,000 land titles held by public authorities. While some – for major reservoirs, transport and utility uses – have been included and mapped in LCC, ECC and VEAC investigations, most of these parcels of land have never been reviewed.

Much of this land is operational, with purpose-built infrastructure or buildings, while other land may no longer be operationally required by public authorities or was purchased for future use but is now not required.

The extent of this land is conservatively estimated as at least 200,000 hectares.

2.4.2 Plantation land

Government-owned softwood and hardwood plantations were transferred to the Victorian Plantations Corporation (VPC) on its establishment in 1993. The VPC was established under the *State Owned Enterprises Act 1992* and the *Victorian Plantations Corporation Act 1993*, to establish, maintain and manage timber plantations on land vested in or managed by the Corporation, and to enter into, administer or manage agreements or licences relating to forest produce on that land.

Approximately 170,000 hectares of Crown land was vested in VPC, including an estimated 107,000 hectares of softwood plantations, 8,000 hectares of hardwood plantations, and approximately 55,000 hectares of non-plantation land, including some native forest.

In March 1998, the Victorian government announced its decision to privatise the VPC. In October 1998, VPC was sold to Hancock Victorian Plantations Pty Ltd (HVP Plantations) including a licence to the 170,000 hectares of land vested with VPC, granting Hancock the right to operate a plantation business on that land in perpetuity. The licence is transferable, registrable and divisible and all

royalties or rents were received by the state in an upfront fee as part of the sale proceeds. Along with the licence, all of VPC's other assets, liabilities and timber supply contracts were transferred to HVP Plantations.

In 2008, some 8,000 hectares of native forest and Mountain Ash plantation in Gippsland's Strzelecki Ranges was relinquished as part of the 'Cores and Links' agreement between the Victorian government and HVP Plantations. The remaining 162,000 hectares of former VPC plantation land in Victoria is Crown land and, for completeness, is included in the total areas of public land in tables 2.1 and 2.2, and mapped in figure 2.1. However, given the perpetual nature of the licence, the licensed land is not considered any further in this investigation.

2.4.3 Land in Aboriginal title

The grant of Aboriginal title operates similarly to principles of 'hand back/lease back' of land elsewhere in Australia. That is, it provides for areas to effectively remain public land despite granting an underlying form of Aboriginal title, as a transfer of Aboriginal title will be conditional on an agreement with the state.

The following description is sourced from the Department of Justice and Regulation and DELWP.

Native title is the recognition in Australian law that some Aboriginal and Torres Strait Islander people continue to hold rights and interests in land and water. The source of native title lies in the laws and customs observed by Aboriginal and Torres Strait Islander people when Australia was colonised by Europeans. For native title to be recognised, those laws and customs must have been acknowledged and observed in a 'substantially uninterrupted' way from the time of settlement until now. The Commonwealth *Native Title Act 1993* provides a process through which Indigenous Australians can lodge an application to seek a determination of native title.

In 2010, acknowledging the difficult nature of having native title determined under the Native Title Act, the Victorian government developed an alternative system for recognising the rights of Victorian traditional owners.

Victoria's *Traditional Owner Settlement Act 2010* allows the government and traditional owner groups to make agreements that recognise traditional owners' relationship to land and provide them with certain rights on Crown land. Under the Act, a settlement package can include a Land Agreement which provides for grants of land in freehold title for cultural or economic purposes, or as Aboriginal title to be jointly managed in partnership with the state.

'Aboriginal title' is an estate in fee simple (freehold) subject to the following statutory conditions and limitations:

- ✦ the traditional owner group entity is not able to sell, transfer, dispose of, encumber or otherwise deal with the estate or any legal or equitable interest in the estate
- ✦ the grant is subject to the limitation that the traditional owner group is not able to lease or license the estate or any legal or equitable interest in the estate, and
- ✦ is subject to a condition that the state is provided with rights to occupy, use, control and manage the land.

To date Aboriginal title has been granted over 16 parks and reserves (more than 90,000 hectares) in two agreements – with the Gunaikurnai and Dja Dja Wurrung. Agreements granting Aboriginal title for parks and reserves to other traditional owner groups are likely in the future (see section 5.2.1 for further information).

2.4.4 Restricted Crown grants

Freehold land is land that has been alienated from the Crown, i.e. sold by the government and granted to an individual or other entity. The freehold interest is the least restricted interest in land and is usually known as 'ownership' of land. A Crown grant is the first freehold land title that was alienated or sold by the Crown, either under the general law system or, from 1862, the Torrens system of recording and registering land ownership.

From the middle of the 19th century to the middle of the 20th century, Crown land was often reserved for a range of specified public purposes – such as libraries, mechanics' institutes, racecourses and showgrounds – and granted to trustees on trust for the purposes of the reservation. In general terms, these restricted Crown grants clearly specify the purpose or purposes for which the land is granted and must be used (hence 'restricted'), provide for a return to the Crown if the land ceases to be used for that purpose, and prevent alienation of the land by the trustees.

Committees of management appointed under the Crown Land (Reserves) Act have generally replaced the earlier trusts. Land Victoria advises that more than 300 restricted Crown grants are recorded on its register of land, of which 43 are managed by restricted Crown grant trusts, and the remainder by organisations such as local councils.

Given the origin of the trusts at an earlier point in history, and in the absence of any subsequent reform to the trusts themselves, it follows that they are not subject to a modern governance framework. For example, the trust deeds do not refer to annual reporting requirements or a periodical re-appointment process (trustees are generally appointed for life or for as long as they want involvement). The absence of formal governance requirements and tools to guide the

management of reserves held through restricted Crown grants was highlighted by the Victorian Auditor-General's Office through its investigation of the management and oversight of Caulfield Racecourse in 2014.

2.4.5 Subterranean land and submerged land

Previous assessments of public land focused on the terrestrial land estate. However Crown land in Victoria also includes submerged land being land beneath water including the seabed out to Victoria's coastal water limit at three nautical miles. Less well known is that subterranean land, i.e. land beneath the surface of the earth, is also usually Crown land. Private land often extends only to 15 metres beneath the land surface and the land beneath that depth is Crown land.

Subterranean land

The source for land ownership extending 'up to the heavens and down to the centre of the earth' or 'from heaven to hell' is the common law principle *usque ad coelom et usque ad inferos*.

This applies to most Crown land in Victoria with the exception being those parcels which are defined in stratum by an upper and lower limit.

The breadth of the concept of land ownership being 'up to heavens and down to the centre of the earth' is subject to further qualifications established by legislation conferring ownership of, for example, all minerals upon the state.

Land alienated in Victoria prior to 29 December 1891 has no depth limitation (i.e. the ownership extends from the heavens to the centre of the earth), and after that date a depth limitation applies to land granted by the Crown (see section 339 of the Land Act). This means that Crown land exists below the land granted with an upper level being the depth limitation (standard depth limitation is now 15 metres below the surface) and a lower level the 'centre of the earth'

In the goldfields region of Victoria the Greater Bendigo National Park and some other areas have been established with a depth limitation of 100 metres beneath the land surface, in order to provide for underground mining.

Submerged land

Submerged land in Victoria's bays and inlets and within the coastal waters of the state are largely, except for marine protected areas, unreserved Crown land. Other exceptions include terrestrial parks under the National Parks Act located on the coast which usually extend seawards to the low water mark and include the intertidal areas, and some coastal reserves reserved for the protection of the coastline under the Crown Land (Reserves) Act which extend up to 600 metres seaward.

The desire to retain the option to extract resources from deep below the seabed of marine national parks has led to the parks having a depth limitation of 200 metres beneath the surface of the seabed, below which is unreserved Crown land which can be accessed from outside the park.

Addressing the first term of reference: Public land classification

In the first of the three specific topics in the terms of reference the Council is requested to investigate and provide 'an assessment of the current system of public land use categories, including identification and evaluation of approaches adopted in other jurisdictions nationally and internationally, and consideration of options for changing or consolidating the existing categories to result in a system of categories that is clear and simple and that supports effective and efficient public land management'.

The terms of reference also requested the Council 'to provide an interim report on the first term of reference that includes options for the consolidation of the existing public land categories by September 2015'.

An interim report was provided to the then Minister for Environment, Climate Change and Water and made available on VEAC's website in September 2015.

The interim report is updated in this discussion paper.

Key points at a glance

- Public land classification is the assignment of public land to particular purposes and uses, and the naming of the resulting categories.
- The review of public land classification in Australian and selected international jurisdictions reveals a wide range of schemes and little consistency in categories or nomenclature. This reflects the varied histories of decision making about public land and different legal and governance frameworks.
- Protected areas—areas set aside for the long-term conservation of nature—have received more attention globally and nationally, and categorisation is more consistent for this subset of public land, often aligned to seven IUCN protected area management categories.
- Victoria's current system has evolved from a set of simplified public land use categories developed by the LCC from 1988 to 1993, based on the recommended use or purpose of the land. There have been major changes in perceptions about public land and its use and management since then, including:
 - recognition of Aboriginal rights and interests
 - increased awareness of climate change
 - continuing fragmentation and degradation of native vegetation
 - socio-economic changes
 - changes in resources uses from public land
 - the digital revolution in information, mapping and entertainment
 - major changes in public administration and agencies managing public land and natural resources.
- Victoria's current system of public land use categories is not particularly complex in a national and international context, and is simpler than many. There are currently 18 primary terrestrial public land categories, four marine categories, six public land overlays, and some 30 sub-categories.
- A strength of the Victorian system is that, unlike many jurisdictions, it comprehensively categorises all public land (parks, forests, Crown land) following systematic review.
- A weakness is that the system is not completely aligned with the legislation reserving land, and some categories are not well understood or are confusing to the public.
- Contributing to confusion are more than 1300 different wordings of Crown land reserve purposes, some of which are obsolete, dating back to nineteenth century land reservations.
- Four options for consolidating or changing the existing public land categories are:
 - Option 1:**
Minimal change, improved communication products
 - Option 2:**
Simple consolidation and re-categorisation
 - Option 3:**
Comprehensive review with clear alignment to legislation
 - Option 4:** Next generation, to address emerging issues in public land management.

Most modern states hold some land in government ownership (public land), and most international and Australian jurisdictions have developed systems of public land classification. Public land classification can be understood for the purposes of VEAC's investigation as the assignment of public land to particular purposes and uses, and the naming of the resulting public land categories. Like many classification systems, the aim is to organise information and make communication easier by having a single name for similar things.

Usually the decisions to assign public land to particular uses have been made incrementally by governments over decades or even centuries. In some cases, as in Victoria, attempts have subsequently been made to re-organise and standardise the ad hoc public land classifications that have arisen as a result of this history. Some parts of the public land estate have been considered in more detail than others; in particular, protected areas - areas set aside for the long-term conservation of nature - have been the subject of extensive discussion and categorisation globally and nationally. Other public lands have generally received less attention.

3.1 Public land classification

3.1.1 Australia

Public land classification in all Australian jurisdictions has been reviewed. Appendix 4 tabulates the results of this review for all states (other than Victoria), the Northern Territory, ACT and the Commonwealth, listing the major public land categories, the governing legislation and land manager.

For most jurisdictions, Crown land outside protected areas and forests is the most difficult to characterise. Some states do not specify standardised purposes for Crown land reserves, providing for reserves to be dedicated for any specific purpose (e.g. South Australia) while others have a long list of specified purposes for reservation or dedication which are equivalent to reserve categories (e.g. 34 in Queensland). Several jurisdictions hold large proportions of land in pastoral leasehold, a form of land tenure virtually unknown in Victoria. For example, in New South Wales about 88 per cent of Crown land is under Western Lands leases and in the Northern Territory pastoral leases account for more than 45 per cent of the land area of the territory.

Commonwealth public land categories have been included for completeness, although they cover a narrower suite of land than the states and territories, focusing on terrestrial and marine protected areas, and land used for government purposes (defence, public buildings).

Section 3.2 describes Victoria's current system of public land classification.

3.1.2 International

Public land classification in New Zealand, United States of America and Canada has been reviewed and the results tabulated in appendix 5. These jurisdictions were selected as those most similar to Victoria's public land in governance and landscape. However, all have a system of government that provides for establishment of major parks and reserves on public land by the federal or national government, which is not the case in Australia. In the case of the US and Canada, these national reserves are complemented by state or provincial reserves. In Australia's federal system, land management is the responsibility of the states.

While the systems of land ownership and tenures in regions such as Europe and Asia may be markedly different from those in Australia, considerable work has been done globally, as noted previously, to standardise protected area categorisations i.e. areas set aside for the long-term protection of nature. For this part of the public land estate, categorisations for an additional sample of five countries (from South America, Africa, Europe, Middle East and Asia) are provided in appendix 6.

3.2 Victoria's current system of public land classification

3.2.1 Public land use recommendations

The origin of the LCC, its role and that of its successors, and the legal status of government-accepted LCC land use recommendations, is described in chapter 2. This section outlines how these public land use recommendations gave rise to Victoria's current system of public land classification.

In 1971 when the LCC began work most public land was classified as unreserved Crown land, national parks, wildlife reserves, reserved forest, road reserves, and a small number of 'other' reserves.

By 1974, the LCC had adopted the approach of assigning public land units to a system of 23 categories, determined by proposed use or purpose. With each regional study however, new categories were created to accommodate the diversity of environment and land uses across the state, and by 1988 the number of categories had grown to 48. The LCC's 1988 statewide assessment proposed a reduction of those 48 categories into 18 category groups (including 'uncategorised' land) with sub-categories retaining much of the relevant detail. Appendix 7 presents the 48 categories and the simplified list of 18 categories from the 1988 report together with a description of each major category and its proposed objectives. The number of principal categories settled at 19 through the development of the LCC's last major regional study: the Melbourne Area District 2 review in 1994. Changes between 1988 and 1994 included the addition of coastal reserve and earth resources categories, and the relegation of education area to a sub-category of community use area. New categories and overlays such as heritage rivers had also been added resulting from recommendations of the Wilderness Special Investigation (1991) and the Rivers and Streams Special Investigation (1991).

Victoria's current system of principal public land categories and sub-categories based on government-accepted recommendations of the LCC, ECC and VEAC is provided in table 3.1, together with the legislation used for implementation. The table also separately lists those land-use categories that are implemented as overlays to the primary land category. Where relevant, the investigation in which a new category or sub-category was introduced after 1988 is noted.

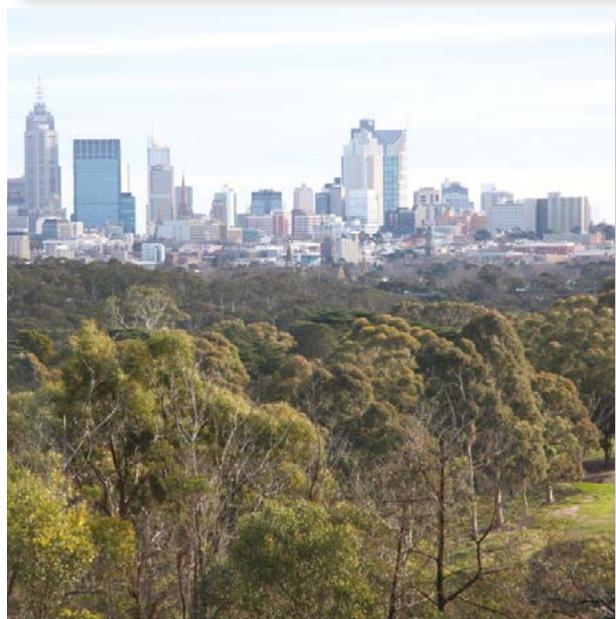


Table 3.1

Current government-accepted public land use categories and sub-categories and legislation usually used for reservation

	Category	Sub-category	Legislation
	Terrestrial		
1.	National park		<i>National Parks Act 1975</i> Sch 2
2.	State park		<i>National Parks Act 1975</i> Sch 2B
3.	Wilderness park ¹		<i>National Parks Act 1975</i> Sch 2A
4.	National heritage park ²		<i>Crown Land (Reserves) Act 1978</i> and <i>National Parks Act 1975</i> Sch 4
5.	Other park (conservation)		<i>National Parks Act 1975</i> Sch 3
		Coastal park	
		NPA Schedule 3 Park ³	
6.	Regional park		<i>Crown Land (Reserves) Act 1978</i> or <i>National Parks Act 1975</i> Sch 3 or <i>Forests Act 1958</i> section 50
		Metropolitan park ⁴	
7.	Nature conservation reserve		<i>Crown Land (Reserves) Act 1978</i> <i>National Parks Act 1975</i> Sch 3 or 4 <i>Wildlife Act 1975</i> section 16
8.	Coastal reserve		<i>Crown Land (Reserves) Act 1978</i>
9.	Historic and cultural features reserve		<i>Crown Land (Reserves) Act 1978</i>
10.	Natural features reserve		<i>Crown Land (Reserves) Act 1978</i>
		Cave	
		Natural and scenic features area	
		Geological and geomorphological features area	
		Wildlife area	<i>Crown Land (Reserves) Act 1978</i> and <i>Wildlife Act 1975</i> section 16
		Streamside area	
		Stream frontage, bed and banks	
		Bushland area	
		Lake	
		Highway park	
		Mineral spring	
11.	Water production		<i>Crown Land (Reserves) Act 1978</i>
		Water distribution and drainage	
12.	Community use area		<i>Crown Land (Reserves) Act 1978</i>
		Education area	
		Recreation area	
		Recreation trail	
		Shooting range	
		Parkland and garden	
		Building in public use	
13.	Alpine resort		<i>Crown Land (Reserves) Act 1978</i>
14.	Forest park ⁵		<i>Crown Land (Reserves) Act 1978</i>

	Category	Sub-category	Legislation
15.	State forest		<i>Forests Act 1958 or Land Act 1958</i>
16.	Plantation	School plantation	<i>Crown Land (Reserves) Act 1978</i>
17.	Earth resources		<i>Crown Land (Reserves) Act 1978</i>
		Mining area	
		Stone reserve	
		Coal production	
18.	Services and utilities area		<i>Crown Land (Reserves) Act 1978</i>
		Transport	
		Electricity and gas	
		Communications, survey and navigation	
		Municipal buildings and services	
		Hospitals, public offices and justice	
		Water and sewerage services	
		Cemetery	
19.	Uncategorised public land	Revegetation area	<i>Land Act 1958</i>
20.	Land not required for public purposes		
Marine			
1.	Marine national park ⁶		<i>National Parks Act 1975 Sch 7</i>
2.	Marine sanctuary		<i>National Parks Act 1975 Sch 8</i>
3.	Multiple-use marine protected area		<i>Crown Land (Reserves) Act 1978 and National Parks Act 1975 Sch 4</i>
4.	Coastal waters ⁷		<i>Land Act 1958</i>
Overlays			
1.	Reference area		<i>Reference Areas Act 1978</i>
2.	Wilderness zone ⁸		<i>National Parks Act 1975 Sch 5</i>
3.	Remote and natural area ⁸		<i>National Parks Act 1975 Sch 6</i>
4.	Heritage river ⁹		<i>Heritage Rivers Act 1992 Sch 1</i>
5.	Natural catchment area ⁹		<i>Heritage Rivers Act 1992 Sch 2</i>
6.	Aquaculture zone ⁶		<i>Fisheries Act 1995 section 88</i>
7.	Conservation area ¹⁰		Not yet implemented

¹ LCC Wilderness Special Investigation (1991)

² ECC Box-Ironbark Forests and Woodlands Investigation (2001)

³ VEAC River Red Gum Forests Investigation (2008)

⁴ VEAC Metropolitan Melbourne Investigation (2011)

⁵ VEAC Angahook-Otway Investigation (2004)

⁶ ECC Marine, Coastal and Estuarine Investigation (2000)

⁷ Referred to in LCC Statewide Assessment of Public Land Use (1988) and recommended in ECC Marine, Coastal and Estuarine Investigation (2000)

⁸ LCC Wilderness Special Investigation (1991)

⁹ LCC Rivers and Streams Special Investigation (1991)

¹⁰ VEAC Yellingbo Investigation (2013)

3.3 Other systems of classifying land in Victoria

3.3.1 Planning scheme zones and overlays

Local government planning schemes may apply to all private and public land in Victoria. A planning scheme is binding on all members of the public, on every Victorian minister, government department, public authority and council. The following information is sourced from the Planning division of DELWP.

Each of the 79 local government areas in Victoria and each of the three special planning areas (Alpine Resorts, Port of Melbourne, and French and Sandstone Island) is covered by a planning scheme, which sets out objectives, policies and provisions for the use, development and protection of land in the area. A planning scheme regulates the use and development of land through planning provisions. Matters that a planning scheme may provide for are described in section 6 of the *Planning and Environment Act 1987*. The planning scheme zones land for particular uses and land may also have an overlay as well as a zone affecting it.

Planning Practice note 2 (June 2015) provides guidance about the appropriate use of the public land zones. Public land is not defined in the Victoria Planning Provisions or the Planning and Environment Act, but it is commonly accepted that public land comprises:

- ✦ Crown land
- ✦ land vested in or owned by a minister, government department, public authority or municipal council
- ✦ land otherwise used for a public purpose.

Public land zones are not intended to identify the legal status of the land nor indicate the existing land use. They are intended to set out appropriate statutory requirements which apply to the use and development of the land in addition to the relevant land management legislation.

Table 3.2 sets out the four public land zones and their purposes.

A public land zone is applied to public land where the surrounding zoning is inappropriate or where there is a special reason to identify separately the public land for planning purposes. Land is not automatically included in a public land zone simply because it is public land. There are situations where a public land zone is not the most appropriate zone. Examples include roads and remnant parcels of public land in rural areas. In such cases the use of other zones and overlays may appropriately recognise the purpose for which the land is reserved.

Table 3.2
Public land zones in planning schemes

Zone	Purpose
Public Use Zone	This zone recognises the use of land for a public purpose and prescribes a number of categories of public use which can be shown on the planning scheme map. This is the main zone for public land used for utility or community service provision.
Public Park and Recreation Zone	This is the main zone for public open space and public recreation areas.
Public Conservation and Resource Zone	This zone provides for places where the primary intention is to conserve and protect the natural environment or resources. It also allows associated educational activities and resource-based uses.
Road Zone	This zone enables declared roads and other important roads or proposed roads to be designated on the planning scheme map.

3.3.2 IUCN protected area categories

Protected areas – national parks, wilderness areas, nature conservation reserves and so on – are the cornerstone of biodiversity conservation. Effectively managed systems of protected areas have been recognised as critical instruments in achieving the objectives of the Convention on Biological Diversity and the Millennium Development Goals.

Consistency in comparing protected areas across Australia is achieved by the allocation and use of an internationally defined set of management categories, known as IUCN (International Union for Conservation of Nature) categories. Protected areas are defined by IUCN as follows:

‘A protected area is a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long term conservation of nature with associated ecosystem services and cultural values’.

There are seven IUCN protected area categories:

- Ia Strict Nature Reserve
- Ib Wilderness Area
- II National Park
- III Natural Monument or Feature
- IV Habitat/Species Management Area
- V Protected Landscape/Seascape
- VI Protected area with sustainable use of natural resources

Under Australia's *Strategy for the National Reserve System 2009-2030* all the state and territory governments and the Australian government have agreed to adopt international standards for the definition of a protected area and management categories used by the IUCN.

IUCN protected area management categories classify protected areas according to their management objectives (see appendix 8). The categories are recognised by international bodies such as the United Nations and by many national governments as the global standard for defining and recording protected areas and, as such, are increasingly being given legal effect such as in Australia's EPBC Act for Commonwealth reserves. The EPBC Act requires that a Commonwealth reserve must be managed in accordance with the Australian IUCN reserve management principles that are prescribed for each IUCN category by the EPBC Regulations. In Victoria, the IUCN categories do not have any legal effect and individual protected areas are assigned to an IUCN category as a reporting tool only. National reporting on protected areas is published in the Collaborative Australian Protected Area Database (CAPAD) described below.

Every two years, the Australian government collects information on protected areas from state and territory governments and other protected area managers. CAPAD is used to provide a national perspective of the conservation of biodiversity in protected areas. It also allows Australia to regularly report on the status of protected areas to meet international obligations such as those in the Convention on Biological Diversity.

CAPAD is a textual and spatial database with information available for nine years between 1997 and 2014. Marine data and information are also available as a separate dataset.

Table 3.3 summarises the IUCN categories most commonly assigned to Victorian public land use categories and sub-categories. While some of Victoria's protected area categories are easily assigned to one of the seven IUCN management categories – national parks for example – others do not sit comfortably in one category or, sometimes, in any category. As well, an individual park or reserve may be assigned to a different category than that listed, depending on its history, the way it was established, and the land uses or activities applying to that area.

Public land overlay categories are also listed where relevant. Land with a legislated public land use overlay will generally be assigned to the IUCN management category most suitable for the overlay, unless the overlay has less strict protection than the underlying land tenure. For example, a reference area in a national park will be assigned to IUCN category 1a as this is the strictest protection applying to the land.

Table 3.3
Public land use categories comprising the protected area system in Victoria with the most commonly assigned IUCN management category

Category	Sub-category	IUCN categories ^{1,2}
Terrestrial		
National park		II
State park		II
Wilderness park		Ib
Other park (conservation)	National Parks Act Schedule 3 park	II, III
	Coastal park	II, III
National heritage park		V
Nature conservation reserve *		Ia
Natural features reserve **	Bushland area/ reserve	III, IV
	Cave reserve	III
	Geological and geomorphological features area	III
	Natural and scenic features area	III
	Streamside area	III, IV
Marine		
Marine national park		II
Marine sanctuary		II, III
Multiple-use marine protected area	Marine and coastal park	III
	Marine park	VI
Overlay		
Reference area		Ia
Wilderness zone		Ib
Remote and natural area		Ib, II
Heritage river		II, III
Natural catchment area		Ib, II

* includes Trust for Nature protected area

** VEAC does not consider the sub-category of wildlife area (hunting permitted) i.e. game reserve to be a protected area, although the category is sometimes reported as an IUCN category VI reserve.



3.4 Assessment of the current system of public land classification in Victoria

The Council's interim report on public land classification provided to the then Minister for Environment, Climate Change and Water in September 2015 included an assessment of Victoria's current system of public land classification. The assessment included a review of the strengths and weaknesses of the current system, informed by input from stakeholders and public land managers.

A summary of the assessment follows, updated as required following further consultation. The full assessment can be found in section 4 of the interim report on VEAC's website at www.veac.vic.gov.au.

The current system has evolved from a set of simplified public land use categories developed by the LCC from 1988 to 1993. Section 3.2.1 describes the LCC/ECC/VEAC processes of assigning public land to land use categories.

The following views expressed in the public consultation so far informed the assessment:

- ✦ unlike other national and international jurisdictions, assignment of public land to categories in Victoria over the last 40 years resulted from systematic studies and reviews, informed by science and thorough consultation
- ✦ the divergence of the LCC/ECC/VEAC categories from the categories used in legislation reserving land leads to reduced management effectiveness on the ground
- ✦ the pressures on and uses of public land have changed in the more than 25 years since the current system of public land categories was established; community perceptions of public land have changed
- ✦ the public does not understand public land categories, particularly in relation to permitted activities, and is often confused by the nomenclature
- ✦ the relevant land manager cannot easily be inferred from the public land category.

3.4.1 Changes since the LCC assessment in 1988

There have been many major changes in perceptions about public land and its use and management in the last 25 years.

Most fundamental is the High Court's 1992 landmark decision overturning the concept of *terra nullius* (that no one owned the lands before European settlement). Other significant changes include:

- ✦ increasing awareness of climate change and its impacts
- ✦ continuing degradation of Victoria's remaining vegetation
- ✦ changes in patterns of resource use from public land

- ✦ socio-economic changes leading to changes in the way the public uses and values public land
- ✦ the digital revolution in information, entertainment and mapping
- ✦ major changes in public administration and the agencies managing public land and natural resources.

3.4.2 Community understanding and awareness

Permitted activities and exceptions

Council notes that attempts to inform the public about the activities that can be carried out in different categories of public land is hampered by misconceptions and misinformation, and the myriad exceptions that exist in almost every category.

Appendix 9 is an example of a summarised table of permitted activities in major public land categories, and illustrates the number of exceptions there are to the general rules applying to particular categories. However, Council acknowledges that the exceptions have arisen over the years as a result of public consultation and political debate, and are often well understood by users of the site.

VEAC's consultation with land managers and stakeholders indicates that the information sought from members of the public about the activities that are permitted on public land is usually activity and site specific. For example, deer hunters and recreational prospectors seek information about where their activity is permitted on public land, maps of those areas, and information about any other restrictions. Other groups such as recreational fishers may be aware of the public land category in which their activity is permitted or not permitted, but require spatially accurate information about the boundary. Confusion also arises in the distinction between forest park and state forest and their respective permitted activities.

There is some anecdotal evidence that the changes in government administration of public land and natural resources over the past 20 to 30 years have made it more difficult for the public to know which department or agency manages a particular area of public land or regulates a particular activity, and where to seek information. Countering that, however, is the exponential development of digital technologies and online resources, which make it easier than ever to find information, irrespective of changes in the land or natural resource manager.

Nomenclature

From anecdotal reports, there seems no doubt that some of the public land categories are confused with each other, are not understood, or are simply unknown to the general community. In particular, state park is routinely confused with state forest, and forest park and regional park are poorly understood.

The national and state designations probably arise from the US system where the appellations actually reflect the level of government under which they are established and managed, unlike the Victorian situation. National and state park designation in Victoria is also sometimes erroneously thought to reflect the level of significance of the land. Although there was an element of significance in the original intent of the LCC in describing the national and state park categories, it has never been reflected in legislation and the distinction has been discarded.

Previous attempts at consolidating categories have sometimes compounded the confusion, by relegating to sub-categories reserve types that may be well known and understood. For example, the 'community use area' category may not be well-known but includes the well-understood sub-categories of recreation reserve, parkland and garden and so on. Similarly, 'natural features reserve' is not as well known as some of its sub-categories such as water (or stream) frontage, wildlife reserve, mineral springs reserve and so on. The natural features reserve category includes sub-categories that are protected areas according to the IUCN definition, and reserves that are not considered to be protected areas, further confusing the purpose of the category.

Other sources of confusion arise from the local retention of well-understood names for particular sites such as e.g. the McKenzie Flora Reserve, while also referring to the site generically as a nature conservation reserve.

3.4.3 Legislative framework for public land management

LCC/ECC/VEAC recommendations as approved by the Governor in Council or the government are binding on government departments and public authorities.

The LCC/ECC/VEAC recommendations, as approved and unless varied by a subsequent decision of government (or Parliament), govern how public land in Victoria is used and managed, irrespective of the underlying legal status. However, to be able to apply and enforce regulations, appropriate reservation through the legislative framework is required.

A key issue hindering effective management is the non-reservation of land in accordance with the accepted LCC/ECC/VEAC recommendations. The misalignment between the approved land use and the legal status of the land makes the creation and application of uniform regulations and compliance and enforcement difficult or impossible, and the issuing of permits or licences potentially cumbersome and complex. Appendix 3 illustrates the complexities of the range of categories available, the legislation used to reserve land and the legislated purposes.

Chapter 4 of this discussion paper considers in detail the level of implementation of accepted recommendations and the current reservation status of public land.

Other issues brought to VEAC's attention include the administrative complexities that arise from the 1300 or more different wordings of reservation purpose for Crown land reserves, which is a legacy of reservation processes over more than 150 years. Some of these issues relate simply to the difficulty in keeping track of all reserves aligned with a particular LCC/ECC/VEAC category in order to apply regulations, but others are the unintended problems caused when a reservation purpose might not reflect specific wording in legislation.

Specific examples of issues include:

- ✦ wildlife reserves are established under the Wildlife Act only by virtue of their reservation purpose under the Crown Land (Reserves) Act. If the exact wording is not used, this will preclude an area becoming a wildlife reserve under the Wildlife Act
- ✦ impacts on leases under the Crown Land (Reserves) Act over certain land that is described by reference to specified purposes unless certain criteria are met. If the purpose is similar but not identical to the legislated wording, other stricter criteria apply (including the possibility of the lease being disallowed by Parliament)
- ✦ reserves within the one land use category may be reserved under different Acts, e.g. there are LCC/ECC/VEAC recommended regional parks reserved under the Crown Land (Reserves) Act, the Forests Act and the National Parks Act

- ✦ reservation and management arrangements do not always sit within the one Act, e.g. some areas are reserved under the Crown Land (Reserves) Act but, through particular legislative provisions, managed under the Forests Act, National Parks Act or Wildlife Act. This reflects the history of Crown land use administration or political decisions.

3.5 Options for consolidation or change to current public land use categories

The Council was requested to provide an interim report on the first term of reference that includes options for the consolidation of the existing public land categories. The following section is based on the options described in the interim report.

Following consideration of the assessment outlined in preceding sections of this report, Council considered that there were four broad options as follows:

Option 1 Minimal change, improved communication products

Option 1 reflects the results of the evaluation of Victoria's system of public land categories in comparison to other jurisdictions. Victoria's system is not complex in comparison to other jurisdictions and is simpler than many. Input from submissions, the Community Reference Group and public land managers suggest that while some confusion is evident, public land classification is not a major issue.

Option 2 Simple consolidation and re-categorisation

Option 2 reflects some of the analysis of strengths and weaknesses of the current system outlined earlier in this chapter.

Option 3 Comprehensive review with clear alignment to legislation

Option 3 consolidates the public land use categories and makes some updates to reflect contemporary values and uses, and aligns the categories to new or amended legislation.

Option 4 Next generation

Option 4 builds on Option 3 to facilitate addressing emerging issues in public land management.

The main elements of the options are provided in table 3.4, including examples of how they might be applied.

Table 3.4
Elements of options 1 to 4

Element	Example	Benefit	Option
Minor changes only to nomenclature	State park category renamed to minimise confusion with state forest Reconsider naming of natural features reserve category	Improves clarity and public understanding Minimal change reduces possibility that stakeholders think that permitted uses have changed for particular areas Minimises need to rename parks and reserves or change signage and publication materials	1
Changes to descriptions of purposes and values associated with public land categories to reflect Aboriginal interests	Amend objects of the National Parks Act to add explicit provision for protection of Aboriginal cultural heritage	Reflects the growth in knowledge and understanding of Aboriginal rights and interests	All options
Development of improved information products	Mobile phone apps with maps for recreational users about where they can undertake their activities on public land	Meets the expressed need of users of public land for spatially accurate information	All options
Consolidation or re-categorisation of a small number of poorly understood or confusing categories and sub-categories	Consolidate national park and state park, forest park and regional park; and rationalise and re-categorise some natural features reserve sub-categories e.g. cave, highway park; and some community use area sub-categories e.g. education area	Reduces public confusion Avoids major consolidations that may lead to changes in the permitted uses on public land	2
Application of new overlays to public land categories which separately designate areas with Aboriginal title or Aboriginal jointly managed land	Parks and reserves under Aboriginal title would be categorised and designated e.g. as national park – Aboriginal land	Acknowledges status of land appropriately Improves public awareness of Aboriginal rights and interests	2,3,4
Alignment of public land categories and their purposes to new or amended legislation that implements the revised categories	Amendment of the National Parks Act (e.g. to a National Parks and Nature Conservation Reserves Act) which would include all protected area categories Amendment of the Crown Land (Reserves) Act to replace the 33 purposes of reservation in section 4 with a smaller number of purposes that align with the purposes of the categories as accepted by successive governments	Better aligns with national and international standards Reflects the input from public land managers and others that effective management and provision of clear information to the public is compromised by land legislation that doesn't align with the Government-accepted public land uses Reduces inconsistencies and streamlines management; avoids administrative complexity and unintended problems of using incorrect wording of purpose	3, 4
Removal of overlapping and obsolete legislative provisions	Forest Act and Land Act amendments to remove the historical division between reserved forest and protected forest in favour of one State forest category administered under the Forests Act Wildlife Act amendments to remove provisions for sub-categorising land; required sub-categories to be established in the relevant primary Act	Reflects the multiple values and uses for which native forests are managed Avoids administrative complexity and unintended problems of using incorrect wording of purpose	3, 4

Element	Example	Benefit	Option
Separate designation of relevant community use area and services and utilities area sub-categories as 'local significance land'	Recreation area, building in public use, municipal buildings and services	<p>Responds to current discussions about appropriate level of management for local reserves</p> <p>Facilitates transfer of ownership and/or management to local government where appropriate</p> <p>Addresses issue that there are currently different governance frameworks for reserves with identical purposes depending only on whether ownership is Crown or local council</p>	4
Separate designation of relevant services and utilities area sub-categories as 'government operational land'	Hospitals, public offices and justice; water and sewerage services	<p>Responding to current discussions about appropriate management facilitates transfer of ownership and/or management to public authorities</p> <p>Addresses issue that there are currently different governance frameworks for reserves with identical purposes depending only on whether ownership is Crown or public authority</p>	4
Facilitation of linkages to local planning schemes to manage natural and heritage assets	Apply the conservation area overlay recommended by VEAC for the Yellingbo area (2013)	Acknowledges the increasing importance of managing fragmented landscapes and habitat linkages across public and private land	4
Incorporation of international designations into legislated public land categories	Ramsar wetland	Acknowledges national and international designations of significance and gives legal effect to obligations	4

Addressing the second term of reference: Current reservation status of public land

In the second of the three specific topics in the terms of reference, the Council is requested to investigate and provide 'an assessment of the current reservation status of public land, including where land use has changed since government accepted a recommendation'. Within the context of the broad purpose of the investigation, this is interpreted as a request to provide an assessment of progress in formally implementing – usually through land reservation – government-accepted recommendations of the LCC, ECC and VEAC, and to note which recommendations may require review.

Council acknowledges that, prior to formal reservation, public land is managed in accordance with the accepted recommendations as far as possible. The absence of formal reservation should therefore not be taken to suggest that the land is not being appropriately managed. However, if an area is not formally reserved the full legislative framework for managing uses is not available, and compliance and enforcement are compromised.

Key points at a glance

- The level of implementation (through formal reservation) of government-accepted LCC/ECC/VEAC public land use recommendations varies according to the public land use category or overlay.
- A substantially higher proportion of recommendations over public land making up Victoria's protected area system are implemented than for other public land use categories.
- All recommendations accepted by government for national, state and wilderness parks, marine national parks and sanctuaries, and alpine resorts have been implemented.
- Three quarters of recommendations for nature conservation reserves have been implemented.
- Assessment so far of recommendations for other public land categories (regional parks, state forests, wildlife areas, historic and cultural features reserves) indicate between approximately 40 and 70 per cent are implemented.
- Implementation of some of the six multiple-use marine protected areas is incomplete, particularly in relation to the coastal components.
- Almost all recommendations for public land use overlay categories (reference area, wilderness zone, remote and natural area, heritage river, natural catchment area) have been implemented (94 to 100 per cent).
- The legislative mechanism for reservation is a major influence on the level of implementation. A much higher proportion of accepted recommendations for land reserved under the *National Parks Act 1975*, or other specific legislation such as the *Heritage Rivers Act 1992*, are implemented than are recommendations for land reserved under either the *Crown Land (Reserves) Act 1978* or the *Forests Act 1958*.
- State forest has not been implemented as a unified land category similar to 'reserved forest' under the *Forests Act*, as the LCC recommended more than 30 years ago. Similar licensed activities in state forests are still administered under two different Acts - either the *Forests Act* or the *Land Act 1958*.
- Insufficient resourcing, which includes prioritisation of staff time and expertise as well as appropriate, thorough and reliable tools to support work flows, are barriers to implementing government-accepted recommendations.
- Information systems for Crown land are no longer fit for purpose, are at risk of becoming inoperable, and require urgent attention.
- Permanent and temporary reservations are an unusual feature of Crown land reservation in Victoria, not used in other Australian jurisdictions.

4.1 Defining implementation of government-accepted recommendations

4.1.1 Government response to recommendations

Formal processes are set out in legislation about how the government must respond to reports and recommendations of VEAC and its predecessors. Section 2.2.2 describes the legal status of government-accepted recommendations of the LCC, ECC and VEAC. For example, section 26 of the VEAC Act provides that, if the statement of the government response to a report specifies that the government wholly or partly accepts a recommendation, the government must ensure that appropriate actions are taken to implement the recommendation to the extent that it has been accepted. Historically, the *Land Conservation Act 1970* provided that, following notice by the Minister to affected government departments and public authorities of the intention to accept the recommendations, an Order of the Governor in Council required departments or public authorities to use 'all diligence and dispatch to give effect to any recommendation' so far as it affects any land vested in or controlled by them.

4.1.2 Land units and land parcels

Public land is usually thought of in terms of discrete areas such as a specific national park, state forest or reserve. However, public land administration deals with land in terms of both individual and multiple 'parcels' of land. A parcel is an allotment of land with defined boundaries and an individual identifying number (analogous to private land parcels that have unique title, subdivision and plan numbers). As box 4.1 shows, land units vary in complexity.

4.1.3 Defining 'implementation' of government acceptance of recommendations

To assess, categorise and inventory the implementation status of recommendations applying to different public land use categories, VEAC described the level of implementation as follows:

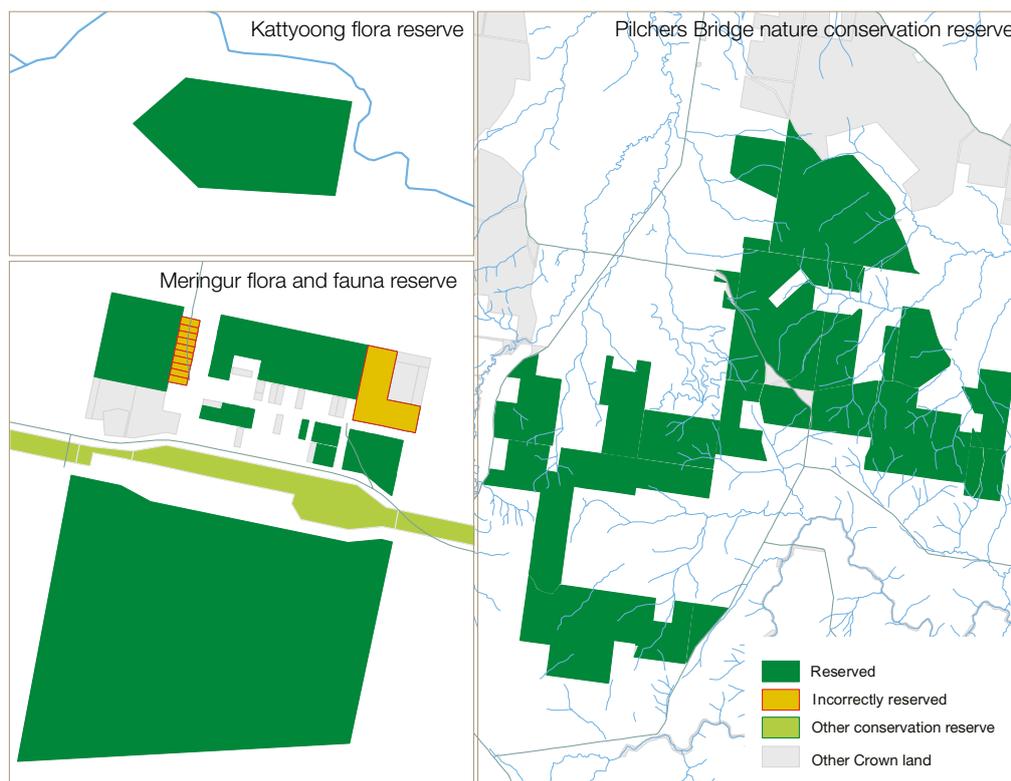
- ◆ fully implemented
- ◆ partially implemented
- ◆ unimplemented
- ◆ implementation unclear.

Box 4.1

Spatial arrangement of parcels in land units of different sizes

Parcel = allotment of land with defined boundaries and an individual identifying number

Land unit = one or more parcels named and managed as one entity



Land units vary in complexity. Some (e.g. Kattoyong flora reserve) consist of only one parcel.

Others (e.g. Meringur flora and fauna reserve) consist of multiple parcels of different sizes, that are not necessarily spatially-contiguous.

Others (e.g. Pilchers Bridge nature conservation reserve) spread over large areas in a patchy manner.

Due to the differences in the way public land is reserved under different legislation, these categories have been adapted as appropriate to suit the land category.

While some recommendations apply to many land units, other land units have multiple recommendations relating to the same area. The LCC regularly made separately numbered recommendations for national parks or additions to national parks. For example, the 22 recommendations A6 to A27 in the Alpine Special Investigation (1983) all relate to the Alpine National Park. It is also common for one recommendation to apply to many existing reserves in a particular category. For example, E1 in the ECC's Box-Ironbark Forests and Woodlands Investigation (2001) refers to 32 existing historic and cultural feature reserves. These conventions and practices make it difficult to meaningfully assess level of implementation using the number of recommendations as a measure.

VEAC's assessment of the implementation of government-accepted recommendations is therefore at the scale of the land unit, in contrast with the LCC's 1988 Statewide Assessment of Public Land Use, which measured implementation of the individual recommendations.

Public land use recommendations include a list of permitted and non-permitted uses for each public land use category, sometimes with recommended variations to the general provisions for specific areas. The implementation of permitted and non-permitted uses has not been analysed at this stage; only the reservation status is included in the assessment. Furthermore, most recommendations specify that the land unit should be permanently reserved. However, for reasons discussed in section 4.3 later in this chapter, many new reservations under the Crown Land (Reserves) Act are temporary. For the purposes of this analysis, VEAC has considered such temporary reservation as implementation of the government-accepted recommendation.

Previous VEAC investigations and most LCC and ECC investigations can be found on the VEAC website at www.veac.vic.gov.au. A full list of past investigations by the LCC and ECC (including summaries of each) can be found in Danielle Clode's 2006 book *As If For A Thousand Years: A History of Victoria's Land Conservation and Environment Conservation Councils*.

4.2 Patterns of implementation

The 1988 Statewide Assessment of Public Land conducted by the LCC estimated the implementation of government-accepted recommendations both by study area and public land use category (see table 4.1). Within the timelines for preparation of this discussion paper, it was not possible to fully assess the implementation status of land units for every public land use category nor for all public land within each study area. In order to give adequate coverage across Victoria, to include the range of legislation used to reserve land and to highlight the range of issues related to formal reservation, VEAC assessed the reservation status of land in the following public land use categories:

- ✦ national park
- ✦ state park
- ✦ wilderness park
- ✦ marine national park
- ✦ marine sanctuary
- ✦ multiple-use marine protected area
- ✦ regional park
- ✦ alpine resort
- ✦ forest park
- ✦ state forest
- ✦ nature conservation reserve
- ✦ wildlife areas (hunting) – sample only
- ✦ historic and cultural features reserve.

VEAC also assessed the implementation of the following public land use overlays:

- ✦ reference area
- ✦ wilderness zone
- ✦ remote and natural area
- ✦ heritage river area
- ✦ natural catchment area.

Table 4.1

Implementation of government-accepted recommendations in 1988 for selected public land use categories and overlays

	Level of implementation ¹ (per cent)	Number of recommendations ²
Public land use category		
National park ³	48	56
State park	64	47
Wilderness park	100	3
Regional park	26	58
State forest ⁴	36	229
Nature conservation reserve ⁵	18	220
Wildlife area	20	285
Historic and cultural features reserve	5	75
Public land use overlay		
Reference area	39	130

Source: Data was sourced from the LCC's 1988 Statewide Assessment of Public Land Use, page 84.

¹ Fully and partially implemented recommendations were included in this figure.

² Where a subsequent review or investigation made recommendations for a land unit subject to an existing recommendation from an earlier investigation, both recommendations were counted.

³ The national park estimates included 22 recommendations for additions to the Alpine National Park and 11 other additions to existing parks that had been accepted, but for which the legislation had not been passed at the time of publication.

⁴ This figure included recommendations for hardwood production and uncommitted land.

⁵ Data for flora reserves and flora and fauna reserves have been combined.

A summary of the implementation status of government-accepted recommendations for selected public land use categories in 2016 is provided in table 4.2. The LCC used a different methodology to measure implementation in 1988 than VEAC has used in this report, so tables 4.1 and 4.2 (overleaf) are not directly comparable. In 1988 the number of individual recommendations was assessed, while in 2016 the number of land units was assessed. The 1988 assessment also reported both fully and partially implemented recommendations as implemented. To enable a broad comparison, the 2016 data in table 4.2 are also aggregated to this level.

Even with these qualifications, across all assessed public land use categories and overlays (apart from wilderness parks which were fully implemented in 1988) the level of implementation has improved in 2016 compared to 1988.

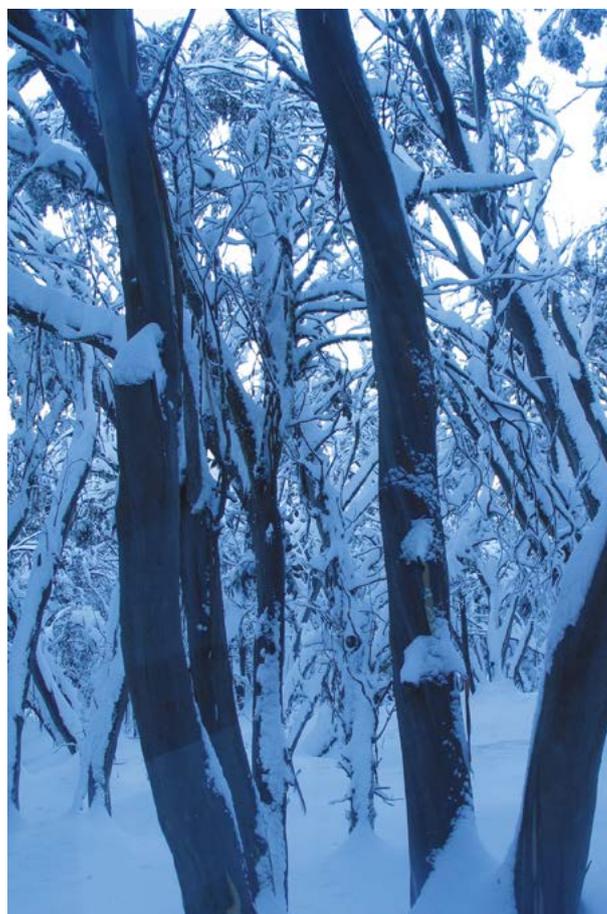


Table 4.2

Implementation of government-accepted recommendations in 2016 for selected public land use categories and overlays

	Legislation used for majority of reservations	Level of implementation (per cent) – full and partial	Number of land units or areas subject to recommendations ¹
Public land use category			
National park	National Parks Act	100	41
State park	National Parks Act	100	25
Wilderness park	National Parks Act	100	3
Marine national park	National Parks Act	100	13
Marine sanctuary	National Parks Act	100	11
National heritage park	Crown Land (Reserves) Act National Parks Act	100	1
Multiple-use marine protected area	Crown Land (Reserves) Act National Parks Act	100	6
Regional park	Crown Land (Reserves) Act Forests Act National Parks Act	48	31
Alpine resort	Crown Land (Reserves) Act Alpine Resorts Act	100	6
State forest ²	Forests Act	57	not applicable
Forest park	Crown Land (Reserves) Act Forests Act	100	1
Nature conservation reserve	Crown Land (Reserves) Act National Parks Act Wildlife Act ⁴	74	421
Wildlife area ³	Crown Land (Reserves) Act Wildlife Act	69	94
Historic and cultural features reserve	Crown Land (Reserves) Act	40	139
Public land use overlay⁴			
Reference area	Reference Areas Act	94	144
Wilderness zone	National Parks Act	100	19
Remote and natural area	National Parks Act	100	24
Heritage river	Heritage Rivers Act	100	17
Natural catchment area	Heritage Rivers Act	100	26

¹ The number of land units or areas in this column may not match numbers presented elsewhere in this report, because occasionally land units are reserved outside the LCC/ECC/VEAC recommendation process. This column only shows the number of land units or areas which are subject to recommendations.

² State forest parcels tend to be much larger than for other public land, and the boundaries tend to be poorly defined, particularly where state forest parcels abut other state forest parcels. For these reasons, it was more appropriate to assess the implementation of state forest recommendations on a hectare basis, rather than by number of land units or areas.

³ Only recommendations for Gippsland Lakes Hinterland, Ballarat, Wimmera and River Red Gum Forests investigation areas were assessed for this public land use category. For this reason, there are fewer land units represented in this category than exist across the state.

⁴ Reference areas were recommended by the LCC as a separate public land use category but are implemented as an overlay on public land. There is no comparative data for wilderness zones, remote and natural areas, heritage river areas or natural catchment areas as these public land use overlays were created after 1988.

4.2.1 National Parks Act areas

Defining implementation

It is straightforward to define the implementation status of the following public land categories and overlays that are implemented through schedules to the National Parks Act:

- ✦ national parks (Schedule Two)
- ✦ state parks (Schedule Two B)
- ✦ wilderness parks (Schedule Two A)
- ✦ wilderness zones (Schedule Five)
- ✦ remote and natural areas (Schedule Six)
- ✦ marine national parks (Schedule Seven)
- ✦ marine sanctuaries (Schedule Eight)
- ✦ national heritage park (Schedule Four)
- ✦ multiple-use marine protected areas (Schedule Four)

The implementation status of an area listed in the schedules to the National Parks Act is taken to be the government-accepted recommendation, even if this varies from the Order in Council or the initial government response prior to parliamentary processes. For example, the LCC's Wilderness Special Investigation (1991) recommended that, if the government decided that logging was not to proceed in the northern part of the Wongungarra River catchment, a particular area should be a wilderness zone (recommendation B16). The government response indicated that logging was not to proceed and that the area should be designated a wilderness zone. The government introduced legislation into Parliament to implement this decision, but the provision did not successfully pass through Parliament.

With a few minor exceptions (explained below) the categories and overlays under the National Parks Act are either fully implemented or not implemented.

A variety of parks and other areas across several public land categories are included in Schedule Three of the National Parks Act. Some of these public land categories, e.g. regional parks, are usually implemented under other legislation such as the Crown Land (Reserves) Act.

Schedule Four provides a different pathway to establishing areas under the National Parks Act. It enables land that is reserved under the Crown Land (Reserves) Act to be managed 'as though it were a park' under all or specified provisions of the Act or regulations. Most areas in Schedule Four are multiple-use marine protected areas, but the schedule also includes Victoria's sole national heritage park (Castlemaine Diggings National Heritage Park) and one nature conservation reserve (Deep Lead Nature Conservation Reserve (No. 1)).

Assessing implementation

The implementation status of most public land categories and overlays implemented through the National Parks Act has been assessed. Tables 4.1 and 4.2 and Map A *Victoria's public land* in the back pocket of this discussion paper show the location of the land units discussed in the following sections.

National parks

Government-accepted recommendations for national parks apply to 41 land units covering some 2,883,800 hectares. Some national parks recommended in earlier investigations and established by government were subsequently reviewed and have been amalgamated into larger parks. For example, Bogong National Park was recommended in the LCC's Alpine Special Investigation (1983) but has since been included in Alpine National Park. The older government-accepted recommendations for national parks have not been counted among the 41 land units.

All recommendations for national parks have been fully implemented, indicated by their inclusion on Schedule Two of the National Parks Act. The largest national park is Murray-Sunset at 664,810 hectares; the smallest is Organ Pipes at 153 hectares. Not all current national parks are covered by recommendations. Churchill National Park was created in 1941 (as Dandenong National Park) and has not been covered by a specific recommendation under any LCC/ECC/VEAC study. Point Nepean National Park is former Commonwealth land which was transferred to the state in three tranches, commencing in 1988. It lies within the LCC's Melbourne Area District 1 Review (1987) study area but could not be considered at that time. Cobboboonee National Park was established in 2008 as the result of an election commitment.

Wilderness parks

Two of the 17 recommended wilderness areas in the LCC's Wilderness Special Investigation (1991) were existing wilderness parks and one additional recommended area was established as a wilderness park: Big Desert Wilderness Park (142,300 hectares), Avon Wilderness Park (39,650 hectares) and Wabba Wilderness Park (20,100 hectares). These are all considered fully implemented by their inclusion on Schedule Two A of the National Parks Act. The remaining 15 wilderness areas recommended by the LCC were established as wilderness zones on Schedule Five of the National Parks Act.

State parks

Government-accepted recommendations for state parks apply to 26 land units covering 156,822 hectares. Several state parks recommended in earlier studies and investigations have subsequently been amalgamated into larger national parks. The older government-accepted

recommendations for state parks which have been subsumed into other parks have not been counted in the analysis. All recommended state parks have been fully implemented, as indicated by their inclusion on Schedule Two B of the National Parks Act. The largest is Lerderberg State Park, which covers 20,185 hectares and the smallest is Cape Nelson State Park, at 210 hectares.

National heritage park

There is one government-accepted recommendation for a national heritage park (Castlemaine Diggings National Heritage Park) covering 7,585 hectares arising from the ECC's Box-Ironbark Forests and Woodlands Investigation (2001). The park has been fully implemented through reservation under the Crown Land (Reserves) Act and listing on Schedule Four of the National Parks Act.

Marine national parks and marine sanctuaries

Government-accepted recommendations apply to 13 marine national parks and 11 marine sanctuaries, covering 52,900 and 876 hectares respectively (see table 4.2 and Map A *Victoria's public land* in the back pocket of this discussion paper). The final recommendations were made under the *Environment Conservation Council Act 1997*, which did not include specific provisions for a government response. As for all areas established under the National Parks Act, however, the government-accepted recommendations are taken to be the areas ultimately included in the schedules of the Act. The recommendations for marine national parks and marine sanctuaries are fully implemented through Schedules Seven and Eight of the National Parks Act.

Multiple-use marine protected areas

Five of the six existing multiple-use marine protected areas in South Gippsland adjacent to Wilsons Promontory National Park are subject to individual government-accepted LCC recommendations, while the sixth – the Bunurong Marine Park – was a later initiative of government. Three of the six areas are marine and coastal parks. Subsequent government decisions have included parts of the multiple-use marine protected areas in the marine national parks and marine sanctuaries and confirmed the remaining areas as multiple-use marine protected areas. The remaining areas in all six multiple-use marine protected areas are fully or partially implemented. VEAC's Final Report for its Marine Investigation (2014) noted that the incomplete reservation of the coastal land within the three marine and coastal parks impedes effective management.

Regional parks

Government-accepted recommendations for regional parks apply to 31 land units covering 101,591 hectares. The largest is the Murray River Park, which covers 37,088

hectares; the smallest is Green Lake Regional Park at 306 hectares. Parks in this category have been established in various ways: six are listed on Schedule Three of the National Parks Act (three of which are known as historic parks); eight are listed on the Fifth Schedule of the Crown Land (Reserves) Act, one of which is not yet actually established (Murray River Park); a further two are reserved under the Crown Land (Reserves) Act but not scheduled, and one (You Yangs Regional Park) is established under the Forests Act. An additional regional park (Canadian Regional Park) is not subject to recommendations, and was established in 2016 under the Crown Land (Reserves) Act as the result of a government decision.

The reasons behind the different implementation mechanisms for this poorly understood public land use category are a complex legacy of available legislation, different management agencies, machinery of government changes and individual decisions of the government of the day. Historically, some regional parks were implemented via the National Parks Act or Forests Act because they were intended to be managed by the agencies that managed land under those Acts at that time. Recently, the usual practice is to establish regional parks under the Crown Land (Reserves) Act.

The diversity of mechanisms for implementation makes it difficult to confidently assess the implementation status of government-accepted recommendations for regional parks. At the present time, it is estimated that 15 regional parks subject to recommendations are fully implemented (36 per cent), while the remaining 16 are considered to be unimplemented (see Map C in the back pocket of this discussion paper). With further detailed analysis, some of those currently considered to be unimplemented may be determined to be partially implemented, but current data systems do not facilitate a simple investigation and analysis of this matter at this time.

The recommended Murray River Park takes in five previously recommended regional parks (Wodonga, Yarrawonga, Cobram, Tocumwal, Echuca) along the Murray River as well as substantial lengths of the River Murray Reserve. While this regional park is already listed in the Fifth Schedule of the Crown Land (Reserves) Act, declaration of the park awaits further steps as provided for in section 47BA of the Crown Land (Reserves) Act.

Wilderness zones (overlay)

Wilderness areas were recommended in the LCC's Wilderness Special Investigation (1991). Government-accepted recommendations apply to 19 wilderness zones within seven national parks covering 655,719 hectares. All wilderness zones have been implemented through their inclusion on Schedule Five of the National Parks Act.

Remote and natural areas (overlay)

Remote and natural areas were recommended in the LCC's Wilderness Special Investigation (1991). Government-accepted recommendations apply to 24 areas covering 450,604 hectares. An additional area (Southern Wilsons Promontory remote and natural area of 14,410 hectares) was established outside the LCC process. All remote and natural areas have been implemented.

The 20 areas within 12 national parks have been implemented through their inclusion on Schedule Six of the National Parks Act. No legislative mechanism was specified by the LCC or in the subsequent Order in Council (dated 12 May 1992) for implementing remote and natural areas that lie outside of national parks (part of Dandongadale and all of Annuello, Seal Islands, and Yarrarabula remote and natural areas). The recommendations for these areas were more akin to policy recommendations, and were therefore not within the scope of the current assessment of implementation status. However, for the purposes of this assessment these areas are also considered to be implemented.

An interactive map showing the Victorian public land use overlays is available on the VEAC website.

4.2.2 Forests Act areas

State forest

Until 1983 the LCC designated the larger areas of forested public land that had not been incorporated into national parks or set aside in various other parks or reserves either as areas for timber production (hardwood and softwood) or as uncommitted land. Timber production areas were already or became reserved forest, while uncommitted land was termed 'unoccupied' or 'unreserved' Crown land. About 4.5 million hectares or two-thirds of the public land investigated by the LCC up to 1983 had been recommended for timber production or as uncommitted land. These two classes of land constitute state forest as defined under the Forests Act.

In 1983 the LCC recommended that land previously designated as hardwood production areas or 'uncommitted land' be together designated as state forest as it believed this term best described public land in timber production areas and uncommitted land, even though it contains a range of vegetation types from tall mountain forests through to woodlands, mallee scrub, heathlands, and swamplands. The LCC believed that the term 'hardwood production' implied erroneously that such areas have few values other than for timber production, while the term 'uncommitted land' belied the significance of this land for many different uses including timber production.

The name 'state forest' was used by the LCC only in a descriptive sense rather than as the term defined in the Forests Act. In that Act, state forest or forest includes reserved forests and protected forests. Reserved forest is spatially defined, but protected forest includes all unoccupied Crown land proclaimed as a protected forest and every unused road and water frontage as defined in the Land Act, making it more difficult to spatially identify and to map.

Defining implementation

For the purposes of this assessment, the LCC's earlier timber production (hardwood and softwood) and uncommitted land recommendations are considered to be recommendations for state forest.

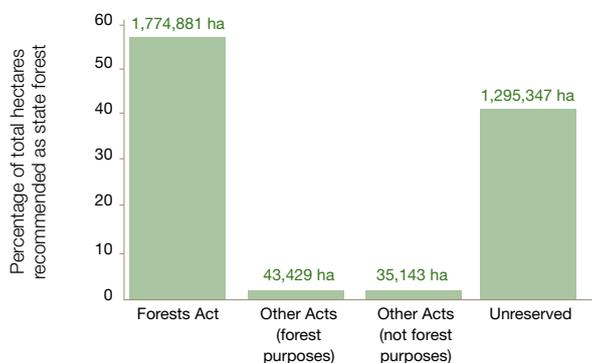
State forest land parcels tend to be much larger than for other types of public land, and the boundaries are often poorly defined, particularly where state forest parcels abut other state forest parcels. Furthermore, LCC/ECC/VEAC recommendations tend not to identify individual land units within state forest. For these reasons, it is more appropriate to assess the implementation of state forest recommendations on a hectare basis, rather than by number of land units or areas.

Most state forest parcels are reserved under the Forests Act. However, a number of parcels have also been reserved under the Crown Land (Reserves) Act and other Acts. Areas assessed as fully implemented were either reserved under the Forests Act, or reserved for an appropriate, forest-related purpose (detailed in table 4.3) under another Act. Areas assessed as unimplemented include both those that are reserved for an unrelated purpose and those that are unreserved.

Assessing implementation

Government-accepted recommendations for state forest cover 3,148,800 hectares, and 56 per cent of the recommended area has been reserved under the Forests Act. A further 1 per cent of the recommended area has been reserved for appropriate purposes under other Acts, predominantly the Crown Land (Reserves) Act, making the recommendations for 57 per cent of the area of state forest fully implemented (see figure 4.1). Nineteen different purposes were considered to be forest-related purposes under other Acts (table 4.3). For the remaining 43 per cent of the area recommended as state forest that is unimplemented, the majority is unreserved, while close to 2 per cent has been reserved for unrelated purposes under other Acts.

Figure 4.1
Assessment of the implementation status of state forest against government-accepted recommendations



Note: Numbers above the bars indicate the area of land within each classification.

Table 4.3
Purposes deemed to be acceptable for state forest reservation under Acts other than the Forests Act

Catchment and conservation of water
Conservation of water
Forests commission purposes
Government road
Growth and preservation of timber
Growth and supply of timber
Growth of timber for eucalyptus oil
Growth, preservation and supply of timber
Preservation and growth of timber
Preservation of an area of ecological significance
Public purposes (Forests Commission purposes)
Public purposes (Forests department purposes)
Public purposes (preservation of an area of ecological significance)
Public purposes (scientific references purposes)
Purposes of the Forests Act
Supply of timber
Timber and water supply
Timber reserve
Water supply to Melbourne and suburbs



Forest parks

This public land category was introduced by VEAC in its Angahook-Otway Investigation (2004), when it recommended the establishment of the Otway Forest Park. Forest parks are distinguished from state forest by the legislative prohibition on the granting of sawlog and pulpwood licences over the area. However, forest parks are distinguished from regional parks by not specifically providing for recreational use by large numbers of people and not being readily accessible from urban centres or major tourist routes.

Outside the VEAC process, the Cobboboonee Forest Park was established in 2008. Both the Otway and Cobboboonee forest parks are permanently reserved under the Crown Land (Reserves) Act but managed under specified provisions of the Forests Act.

The forest park category in its current form differs from forest parks that were previously declared under the Forests Act. These were relatively small areas of reserved forest managed as part of the broader state forest estate; they form a group that would correspond more closely to a zone or sub-category within one of the current public land use categories. However, this designation is effectively redundant now with most of the initially modest number having been subsumed into land units in other categories ten or more years before the introduction of the forest park category in 2004. Any that formally remain are managed in categories other than state forest in accordance with government-accepted recommendations, e.g. You Yangs Regional Park.

4.2.3 Crown Land (Reserves) Act areas

Defining implementation

Most reservations under the Crown Land (Reserves) Act are made by Order of the Governor in Council published in the Government Gazette. It is much more complex and time-consuming to assess the implementation of public land categories that are reserved via this mechanism, as the data about reserved land units are not all listed together in an easily accessible place.

For a land unit to be classified as fully implemented, all parcels covered by one or multiple government-accepted recommendations must be reserved. In addition, the reservation purpose must be appropriate to the public land use category. For example, 'public purposes' is not considered to be an appropriate reservation purpose for a recommendation for a natural features reserve - wildlife area.

Land units classified as partially implemented have between 25 and 99 per cent of parcels in the land unit correctly reserved in line with the government-accepted recommendation.

There are multiple reasons leading to a land unit being classified as unimplemented. These include having fewer

than 25 per cent of parcels correctly reserved, parcels that are unreserved, parcels reserved for the wrong purpose, and parcels reserved for a different and potentially similar purpose (e.g. a parcel was recommended as an historic reserve, but is appropriately reserved for a cemetery as it is currently used as an active cemetery).

Land units are classified as 'implementation unclear' if there is inadequate or conflicting information about reservation status for parcels and/or about the final government-accepted recommendation for parcels.

Analysing implementation

To determine the implementation status of each land unit, two methods were used: the parcel-count method and the parcel-area method.

Both methods assess the reservation status of individual land parcels through assigning each parcel as: correctly reserved, unreserved, incorrectly reserved, or recommendation/reservation unclear. Following this step:

- ✦ the parcel-count method sums the number of parcels that are assigned to each reservation status
- ✦ the parcel-area method sums the hectares of parcels that are assigned to each reservation status.

Where there were tied results based on either method, partially-implemented was selected over implementation unclear and unimplemented, and implementation unclear selected over unimplemented.

While the parcel-count and the parcel-area methods lead to very similar results for the public land categories analysed in this discussion paper, it should not be assumed this would necessarily be the case for other categories not yet assessed. The two methods used may have different results for public land categories which are configured differently by area and parcel to those reserves analysed to date.

Assessing implementation

To understand the reservation status of government-accepted recommendations primarily implemented under the Crown Land (Reserves) Act, a subset of public land categories was assessed:

- ✦ nature conservation reserve
- ✦ natural features reserve – sub-category wildlife area
- ✦ historic and cultural features reserve
- ✦ alpine resort.

Assessing implementation is a resource-intensive process involving checking the reservation status of each parcel of land within a recommended land unit against a number of internal and external databases. Accordingly, only a sample of recommendations for wildlife area was able to be assessed in the time available: Ballarat (LCC 1982),

Gippsland Lakes Hinterland (LCC 1983), Wimmera (LCC 1986) and River Red Gum Forests (VEAC 2008) investigation areas. In contrast, VEAC was able to assess all nature conservation reserves, alpine resorts and historic and cultural features reserves across all LCC/ECC/VEAC study areas.

Nature conservation reserves

With the exception of Langwarrin Flora and Fauna Reserve and Deep Lead Nature Conservation Reserve, which are on Schedules Three and Four respectively of the National Parks Act, all other formally reserved nature conservation reserves are implemented through the Crown Land (Reserves) Act.

Government-accepted recommendations for nature conservation reserves apply to 421 land units totalling 262,916 hectares. The reserves range in size from 0.79 to 35,284 hectares. Many consist of a single land parcel (see table 4.4). A further 86 nature conservation reserves have been established outside of the LCC/ECC/VEAC process, predominantly through land purchases, covering a total of 26,447 hectares.

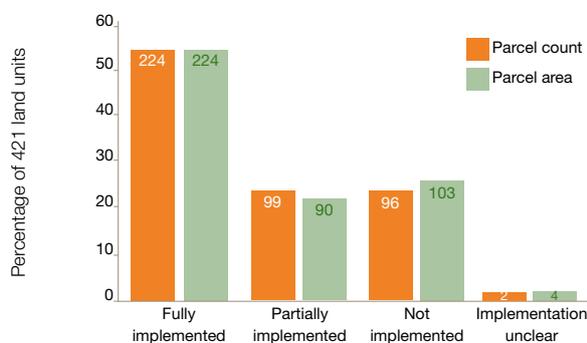
Table 4.4
Summary information on nature conservation reserves

Smallest	Edna Bowman Nature Conservation Reserve (0.79 hectare)
Largest	Annuello Flora and Fauna Reserve (35,284 hectares)
Least parcels	141 separate land units consist of a single parcel
Most parcels	Bannerton Flora and Fauna Reserve (165 parcels)

Using the parcel-count method to assess implementation of land units against government-accepted recommendations, 53 per cent of nature conservation reserves are fully implemented, 23 per cent are partially implemented, 23 per cent are unimplemented, and for less than 1 per cent the implementation status is unclear. Using the parcel-area method to assess implementation of land units against government-accepted recommendations returns a very similar result: 53 per cent of nature conservation reserves are fully implemented, 21 per cent are partially implemented, 25 per cent are unimplemented and for less than 1 per cent the implementation status is unclear (see figure 4.2).

Figure 4.2

Assessment of the implementation status of nature conservation reserves against government-accepted recommendations using two methodologies



Note: Numbers in the bars indicate the number of land units in each classification

For the majority of implemented (correctly reserved) parcels (73 per cent), reservation for the correct purpose occurred after the most recent investigation. In just 18 per cent of cases, parcels were already reserved for the correct purpose prior to the most recent investigation. For the remaining 9 per cent of parcels, it was not possible to determine when they were correctly reserved due to discrepancies in information from different databases. Map C in the back pocket of this discussion paper shows the reservation status of nature conservation reserves.

Where parcels were unimplemented, most were unreserved (78 per cent) compared with those that were reserved for a different purpose (22 per cent). Where there was an incorrect reservation purpose, for just over half (54 per cent) it was not possible to determine whether the reservation was permanent or temporary. A third of parcels had incorrect temporary reservations, and 13 per cent had incorrect permanent reservations. Every case of unclear implementation status was due to unclear reservation status, owing to discrepancies between different databases.

Nature conservation reserves have been reserved using 52 different forms of the wording of purpose (see table 4.5).

Table 4.5**Reservation purposes for nature conservation reserves**

An area and facilities for the study of the natural environment
Conservation of an area of ecological significance
Conservation of an area of natural interest
Conservation of an area of natural interest and ecological significance
Conservation of an area of natural interest and preservation of species of native plants
Conservation of an area of natural interest or beauty
Conservation of an area of natural interest or beauty or of historical or scientific interest
Conservation of native plants and animal
Conservation of native plants and historic interest
Conservation of species of native plants
Conservation of wildlife
Future restoration and preservation of species of native plants
Management of wildlife
Management of wildlife and preservation of species of native plants
Management of wildlife and the preservation of wildlife habitat
Nature conservation
Park
Preservation of an area of ecological significance
Preservation of an area of natural interest
Preservation of areas of ecological significance
Preservation of areas of ecological significance and species of native plants
Preservation of habitat for native fauna
Preservation of koalas
Preservation of native birds and animals
Preservation of native flora
Preservation of native flora and fauna
Preservation of native flora and wildlife habitat
Preservation of native grasslands
Preservation of native plants
Preservation of species of native plants
Preservation of species of native plants and animals
Preservation of species of native plants and management of wildlife
Preservation of wildlife habitat
Preservation or management of wildlife or preservation of wildlife habitat
Propagation or management of wildlife
Propagation or management of wildlife or the preservation of wildlife habitat
Protection of native flora
Public purposes (Conservation of an area of natural beauty)
Public purposes (Conservation of flora)
Public purposes (Conservation of wildlife)
Public purposes (Conservation of wildlife, water supply and public recreation)
Public purposes (Native flora and public recreation)
Public purposes (Nature conservation)
Public purposes (Preservation of flora and fauna)
Public purposes (Preservation of flora)
Public purposes (Preservation of landscape and flora)
Public purposes (Preservation of native flora and fauna)
Public purposes (Preservation of native flora)
Public purposes (Preservation of species of native plants)
Public purposes (Study of wildlife)
Public recreation, drainage and conservation of an area of natural interest
Wildlife purposes

Natural features reserves–wildlife areas

Wildlife areas are a sub-category of natural features reserves and are distinguished from nature conservation reserves in that they may permit hunting. They are sometimes known as game reserves. Recommendations for wildlife management co-operative areas are included in this public land sub-category.

To meet the timeline for the current investigation, the assessment of the implementation status of natural features reserve–wildlife areas is limited to government-accepted recommendations from the LCC’s Ballarat Area, Gippsland Lakes Hinterland Area and Wimmera Area and VEAC’s River Red Gum Forests investigation area, as described earlier in this section. Within these study areas, government-accepted recommendations apply to 94 land units over 32,591 hectares (see table 4.6). These range in size from 4 to 8,319 hectares. Many consist of single parcels isolated in the landscape.

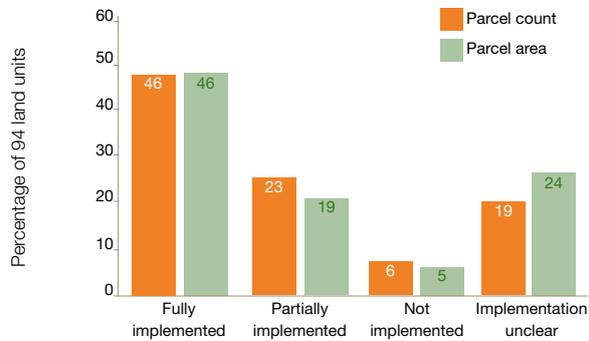
Table 4.6
Summary information on wildlife areas within the four selected study areas

Smallest	Koonik Koonik Wildlife Reserve (4 hectares)
Largest	Lake Buloke Wildlife Management Co-operative Area (8,319 hectares)
Least parcels	43 separate land units consist of a single parcel
Most parcels	Lake Buloke Wildlife Management Co-operative Area (108 parcels)

Using the parcel-count method to assess implementation of land units against government-accepted recommendations, 49 per cent of wildlife areas are fully implemented, 25 per cent are partially implemented, 6 per cent are unimplemented, and for 20 per cent the implementation status is unclear. Using the parcel-area method to assess implementation of land units against government accepted recommendations returns a very similar result: 49 per cent of wildlife areas are fully implemented, 20 per cent are partially implemented, 5 per cent are unimplemented and for 26 per cent the implementation status is unclear (figure 4.3).

Figure 4.3

Assessment of the implementation status of natural features reserve–wildlife areas within four selected study areas against government-accepted recommendations using two methodologies



Note: Numbers in the bars indicate the number of land units in each classification

For the majority of parcels (73 per cent) that were implemented (correctly reserved), reservation for the correct purpose occurred after the most recent investigation. Only 19 per cent of parcels were already reserved for a suitable purpose prior to the most recent investigation. In 8 per cent of parcels it was not possible to determine when they were correctly reserved due to discrepancies between information from different databases. Where parcels were unimplemented, this was largely because they were unreserved (90 per cent) compared to being reserved for an unrelated purpose (10 per cent).

Where an incorrect reservation purpose existed, in the majority of cases this was a temporary reservation (72 per cent). An incorrect permanent reservation existed for only 7 per cent of parcels, and in 21 per cent of parcels it was not possible to determine whether the incorrect reservation was permanent or temporary. In 99 per cent of parcels with unclear implementation status, this was due to unclear reservation status, owing to discrepancies in information from different databases. In 1 per cent of parcels with unclear reservation status, both the reservation status and government-accepted recommendation was unclear.

Natural features reserve–wildlife areas have been reserved using 18 different forms of the wording of purpose (see table 4.7).

Table 4.7
Reservation purposes for wildlife areas

Classified state game reserve
Fisheries and wildlife department purposes
Management of wildlife
Management of wildlife (State game reserve)
Management of wildlife and preservation of wildlife habitat
Management of wildlife and the preservation of wildlife habitat
Management of wildlife or wildlife habitat
Management of wildlife- preservation of wildlife habitat or wildlife habitat
Preservation of wildlife
Preservation of wildlife habitat
Preservation or management of wildlife
Preservation or management of wildlife or preservation of habitat
Preservation or management of wildlife or preservation of wildlife habitat
Propagation or management of wildlife or the preservation of wildlife habitat
Public purposes (Preservation of wildlife)
Public purposes (Wildlife)
Victorian college of agriculture and horticulture and Management of wildlife
Wildlife purposes

Historic and cultural features reserves

Government-accepted recommendations for historic and cultural features reserves apply to 138 land units across 35,587 hectares. They range in size from less than 1 to 8,725 hectares. Many of these land units consist of a single parcel (see table 4.8).

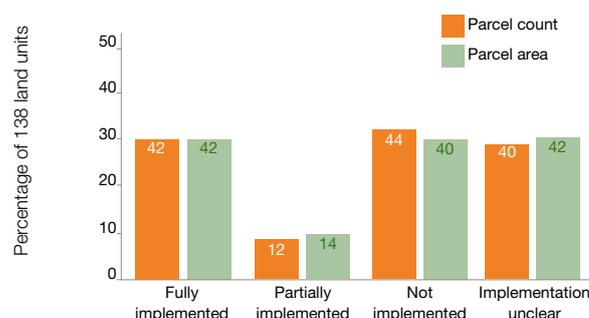
Table 4.8
Summary information on historic and cultural features reserves

Smallest	Landsborough West School Historic and Cultural Features Reserve (0.004 hectare)	
Largest	Mount Wills Historic Area (8,725 hectares)	
Least parcels	75 separate land units consist of a single parcel	
Most parcels	Grant Historic Area (248 parcels)	
Total hectares ¹	Implemented	4,013
	Unimplemented	15,030
	Implementation unclear	16,544

¹ The classification *partially implemented* does not apply here, because this analysis is at the scale of the parcel, and individual parcels were not partly reserved.

Using the parcel-count method to assess implementation of land units against government-accepted recommendations, 30 per cent of historic and cultural features reserves are fully implemented, 9 per cent are partially implemented, 32 per cent are unimplemented and for 29 per cent the implementation status is unclear. Using the parcel-area method to assess implementation of land units against government-accepted recommendations returns a very similar result: 30 per cent of historic and cultural features reserves are fully implemented, 10 per cent are partially implemented, 30 per cent are unimplemented and for 30 per cent the implementation status is unclear (see figure 4.4).

Figure 4.4
Assessment of the implementation status of historic and cultural features reserves against government-accepted recommendations using two methodologies



Note: Numbers in the bars indicate the number of land units in each classification

The majority of parcels (58 per cent) that were implemented (correctly reserved) were already reserved for the correct purpose prior to the most recent investigation. In many cases, this simply reflects that a parcel was reserved after an earlier investigation. For 22 per cent of parcels, reservation for the correct purpose occurred after the most recent investigation. For the remaining 20 per cent of parcels, it was not possible to determine when they were correctly reserved due to discrepancies in information from different databases.

There are a number of reasons for parcels being classified as unimplemented. This includes where they were reserved for an unrelated purpose (8 per cent) or reserved for a different but more closely related purpose (2 per cent). The bulk of cases (90 per cent) were unreserved parcels. Where an incorrect reservation purpose was the reason for the classification as unimplemented, the reservation was predominantly a temporary one (79 per cent), with 16 per cent permanently reserved. For the remaining 5 per cent of parcels with an incorrect reservation purpose, it was not possible to determine if the reservation was permanent or temporary, due to discrepancies in information from different databases. Where the implementation status for a parcel was

unclear, this was largely because the reservation status was unclear (58 per cent of cases), due to discrepancies in information from different databases. In 28 per cent of cases, it was not possible to determine the correct recommendation, largely due to lower mapping resolution associated with older investigations. For 14 per cent of unclear parcels, both the reservation status and recommendation were unclear.

Historic and cultural features have been reserved using 18 different forms of the wording of purpose (see table 4.9). In some cases, the reservation purpose may be specific to a particular land unit, e.g. 'Public purposes (Tourist railway purposes)' for the Puffing Billy tourist railway.

Table 4.9
Reservation purposes for historic and cultural features reserves

Conservation of an area of historic and cultural interest
Conservation of an area of historic and scientific purposes
Conservation of an area of historic interest
Conservation of an area of historic value
Conservation of an area of natural and historic interest
Historic building
Historic building purposes
Historic buildings
Historic interest
Museum
Museum and promotion of tourism
Powder magazine reserve
Public purposes (Historical and geological purposes)
Public purposes (Historical park)
Public purposes (Historic building)
Public purposes (Historic buildings)
Public purposes (Preservation of relics and buildings, recreation, education and tourism)
Public purposes (Tourist railway purposes)

Alpine resorts

The locations of Victoria's six alpine resorts are indicated on Map A *Victoria's public land* in the back pocket of this discussion paper.

Government-accepted recommendations for alpine resorts apply to six land units covering 16,395 hectares, arising from recommendations in the LCC's Alpine area investigations in 1979 and 1983, and the Melbourne Area District 2 review (1994). Recommendations for alpine resorts are considered to be fully implemented if the recommended area is reserved for alpine resort

purposes under the Crown Land (Reserves) Act, listed on the schedule of the *Alpine Resorts Act 1983*, and declared to be an alpine resort. The six current resorts are: Mount Hotham, Falls Creek, Mount Buller, Mount Stirling, Mount Baw Baw and Lake Mountain. While Mount Torbreck remains listed on the schedule of the Act, it has never been declared as an alpine resort. The government accepted the LCC's recommendation in the Melbourne District 2 review that it be deleted from the schedule.

Recommendations for alpine resorts are fully implemented. All alpine resorts are deemed to be permanently reserved.

4.2.4 References Areas Act 1978 and Heritage Rivers Act 1992 areas

Defining implementation

Reference areas are implemented under the Reference Areas Act by proclamation and publication in the Government Gazette. Similarly to Crown Land (Reserves) Act gazettals, it is more complex and time-consuming to assess the implementation of reference areas under the Reference Areas Act, as the data for implemented land units are not all listed together in an easily accessible place. Accordingly, reference areas are classified as either fully implemented (published in the Government Gazette) or unimplemented (no record of their proclamation published in the Government Gazette). A finer-grained analysis may reveal that some of the areas currently considered fully implemented could potentially be only partially implemented, due to differences in the area recommended and the area proclaimed.

Heritage river areas and natural catchment areas are detailed in Schedules 1 and 2 respectively of the Heritage Rivers Act. Their implementation status is straightforward to define because the areas that are included in the schedules to the Act are the government-accepted recommendations. These public land category overlays are either fully implemented or unimplemented.

Assessing implementation

Reference areas

Government-accepted recommendations for reference areas apply to 144 areas covering 112,669 hectares. Of these, 94 per cent are fully implemented. The nine unimplemented areas were recommended in the LCC's Alpine Special Investigation (1983) (Mount McAdam), the ECC's Box-Ironbark Forests and Woodlands Investigation (2001) (Killawarra, Kingower, Reef Hills, Sandhurst and Warby Range) and VEAC's Angahook-Otway Investigation (2004) (Aquila Creek, Painkalac Creek and Porcupine Creek).

Heritage rivers

Heritage rivers were first recommended in the LCC's Rivers and Streams Special Investigation (1991), and several have been reviewed in later studies and investigations. Government-accepted recommendations apply to 17 heritage rivers covering 158,009 hectares. An additional heritage river (Aberfeldy Heritage River, 773 hectares) was established outside the LCC process. All 17 heritage rivers are fully implemented. With the exception of the Upper Buchan and Genoa heritage rivers, which lie within the Alpine and Coopracambra National Parks respectively, all other heritage rivers cross multiple public land use categories.

Natural catchment areas

Like heritage rivers, natural catchment areas were an outcome of the LCC's Rivers and Streams Special Investigation (1991). Government-accepted recommendations apply to 26 natural catchment areas covering 151,335 hectares. All 26 natural catchment areas have been fully implemented through their inclusion on Schedule 2 of the Heritage Rivers Act. Most natural catchment areas occur within national parks (98,730 hectares) and wilderness zones (39,853 hectares), but some are in state forest (12,732 hectares) and alpine resorts (21 hectares).

4.3 Barriers to full implementation

Resourcing

The LCC's 1988 statewide assessment identified a number of barriers to the formal implementation of government-accepted recommendations. The key barrier identified was the availability of adequate resources including the staff time and expertise required for administrative implementation. Specific barriers included the need to survey boundaries for some reserve types and the complexities involved in revoking existing reservations, particularly permanent reservations. To address these issues, the LCC suggested that ways to streamline the process should be investigated. This has not been done to date in a comprehensive manner.

Resourcing relates not just to the availability of staff time and expertise, but also the way in which work is prioritised, and the availability of appropriate legislative and data management tools. Recent consultation with departmental staff indicates that insufficient resourcing continues to hamper the formal implementation of government-accepted recommendations. There has recently been a decline in public land administration staff, and reserving land can be less urgent than other public land administration work, such as leasing and licensing, and supporting committees of management. In some cases, the administration involved in revoking old and inappropriate permanent reservations is still preventing new reservations from being made. In other cases, given that the land unit is already being managed in accordance with the government-accepted recommendation, it is not considered to be a priority to re-reserve land with the appropriate purpose.

Patterns of implementation

The LCC noted in its 1988 assessment discrepancies between different land use categories in the proportion of fully implemented recommendations. When resources are limited, risks are assessed and priorities developed. Recommendations associated with parks and conservation areas were implemented first. This can be clearly seen in table 4.1, where national, state and wilderness parks had much higher levels of implementation than natural features reserve-wildlife areas and historic and cultural features reserves in 1988.

These patterns persist in 2016. The major reason is that successive governments have placed a higher priority on the implementation of protected areas such as parks and conservation reserves, and consequently there is little scope for departmental discretion in the timing of formal implementation of these areas. The requirement for most extractive activities to cease in national parks and conservation reserves is also a driver to formally and legally establish the areas.

In contrast, VEAC found a higher level of uncertainty

around the reservation status and the approved recommendations for historic and cultural features reserves. This may stem from lower stakeholder and community interest in or scrutiny of these types of public land use categories, based on the perception that they are protected as they are on public land and are largely being actively and appropriately managed.

Reservation purpose

The LCC identified the potential for reservation that was not in accordance with the government-accepted recommendation. This does not appear to be a current concern (see table 4.10) for the public land categories that were assessed for reservation under the Crown Land (Reserves) Act. Across nature conservation reserves, natural features reserves–wildlife areas, and historic and cultural features reserves, there were just 17 land units with land parcels which were incorrectly reserved subsequent to the most recent investigation. In most cases where parcels were incorrectly reserved, this occurred prior to the most recent investigation, indicating that these older and inappropriate reservations had not yet been revoked and re-reserved.

Table 4.10
Assessment of incorrect reservation purposes post-dating the most recent LCC/ECC/VEAC study or investigation

	Number of incorrectly reserved parcels (any date)	Incorrect new temporary reservations	Incorrect new permanent reservations
Nature conservation reserves	318	13	4
Natural features reserve–wildlife areas	14	0	0
Historic and cultural features reserves	62	8	0

Other issues have arisen with reservation purposes. As identified in the assessment of reservation, 18 different wordings of purposes were used for reserving historic and cultural features reserves, 18 for wildlife areas and 52 for nature conservation reserves. Issues related to the multitude of reservation purposes include:

- ✦ difficulty in identifying and keeping track of all reserves aligned with a particular LCC/ECC/VEAC category to apply regulations
- ✦ unintended consequences caused when the reservation purpose might not reflect specific wording required by legislation (see section 3.4.3)
- ✦ it is difficult for government to convey to interested members of the public all of the nuances related to reservations under a particular public land use category.

Information systems

Modern land administration relies on accurate, up to date mapping and database systems to support planning and decision making. In many cases, the absence of such systems impedes not only land administration, but also the ability to assess the implementation of previous government-accepted LCC/ECC/VEAC recommendations.

Databases to support land administration have developed independently over a number of years to address particular needs. There are now a number of DELWP databases that together hold information about Crown land parcels. Because of their differing histories and uses, at times these databases contain conflicting or contradictory information. As there is no electronic connectivity between all of these databases, they must be manually updated, meaning that each of them is updated (or not) at differing frequencies, depending on resourcing, staff knowledge and priority. This prevents a clear understanding of the reservation status of land parcels and hence the implementation of government-accepted recommendations for public land.

The range of deficiencies in Crown land information systems also creates other difficulties including (but not limited to) the inability of individual departments to properly report on land assets, challenges in identifying sites for key government initiatives, a lack of clarity about the status and ownership of land which reduces DELWP’s ability to systematically identify and mitigate risk, and little ability to record interests in Crown land. This appears to be a long-standing problem as it was identified in the LCC’s 1988 assessment and by the Auditor-General in financial audits of the then Department of Sustainability and Environment between 2005 and 2008.

The move from paper-based mapping systems (e.g. parish plans) to online and GIS-based systems has markedly improved the accessibility of land information.

However, the transition has not always been accurate. Parcel boundaries transferred from parish plans may either not reflect the on-ground situations or pertinent additional information is stored in other online and/or offline systems. Furthermore, due to the lower resolution of the older, paper-based mapping, it is not always possible to determine the correct recommendation for a parcel. This impedes reservation in line with the intent of the government-accepted recommendation.

Legislative instruments

As with much of Victoria's other legislation, the current legislation used to govern and reserve Crown land is largely a legacy of much earlier legislation. The Land Act, Forests Act and Crown Land (Reserves) Act all have their origins in Acts dating back 100-150 years.

The National Parks Act appears to be an effective mechanism for implementing recommendations. This is demonstrated by the high levels of implementation for national parks, state parks, wilderness parks, wilderness zones and remote and natural areas (table 4.2). Because these public land use categories and overlays are proclaimed through amending legislation, multiple land units can be dealt with simultaneously. An additional benefit of creating these parks and overlays through schedules to the National Parks Act is that they are easily available for public information and scrutiny. Moreover, because section 41A of the Act automatically revokes existing reservations, revokes reserved forest, and removes government roads, there is no need to separately process these transactions prior to the creation of new parks. In addition, Parks Victoria is already established as the land manager.

The Crown Land (Reserves) Act is a less effective mechanism for implementing recommendations than the National Parks Act, demonstrated by the lower levels of implementation for nature conservation reserves, wildlife areas and historic and cultural features reserves (table 4.2). Each land unit has to be reserved separately, requiring more administrative resources. While section 6 of the Crown Land (Reserves) Act deems previous temporary reservations to be revoked when land is permanently reserved, most reservations are temporary and so do not benefit from this provision. Instead, existing reservations must be revoked before re-reservation can proceed. This can be time-consuming, as existing permanent reservations must be revoked through legislation. Table 4.10 indicates that this is potentially a large issue, as there are many incorrectly reserved parcels just within three public land use categories assessed for this discussion paper.

All reservations under the Crown Land (Reserves) Act are published weekly in the Government Gazette. However, because the Orders in Council refer to the Crown Allotment/s and Parish and not necessarily the name of the land unit, it is potentially difficult to locate particular reserves of interest. As a result, these reservations are much less transparent than those under the National Parks Act. This factor has significantly impeded the assessment of the implementation status of public land use categories reserved under this Act.

Addressing the third term of reference: Public land values

In the third of the three specific topics in the terms of reference, the Council is requested to investigate and provide ‘an inventory of the types of values on public land’. Within the context of the broad purpose of the investigation, Council has taken the opportunity to provide a comprehensive stocktake of the values on public land, as this information is otherwise dispersed and not readily available. While Council recognises that there are strong inter-relationships between types of values, for the purposes of the discussion paper, the values are organised into the following groups:

- ✦ biodiversity
- ✦ cultural values
- ✦ recreation and tourism
- ✦ resource uses
- ✦ government and operational uses.

5.1 Natural values

5.1.1 Biodiversity

The term ‘biodiversity’ is defined by the Convention on Biological Diversity as the variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems.¹ Biodiversity encompasses all native animals, plants, fungi, and microorganisms, the habitats and ecosystems these species live in, and all of their genetic diversity.

Maintaining, protecting and enhancing biodiversity are important priorities for communities, and local, state and national governments. People value biodiversity for its own sake and appreciate opportunities to experience it. Many believe that future generations should have the same opportunities that current generations have to experience natural biodiversity. In addition to its intrinsic value, biodiversity contributes to the provision of many ecosystem services, including healthy air, soil and waterways. The most effective way to protect biodiversity for the long term is to maintain native vegetation in a healthy state.

Biodiversity is present across the landscape – on all types of public and private land as well as in Victoria’s marine environment. Victoria has a well-developed framework for cross-tenure management of biodiversity, including the *Flora and Fauna Guarantee Act 1988* (currently being reviewed) and several statewide biodiversity strategies and plans, the most recent of which are currently under development.²



5.1.2 Terrestrial biodiversity

Of the many potential perspectives that could be used to describe the contribution of Victoria's public land to protection of terrestrial biodiversity, these six are explored in the following sections:

- ✦ statewide extent of native vegetation
- ✦ bioregional extent of native vegetation
- ✦ statewide extent of ecological communities
- ✦ bioregional extent of ecological communities
- ✦ representativeness of the protected area system
- ✦ integrated biodiversity values including threatened species.

Key points at a glance

- Native vegetation is the key indicator of the overall state of terrestrial biodiversity. Some 45 per cent (11.2 million hectares) remains of Victoria's original coverage of native vegetation.
- Although public land accounts for only 40 per cent of Victoria's land area, it supports more than two thirds (70 per cent) of its remaining native vegetation.
- To assess changes in the extent of each Ecological Vegetation Class (EVC), the 2015 EVC extent was compared to the pre-1750 EVC extent.
- There is significant variation between retained vegetation on public land across bioregions, including variations between native vegetation in protected areas compared with that on other public land.
- EVCs that have experienced the greatest levels of clearing compared to their pre-1750 extent are those that are the most suitable for agriculture.
- There are three regions of Victoria where under-represented EVCs form a distinct cluster: South West Victoria, Strzelecki Ranges-Gippsland Plain and Central Victorian Uplands.
- The highest terrestrial biodiversity values occur on public land, indicated by an analysis of strategic biodiversity values (NaturePrint).
- Public land with the highest strategic biodiversity values is in the protected area system.
- The protected area system contains few areas in the lowest categories of strategic biodiversity values, whereas these categories account for a large majority of private land.
- On public land outside protected areas, additional concentrations of areas with high biodiversity values have been identified.
- Public land covers 40 per cent of Victoria's land area accounting for over 70 per cent of the areas in the highest biodiversity values category, and 67 per cent of the areas supporting biodiversity values in the two highest categories.
- The protected area system supports 40 per cent of Victoria's highest biodiversity value areas on less than 20 per cent of Victoria's land.
- Victoria accounts for only 3 per cent of the land area of Australia, but supports more than 500 endemic species (species that occur only in Victoria).

Statewide extent of native vegetation

Native vegetation extent refers to the area of land covered by native vegetation. It includes the largely intact areas typically found in national parks and state forests as well as the remnant patches and scattered trees in urban, peri-urban and rural landscapes. Remnant patches retain part of the native understorey, while scattered trees are mature native trees with little if any native understorey. Native vegetation supports nearly all Victoria's terrestrial biodiversity and so is a key indicator of the spatial occurrence of biodiversity. Victoria is the most cleared state in Australia, accounting for 12 per cent of the nation's total clearing of vegetation in only 3 per cent of its land area.³ Victoria's remaining native vegetation is therefore especially important for biodiversity conservation.

The Department of Environment, Land, Water and Planning (DELWP) and its predecessors have been developing and refining maps of native vegetation extent for several years. This mapping is generated by combining fine-scale, high-resolution satellite imagery into a model with a variety of environmental datasets. For this investigation, native vegetation extent is based on the 2010 modelled extent, modified to include 2015 modelling of grasslands and wetlands to produce the most reliable current understanding of the extent of native vegetation. The department continues to refine and improve this modelling.

Table 5.1 provides some insight into the different categories and components into which the model classifies the imagery. Map F and Map G in the back pocket of this report show the results of the analysis spatially and table 5.2 presents the overall extent of native vegetation numerically.

Native vegetation covers around 45 per cent of Victoria, or some 11,184,900 hectares (table 5.2). Although public land (including many water bodies) accounts for only around 40 per cent of Victoria's land area, it supports about 70 per cent (7,880,200 hectares) of the remaining native vegetation. Only 9 per cent of terrestrial public land does not support native vegetation — mostly road reserves or land submerged by artificial water bodies.

The vast majority (92 per cent) of native vegetation on public land consists of native trees, which occur primarily in large, contiguous blocks in the east and north west of the state (see Map F). The category 'native pasture-shrubs' is the second-most common (5 per cent), and occurs primarily in a few large blocks in the north west. The pattern differs on private land; 63 per cent of native vegetation consists of native trees (in smaller blocks, predominantly in the southern parts of the state) and 30 per cent consists of native pasture-shrubs (throughout the state, but concentrated in central Victoria) (see Map G). Native wetlands and natural low cover contribute small amounts to native vegetation extent across both public and private land, although native wetlands account for 7 per cent of native vegetation on private land.

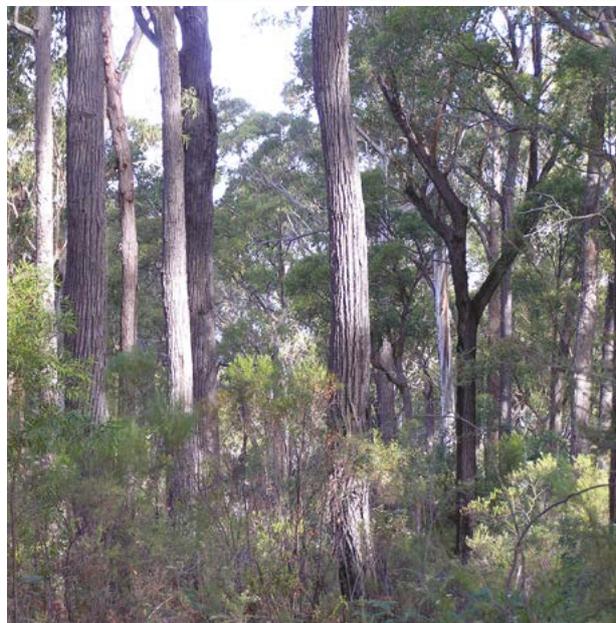


Table 5.1

Modelled vegetation categories contributing to native vegetation extent

Category	Component	Definition	Included in assessment of native vegetation extent
Native trees	Native – woody cover (including heaths and woody wetlands)	Woody native vegetation cover (apart from semi-arid chenopod shrublands) (including heaths and woody wetlands)	Yes
Native pasture-shrubs	Native – grasslands and chenopod shrublands (including some wetlands)	Native grasslands and pastures and semi-arid chenopod shrublands (including some wetlands)	Yes
Native wetland	Native – open, non-woody wetlands and waterbodies	Potential or existing non-woody wetland cover (includes smaller embayments and estuaries)	Yes
Natural low cover	Native – sparse cover	Other native cover and bare ground (fires scars, sand dunes, very low cover on floodplains etc.)	Yes
Plantation tree cover	Pine	All coniferous plantations	No
	Blue gum	All blue gum plantations	No
Exotic tree cover	Non-native tree	Exotic trees including garden trees, willows, cypresses, pines, fruit trees, horticultural plantings	No
	Non-native shrub	Areas of exotic shrub cover	No
Exotic largely treeless	Farmland	Exotic pasture and/ or crops	No
	Built	Built hard surfaces includes urban areas, buildings, carparks, sealed roads, towns	No
	Disturbed ground	Artificially disturbed ground such as mines, quarries, dirt roads, bare industrial areas	No
Water	Artificial impoundment	Open waterbodies e.g. lakes, rivers, dams, artificial impoundment	No

*Areas mapped as native pasture may, but do not necessarily, meet remnant patch criteria (25 per cent of total vegetation cover is made up of native vegetation) either as native grassland or derived grassland (native grass remaining once woody vegetation is removed). Areas mapped as native pasture may be of low condition and contain only a small percentage of native grasses, bryophytes and lichen mixed with exotic grasses and bare ground.

Table 5.2

Native vegetation extent on public and private land in Victoria

Component	Public land		Private land		Total hectares
	hectares	%	hectares	%	
Native trees	7,220,264	91.6	2,073,338	62.7	9,293,602
Native pasture-shrubs	368,333	4.7	975,762	29.5	1,344,095
Native wetland	198,124	2.5	245,785	7.4	443,909
Natural low cover	93,497	1.2	9,774	0.3	103,271
Total	7,880,218	100.0	3,304,659	100.0	11,184,877

Bioregional extent of native vegetation

Native vegetation in Victoria is often considered in terms of the biogeographical region (bioregion) in which it occurs. Bioregions are a landscape-scale classification of the environment using a range of features including climate, geology, landform, native vegetation and species information. Of the 89 bioregions identified in the Interim Biogeographic Regionalisation for Australia (IBRA), 11 occur in Victoria. The broad scale that is appropriate for national purposes does not provide adequate discrimination at a statewide level and so Victoria has been further divided into 28 bioregions (which are equivalent to the IBRA subregions) (figure 5.1).

Figure 5.1
Victorian bioregions

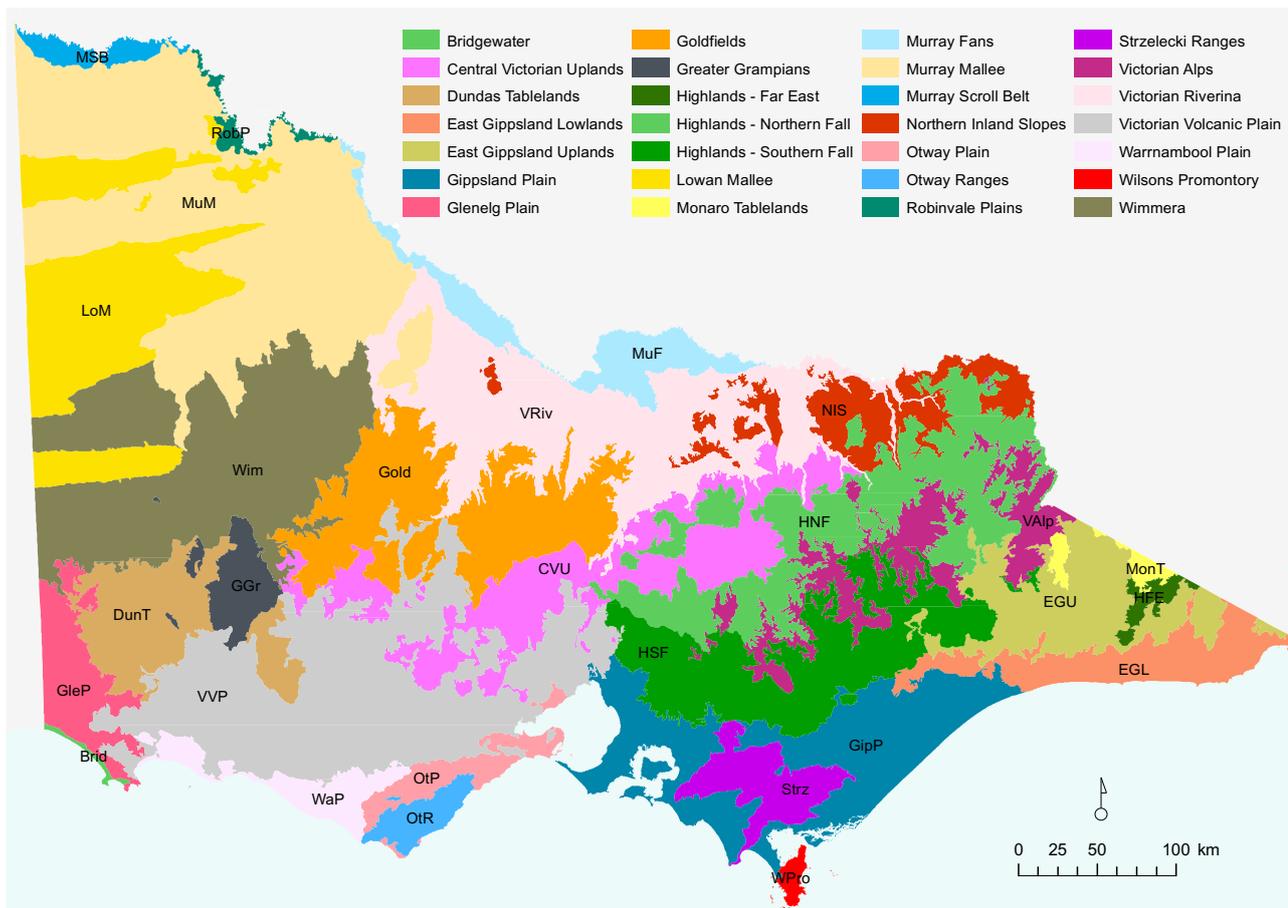
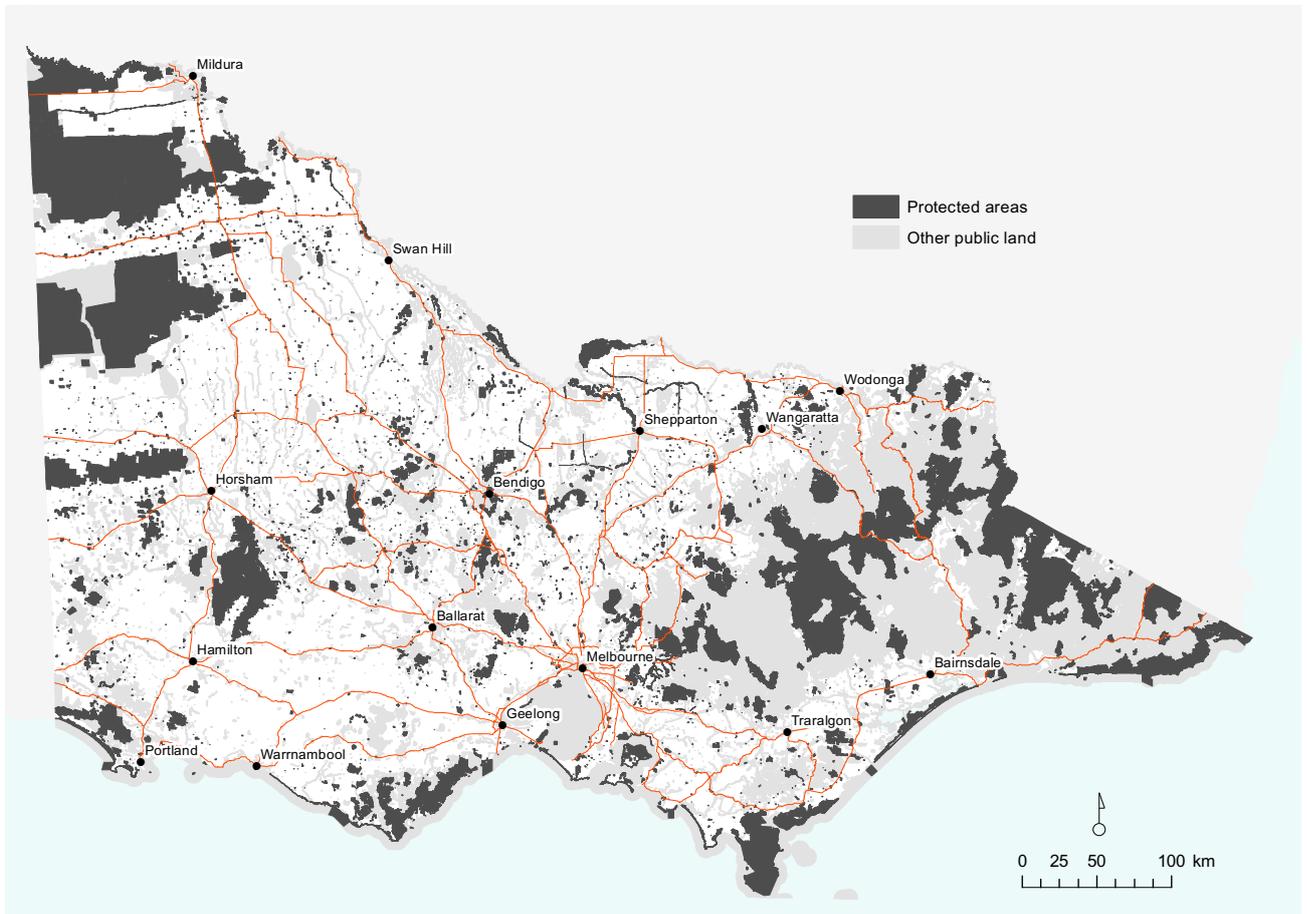


Figure 5.2
Protected area system in Victoria



Within Victoria's 28 bioregions, VEAC has separately assessed the extent of native vegetation within the protected area system, other public land and private land (see figure 5.2 and table 5.3).

For the purposes of the assessment, bioregions have been sorted into three main groups: most cleared, moderately cleared and least cleared.

The least cleared bioregions tend to be mountainous or on formerly flood-prone country and retain over 79 per cent of their original native vegetation. These bioregions have higher protected area representation and a high proportion of native vegetation occurs on public land.

A combination of the early establishment of the national park and remoteness largely protected the Wilsons Promontory bioregion from clearing and fragmentation, with the result that over 99 per cent of native vegetation

in this bioregion occurs within the protected area system (figure 5.3). Although the Grampians National Park was established much later, the generally rugged terrain of the Greater Grampians bioregion has led to a similar outcome, with 80 per cent of the bioregion's native vegetation within protected areas. The Victorian Alps and Highlands–Far East bioregions have a high proportion of native vegetation on public land, but only 48 per cent and 35 per cent respectively within protected areas. The Murray Scroll Belt and Robinvale Plains bioregions have relatively high proportions of their remaining native vegetation in protected areas—78 per cent and 63 per cent respectively—with small proportions on other public land. However, the assessment for VEAC's Remnant Native Vegetation Investigation found that native vegetation in these bioregions is in poor condition due to reduced inundation of the Murray River floodplains.⁴

Table 5.3

Area (hectares) of native vegetation in protected areas, other public land, private land and private land across 28 bioregions

Bioregion	Protected areas	Other public land	Private land	Not native vegetation ¹	Total
Wilson's Promontory	40,709	1	37	12	40,760
Highlands - Far East	24,420	45,400	133	98	70,051
Victorian Alps	343,869	364,009	5,261	1,226	714,365
East Gippsland Uplands	260,090	400,412	80,541	51,457	792,499
Greater Grampians	177,342	13,454	31,077	16,057	237,931
East Gippsland Lowlands	117,347	308,909	53,944	58,418	538,618
Murray Scroll Belt	79,923	6,081	16,536	13,956	116,496
Highlands - Southern Fall	269,898	632,415	151,677	148,690	1,202,680
Highlands - Northern Fall	279,556	798,219	151,222	190,571	1,419,568
Otway Ranges	74,540	29,784	25,281	20,978	150,583
Robinvale Plains	34,994	14,258	6,015	8,973	64,240
Lowan Mallee	938,349	195,658	60,965	228,273	1,423,244
Monaro Tablelands	13,936	28,753	17,326	15,107	75,122
Bridgewater	10,284	569	2,289	5,170	18,313
Goldfields	124,272	213,643	470,143	530,445	1,338,502
Central Victorian Uplands	70,433	196,842	387,688	576,401	1,231,364
Northern Inland Slopes	57,008	82,142	150,065	283,615	572,829
Glenelg Plain	51,808	92,924	53,917	203,545	402,193
Otway Plain	26,479	37,611	34,658	144,075	242,823
Murray Fans	49,627	50,513	58,732	281,394	440,265
Gippsland Plain	89,816	140,298	212,503	846,945	1,289,562
Strzelecki Ranges	5,750	50,789	62,507	229,018	348,064
Dundas Tablelands	7,073	62,630	153,360	472,311	695,375
Murray Mallee	436,583	224,019	155,438	2,139,671	2,955,710
Victorian Volcanic Plain	36,017	177,994	356,597	1,840,841	2,411,449
Victorian Riverina	26,449	126,616	292,351	1,477,600	1,923,016
Wimmera	37,545	140,696	282,786	1,580,121	2,041,147
Warrnambool Plain	15,249	16,880	26,259	211,610	269,998
Total	3,699,364	4,451,521	3,299,306	11,576,576	23,026,767

¹ Not native vegetation includes areas with non-native vegetation and areas without any vegetation

Figure 5.3

Cover of native vegetation across protected areas, other public land and private land in the **least** cleared bioregions

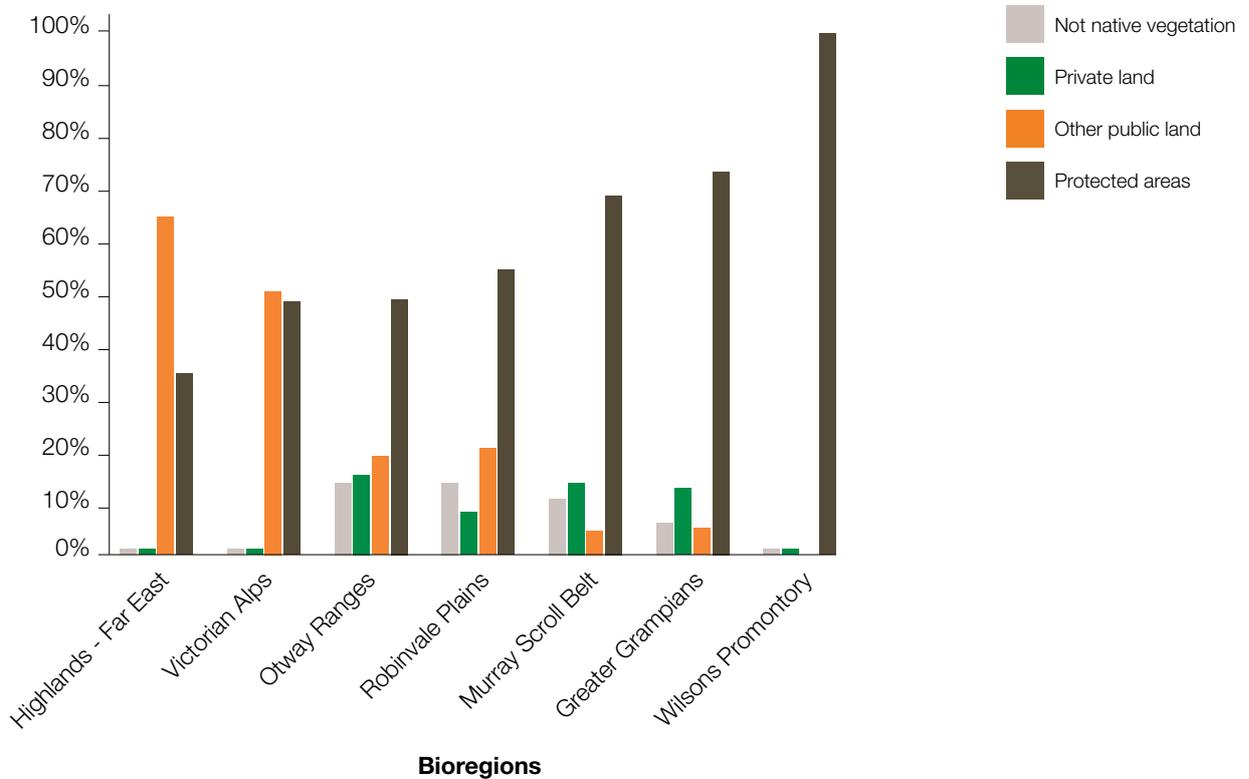


Figure 5.4

Cover of native vegetation across protected areas, other public land and private land in **moderately** cleared bioregions

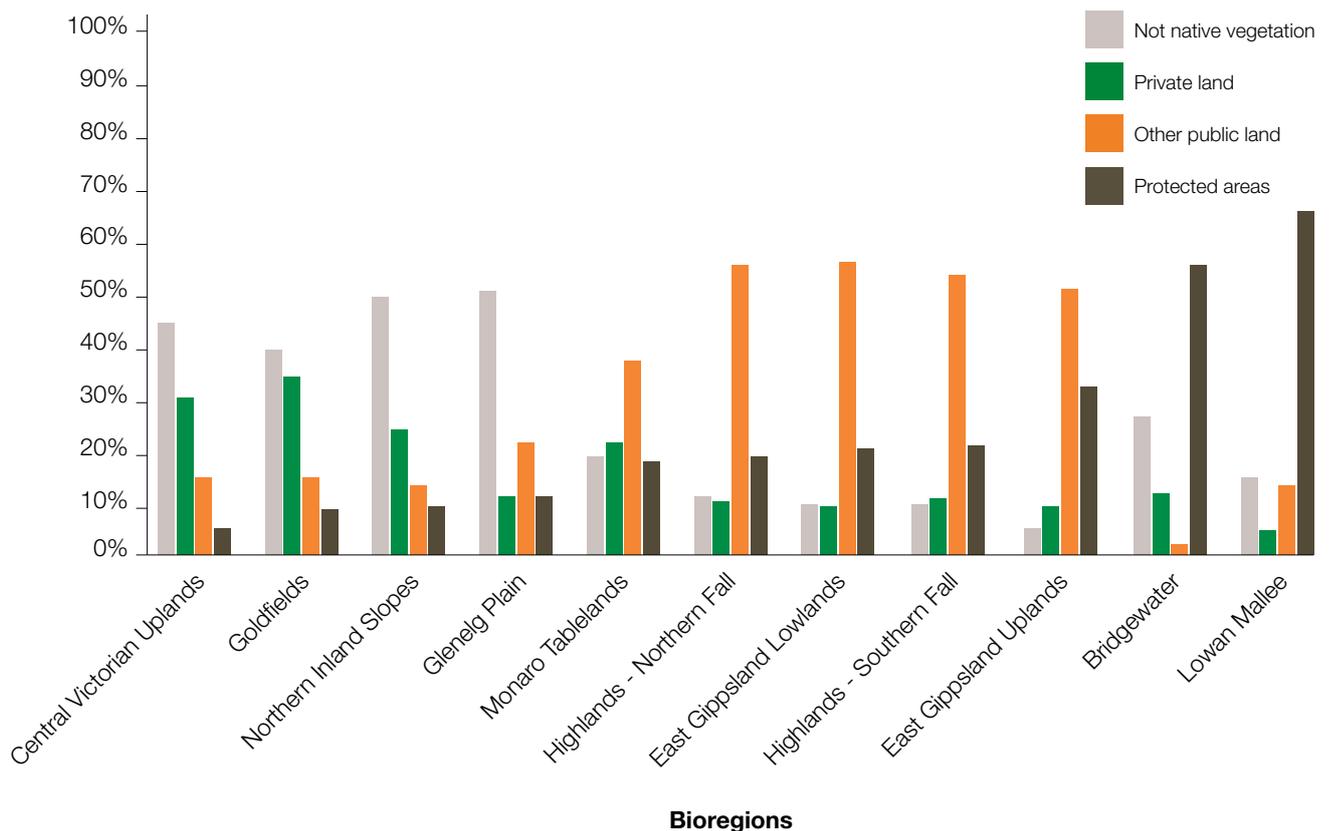
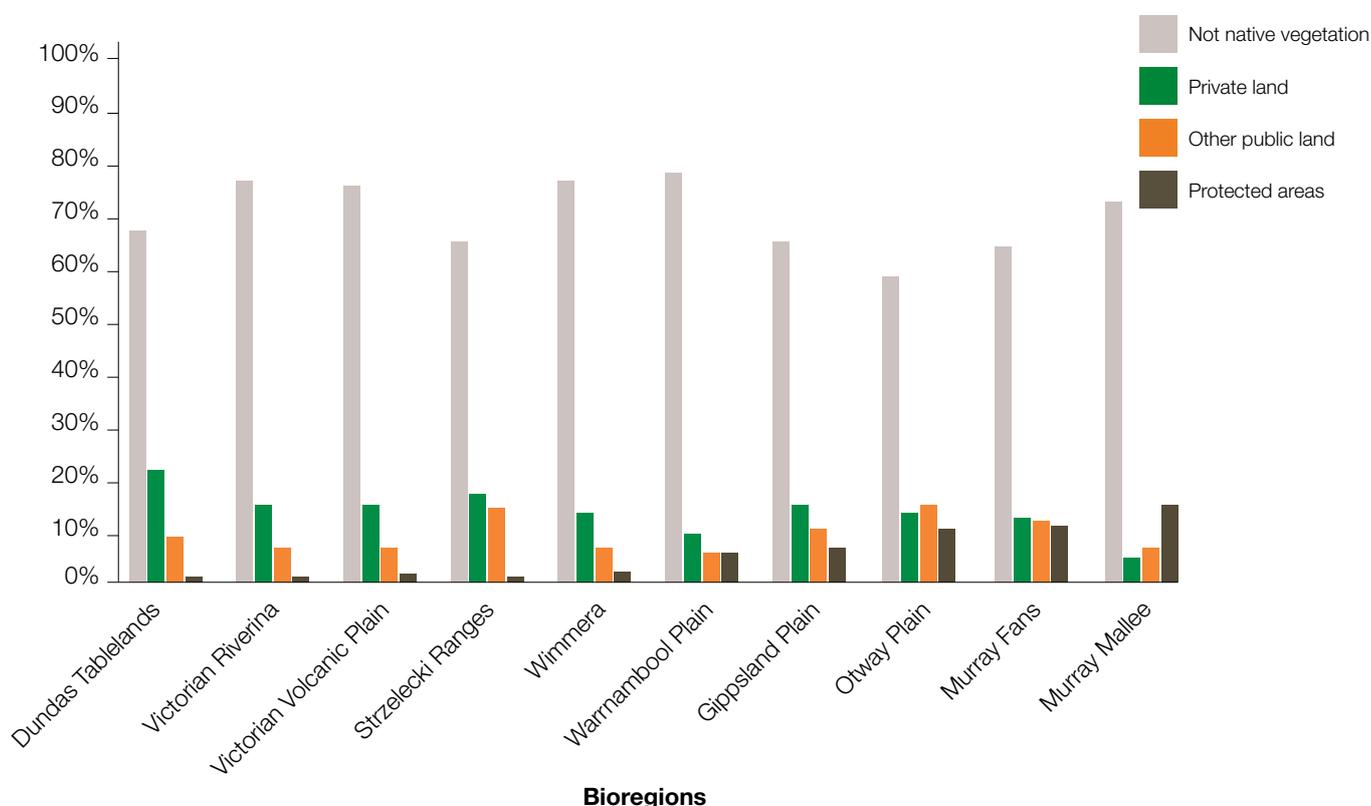


Figure 5.5

Cover of native vegetation across protected areas, other public land and private land in the **most** cleared bioregions



Moderately cleared bioregions tend to occur in the foothills or less fertile, flatter country. These bioregions have widely varying proportions of their remaining native vegetation in protected areas, from 11 per cent in the Central Victorian Uplands to 78 per cent in the Lowan Mallee (figure 5.4). Some moderately cleared bioregions are highly fragmented due to land use history. For example, in the Central Victorian Uplands bioregion, only 3 per cent of the landscape is largely intact.⁴ This is a result of its history of gold mining, farming and timber harvesting which has led to the current poor condition of remnant vegetation.

A number of moderately cleared bioregions have a substantial proportion of native vegetation on other public land, particularly in the north and east of the state. In particular, the Highlands-Southern Fall and Highlands-Northern Fall bioregions have 60 per cent and 65 per cent of native vegetation on other public land, and this public land occurs within largely intact landscapes.⁴ The Glenelg Plain and Central Victorian Uplands were previously recommended as candidate bioregions for further investigation to improve protected area representation by VEAC in 2011.⁵

The most cleared bioregions have less than 27 per cent of their original extent of native vegetation remaining (figure 5.5). These bioregions often occur on low elevation,

flat, fertile country which was converted to agriculture during early settlement. There is more likely to be poor protected area representation, with a high proportion of native vegetation occurring on private land or in road reserves. This is particularly the case for the Dundas Tablelands, Victorian Riverina, Victorian Volcanic Plain, Strzelecki Ranges and Wimmera bioregions. In many of the most cleared bioregions, the vegetation is in relatively poor condition and exists in a highly fragmented landscape.⁴

Although the Dundas Tablelands and Strzelecki Ranges have relatively large extents of native vegetation on other public land compared to the small extent of their protected areas, little native vegetation exists on other public land in the most cleared bioregions. The Dundas Tablelands, Wimmera, Gippsland Plain and Strzelecki Ranges bioregions were recommended as priorities for further assessment to improve protected area representation in VEAC's Remnant Native Vegetation Investigation (2011).⁵ Because most of the remaining public land in the Victorian Volcanic Plain and Victorian Riverina exists in small, narrow and fragmented blocks, there is little scope to extend protected areas. In these bioregions, it is important to conserve native vegetation on private land, even though this vegetation is generally to be in poorer condition than the native vegetation on public land.

Statewide extent of ecological communities

Ecological vegetation classes (EVCs) are the standard unit for describing native vegetation types in Victoria and have been used as surrogates for ecological communities for many years. EVCs are defined by a combination of floristics (occurrence of plant species), lifeforms, position in the landscape, and an inferred preference for and fidelity to particular environments. Each EVC includes a collection of plant communities that may differ in species, but have similar habitat and ecological processes operating. DELWP's Biodiversity Interactive Map at www.delwp.vic.gov.au show the distribution of EVCs across Victoria. There are currently 658 EVCs, aggregates, complexes and mosaics recognised in Victoria.

To assess changes in the extent of each EVC, the 2015 EVC extent was compared to the pre-1750 EVC extent. The pre-1750 dataset is the estimated extent of EVCs prior to European settlement, based on modelling using field data, environmental spatial data (e.g. soils, rainfall, topography) and historical records such as parish plans.

Based on the percentage remaining, EVCs that have experienced the greatest levels of clearing compared to their pre-1750 extent are those that are the most suitable for agriculture. Less than 20 per cent remains of plains grassland and woodland type EVCs (e.g. Plains grassy woodland, Basalt shrubby woodland, Plains grassy forest) (see full data table at www.veac.vic.gov.au). Mosaics and complexes consisting of these grassy EVCs have also been substantially cleared, particularly where they include a swampy, wetland or riverine component (e.g. Swamp scrub/Plains grassy forest mosaic). Much of the remaining extent of these grassy EVCs occurs on private land. Other EVCs with a small percentage remaining include damp heathlands in mosaics and complexes with other damp EVCs (e.g. Wet heathland/Damp heathland mosaic) and warm temperate rainforest mosaics (e.g. Riparian forest/Warm temperate rainforest mosaic).

In terms of the total number of hectares cleared, the most depleted EVC types are also plains woodlands and grasslands. This includes grassy woodland EVCs in mallee and northern plains ecosystems (e.g. Plains savannah, Ridged plains mallee) and grassy foothill forests (e.g. Valley grassy forest, Herb-rich foothill forest). Some EVCs that have lost a large area in absolute terms still retain a reasonable proportion of the original extent because they were initially very widespread. For example, over 290,000 hectares of Herb-rich foothill forest have been lost but 73 per cent of the original extent remains. Some of these EVCs are well-represented on public land (e.g. Herb-rich foothill forest, Lowland forest), whereas plains woodlands and grasslands occur predominantly on private land.

Conversely, EVCs that have experienced a small relative or absolute reduction tend to be those unsuitable for agriculture. These EVCs occur in rocky, ridgeline, montane, sub-alpine and alpine areas (e.g. Rocky outcrop herbland, Sub-alpine woodland, Blackthorn scrub). Due to the early history of reserving Crown land in areas deemed generally unsuitable for agriculture or other resource use, these EVCs are well-represented on public land.

Even when not highly depleted, EVCs with a small (less than 1,000 hectares) pre-1750 extent are also of special interest. Such EVCs are typically the product of particular and unusual combinations of environmental characteristics and often support unique and irreplaceable biota despite their limited spatial extent. For example, in the Victorian Alps a number of EVCs occur with initial extents of less than 200 hectares (e.g. Alpine fen, Alpine coniferous shrubland, Late-lying Snowpatch herbland, Snowpatch grassland, Alpine valley peatland). Largely because of their small extents, these EVCs are either endangered or vulnerable but they mostly occur on public land, and have 95 per cent or more of their original extent remaining. Although found in a number of bioregions, rainforests are also often indicative of specific environments. Essentially relicts of past climatic conditions, they also contain many endemic species. Cool temperate rainforest is the most widely distributed rainforest type, with 96 per cent of the original extent remaining, nearly all on public land. In contrast, the more restricted Dry rainforest and Gallery rainforest EVCs have only 75 per cent and 14 per cent remaining on public land, respectively.

Bioregional extent of ecological communities

Many EVCs occur across multiple bioregions. Within every bioregion, each EVC is assigned a bioregional conservation status (BCS). Appendix 10 shows the criteria for BCS of EVCs in Victoria. The BCS is a function of the current extent and condition for each EVC compared to its pre-1750 extent and condition. As different bioregions have more or less native vegetation remaining, an EVC may have a different BCS in different bioregions. The BCS was last updated for each EVC by DELWP in 2005.

In the least cleared bioregions, where a high proportion of the remaining native vegetation is on public land (e.g. Wilsons Promontory and Victorian Alps), most EVCs have a conservation status of 'least concern'. This is the case whether the vegetation occurs on public or private land (see Map D and Map E in the back pocket of this report). For example, in the Victorian Alps, EVCs with a conservation status of 'least concern' make up 96 per cent and 86 per cent of vegetation on public and private land respectively.

When bioregions are grouped by the level of clearing, differences become apparent between the relative extent of vegetation on public and private land. In the most cleared bioregions (e.g. Wimmera, Dundas Tablelands and Victorian Volcanic Plain), a much higher proportion of native vegetation occurs on private land. Furthermore, much more of the native vegetation on private land comprises endangered and vulnerable EVCs. For example, in the Victorian Volcanic Plain, 19 per cent of native vegetation on public land has a conservation status of 'least concern', and 48 per cent has a conservation status of 'endangered' or 'vulnerable'. On private land in this bioregion, 96 per cent of native vegetation has a conservation status of 'endangered' or 'vulnerable'. This pattern points to gaps in the types of vegetation represented on public land in highly cleared bioregions.

There is also great natural variation in the bioregional extent of EVCs, based largely on topography. For example, the relatively flat Murray Mallee bioregion is Victoria's largest (2,919,064 hectares) but only has 48 EVCs compared to the rugged Greater Grampians bioregion which is less than a tenth its size (237,351 hectares – the ninth smallest bioregion) but has more than four times as many EVCs (216 – the most of any bioregion).

Similarly, four of the five EVCs with the largest pre-1750 extent occur on flat to gentle terrain – such as Plains Woodland, the most extensive EVC pre-1750 at 1,762,501 hectares (table 5.4). However, because these flat landscapes are highly favoured for agriculture they have been heavily cleared such that the six most extensive EVCs are now foothill forests such as Herb-rich Foothill Forest which, at 808,829 hectares, is now the most widespread EVC in Victoria (table 5.4).

Table 5.4
Statewide extent (both public and private land) of the 22 most extensive EVCs pre-1750

EVC name	Pre-1750 extent (hectares)	Current extent (hectares)	Percentage of pre-1750 extent remaining
Plains Woodland	1,762,501	246,554	14.0
Plains Grassy Woodland	1,666,283	340,936	20.5
Plains Grassland	1,267,194	169,056	13.3
Herb-rich Foothill Forest	1,102,175	808,829	73.4
Grassy Woodland	996,722	348,418	35.0
Shrubby Dry Forest	817,600	798,088	97.6
Lowland Forest	767,349	543,490	70.8
Damp Forest	728,773	591,786	81.2
Woorinen Mallee	722,528	174,627	24.2
Ridged Plains Mallee	613,864	49,445	8.1
Grassy Dry Forest	582,619	412,238	70.8
Plains Savannah	486,274	41,190	8.5
Woorinen Sands Mallee	472,735	226,246	47.9
Loamy Sands Mallee	471,914	379,111	80.3
Valley Grassy Forest	444,419	181,211	40.8
Heathy Dry Forest	436,793	380,974	87.2
Box Ironbark Forest	427,581	333,605	78.0
Wet Forest	423,331	350,186	82.7
Semi-arid Woodland	399,364	126,166	31.6
Montane Dry Woodland	349,228	334,981	95.9
Heathy Mallee	326,025	308,012	94.5
Heathy Woodland	304,331	247,807	81.4

Representativeness of the protected area system

Section 3.3.2 in chapter 3 describes Victoria's protected areas system and the public land categories considered to be protected areas. As summarised in chapter 3, through the Convention on Biological Diversity the Australian and Victorian governments are committed to establishing a representative protected area system. For terrestrial areas, this is largely achieved through the National Reserve System (NRS). The NRS is a formally-recognised, national network of protected areas which cover terrestrial and inland freshwater ecosystems. It is complemented in marine environments by the National Representative System of Marine Protected Areas (NRSMPA).

The NRS and the NRSMPA processes incorporate the broad requirement for a comprehensive, adequate and representative protected area system. This is commonly referred to as the 'CAR' system (see box 5.1). The CAR criteria set targets at the ecosystem level; for terrestrial areas in Victoria, Ecological Vegetation Classes are used as ecosystem surrogates.

Box 5.1

The CAR reserve system

Comprehensive refers to the inclusion, within protected areas, of all of the ecosystems within each bioregion. This is the most important of the criteria, as the likelihood of including functional assemblages of all species within a bioregion will be greatest when the full range of ecosystems within an area is protected.

Adequate refers to the inclusion of sufficient areas of each ecosystem within the protected area network to allow for the ecological viability and integrity of populations, species and communities. Generally, where a greater extent of an ecosystem is reserved, the more likely it is that its ecological function and species composition will be maintained. Including ecosystems within the protected area network at multiple sites provides a greater safeguard against catastrophic events.

Representative refers to a finer-scale of comprehensiveness. It involves including the variability within ecosystems to ensure that information on species distributions and intrinsic/genetic variations are captured within the reserve system.

Source: Commonwealth of Australia (1999)⁶

A number of national targets have been set in agreements between the Commonwealth and state/territory governments to help establish a comprehensive, adequate and representative terrestrial reserve system. The first of these were developed in 1996 for forests, and are widely known as the JANIS criteria.⁷ The JANIS definitions of endangered, vulnerable and rare ecosystems align closely with the definitions for the bioregional conservation status of EVCs in Victoria (see appendix 10). The JANIS targets for inclusion of ecosystems within the forest reserve system are:

- ✦ 15 per cent of the pre-1750 distribution of each vegetation type
- ✦ at least 60 per cent of the remaining extent of vulnerable ecosystems. A vulnerable ecosystem is one that has been reduced by around 70 per cent within a bioregion and remains subject to threatening processes or is not depleted but is subject to continuing or significant threatening processes
- ✦ all remaining rare and endangered forest ecosystems. A rare ecosystem has a small range of less than 10,000 hectares, or occupies a total combined area of less than 1,000 hectares, or occurs in isolated patches less than 100 hectares. Endangered ecosystems have been reduced to less than 10 per cent of their former range or have 90 per cent of the area in small, threatened patches.

The national policy framework for building the NRS was updated in 2009.⁸ This strategy identifies priority actions to provide a nationally coordinated approach, including the following national targets for a national reserve system:

- ✦ examples of at least 80 per cent of all regional ecosystems in each bioregion by 2015
- ✦ examples of at least 80 per cent of all regional ecosystems in each subregion by 2025
- ✦ core areas established for the long-term survival of threatened ecosystems and threatened species habitats in each of Australia's bioregions by 2030
- ✦ critical areas for climate change resilience, such as refugia, to act as core lands for broader, whole-of-landscape scale approaches to biodiversity conservation by 2030.

In 2010, at the tenth meeting of signatories to the Convention on Biological Diversity in Nagoya, Japan, a revised strategic plan for biodiversity in the 2011-2020 period was adopted. This plan is often referred to as the Aichi Biodiversity Targets. Target 11 is particularly relevant to protected areas:

By 2020, at least 17 per cent of terrestrial and inland water areas and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascape.⁹

In summary, there has been a trend from relatively specific targets towards those that are less well defined i.e. from numerical targets applying to ecosystems in Australian forests (JANIS targets) to 'well-connected' protected areas applying to bioregions across the globe (Aichi targets). While the current expression of targets has merit, in that it explicitly acknowledges the need for connectivity and integration into the wider landscape, there is also a need for the broader targets to be translated to concrete and specific targets for their application. Australia is currently reviewing the first five years of its *Biodiversity Conservation Strategy 2010-2030* to align with the Aichi Biodiversity Targets. A translation of Target 11 to operational targets will be needed subsequently if it does not arise from this review. In the meantime, the following analyses are based on the numerical JANIS targets.

Appendix 11 shows a sample of the extent data for assessing the protected area status of each bioregional EVC in Victoria (full data table available at www.veac.vic.gov.au). These data enable a comprehensive assessment of Victoria's protected area system in terms of ecosystem representation, a lengthy and detailed exercise. Some notable findings are presented in the following paragraphs.

There are several measures that could be used to assess which bioregions have the poorest representation of EVCs in protected areas, i.e. those that would generally be high priorities to improve protected area representativeness. The simplest characterisation might be to identify the bioregional EVCs that require the largest areas to be added to the protected area network to meet their respective targets.

The analysis presented in table 5.5, shows that Plains Grassland in the Victorian Volcanic Plain would require the greatest area, some 115,600 hectares, of additional protected areas to meet its nominal target. However, apart from the 2,060 hectares of this EVC currently in protected areas, only around 12,300 hectares of this EVC – barely 10 per cent of the 'deficit' – occurs on other public land in this bioregion. Much of those 12,300 hectares occur in road reserves and other small units that would generally be problematic to include in protected areas.

As shown in table 5.5 this is a common pattern. The majority of the most poorly-represented bioregional EVCs are plains grasslands and grassy woodlands in topographically flat bioregions, which have a low percentage of the overall shortfall available on public land and a bioregional conservation status of endangered. Further down the table there is a trend towards bioregional EVCs that are grassy woodlands and forests on low rises and foothills. These EVCs tend to have bioregional conservation statuses of vulnerable, and a much higher percentage (often 100 per cent) of the overall shortfall is available on public land.



Table 5.5

The 40 Victorian bioregional Ecological Vegetation Classes (EVCs) that require the greatest additional areas to meet the target of 17 per cent reservation in the protected area system

Bioregion	EVC	BCS*	1750 extent	Current dedicated reserve	Current other public land	Private land	Overall 'shortfall'	% of shortfall that could be potentially met on public land
Victorian Volcanic Plain	Plains Grassland	E	868,985	2,059	12,332	103,276	-115,608	10.7
Wimmera	Plains Woodland	E	786,778	1,649	18,695	92,655	-111,350	16.8
Victorian Volcanic Plain	Plains Grassy Woodland	E	716,739	1,711	15,446	92,980	-108,426	14.2
Victorian Riverina	Plains Woodland	E	738,259	1,360	17,656	77,465	-95,121	18.6
Dundas Tablelands	Plains Grassy Woodland	E	312,685	2,190	21,649	58,051	-79,699	27.2
Goldfields	Grassy Woodland	V	411,150	8,623	21,921	141,122	-65,384	33.5
Victorian Riverina	Plains Grassy Woodland	E	203,319	484	9,626	35,662	-45,289	21.3
Central Victorian Uplands	Grassy Woodland	E	136,643	611	4,343	39,874	-44,217	9.8
Victorian Riverina	Plains Grassland	E	268,174	3,682	4,181	34,947	-39,129	10.7
Northern Inland Slopes	Valley Grassy Forest	E	133,378	3,991	7,050	31,203	-38,253	18.4
Goldfields	Grassy Woodland/ Alluvial Terraces Herb-rich Woodland Mosaic	E	103,220	2,240	5,952	28,821	-34,773	17.1
Central Victorian Uplands	Valley Grassy Forest	V	202,512	2,176	10,588	65,918	-34,276	30.9
Murray Mallee	Ridged Plains Mallee	E	468,963	1,045	7,037	27,201	-34,238	20.6
Central Victorian Uplands	Plains Grassy Woodland	E	111,619	1,043	5,473	24,932	-30,404	18.0
Wimmera	Plains Savannah	E	380,016	842	6,126	24,162	-30,288	20.2
Gippsland Plain	Swamp Scrub	E	152,442	3,046	9,161	19,201	-28,361	32.3
Strzelecki Ranges	Damp Forest	E	136,143	425	6,799	21,263	-28,062	24.2
Northern Inland Slopes	Grassy Woodland	E	104,244	3,709	3,643	22,219	-25,862	14.1
Murray Mallee	Woorinen Mallee	V	689,730	98,901	19,688	31,704	-25,251	78.0
Wimmera	Low Rises Woodland	E	142,328	2,438	4,619	15,536	-20,155	22.9
Gippsland Plain	Plains Grassy Woodland	E	154,064	906	4,598	15,171	-19,769	23.3
Wimmera	Plains Grassy Woodland	E	47,880	1,448	3,451	15,227	-18,679	18.5
Murray Mallee	Chenopod Mallee	V	229,081	23,580	25,004	14,427	-17,654	100.0
Murray Fans	Riverine Chenopod Woodland	E	79,200	3,352	6,255	10,681	-16,936	36.9
Murray Fans	Plains Woodland	E	114,956	3,138	3,067	13,175	-16,242	18.9

Table 5.5 (continued)

Bioregion	EVC	BCS*	1750 extent	Current dedicated reserve	Current other public land	Private land	Overall 'shortfall'	% of shortfall that could be potentially met on public land
			hectares					
Gippsland Plain	Lowland Forest	V	119,673	6,036	13,451	21,665	-15,506	86.8
Central Victorian Uplands	Herb-rich Foothill Forest	D	148,537	6,858	32,189	49,127	-15,422	100.0
Victorian Volcanic Plain	Plains Sedgy Wetland	E	28,938	62	812	14,583	-15,394	5.3
Strzelecki Ranges	Wet Forest	D	121,737	2,950	30,408	25,084	-15,311	100.0
Central Victorian Uplands	Grassy Dry Forest	D	223,490	18,772	40,009	87,416	-14,752	100.0
Dundas Tablelands	Damp Sands Herb-rich Woodland/Plains Grassy Woodland Mosaic	E	76,821	8	1,800	12,924	-14,724	12.2
Victorian Volcanic Plain	Stony Knoll Shrubland/Plains Grassy Woodland/Plains Grassy Wetland Mosaic	E	52,779	74	703	13,171	-13,874	5.1
Gippsland Plain	Plains Grassy Forest	V	84,563	1,584	16,781	13,271	-13,637	100.0
Victorian Riverina	Wetland Formation	E	25,209	64	3,549	9,886	-13,435	26.4
Goldfields	Creekline Grassy Woodland	E	25,844	624	3,770	9,629	-13,399	28.1
Wimmera	Ridged Plains Mallee	E	142,373	567	2,441	10,225	-12,666	19.3
Victorian Volcanic Plain	Herb-rich Foothill Forest	V	81,326	2,187	8,350	12,471	-12,452	67.1
Victorian Riverina	Chenopod Grassland	E	76,262	3,648	1,575	10,670	-12,245	12.9
Goldfields	Plains Grassy Woodland	E	33,401	374	1,327	10,741	-12,068	11.0

* BCS = Bioregional conservation status, as described earlier in this chapter on page 66.

It would be impractical, and would misleadingly emphasise the discreteness of EVCs, to prioritise individual bioregional EVCs in addressing their under-representation in the protected area system. A more effective approach is to identify parts of Victoria where there is a concentration of poorly represented EVCs with sufficient occurrence on public land outside current protected areas to substantially improve representation. These regions would then require a more detailed assessment incorporating the full range of public land values, socio-economic considerations and community views. Broadly, this is the approach that VEAC and its predecessors have undertaken in regional investigations spanning 45 years to progressively improve the representativeness of Victoria's protected area system. A summary of analyses that would inform such an approach is presented in table 5.6.

This analysis shows that there are three regions of Victoria where under-represented EVCs form a distinct cluster. While not showing shortfalls in EVC representation specifically, Map D (in the back pocket of this discussion paper) also assists in understanding these clusters:

- ✦ *South west cluster.* The core of this cluster is the Glenelg Plain bioregion, the Dundas Tablelands bioregion (particularly the Cherrypool link between the Grampians National Park and Black Range State Park) and the western part of the Wimmera bioregion, especially south of the Little Desert. Adjoining areas with large shortfalls that may be readily included in an assessment of this cluster are the Warrnambool Plain bioregion and the western part of the Victorian Volcanic Plain bioregion.
- ✦ *Strzelecki Ranges–Gippsland Plain cluster.* This cluster comprises the two bioregions after which it is named.
- ✦ *Central Victorian Uplands cluster.* This is a less sharply defined cluster than the other two. It is based on the Central Victorian Uplands bioregion – itself an extensive, dispersed bioregion – and may include a number of adjoining bioregions with significant shortfalls, e.g. the Northern Inland Slopes, Goldfields and Highlands-Southern Fall.

The analyses that identified these three clusters reinforce similar conclusions arrived at in the 2011 Final Report for VEAC's Remnant Native Vegetation Investigation.⁵

In addition to the clusters described above, table 5.6 highlights three other bioregions with substantial shortfalls that are also of interest. Of the 73,100 hectare shortfall in the Murray Mallee bioregion, some 37,300 hectares is accounted for by just two EVCS, Woorinen Mallee and Chenopod Mallee. A full-scale investigation covering this very large (nearly three million hectares) bioregion would be excessive when a more targeted assessment of these two EVCs and perhaps a small number of others would be sufficient. The Murray Fans and Victorian Riverina bioregions were largely assessed in the relatively recent VEAC River Red Gum Forests Investigation (2008) and ECC Box-Ironbark Forests and Woodlands Investigation (2001). As a result the remaining shortfalls are likely to be difficult to address. Much of the shortfall in the Murray Fans bioregion occurs in a single block, the Gunbower State Forest.

The total area of shortfall covered by the identified clusters and the Murray Mallee bioregion represents about 78 per cent (or 539,400 hectares) of the total shortfall. However, it would be impractical to add all these areas to the protected area estate given that there will be many EVCs that occur largely in small patches such as road reserves or other public land strongly committed to other uses. Detailed analysis of the clusters and bioregions identified above would further develop the public land component of the commitment to achieve a more comprehensive, representative and adequate protected area system for Victoria. This detailed analysis is beyond the scope of the current statewide assessment.

Table 5.6

Total area of 'shortfall' in under-represented EVCs as a percentage of total area for each bioregion

Bioregion	Total of 'shortfall' on public land (hectares) ¹	Bioregion total area (hectares)	Shortfall as percentage of total area	Comments ²
Strzelecki Ranges	-29,730	342,179	8.69	Include in Strzelecki-Gippsland Plain cluster
Dundas Tablelands	-42,070	688,164	6.11	Include in South west cluster
Central Victorian Uplands	-70,638	1,217,609	5.80	Include in Central Victorian Uplands cluster
Glenelg Plain	-22,055	398,828	5.53	Include in South west cluster
Gippsland Plain	-66,292	1,208,072	5.49	Include in Strzelecki-Gippsland Plain cluster
Northern Inland Slopes	-30,625	565,808	5.41	Potential supplement to Central Victorian Uplands cluster
Victorian Riverina	-73,844	1,890,328	3.91	Although this bioregion has a large shortfall (absolutely and relative to its total area) much of it has been assessed in the recent investigations and substantial further protected area additions are unlikely
Murray Fans	-16,874	435,153	3.88	Although this bioregion has a large shortfall relative to total area, it has recently been assessed and substantial further protected area additions are unlikely
Goldfields	-47,617	1,325,762	3.59	Potential supplement to Central Victorian Uplands cluster
Monaro Tablelands	-2,667	74,821	3.57	
Wimmera	-69,050	2,011,321	3.43	Include western half in South west cluster
Warrnambool Plain	-8,733	264,110	3.31	Potential inclusion in South west cluster
Otway Plain	-7,353	237,190	3.10	
Highlands - Far East	-1,938	70,018	2.77	
Victorian Volcanic Plain	-63,139	2,355,732	2.68	Western part is a potential inclusion in South west cluster
Murray Mallee	-73,091	2,919,064	2.50	Although this bioregion has a large shortfall, over 50 per cent of it is accounted for by just two EVCs – Woorinen Mallee and Chenopod Mallee.
East Gippsland Uplands	-17,074	791,031	2.16	
Highlands - Southern Fall	-18,214	1,196,155	1.52	
East Gippsland Lowlands	-7,308	531,830	1.37	
Highlands - Northern Fall	-16,328	1,415,346	1.15	Potential supplement to Central Victorian Uplands cluster
Victorian Alps	-6,941	714,321	0.97	
Otway Ranges	-1,395	149,755	0.93	
Robinvale Plains	-511	64,186	0.80	
Greater Grampians	-1,341	237,351	0.56	
Bridgewater	-6	18,110	0.03	
Lowan Mallee	-270	1,419,874	0.02	
Murray Scroll Belt	-1	116,144	0.00	
Wilson's Promontory	0	40,361	0.00	
Total	-695,106	22,698,623	3.06	

¹ The 'shortfall' on public land for each under-represented EVC is the area of public land required to be added to the protected area system to meet the JANIS targets. If the target is greater than the total area of public land with that EVC outside current protected areas, this figure is 100 per cent. The figures in this column are the total of the shortfalls for all under-represented EVCs in each bioregion.

² See page 72 for descriptions of the clusters identified in this column.



Integrated biodiversity values, including threatened species

Threatened species

Victoria accounts for only 3 per cent of the land area of Australia, but supports more than 500 endemic species (species that occur only in Victoria). The majority of known endemic species are vascular plants (344 species), invertebrates (137 species) and lichens (47 species). Victoria has three endemic vertebrate species, all of which are endangered or critically endangered: Leadbeater's possum (*Gymnobelideus leadbeateri*), alpine bog skink (*Eulamprus kosciusko*) and Baw Baw frog (*Philoria frosti*).¹⁰ Four bioregions support high numbers of endemic species, namely the Victorian Alps, the Victorian Volcanic Plain, the Otway Ranges and Greater Grampians.

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the Australian government's principal environment legislation. The EPBC Act provides for the listing of threatened species and communities, and their nomination is open to anyone. Nominations are subject to annual decision-making by the responsible Minister, informed by advice from the Threatened Species Scientific Committee. When a species or community is listed, the recovery of that species or community is promoted using conservation advice, recovery plans and the EPBC Act assessment and approval provisions for actions that may affect that species or community.

This legislation is complemented in Victoria by the *Flora and Fauna Guarantee Act 1988* which is currently under review. Similarly to the EPBC Act, the Flora and Fauna Guarantee Act provides for the listing of taxa (genera, species, subspecies and varieties) and communities of flora and fauna. Anyone can submit a nomination, which is assessed by a Scientific Advisory Committee and a decision made by the responsible Minister. The recovery of listed organisms and communities is assisted through the production of action statements, which outline the actions required to conserve and manage a taxon or community.

DELWP also maintains advisory lists for threatened flora and fauna. The lists are based on advice from technical experts and are reviewed periodically. The inclusion of a species on these lists does not provide the protection afforded by inclusion on the statutory lists. Instead, the advisory lists are intended to inform planning processes including park and reserve management plans, local government planning schemes, and regional catchment strategies.

The species that occur in Victoria and are included on one or more of these lists are available at www.delwp.vic.gov.au. As vertebrates and vascular plants are relatively well-studied, the lists for these taxa are likely to be relatively good representations of their conservation status.

However, given the vast numbers of invertebrates (100 times more than vertebrates) and fungi (10 times more than vascular plants) and our low level of knowledge about these species, the lists for these taxonomic groups should be viewed as underestimates.

Knowledge of where species are, or are likely to be present, is essential information in biodiversity management. While many threatened species are recorded on public land, records alone are not sufficient, as threatened species typically occur in isolated, patchily-distributed or small populations which are difficult to locate. Species distribution models can be used to describe where the habitat of a species is likely to be present, and can also be used to guide new survey effort to locate new populations.

NaturePrint

DELWP has developed a suite of decision-support tools known collectively as NaturePrint. These tools are based on a comprehensive analysis of biodiversity values across Victoria (excluding the marine environment).

NaturePrint also includes habitat distribution and habitat importance models for many threatened and common species of flora and fauna. Habitat distribution models predict the suitability of a location for a particular flora or fauna species based on mapped presence data, systematically allocated absence data, geographic and environmental characteristics. These models have been developed for all rare or threatened Victorian species where sufficient data are available and for many common species. Approximately 2,000 habitat distribution models have been used in DELWP's current analyses; two thirds of these are for flora and a third for fauna. Habitat distribution models have been used to inform the development of habitat importance models for some species. These models show the relative importance of locations for species, relative to other suitable habitats for that species. Habitat distribution and habitat importance models can be viewed at www.data.vic.gov.au/data/dataset.

As well as mathematical models of species habitats and distributions, NaturePrint incorporates habitat condition, pathways for connectivity and potential to recover connectivity, threatening processes and ecosystem function. NaturePrint offers an improved method for prioritising action across diverse assets and circumstances due to extrapolation and integration of available data.

Modelling the distribution of Victorian plants and animals assists to transparently and repeatably improve knowledge about where important values are located. Given the complexity of the natural and socio-economic environments, integrated information is required to allow consideration of multiple biodiversity needs simultaneously.

NaturePrint displays information on the relative habitat value for all of terrestrial Victoria, including areas without native vegetation coverage. This means that the value of cleared areas used by highly mobile fauna is also considered. To obtain the information behind NaturePrint, every part of Victoria (75 x 75 metre cell) was ranked according to its biodiversity value and cells were grouped into five categories from highest value to lowest value to produce the strategic biodiversity values map. This map shows areas that make the greatest contributions to biodiversity conservation and can be used to identify biodiversity assets or values, based on locations where multiple species, rare or highly depleted species/habitats, or unique assemblages of species occur. Biodiversity assets identified in this map tend to be largely intact and mostly high value areas, areas where there are strong options to improve connectivity or groups of high values within an area of otherwise lower priority. The most recent version of NaturePrint's strategic biodiversity values map can be viewed on Map H in the back pocket of this report.

For this discussion paper, VEAC has also produced strategic biodiversity values maps for protected areas, other public land and private land (see Map I, Map J and Map K respectively in the back pocket of this report).

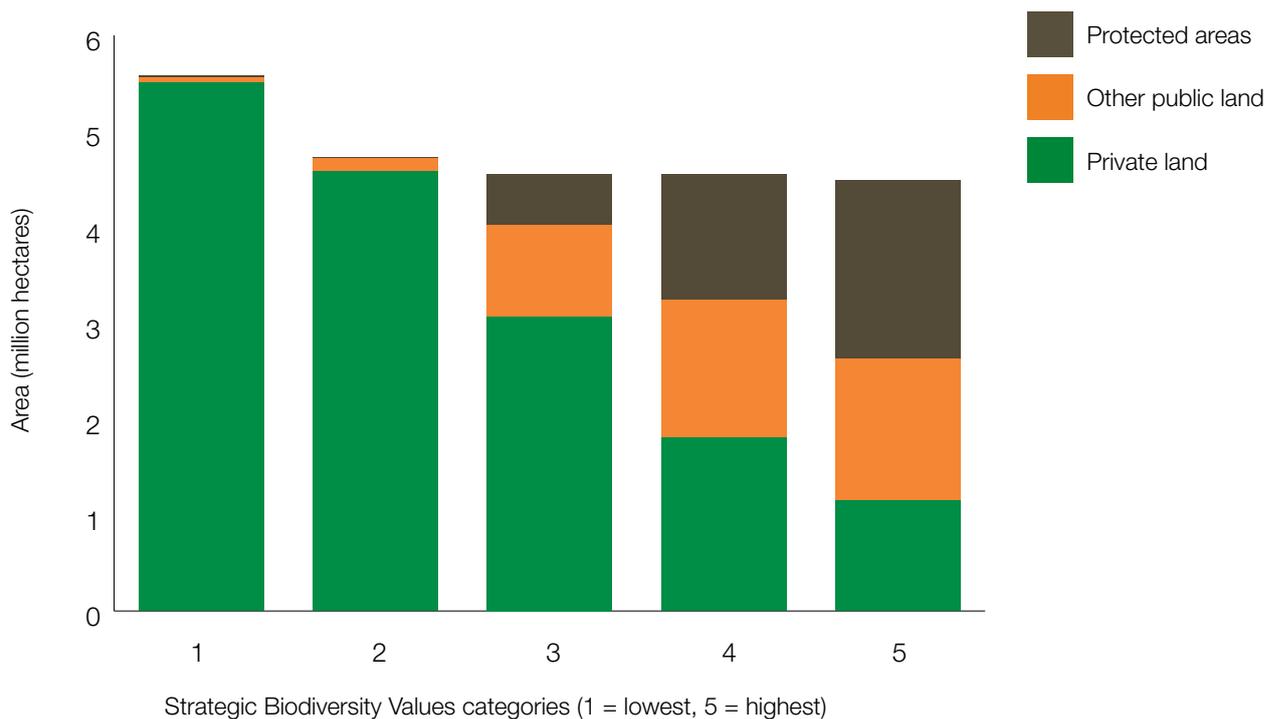
Many important points can be drawn from these maps. An overall comparison of the three maps shows that the protected area system contains few areas in the lowest categories of strategic biodiversity value (Map I) whereas the lowest categories of strategic biodiversity value account for a large majority of private land (Map K). On public land outside protected areas (Map J), these lowest strategic biodiversity categories are visible in patches that result mostly from timber plantations, most noticeable in Gippsland, the Otways and the southeast and northeast of the state.

In terms of the highest strategic biodiversity values categories, the pattern is essentially reversed. The protected area system has the greatest concentration of land in these categories (Map I). Relatively little private land is in the highest strategic biodiversity categories but there are several concentrations of these, such as the plains west of Melbourne, near the Gippsland Lakes and west of Echuca (Map K). These areas have been the focus of private land nature conservation initiatives by catchment management authorities, government agencies and Trust for Nature.

Map J reveals a somewhat more complex pattern on public land outside protected areas. It shows concentrations of high biodiversity value areas in the clusters identified in table 5.6, such as in the south west and Cherrypool link west of the Grampians, and in the Strzelecki Ranges and Gippsland Plain. However, it also shows many patches of high biodiversity value outside these areas, such as in East Gippsland and the mountain ranges immediately east of Melbourne. While some of these areas may be high priorities for addition to protected areas, much more detailed analyses required. It cannot be assumed that these values are under threat or that protected area status is the best option for mitigating any particular threats they may face.

The analysis indicates that the highest values are on public land (see figure 5.6). For example, although public land covers only 40 per cent of Victoria's land area, it accounts for over 70 per cent of the areas in the highest biodiversity values category, and 67 per cent of the areas supporting biodiversity values in the two highest categories. Protected areas in particular support a disproportionately high share of Victoria's highest biodiversity value areas: more than 40 per cent on less than 20 per cent of the land area.

Figure 5.6
Spatial extent of land supporting Strategic Biodiversity Values



5.1.3 Marine biodiversity

Key points at a glance

- Victoria's marine waters cover more than 10,000 square kilometres, extending three nautical miles from the coastline.
- There are five marine bioregions in Victoria.
- DELWP is currently undertaking a statewide marine habitat mapping and classification project with the objective of collating Victorian marine habitat data.
- The 24 areas recommended by the ECC as marine national parks and marine sanctuaries were implemented in 2002 with several substantial boundary amendments.
- Preliminary assessments based on available information, indicate that the existing system of no-take marine protected areas has some gaps in representation, and individual marine protected areas may be inadequate.

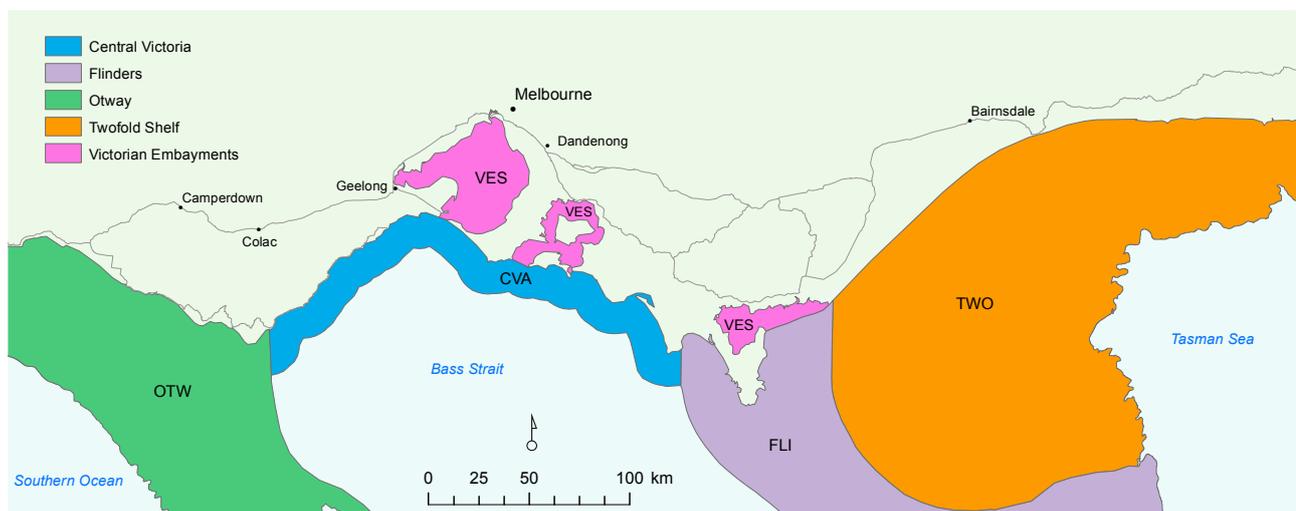
The southern coast of Australia is the only major south-facing coastline in the southern hemisphere. It has been relatively isolated for some 65 million years and, as a result, Australia's southern waters are unique. Southern Australia has high species richness and high rates of endemic species across most taxa, often about 90 per cent of species.¹¹

Victoria's marine waters cover more than 10,000 square kilometres, extending three nautical miles (approximately 5.5 kilometres) from the coastline. They include bays, inlets and estuaries, as well as the exposed waters of Bass Strait and the open ocean. Most waters are shallow, but some areas reach depths of more than 100 metres.¹²

A nationally agreed regional ecosystem-based classification for the Australian marine environment recognises five biophysical regions in Victoria. The Integrated Marine and Coastal Regionalisation of Australia (IMCRA) is a spatial framework for classifying Australia's marine environment into bioregions that make sense ecologically and are at a scale useful for regional planning. These bioregions are the basis for the development of a National Representative System of Marine Protected Areas. There have been a number of iterations to the marine regionalisation process, the latest is IMCRA version 4.0 (2006).

The five IMCRA bioregions in Victoria are Otway, Central Victoria, Flinders, Twofold Shelf and Victorian Embayments (see figure 5.7).

Figure 5.7
Marine bioregions in Victoria



Source: IMCRA v4.0 Meso-scale bioregions, Commonwealth of Australia 2006

Knowledge of Victoria's marine biodiversity has continued to improve since 1991 when the LCC began its Marine and Coastal Special Investigation. When the investigation was concluded in 2000, the ECC observed that 'despite considerable research interest in Victoria's marine environment and a relatively high level of knowledge by world standards, there are areas in which information is lacking or even completely unavailable'.¹¹ It was recognised however that complete inventories of biodiversity were not realistic for terrestrial, much less for marine environments, and that habitats and ecosystems can serve as proxies for biodiversity for many purposes.

As recently as 2009, our knowledge of Victorian marine natural values was characterised as 'relatively poor and very patchy in spatial coverage and quality'.¹³ In particular, there was considered to be low coverage of habitat mapping along the coast, mostly confined to marine protected areas and, with some notable exceptions,^{14, 15} few systematic and robust biodiversity and community surveys across the coast of Victoria. While there had been several detailed biodiversity surveys, most were spatially confined.

There are presently no comprehensive marine habitat classification schemes for Australia or Victoria. Of the existing schemes, most classify broad habitat features and do not resolve finer scale, community-level biotopes, which are the most informative level.¹⁶

Marine habitat mapping and classification

To address these knowledge gaps, DELWP is currently undertaking a statewide marine habitat mapping and classification project with the objective of collating Victorian marine habitat data into a single Geographic Information System with a focus on mapping marine ecosystems at different hierarchical scales. The core of this project is based around the Combined Biotope Classification Scheme (CBiCS), a relatively new scheme that adapted components from the European (JNCC-EUNIS) and US (CMECS) classification schema. The CBiCS scheme provides a unified scheme for classifying all marine habitats and biotopes and is consistent with the terrestrial classification of vegetation biotopes and biotope complexes (EVCs and EVC communities). The CBiCS scheme incorporates standardised classification of seven components:

- ✦ biogeography
- ✦ aquatic setting
- ✦ water column
- ✦ substratum type
- ✦ geofoms
- ✦ biotic types
- ✦ biological morphotypes (used to identify assemblages).

The hierarchical nature of CBiCS enables the incorporation of a variety of information sources of disparate types and levels of resolution.

The project is being implemented in phases, commencing with the regions of Port Phillip Bay, Western Port and Gippsland Lakes and then the Victorian open coast. For each of the areas, existing mapping is reclassified in accordance with CBiCS and updated with additional information from: the literature; an analysis of recently acquired data from lidar bathymetry, multibeam echo sounding bathymetry and aerial photography (where available); a reclassification of existing towed video ground truthing; and site visits for ad hoc (infill) ground truthing. The work has generally progressed by developing coarse habitat maps from older information (kilometre scales) and refining these with fine-scaled classification using features of substratum depth, slope, relief, rugosity, surface area, texture, hardness and CIE Lab colour (at 0.5 metre and 5 metre scales). The classification methods varied according to the nature of the data and the availability of ground truthing data. Some prior mapping was comprehensive and required minimal adjustment for incorporation, including for saltmarsh, mangroves and subtidal seagrass.

Representation of marine protected areas

Victoria's existing marine protected areas date from 1979 when the Harold Holt Marine Reserves in Port Phillip Bay were established following a proposal from the Scuba Divers Federation of Victoria in the early 1970s. Several more marine protected areas were established between 1981 and 1991, mainly in South Gippsland. In 1991 the LCC began a statewide investigation (concluded by the ECC) which culminated in the establishment of a system of 24 no-take marine national parks and marine sanctuaries in 2002 covering 5.3 per cent of Victorian state waters. In total, the existing marine protected areas in Victoria cover approximately 11.7 per cent of Victorian waters,¹² including six multiple-use areas. See Map A *Victoria's public land* in the back pocket of this report for the location of all the marine protected areas.

Important factors in the ECC's recommendations in 2000 for a comprehensive, adequate and representative system of marine protected areas were that the range of habitats within each of the five biophysical regions in Victoria was represented (comprehensiveness), and that more than one example of major habitats was included to incorporate the range of variability within each habitat type (representativeness) and to guard against loss due to unforeseen or catastrophic events (adequacy).¹¹ The information gaps described above limited the ECC's recommendations to some extent.

Victoria's marine protected areas contribute to the National Representative System of Marine Protected Areas (NRSMPA) which, in turn, helps to meet Australia's

obligations as a signatory to the Convention on Biological Diversity (CBD), and supports national commitments under the Inter-Governmental Agreement on the Environment (1992).

For marine areas, earlier commitments under the CBD to establish a system of protected areas have been replaced by the adoption in 2010 of Aichi Biodiversity Target 11 stating that by 2020 at least '10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascape'.⁹

A National Biodiversity Strategy and Action Plan is the main instrument for each member to implement its obligations under the Convention at the national level. Australia is reviewing the first five years of *Australia's Biodiversity Conservation Strategy 2010-2030* in 2015-16 to align with the Aichi Biodiversity Targets.

The general areas recommended by the ECC as marine national parks and marine sanctuaries were implemented in 2002, several with substantial boundary changes.

Since then, additional valuable data have been collected – for example through statewide lidar (light detection and radar remote sensing) of shallower waters – and progress is being made on a standardised scheme for habitat classification analogous to Victoria's EVCs for terrestrial biodiversity. These will substantially improve the ability to assess Victoria's current system of marine protected areas against criteria for comprehensiveness, adequacy and representativeness (CAR).

VEAC's assessment of Victoria's existing marine protected areas for its recent Marine Investigation was limited by the wording of its terms of reference to an assessment of their performance in meeting the purposes for which they were established, and any ongoing threats and challenges to their effective management. The assessment did not explicitly address CAR criteria.¹⁷

It is evident from preliminary assessments based on available information, however, that the existing system of no-take marine protected areas has some gaps in representation, and individual marine protected areas may not meet the adequacy criterion. Some of the issues that have been raised with the design of individual marine national parks or sanctuaries include that the areas are too small or have high perimeter to area ratios; and that some boundaries are not located in accordance with natural ecological boundaries, so that habitats are bisected or fragmented.¹⁴

Changes from the ECC's recommended boundaries resulted in some cases in the exclusion of significant ecological features and major habitats from the

implemented marine national parks, e.g. offshore reefs in the Cape Howe Marine National Park, and shallow reefs and intertidal reefs from the Discovery Bay Marine National Park. Gaps may also be evident now with improved mapping. Other gaps in representation were known at the time the recommendations were made and were a result of areas being excluded after consideration of commercial or recreational users.

Victoria's six multiple-use marine protected areas are difficult to assess. In the final report for its Marine Investigation, VEAC noted that the absence of an effective legal and governance basis impedes effective planning and management, and few specific biodiversity goals and objectives have been identified.¹⁷ VEAC made several recommendations to address these matters.

Management of the marine environment

Many strategies and reports have drawn attention to the absence of, and the need for, an integrated approach to management of the state's marine waters. The Victorian Auditor-General's Office noted in 2011, for example, that around 80 per cent of the state's marine waters have no detailed planning policy or management strategy in place, limiting the effectiveness of planning for protecting marine biodiversity.¹⁸ The report added that arrangements between the various stakeholders are inadequate to enable effective planning.

In the final report for its Marine Investigation, VEAC recommended that the development of statewide policy be prioritised, in consultation with stakeholders, to guide ecologically sustainable management and use of Victoria's marine environment.¹⁷

The current *Victorian Coastal Strategy* includes an action to explore a range of integrated marine planning systems and recommend an appropriate system for Victoria.¹⁹



5.1.4 Ecosystem services

Key points at a glance

- Healthy, well-functioning and biodiverse ecosystems are essential for the provision of ecosystem services benefits for use in economic and other human activity.
- They are critical for supporting human life and community wellbeing.
- Ecosystem services fall mainly into three main categories:
 - *Provisioning* services provide tangible goods and services that can be exchanged or traded as well as consumed or used directly by people and include food, water, and other raw materials.
 - *Regulating* services define the environment of people and include water and air purification, climate regulation, and coastal protection.
 - *Cultural* services cover the non-material ecosystem outputs that have symbolic, social or intellectual significance such as recreation and amenity.
- Some of these services provide direct financial benefit, others help avoid costs, while another group provides benefits which are more intangible.



Healthy, well-functioning and biodiverse ecosystems are essential for the provision of ecosystem services to all Victorians. Ecosystem services are the contributions of ecosystems to benefits used in economic and other human activity. They are generated through the interaction of the unique characteristics of particular ecosystems, and the links (or flows) between both processes within a single ecosystem and those between multiple ecosystems.²⁰ Globally, these services, and the healthy and resilient ecosystems that provide them, are increasingly being recognised as critical for supporting human life and community wellbeing.²¹

While there are different ways to conceptualise ecosystem services, the United Nations Statistical Commission has grouped them into three main categories, with a fourth minor category often included. Provisioning services provide tangible goods and services that can be exchanged or traded as well as consumed or used directly by people and include food, water, and other raw materials. Regulating services are the ways in which ecosystems control or modify parameters that define the environment of people and include water and air purification, climate regulation, and coastal protection. Cultural services cover the non-material ecosystem outputs that have symbolic, social or intellectual significance such as recreation and amenity. A fourth category, supporting or intermediate services, reflects services within or between ecosystems that directly benefit other ecosystems and indirectly affect the delivery of other ecosystem services.²⁰

Some of these services provide direct financial benefit, others help avoid costs, while another group provides benefits which are more intangible (and therefore harder to quantify). Attempting to put a dollar value to all of these services is extremely complex and difficult, as many of the services offer non-monetary value, have no current financial market or are near impossible to quantify financially.²⁰ Capturing this value is an important goal however, as in the past 'intangible' ecosystem services have not been measured and therefore not accounted for in decision making processes when clearly the absence of a price for ecosystem services does not indicate an absence of value. Recent work^{22,23} has shown that ecosystem services contribute greatly to the Victorian economy.

The value of the major provisioning services on public land is described in section 5.4 of this chapter. Due to the inherent complexity in quantifying the full range of ecosystem services delivered by public land, VEAC has made no attempt to do this. However, a number of key ecosystem services are described in appendix 12 and a sample of these can be found overleaf (table 5.7).

Table 5.7

Examples of ecosystem services provided by public land in Victoria
(see appendix 12 for table showing further examples)

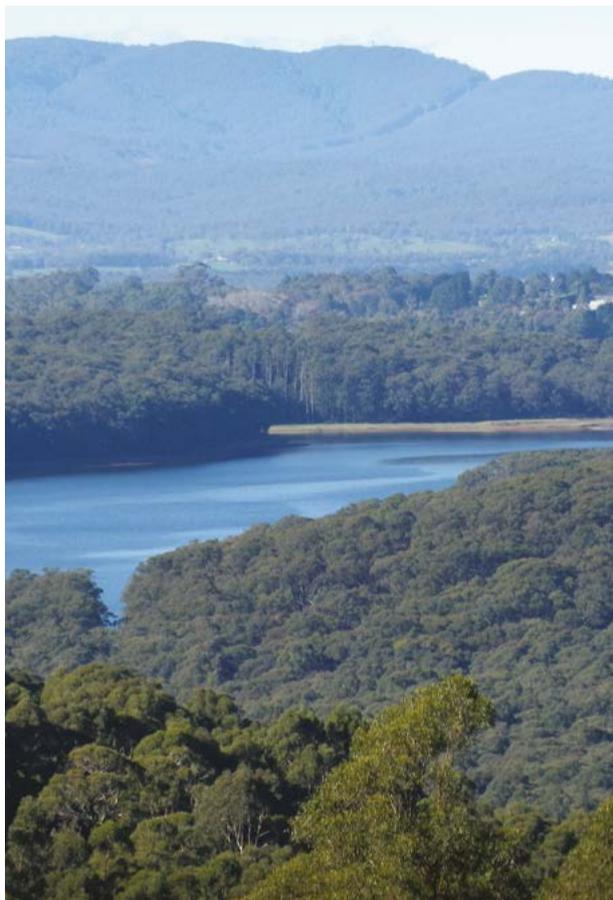
Type of service	Description of benefits to society and economy	Direct beneficiaries	End users and final beneficiaries
Timber and fuel (Provisioning)	Forested public land (e.g. state forests) is a source of valuable timber for a range of uses including firewood, saw logs, pulpwood, fence posts and landscaping timbers. For more detail about timber harvesting on public land, see section 5.4.1	Producers of timber products	Timber consumers and businesses
Coastal asset protection (Regulating)	Approximately 19 per cent of Victorians live by the coast, and many of these coastal communities rely on stable and healthy coastal ecosystems to avoid the inundation of homes and assets from storm and tidal surges. Coastal and marine habitats including mangrove, salt marsh, seagrass and coastal dune systems absorb wave energy, which helps buffer shoreline areas from storm damage, inundation and erosion. Without these intact ecosystems, physical infrastructure like sea walls and breakwaters would be required to provide such protection.	Local councils, Victorian government	Victorian communities and businesses
Recreation opportunities (Cultural)	Open space on public land provides diverse opportunities for nature-based recreation. The direct benefits include personal enjoyment and appreciation of nature, which has flow on benefits for physical/mental health and the economy through tourist visits to terrestrial, aquatic and marine parks and reserves. For more details on recreation on public land, see sections 5.3.3-5.3.9.	Local residents and tourists visiting parks and reserves	Victorian and global communities
Opportunities for cultural connection (Cultural)	The natural and cultural (both Aboriginal and non-Aboriginal) assets maintained on Victoria's public land estate offer opportunities for cultural connection to significant places. For more detail on Aboriginal heritage, see section 5.2.1; non-Aboriginal cultural heritage, see section 5.2.2; and spiritual/experiential connection to nature, see section 5.3.1.	Traditional Owners, population valuing non-Aboriginal heritage	Aboriginal, Victorian, Australian and international communities
Maintenance of habitats (Supporting/ intermediate)	One of the key purposes of the Victorian parks and reserves network on public land is to protect and conserve representative ecosystems (including terrestrial, marine and coastal and other aquatic ecosystems) and the biodiversity contained within them. This biodiversity includes diversity within species, between species and between ecosystems. These ecosystems and their species, functions and processes have a fundamental intrinsic value in addition to being the foundation for a wide range of additional ecosystem services.	Ecosystems and native species	Victorian, Australian, and international communities

Source: *Millennium Ecosystem Assessment*,²¹ Parks Victoria and DELWP²³

5.1.5 Climate change

Key points at a glance

- In Victoria, the effects of climate change have been seen to accentuate naturally occurring climate variability causing an increased level of uncertainty.
- Changes to the natural environment especially impact water managers as well as members of the Victorian community living in vulnerable areas or those relying on the land for their livelihood.
- Biodiversity is one of the most vulnerable sectors when considering the impacts of climate change.
- In order to minimise the negative impacts on biodiversity (and realise any possible opportunities), effective adaptation is required.



Major continuing or emerging pressures on natural ecosystems in Victoria since the LCC's assessment in 1988 include habitat fragmentation and degradation, resulting in part from increasing population and climate change. A report by the Intergovernmental Panel on Climate Change, the *Fifth Assessment Report*, found that it is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century.²⁴ The report also describes that human influence has been detected in:

- ✦ warming of the atmosphere and the ocean
- ✦ changes in the global water cycle
- ✦ reductions in snow and ice
- ✦ global mean sea level rise
- ✦ changes in some climate extremes.

These described changes threaten to cause permanent and irreversible impacts on the natural environment, thereby compromising the opportunity for future generations to enjoy and value it.

Victoria has already become warmer and drier. This climate trend is likely to continue into the future. Climate change is expected to increase the number of days with very high and extreme fire weather, particularly in southern Australia. The potential environmental impacts of changing fire regimes and the related fire prevention and suppression strategies are profound.

As summarised by DELWP,²⁵ other expected changes for Victoria include:

- ✦ temperatures to continue to increase year round
- ✦ fewer frosts
- ✦ more frequent and more intense downpours
- ✦ harsher fire weather and longer fire seasons
- ✦ warmer and more acidic oceans
- ✦ more hot days and warm spells
- ✦ less rainfall in winter and spring south of the Divide; less rainfall in autumn, winter and spring north of the Divide
- ✦ rising sea level
- ✦ increased frequency and height of extreme sea level events.

In Victoria, the effects of climate change have accentuated naturally occurring climate variability, causing an increased level of uncertainty. In an already dry environment, this has especially impacted water managers as well as members of the Victorian community living in vulnerable areas or those relying on the land for their livelihood. DELWP has recently released a discussion paper *Water for Victoria* which states that 'more severe and prolonged droughts are a predicted part of our future' and discusses the 1997-2009 drought as an example of the type of water shortages that we can expect to face again.²⁶ Similarly, the wet years that followed this drought have demonstrated the need for effective flood management arrangements and stormwater drainage systems.

It is widely accepted that biodiversity is one of the most vulnerable sectors when considering the impacts of climate change.²⁷ Public land plays an important role in biodiversity conservation alongside a range of other natural environment values. In addition to acknowledging the contribution that existing public land makes to these values at present, it is important to consider the potential contribution of public land in the future and the part it might play in our changing landscape. In order to minimise the negative impacts on biodiversity (and realise any possible opportunities), effective adaptation is required.²⁷ To enable this, adaptation planning—the development of strategies that involve actions in response to changes that are either inevitable or likely—could be employed. Adaptation planning involves modifications to current management practices, examples of which include:

- ✦ the networking of protected areas
- ✦ restoration of essential habitats
- ✦ in some cases, engineered strategies designed to increase the ability of species or systems to be more resilient to change.²⁷

It is important to also consider the current contribution made by private land to biodiversity conservation, as well as the potential that private land has to contribute in the future (e.g. through using the National Reserve System principles and approach for private protected areas). This is particularly pertinent in the context of climate change and future needs for the conservation estate to adapt to negative climate change impacts. DELWP recently released the draft biodiversity plan, *Protecting Victoria's Environment – Biodiversity 2036*, which discusses the opportunity for the Victorian government to work with private landholders to significantly increase biodiversity gains on private land.²⁸

The Victorian government has recently launched a new 'Climate Change and Victoria' website which aims to help Victorians to reduce their greenhouse gas emissions and adapt to the effects of climate change. Climate updates have been created which include projected climate

change for regions across Victoria and how communities are already adapting, and what communities can do to continue to adapt and respond effectively to these changes. A Victorian Climate Change Framework is being developed at present and is due to be released later in 2016.

The *Victorian Coastal Strategy 2014* summarises the potential impacts of a changing climate as including: effects on coastal, estuarine and marine areas through sea level rise; more frequent and extreme storm events; changing sea temperatures; altered patterns of wet and dry periods; and ocean acidification. Each of these changes is likely to have varied impacts on the coastal environment and the combined impact of these, while difficult to precisely predict, presents a significant threat to current coastal values.

For example, sea level rise could cause more frequent and extensive inundation of low-lying areas, a loss of significant heritage sites, erosion of cliffs, beaches and foreshores, and a loss of coastal Crown land (potentially encroaching onto freehold land). Sea level rise could also result in some coastal infrastructure (e.g. walking tracks, beach access, seawalls) becoming damaged or lost completely. Coastal habitat including nesting sites, intertidal areas and coastal wetlands might also be lost. These changes would be likely to interfere with current coastal recreation opportunities and experiences.

A number of key socio-economic changes were identified in an assessment of the vulnerability of Australia's biodiversity to climate change, these include:

- ✦ the decline of agriculture in marginal landscapes
- ✦ different or new landscape uses such as carbon sequestration
- ✦ high-density urban living
- ✦ 'sea change' and 'tree change' social movements
- ✦ the expanding Indigenous estate as land is restored to Aboriginal ownership
- ✦ private sector conservation.

These trends have been characterised as a movement in developed nations towards non-agricultural production land uses.

5.2 Cultural heritage

Key points at a glance

- Public land often has especially well preserved tangible Aboriginal heritage, as well as broad Aboriginal cultural landscapes with rich intangible heritage.
- Many sites on public land have shared cultural heritage values – they are highly significant to Traditional Owners while also being rich in non-Aboriginal heritage.
- Not all Aboriginal cultural heritage sites are known. Some sites may be located in mountainous areas or covered in thick vegetation, which could be revealed if the landscape is altered by events such as bushfires, landslides, erosion or coastal dune processes.
- Identification and documentation of Aboriginal cultural heritage sites and objects is important for future management as well as for their protection.
- The *Aboriginal Heritage Act 2006* recognises Traditional Owners as the primary guardians, keepers and knowledge holders of Aboriginal cultural heritage, while at a local level, Registered Aboriginal Parties are the voice of Aboriginal people in the management and protection of Aboriginal cultural heritage in Victoria.
- Under the *Traditional Owner Settlement Act 2010*, Recognition and Settlement Agreements facilitate the formal involvement of Traditional Owners in land management, planning access and use of natural resources. The Victorian government currently has agreements with five Traditional Owner groups.
- Public land plays an important role in protecting existing ancestral remains in Victoria and in providing burial sites for ancestral remains being returned to Country.
- Sites of non-Aboriginal history listed on the Victorian Heritage Register for public land include sites relating to forestry, law enforcement, maritime industry, mining, monuments, parks and gardens, public utility, transport and water supply.
- VEAC completed an investigation into historic places on public land in August 2016.



Cultural heritage sites and objects are a tangible link to the past. They illustrate Victoria's written and oral history. These irreplaceable resources evoke a strong spiritual connection to the past for many people. The landscape itself is a spiritual and cultural heritage place for many Aboriginal people and reflects deep connections to traditional lands or country.

Many sites in Victoria are both highly significant to Traditional Owners and important non-Aboriginal heritage sites. This is not surprising since many of the values that attracted Aboriginal people — such as proximity to water, elevated views and shelter — also attracted early European settlers to sites. Thus, many sites on public land have shared values.

Victorian cultural heritage legislation is divided into two areas, each with its own Act:

- ✦ the Victorian Aboriginal Heritage Council, under the *Aboriginal Heritage Act 2006*, is responsible for Aboriginal heritage, both pre- and post-European contact
- ✦ the Heritage Council of Victoria, under the *Heritage Act 1995*, is responsible for non-Aboriginal heritage.

The Aboriginal Heritage Act and the Heritage Act work independently of each other, with neither Act referencing the other.

In Australia, heritage is protected under a three-tier system based on the level of cultural significance: national (and global), state and local significance. Historic places of significance may be recorded in one of several complementary but overlapping heritage registers, lists, and inventories, each established in accordance with the specific requirements of relevant government agencies and custodians.

5.2.1 Aboriginal cultural heritage and knowledge

Since the LCC's statewide assessment of public land in 1988, the relationship between the Victorian government and the Aboriginal people of Victoria has shifted in legislation, administration and policy. The High Court's 1992 Mabo decision and the resulting *Native Title Act 1993* (Commonwealth) resulted in a fundamental shift in the law and in government policy towards a greater recognition of the interest of Indigenous people and Traditional Owners across Australia. Aboriginal rights are now recognised in Victoria in various ways, including through determinations under the Native Title Act and the *Traditional Owner Settlement Act 2010* (Victoria). Understanding and awareness of Aboriginal cultural heritage has also grown significantly in the last decade.

Extensive and often sensitive Aboriginal cultural heritage exists across Victoria. Land in public ownership often has especially well preserved tangible heritage, as well as broad Aboriginal cultural landscapes with rich intangible heritage.

Associations with the land

Traditional Owner groups have established spiritual ties with specific tracts of land over hundreds of generations. These are often based on belief systems, practices, social and ceremonial rules and responsibilities, all of which have developed over generations and continue to exist and evolve today. Understanding the physical environment and managing natural resources formed an important and integral part of the lifestyle patterns of everyday living for Aboriginal people.

Geographical or totemic features such as hills and rivers were (and still are) used to define and confirm tribal boundaries or country. Movements between, and entering into, the traditional area or Country of another group were governed by highly developed and agreed protocols. Many of these protocols still apply and tribal boundaries are observed by many Aboriginal people today.

Aboriginal cultural heritage sites and objects

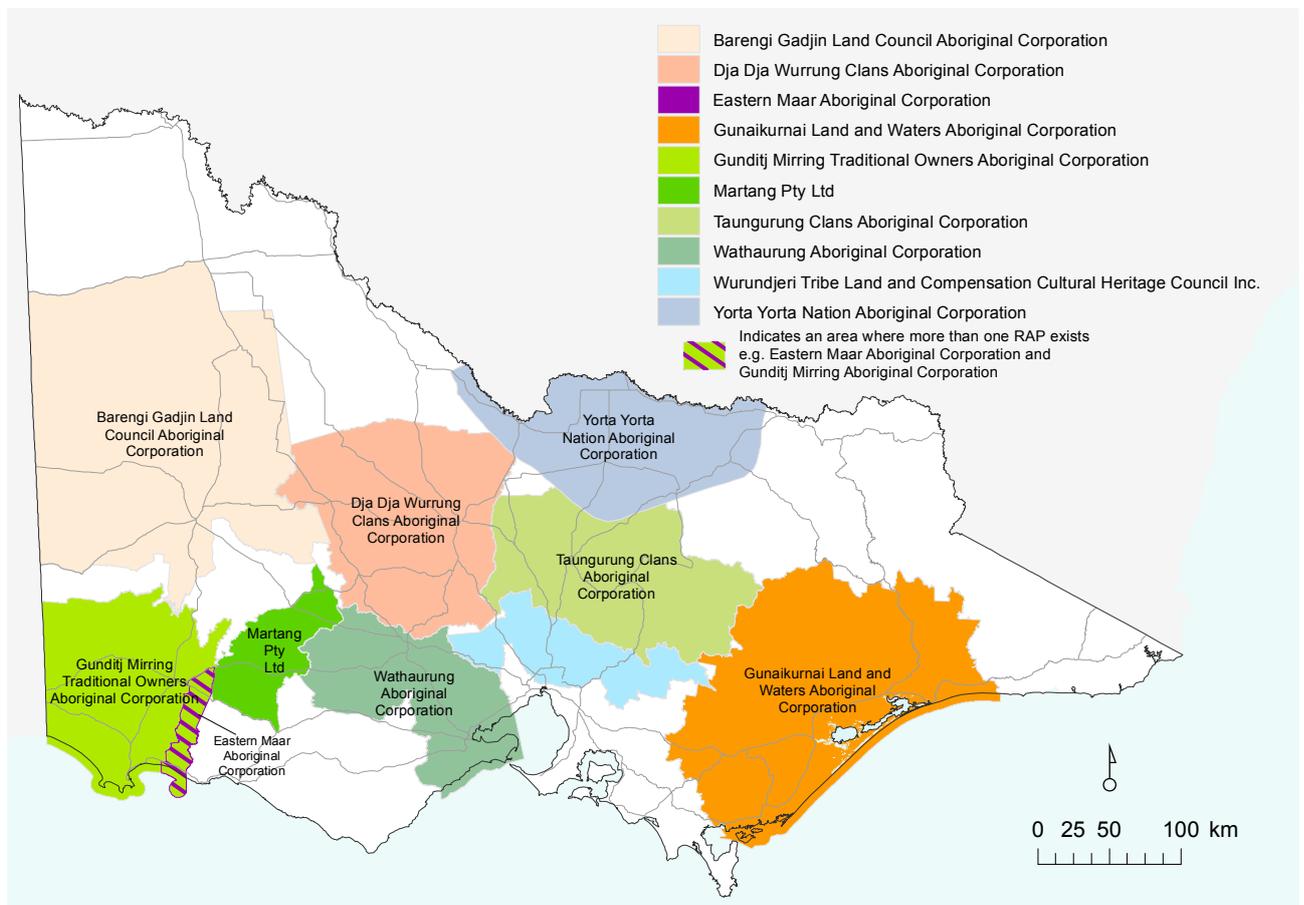
Identification and documentation of Aboriginal cultural heritage sites and objects are important for future management as well as protection. Sites of Aboriginal cultural heritage may have a material nature (e.g. burials, scarred trees and artefact scatters) or may be related to events or spirituality and have no tangible on-ground evidence. Some Aboriginal cultural heritage sites (e.g. campsites, meeting places, massacre sites and missions) are associated with the period following European contact.

Not all Aboriginal cultural heritage sites are known. Mountainous areas and land covered in thick vegetation or soil and sand from landslides and erosion may contain or expose numerous undiscovered sites or objects. Events that alter the landscape, such as bushfires, landslides, erosion and coastal dune processes may reveal sites and objects that had not previously been detected. Distribution patterns of known Aboriginal cultural heritage places generally reflect several common trends. The sites and objects are often found near waterways and in areas where permanent settlement would be difficult due to seasonal environmental changes (e.g. flooding) and these areas tend to remain public land. Land that has been sealed, cleared or irrigated (e.g. urban areas, agricultural land) may have previously contained sites or objects of Aboriginal cultural heritage; however, evidence of them is often lost with the landscape changes. Recognition of the history of cultural contact and an awareness of places reflecting that history, is important in understanding our shared past.

Aboriginal cultural heritage sites and objects are protected through cultural heritage legislation. The Aboriginal Heritage Act 2006 recognises Traditional Owners as the primary guardians, keepers and knowledge holders of Aboriginal cultural heritage. At a local level, Registered Aboriginal Parties (RAPs) are the voice of Aboriginal people in the management and protection of Aboriginal cultural heritage in Victoria. There are currently 10 RAPs in Victoria (see figure 5.8).

In addition to specific cultural heritage legislation, recognition and management of Aboriginal values is now incorporated into most government decision-making, management and planning. For example, the recent discussion paper *Water for Victoria* released by DELWP identifies recognising and managing for Aboriginal values as one of its nine key focus areas.²⁹

Figure 5.8
Registered Aboriginal Parties in Victoria



Source: Registered Aboriginal Party - DELWP_VSDL

DELWP also recently released its Aboriginal Inclusion Plan 2016-2020 *Munganin Gadhaba*. Its four key principles is recognition of Aboriginal peoples' right to access and role in caring for Country. It states:

Caring for Country is a cultural responsibility for Traditional Owners that involves protecting land, waterways and natural resources from harm. Caring for Country is a fundamental expression of Aboriginal culture as a consciousness that defines a clan's wellbeing. Accessing country and its resources is a form of cultural connectedness, relating to traditional custom and knowledge and economic pursuits.²⁹

Aboriginal ancestral remains

Protecting the burial places of ancestors and returning others to Country is of great importance to Aboriginal people. The *Aboriginal Heritage Amendment Act 2016* amended the Aboriginal Heritage Act to establish a new system for managing Aboriginal ancestral remains in Victoria. All institutions (includes museums, hospitals, other state agencies and universities) are now required to report on any remains in their collections to the Victorian Aboriginal Heritage Council within two years. All ancestral remains are required to be returned to the Victorian Aboriginal Heritage Council for the Council to manage (or to Museum Victoria for safe keeping if the Council or relevant Traditional Owner is unable to care for the ancestral remains).

Public land plays an important role in protecting existing ancestral remains in Victoria and in providing burial sites for ancestral remains being returned to Country.

Land justice and native title

Following the 1992 High Court Mabo decision, the Australian Parliament passed the *Native Title Act 1993*, which enabled Indigenous people throughout Australia to claim traditional rights to unalienated Crown land. The Act adopts the common-law definition of 'native title' as recognition of rights and interests over land and water possessed by Indigenous people in Australia under their traditional laws and customs. The Act was extensively amended in 1998 following the 1996 *Wik v Queensland* High Court native title decision, which clarified that native title rights and interests may coexist over land which is, or has been, subject to a pastoral lease, and possibly other forms of leasehold tenure.

As described in section 2.4.3, in 2010, acknowledging the difficult nature of achieving a determination of native title under the Native Title Act, the Victorian government developed an alternative system for recognising the rights of Victoria's Traditional Owners. Victoria's *Traditional Owner Settlement Act 2010* (TOS Act) allows the government and Traditional Owner groups to make agreements that recognise Traditional Owners' relationship to land and provide them with certain rights on Crown land. Under the TOS Act, Recognition and Settlement Agreements facilitate the formal involvement of Traditional Owners in land management, planning, access and the use of natural resources.

The Victorian government currently has agreements with five Traditional Owner groups. These agreements have arisen out of, or complemented, native title determinations. Table 5.8 summarises the nature of the agreements with the five Traditional Owner groups. The Gunaikurnai Settlement Agreement in 2010 was the first agreement to be reached under the TOS Act, followed by the Dja Dja Wurrung Recognition and Settlement Agreement in 2013.

Table 5.8
Current agreements with Traditional Owner groups

Traditional Owner group	Agreements	Details
Gunaikurnai	Gunaikurnai Settlement Agreement and Traditional Owner Land Management Agreement (TOLMA)	<p>The settlement includes:</p> <ul style="list-style-type: none"> - Orders by the Federal Court recognising that the Gunaikurnai people hold native title in the settlement area - An agreement for some national parks and reserves to be granted as Aboriginal title to the Gunaikurnai people to be jointly managed with the state (a TOLMA established the Gunaikurnai Traditional Owner Land Management Board to jointly manage ten national parks and reserves) - Rights for Gunaikurnai people to access and use Crown land for traditional purposes, including hunting, fishing, camping and gathering in accordance with existing laws - Funding for the Gunaikurnai to manage their affairs, including responding to their obligations under the settlement.
Yorta Yorta	Yorta Yorta Co-Operative Management Agreement and Traditional Owner Land Management Agreement (TOLMA)	<ul style="list-style-type: none"> - The Yorta Yorta people were recognised by the state as having a connection to their country, but were not found by the Federal Court to meet the legal standard of native title - Co-operative management agreement established to facilitate greater cooperation between the Yorta Yorta and government in the management of their Country (a TOLMA established the Yorta Yorta Traditional Owner Land Management Board to jointly manage Barmah National Park).
Wimmera	Wimmera Settlement Agreement and Co-operative Management Agreement	<ul style="list-style-type: none"> - Federal Court recognised that the Wimmera groups hold native title - Native title settlement agreement entered into with the Barengi Gadjin Land Council Aboriginal Corporation (BGLCAC – the representative body for the Wimmera groups) by the state - Co-operative Management Agreement included in the settlement agreement, applies to certain areas of Crown land in western Victoria where non-exclusive native title rights were found to exist.
Gunditjmara	Gunditjmara Settlement Agreement and Co-operative Management Agreement	<ul style="list-style-type: none"> - The state entered into a co-operative management agreement which applies to Mt Eccles National Park - The state agreed to the freehold transfer of Lake Condah to Gunditj Mirring Traditional Owners Aboriginal Corporation (GMTOAC) as part of the settlement.
Dja Dja Wurrung	Dja Dja Wurrung Recognition and Settlement Agreement and Traditional Owner Land Management Agreement (TOLMA)	<ul style="list-style-type: none"> - The state and the Dja Dja Wurrung Clans Aboriginal Corporation (DDWCAC – the representative body of the Dja Dja Wurrung Traditional Owner group) entered into a recognition and settlement agreement - The agreement recognises the Dja Dja Wurrung as the Traditional Owner group on approximately 266,532 hectares of public land in central Victoria <p>The settlement includes:</p> <ul style="list-style-type: none"> - Granting of Aboriginal title over two national parks, one regional park, two state parks and one reserve to the Dja Dja Wurrung, to be jointly managed with the state (a TOLMA established the Dhelkunya Dja Land Management Board to jointly manage six parks and reserves) - Transfer of two freehold properties of cultural significance at Carisbrook and Franklindford - Financial resources to the DDWCAC to meet settlement obligations - Rights for Dja Dja Wurrung people to access and use Crown land for traditional purposes, including hunting, fishing, camping and gathering - A land use activity agreement provides the corporation with the opportunity to give input or agreement to certain activities taking place on Crown land.

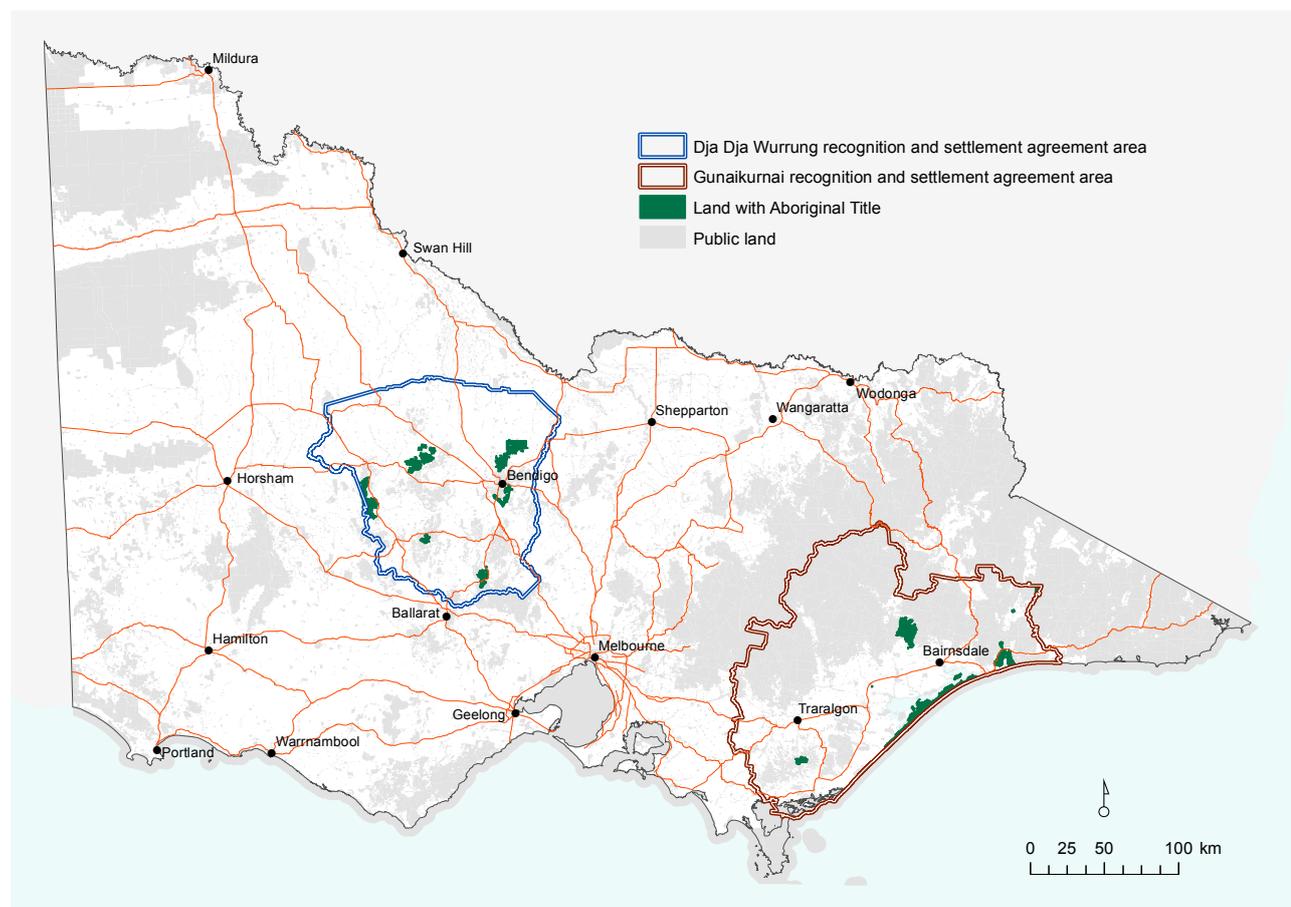
Source: DELWP³⁰

Note: The principal legislation that relates to the establishment and function of Traditional Owner Land Management Boards is the *Conservation, Forests and Lands Act 1987*, and the boards are recognised as public entities under the *Public Administration Act 2004*.

Aboriginal title

Aboriginal title has been granted over 16 parks and reserves (more than 90,000 hectares) in two agreements – with the Gunaikurnai and Dja Dja Wurrung (see figure 5.9). Agreements granting Aboriginal title for parks and reserves to other Traditional Owner groups are likely in the future.

Figure 5.9
Land with grant of Aboriginal title



Source: DELWP

5.2.2 Non-Aboriginal cultural heritage

Many historic places or sites of cultural heritage significance are located on public land. Some sites such as historic buildings may remain as operating institutions and continue to be used by the community. VEAC is currently finalising its Investigation into Historic Places. Readers are referred to the draft proposals paper for that investigation for a detailed description of the current arrangements and setting for the management of historic places on public land, not including places associated with Aboriginal cultural heritage prior to contact with non-Aboriginal people.³¹

Many thousands of non-Aboriginal historic places from the post-contact and settlement periods are located on public land across Victoria. These range from the UNESCO World Heritage listed Royal Exhibition Buildings and Carlton Gardens to numerous sites of local significance, as well as historic objects or archaeological ruins. Of importance is Castlemaine Diggings National Heritage Park, established in 2002 following the ECC's Box-Ironbark Forests and Woodlands Investigation. This park recognises and protects an outstanding gold mining natural and cultural landscape. The park was subsequently included on the Commonwealth's National Heritage List comprising places of significance to the entire nation.

Heritage-specific provisions are also contained in the *Crown Land (Reserves) Act 1978* for creation of reserves for historic or archaeological interest, and maritime sites are protected by *Victoria's Historic Shipwrecks Act 1981* which reflects Commonwealth legislation established in 1976.

In 2000 the Australian Heritage Commission developed a national framework — the Australian Historic Themes Framework — through which comparative or contextual understandings and linkages can be explored. In 2010

the Heritage Council of Victoria and Heritage Victoria built on this national work and published a framework specifically for Victoria comprising nine historical themes. The framework recognises that all places in Victoria have associations for Aboriginal people. Recent work undertaken by VEAC for the Investigation into Historic Places identified more than 850 public land places and objects, as well as some 780 shipwrecks, listed on the Victorian Heritage Register. The results show that public land is particularly important for themes relating to forestry, law enforcement, maritime industry, mining, monuments, parks and gardens, public utility, transport and water supply.

In addition to European settlers, large numbers of Chinese settlers arrived in Victoria in the mid-nineteenth century with the hope of finding gold. The majority were men that were under contract to Chinese and foreign businessmen.³² They had their voyages sponsored and were then required to work on the goldfields until they had repaid their debt. By 1861, the Chinese community made up almost seven per cent of the Victorian population. As the end of the gold rush approached, many Chinese settled in Victoria often starting their own business or working the land.³³

A number of historically significant sites around Victoria relate to the Chinese settlers that arrived at this time. For instance, the Beechworth Cemetery has a section where approximately 2,000 Chinese gold seekers and settlers are buried. Paper prayers were burnt in the Chinese burning towers and meals were provided on the altar for the spirits of the dead.³⁴



5.3 Recreation and tourism

Key points at a glance

- Access to parks and reserves, the presence of green space and the opportunity to leave the urban environment for natural areas, is of great importance to many Victorians.
- Many people value simply knowing that natural places exist, whether they choose to experience them directly or not.
- In 2013–14, tourism was estimated to be worth \$20.6 billion to the Victorian economy. Public land is the basis for most nature-based tourism in Victoria.
- Most public land is generally available for outdoor recreation, although all recreational activities are not suitable for every site. Recreational activities vary in intensity, and settings on public land range from remote to intensively developed.
- Recreational opportunities on public land provide benefits to individuals (e.g. connecting with nature, being physically active, socialising, enjoyment, stress relief) and benefits to society (e.g. the conservation of cultural and natural heritage, generation of employment, healthier communities).
- Most Victorians regularly participate in a variety of outdoor activities on public land, with high levels of visitation to local parks, coasts, and rivers and waterways.
- In 2014–15 there were 37.8 million visits to national and state parks, 16 million visits to Melbourne's metropolitan parks, and 44.6 million visits to coastal areas, piers and jetties around the bays.
- Many areas of public land in or near residential areas are reserved for sports and organised recreation, such as golf courses, racecourses, rifle ranges, showgrounds and sportsgrounds.
- Public land heavily used by the community in cities and towns include public parks and gardens, and public buildings such as public halls, tourist advice, community centres, galleries, museums, exhibition centres and libraries.
- Almost all public land is available for education in broad terms, with formal environmental education provided for in a small number of areas.
- There is significant hunting (deer, native ducks, quail and pest animals) on public land in Victoria.
- Victoria's marine, state and inland waters provide extensive and diverse opportunities for approximately 800,000 recreational fishers.
- Recreational prospecting on public land provides a connection with Victoria's history, cultural heritage and the natural environment.

Recreation and tourism are important uses of public land. Most public land is generally available for outdoor recreation, although all recreational activities are not suitable for every site. Recreational activities vary in intensity, and settings on public land range from remote to intensively developed. Activities may be incompatible with each other or with other uses or values of public land. Recommendations of the LCC, ECC and VEAC have broadly or specifically provided for compatible recreational activities in different areas of public land, while separating those that would conflict with other uses or would have an impact on other values.

Tourism and recreation are important contributors to state and regional economies.

5.3.1 Community values and attitudes

Spiritual and experiential values

Public land is valued by a wide range of people in our society. Access to the natural environment in parks, reserves and coastal areas, the presence of green space and trees, and the opportunity to leave urbanised environments for the fresh air and quiet surroundings of natural areas is of great importance to a large proportion of the Victorian community.

In addition, the Australian landscape and the spiritual value of Country for Aboriginal people is unique. Formal recognition and joint management arrangements are very important for Traditional Owners directly, and are also a mutual acknowledgement by both the Victorian Aboriginal and non-Aboriginal communities of their connection to Country.

Many people describe an inherent appreciation for the natural world, placing value on escaping a busy urban life through outdoor recreational pursuits, both active and passive. The aesthetic value of the natural environment provides solace for many, while visiting sites of scenic beauty is a valued experience for some. It is important to many people that they are able, if they choose, to access natural areas themselves, but also for them to know that future generations will be afforded the same opportunity. Many people take comfort from simply knowing that natural places exist, whether they choose to experience them directly or not.

Research conducted in 2004 for the then Department of Sustainability and Environment found that relaxation and peace of mind stood out as the most important values of public land (particularly for visitors to coastal lands/waters), while appreciation of nature and spending quality time with the family were also top of mind. Ninety-five per cent credited public land with improving their quality of life and general wellbeing.³⁵

Wilderness protection in Victoria, resulting from recommendations of the LCC's Wilderness Special Investigation in 1991, is an acknowledgement of the experiential value placed by individuals on a specific type of public land — substantially unmodified natural areas. Maintaining wilderness allows for the direct use of such areas for self-reliant recreational use including solitude, inspiration and challenging activity.

Acknowledgement of the spiritual connection that many people have with the natural environment as well as the experiential value that access to natural areas provides is important to ensure that decision-making in policy and planning roles and public land management reflects all community values.

Information from research and monitoring

For VEAC's recent Marine Investigation, an expert review of the contemporary literature was commissioned on the key social values of Victoria's existing marine protected areas.³⁶ The review provided a current understanding of the many dimensions of the concepts of 'enjoyment, appreciation and understanding' as relevant to Victorian marine protected areas. A supplementary report collated and reviewed the existing data on visitor use related to Victorian marine protected areas.³⁷

The review discussed the current approach to measuring visitor outcomes in protected areas and/or natural areas (predominantly terrestrial), which focuses on either the benefits and/or visitor satisfaction that arise from the visit.

Included in the benefits approach are benefits to individuals (e.g. connecting with nature, being physically active, socialising, enjoyment, stress relief) and benefits to society (e.g. the conservation of cultural and natural heritage, generation of employment, healthier communities).

The other commonly used approach to measuring visitor outcomes is the measurement of visitor satisfaction and, more recently, loyalty. For example, Parks Victoria uses a visitor satisfaction monitor (a component of its Visitor Research Strategy) to monitor the performance of a number of national, state and regional parks and piers and to capture the experiential value of the natural environment.

Table 5.9 lists the experience aspects identified in the visitor satisfaction monitor, and table 5.10 lists the five experience aspects that visitors were most likely to agree that visiting this type of park provided.

Table 5.9
Experience aspects offered to visitors, Parks Victoria visitor satisfaction monitor

Experience aspects
Access natural experiences
Achieve mental health benefits
Achieve physical health benefits
Appreciate biodiversity
Appreciate scenic beauty
Be in a comfortable and safe place
Challenge yourself
Connect with culture
Connect with heritage
Connect with nature
Connect with your spiritual side
Escape the urban environment
Find peace and solitude
Have fun
Improve quality of life
Learn about nature, culture and heritage
Participate in outdoor recreation activities
Reflect on personal values
Relax and unwind
Socialise with family and friends
Strengthen family ties
Strengthen social networks

Source: Visitor Satisfaction Monitor 2013-2014, Parks Victoria, unpublished.

Additional feedback gained through the visitor satisfaction monitor indicates that visitors to urban, peri-urban and country parks value different aspects of each category of park. For instance, the most positive aspect of urban parks is 'being outdoors/mountains/open space/fresh air' while for peri-urban and country parks, the most positive aspect of the visit is 'scenery/the views/attractive'.

The review of the social values of Victoria's marine protected areas revealed that many factors can affect an individual's experience of, most of which will also be relevant for public land more generally. These include:

- ✦ their knowledge, attitudes, feelings and beliefs
- ✦ the activity they are undertaking, how engaged they are with it and the extent to which it fulfils their needs and desires
- ✦ the marine protected area they are engaging with — or environment within the area
- ✦ their past experience with respect to the area/s and its declaration of protection.

The spectrum of recreational and educational users of marine protected areas comprises on-site visitors (recreational users, students, volunteers), virtual or off-site visitors (through internet, media, aquaria, museums, zoos) and non-visitors (who may value a site simply because it exists).

The Victorian Coastal Council has commissioned research which assessed the aspects of the coast that are most valued by the public, the levels and types of usage of coastal areas, and perceptions about their management (also see section 5.3.3 *Coastal Recreation*). This research was first carried out in 1996 with subsequent 'waves' taking place in 2000, 2007 and 2011 providing an opportunity for comparisons to be made between years, and an assessment of changes to coastal area usage and behaviours over time.

Table 5.10
The experience aspects that visitors to a range of parks were most likely to agree on as the major opportunities provided by the visit

	Experience aspect 1	Experience aspect 2	Experience aspect 3	Experience aspect 4	Experience aspect 5
Urban parks	Have fun	Socialise with friends and family	Relax and unwind	Achieve physical health benefits	Be in a comfortable and safe place
Peri-urban parks	Appreciate scenic beauty	Have fun	Escape the urban environment	Achieve physical health benefits	Access natural experiences
Country parks	Appreciate scenic beauty	Escape the urban environment	Access natural experiences	Have fun	Connect with nature

Source: Visitor Satisfaction Monitor 2013-2014, Parks Victoria, unpublished.

Results from the 2011 research show that when visitors to the Victorian coast were asked to state the most enjoyable aspect of their trip, 'enjoying the atmosphere/scenery/just being there', 'spending time with friends/family' and 'walking/hiking' were the answers most frequently given.³⁸ Other common reasons included 'relaxing/de-stressing/getting away from it all' and 'swimming/water sports'. The most commonly reported uses among those who visited the Victorian coast were 'walking/hiking', 'swimming', 'nature based activities appreciation', 'lying on the beach/ sunbathing/relaxing on the beach' and 'fishing'. The negatively framed statement 'the coastal and marine environments are unimportant to my lifestyle' was asked in 2011 and it received a mean rating of 2.8 (on a scale of zero to ten), showing relatively strong disagreement with the statement. Additionally, the qualitative aspect of the research reflected the importance of Victorian coastal and marine environments to Victorians' lifestyles, with participants discussing frequent visits to the coast either at present or as a significant part of growing up and family holidays.

5.3.2 Tourism

Tourism (defined as travelling more than 50 kilometres from home) contributes to regional economies through money spent on transportation, accommodation, food and beverages, entertainment, equipment, sightseeing, souvenirs and a variety of personal services.

Tourism makes a significant contribution to the Victorian economy. In 2013–14, tourism was estimated to be worth \$20.6 billion (directly and indirectly) to the Victorian economy,³⁹ up from \$4 billion in 1986⁴⁰ and to employ approximately 206,000 people. This represents 5.9 per cent of gross state product.³⁹

In its 2014 report on the *Inquiry into Heritage Tourism and Ecotourism in Victoria*, the Parliamentary Environment and Natural Resources Committee highlighted the significance of the state's distinctive natural and cultural assets for a sustainable tourism industry.⁴¹ The state's natural assets are overwhelmingly on public land.

Visitation data and visitor facilities

At a statewide level, for the year ending March 2016 it is estimated that there were 2.5 million international overnight visitors to Victoria⁴² and 21.8 million domestic overnight visitors.⁴³ Domestic day trip visitor estimates for Victoria for the year ending March 2016 show that there was a total of 46.4 million domestic day trip visitors.⁴³

No breakdown of these data are available that provide information on visitation to different categories of public land. However, some information is collected by public land managers. Parks Victoria's primary source of information on visitation to parks and waterways is the Visitor Number Monitor.

The Visitor Number Monitor aims to:

- ✦ obtain accurate and reliable total visitor numbers for national and state parks, metropolitan parks, other parks and gardens, bays, rivers and coasts in Victoria
- ✦ determine the contribution of different source market groups (e.g. intrastate, interstate and international visitors)
- ✦ track long-term trends in Parks Victoria's output/productivity, for input to strategic planning
- ✦ obtain estimates of the reasons for visiting and activities undertaken during the visit to national and state parks, metropolitan parks, other parks and gardens, bays, rivers and coasts in Victoria.⁴⁴

Data is primarily collected via a telephone survey of Victorian and interstate residents. The surveys collect a range of information on visitation to sites, including: when the respondent last visited parks of different categories; the names of parks visited; the number of visits to each park; and the reasons for the respondent's last visit and other activities undertaken. In 2014–15 there were:

- ✦ 37.8 million visits to national and state parks
- ✦ 16 million visits to Melbourne's metropolitan parks
- ✦ 44.6 million visits to piers and jetties around the bays.

In addition to the land-based parks, reserves and piers, there were an estimated 3.8 million visits to marine national parks and sanctuaries; an increase from 2.7 million in 2003.

Public land along Victoria's coastline is also managed by community-based committees of management or local government. Data on visitation to these areas is generally not available, except for specific locations where there is a need to gauge vehicle and visitor numbers for a site for planning and management purposes.

The visitors to Victorian national and state parks were made up of:

- ✦ 25.9 million visits by Melburnians (68 per cent)
- ✦ 9.7 million visits by other Victorians (25.8 per cent)
- ✦ 783,000 visits by international visitors (2.1 per cent)
- ✦ 1.4 million visits by interstate visitors (3.7 per cent).

Visitors to Melbourne's metropolitan parks were made up of:

- ✦ 14.8 million visits by Melburnians (92 per cent)
- ✦ 132,000 visits by other Victorians (1 per cent)
- ✦ 862,000 visits by international visitors (5.4 per cent)
- ✦ 287,000 visits by interstate visitors (2 per cent).

The reasons for visiting Victoria's national/state parks were*:

- ✦ Physical activities – 71 per cent
- ✦ Sightseeing and spectating – 28 per cent
- ✦ Eating and drinking – 20 per cent
- ✦ Socialising and child's play – 18 per cent
- ✦ Journey / tour – 12 per cent
- ✦ Passive activities – 9 per cent
- ✦ Other activities – 7 per cent
- ✦ Non recreational – 4 per cent
- ✦ Events and markets – 2 per cent
- ✦ Education and research – 1 per cent.

*Respondents were asked what the main reason for their visit was and whether they undertook any other activities, and these figures include all activity mentions. As a result, the figures do not add to 100 per cent.

Victoria has a range of visitor sites and tracks on public land available for tourists and the local community to use. Table 5.11 quantifies the current availability of these sites and tracks in state forest as reported by the Department of Environment and Primary Industries (now DELWP) in 2014. A major investment in forest tourism and recreation has been the rebuilding of infrastructure following the catastrophic 2009 bushfires and major floods in 2011.⁴⁵ About 20 per cent of state forest visitor assets in the state have been replaced after damage by fires.

Similar figures are not currently available for sites and tracks in Parks Victoria managed parks and reserves. Parks Victoria is currently undertaking a major review of its visitor opportunities through the implementation of the Visitor Experience Framework. As part of this review, Parks Victoria aims to comprehensively audit visitor opportunities (mapping visitor sites, trails, bay and waterway sites and broader visitor experience areas) across Parks Victoria managed land. Major audit activities are currently underway within the River Red Gum landscape and Greater Alps landscape. Parks Victoria has commented that work to date suggests that the total number of visitor sites (e.g. picnic areas, camping areas) will be significantly larger than currently recorded. Clearer definitions, increased auditing and new areas of land being assigned to Parks Victoria are some of the reasons for these increases.

Table 5.11
Sites and tracks available in state forests for recreation and tourism activities

Activity	
Short walks, less than 3 kilometres (number)	113
Medium walks, 3-8 kilometres (number)	44
Day trails, 8-12 kilometres (number)	12
Overnight trails, more than 12 kilometres (number)	11
Walking trails (kilometres)	916
Mountain biking trails (kilometres)	334
Horse riding trails (kilometres)	71
Four-wheel driving touring routes (kilometres)	251
Scenic drives (kilometres)	403
Trail bike touring routes (kilometres)	58

Source: Department of Environment and Primary Industries⁴⁵

Licensed tourism operations on public land

A Tour Operator Licence is required by people or businesses who conduct an organised tour or recreational business for profit on public land in Victoria. The majority of licensed commercial tours and activities occur in national and state parks and state forests and are managed by Parks Victoria, although DELWP advises that there is increasing commercial tourism and recreation activity occurring on land managed by delegated committees of management under the Crown Land (Reserves) Act (including councils) and Alpine Resort Management Boards.

Industry has endorsed and the government has funded a project to develop documented adventure activity standards for the outdoor recreation industry. There are currently adventure activity standards for the following licensed activities:

- ✦ Abseiling
- ✦ Bushwalking
- ✦ Canoeing / kayaking
- ✦ Four wheel driving
- ✦ Horse trail riding
- ✦ Mountain biking
- ✦ Recreational angling
- ✦ Recreational caving
- ✦ River rafting
- ✦ Rock climbing
- ✦ Snorkelling, scuba diving, and wildlife swims
- ✦ Surfing sessions
- ✦ Snow sports
- ✦ Trail bike touring.

Compliance with the relevant standard is a condition of the licence. As at 30 June 2016, there were 430 licensed tour operators. The top ten activities provided by operators are: bushwalking; coach and bus tours; vehicle based sightseeing; coastal walking; bird watching; wildlife viewing; motorised boat tours; mountain biking; canoeing/kayaking and four wheel drive tours. The most popular activity, bushwalking, is offered by 176 operators.

Aboriginal cultural heritage and tourism

Aboriginal culture is understood to be a key drawcard for international visitors to Australia. The Parliamentary Inquiry into Heritage Tourism and Ecotourism in Victoria observed that typically Aboriginal tourism combines aspects of nature-based and heritage tourism, as it often focuses on the historical and cultural relationship of Aboriginal peoples to the land.⁴¹

While there is not a large number of Aboriginal tourism ventures in Victoria, there are some Aboriginal heritage sites on public land that are managed for commercial tourism and cultural heritage education. There are several Aboriginal guided tour operators providing commercial tours and the sale of Aboriginal souvenirs. For example, in the Grampians area of western Victoria, Brambuk – the National Park and Cultural Centre offers tours and the sale of Aboriginal-related gifts, books, artwork and maps. Worn Gundidj Aboriginal tours at Tower Hill Wildlife Reserve near Warrnambool offer interactive walks conducted by experienced guides as well as school programs. Recently a new initiative for the Wurundjeri Traditional Custodians of the area at Grants Picnic Ground in the Dandenong Ranges is to provide tours that will enable visitors to experience Wurundjeri culture, including storytelling and a bush tour.

5.3.3 Nature-based outdoor recreation

Nature-based outdoor activities — activities and experiences in natural or semi-natural environments where the natural environment is central to the nature-based outdoor activity, not just incidental to it — contribute to the Victorian community in a number of ways, including:

- ✦ supporting regional economies
- ✦ economic contribution of physical and mental health benefits
- ✦ avoided healthcare system costs
- ✦ education and developmental benefits
- ✦ social cohesion or character, and quality of life
- ✦ value of environmental services provided by outdoor recreation areas to those not participating in recreation.

The role of Victoria’s nature-based outdoor sector as a major economic driver provides further support for ensuring that Victoria’s natural areas and associated

facilities are maintained to a high standard that encourages the community to continue using these areas and promotes human activity on public land.

Research undertaken in 2004 for the then Department of Sustainability and Environment explored how Victorians use and value public land.³⁵ The research indicated that most Victorians regularly participated in a variety of outdoor activities on public land. Popular interests included short walks, viewing nature and wildlife, visiting seaside cafes or restaurants and scenic driving. Other activities commonly undertaken related to visiting historic buildings, picnicking and walking the dog. Camping and bike riding also stood out in responses. One in six people regularly went fishing (13 per cent in Melbourne, 32 per cent in regional and 25 per cent in rural Victoria), while one in seven were actively involved in four wheel driving. A further one in ten regularly participated in water sports.

Most people identified strongly with their local park and visitation levels to local parks were high — particularly in Melbourne. A very high proportion of people also used coastal lands and waters, as well as rivers and waterways (82 per cent and 71 per cent respectively).

Passive or low-intensity recreation

Nature-based recreational activities are often categorised as ‘passive’ or low-intensity recreation, and ‘active’ or high-intensity recreation. This division is somewhat arbitrary and the categories overlap. The division sometimes reflects the potential for impact of the activity on natural environments or the degree to which special facilities need to be provided (e.g. skiing), rather than the level of physical activity involved.

Low-intensity recreation includes non-consumptive activities such as camping, wildlife observation (including birdwatching), dog walking and picnicking. Active pursuits such as bushwalking, canoeing and kayaking, and scuba diving and snorkelling are also included here.

There are a number of day visitor areas and campgrounds available in state forest and in parks and reserves that cater for low-intensity recreation. (see table 5.12).

Table 5.12
Forest sites available for recreation and tourism activities

Activity	State forest	Parks Victoria managed land
Day visitor areas	261	752
Campgrounds	249	680
Total recreational sites	398	1432

Source: Department of Environment and Primary Industries⁴⁵



Bushwalking

There are a range of bushwalking trails available on public land to accommodate those looking to walk for only short distances as well as those interested in multiple-day walks with overnight camping.

Virtually all public land is available for bushwalking activities, with the exception of reference areas and some water production areas. In some places, other activities such as timber harvesting, mining and to a lesser extent, motor vehicles and trail bikes utilise the same areas compromising the experience of some bushwalkers.

Solitude is an important recreational experience for some bushwalkers and is available in wilderness areas and similar zones within large parks. Perceptions of wilderness range from the concept of primeval wilderness — completely unaltered, without roads and even remote from aeroplane flightpaths — to wilderness perceived by some in relatively small patches of urban bush.

Camping

Camping on public land is available at a range of sites managed by Parks Victoria, DELWP and committees of management across Victoria.

As an indicator of the level of camping activity, in Victoria there are 680 campgrounds in Parks Victoria managed parks and reserves and 249 in state forest (table 5.12). Camping ranges from fully serviced sites with luxury tents (such as the safari-style tents located in Wilsons Promontory National Park, Cape Conran Coastal Park and Buchan Caves Reserve) through to remote camping locations in the bush.

Some campgrounds offer car-based camping, with toilets, water and, in some cases, showers. Others offer only drop toilets and few other facilities. Some are for bushwalking and camping only and several allow dogs.

Large numbers of people from Victoria as well as interstate and international visitors camp in Parks Victoria managed parks and reserves every year. Data obtained from Parks Victoria shows that for the 2014-15 financial year, almost 233,000 people camped at fee serviced sites across Victoria (made up of around 85,700 bookings for 148,900 nights). For the 2015-16 financial year (as at 1 May 2016), just over 224,000 people camped at fee serviced campsites across Victoria, with approximately 93,700 bookings being made for 161,800 nights of camping.

The Parks Victoria fee structure has been changed in recent years. New fees were introduced in July 2014 and basic level campsite fees were removed altogether in April 2015. Only three fee categories (which are based on the level of facilities and services provided) exist at present ranging between \$28.00 and \$60.80 per night. Fees now apply in only 116 (17 per cent) of the 680 campgrounds in parks across the state. The number of people camping at sites where fees do not apply has not been monitored and is therefore additional to the numbers outlined above.

Canoeing and kayaking

Victoria's rivers and lakes, and remote areas of wilderness that are not accessible by road or foot, can be accessed by canoe or kayak. Melbourne's Yarra River offers canoeing and kayaking opportunities, and outside Melbourne, sites include Nagambie Lakes in the Goulburn Valley, the Barwon River out of Geelong and Lake Wendouree at Ballarat. The Murray River is a major canoeing destination, while the Glenelg River is recommended for longer trips and the Snowy, Thompson, Mitchell and Mitta Mitta rivers in Victoria's High Country are popular. Sea kayaking is also a popular pastime in Victorian waters.

Coastal recreation

Coastal, estuarine and marine areas in Victoria are used and valued by residents and visitors for a number of reasons. In research commissioned by the Victorian Coastal Council,³⁸ visitors to the Victorian coast were asked what the most enjoyable aspect of the trip was and the answer given most frequently (by 19 per cent of respondents) was 'enjoying the atmosphere/scenery/ just being there' followed by 'spending time with friends/ family' and 'walking/hiking' (both of which were given by 11 per cent of respondents). Other common reasons included 'relaxing/de-stressing/getting away from it all' and 'swimming/water sports'.

This research also identified Victorian coastal areas as an important part of the lives of most Victorians with

84 per cent of those surveyed reporting making at least one day trip to the coast in the last twelve months with the average number of day trips in the last twelve months being 23.4 trips. Among those who visited the Victorian coast, the most commonly reported uses were 'walking/hiking', 'swimming', 'nature based activities appreciation', 'lying on the beach/sunbathing/relaxing on the beach' and 'fishing'.

Dog walking

Australia has one of the highest rates of pet ownership in the world (63 per cent in 2013).⁴⁶ Dogs are the most common pet, with 39 per cent of households owning a dog (43 per cent in Victoria/Tasmania).

Dog walking is a major use of both public land and local government land in Victoria. Data provided by DEDJTR indicates that, in 2015, there were 680,994 dogs registered in Victoria. Table 5.13 shows that the number of dogs registered has remained relatively stable between 2012-2015. However, these data do not reflect actual dog ownership numbers. DEDJTR advises that dog ownership numbers are likely to be significantly higher than the provided data due to dogs in private ownership that are unregistered.

Table 5.13
Registered dogs in Victoria

Year	Number of dogs registered
2012	684,788
2013	679,564
2014	673,039
2015	680,994

Dog walking on both public land and local government land is frequently a source of conflict, especially in urban areas where public open space is highly contested and the available land is used for multiple activities.

In some areas, dogs pose a conservation threat to Victoria's native fauna. For example, Hooded Plovers ground-nesting above the high water mark are particularly vulnerable to disturbance by dogs and will abandon their eggs or chicks if they are persistently disturbed. The Hooded Plover is listed as Vulnerable on the Advisory List of Threatened Vertebrate Fauna 2013 and is listed as threatened under the *Flora and Fauna Guarantee Act 1988*.

Dogs are banned from most national parks across Victoria. Dog walking is currently allowed in approximately a third of the Mornington Peninsula National Park coastline (a key breeding ground of the Hooded Plover). However, from 1 November 2016, dogs will be banned from the entire Mornington Peninsula National Park. Dogs are allowed on leads in specific areas in seven of Victoria's

46 national parks (Great Otway, Greater Bendigo, Kinglake, Dandenong Ranges, Lake Eildon, Heathcote-Graytown and Lower Glenelg national parks).

A number of campgrounds on Parks Victoria managed land allow dogs, including: Johanna Beach, Great Otway National Park; Jerusalem Creek, Lake Eildon National Park; Upper Yarra Reservoir Park; Gippsland Lakes Coastal Park, Honeysuckles campsite, shoreline drive at Golden Beach; Lake Hindmarsh Reserve; Howqua Hills Historic Area; and Lake Albacutya Park.

Scuba diving and snorkelling

The Victorian coastline (including bays and inlets) has many dive sites and opportunities for snorkelling.

In the Melbourne area, most dive sites are at the southern end of Port Phillip Bay or just outside the heads and near the entrance to Western Port. Dive sites include Popes Eye (a ring of rocks that was originally built on the sea bed as a fort at Port Phillip Bay heads) and Seal Rocks (off the western tip of Phillip Island). There are many shore dives or snorkelling opportunities at the piers at Portsea, Rye and Flinders.

Melbourne is also an ideal area for shipwreck diving, with more than 60 shipwrecks from the 19th century. Outside Melbourne, particularly around Port Campbell, Warrnambool and Portland, is an area known as the Shipwreck Coast which offers further shipwreck dive sites. While many of these Shipwreck Coast shipwrecks are in deep waters and are only suitable for very experienced divers, a number can be found in shallow waters and are easily accessible.

There are 24 marine parks and sanctuaries along Victoria's coastline, which together provide excellent diving and snorkelling opportunities for all skill levels.

5.3.4 Active or high-intensity recreation

Active or high-intensity recreation includes activities such as skiing, horse riding, and mountain and trail biking. Public land is also used for holding running, rogaining and triathlon events, on both trails and roads.

Rock climbing

Major rock climbing destinations in Victoria include the areas of Mt Arapiles, the Grampians and Mt Buffalo. Many smaller crags occur on public land in other parts of Victoria.

Skiing

Victoria's alpine areas cater for a variety of recreational pursuits, with skiing — both downhill and cross-country — snowboarding, tobogganing, riding snow-mobiles and sunset tours dominant during the winter months. In Victoria in 2015, the combined alpine resorts winter season contributed \$671 million to the Victorian economy.⁴⁷ For the rest of the year, the alpine areas support other pursuits, such as four-wheel driving, bike riding, bushwalking, camping, trail riding and picnicking.

Mt Buffalo provides snow play, tobogganing and cross-country skiing. Skiing began on public land at Mt Buffalo in the 1890s and the Mt Buffalo Chalet was constructed in 1910. Australia's first ski tow was constructed near Mt Buffalo in 1936 and Mt Buffalo's first ski lodge was built at Dingo Dell in 1954. A bushfire in 2006 forced the temporary closure of the resort and options are under evaluation for their economic viability and appropriate use.

Mt Baw Baw, 120 kilometres east of Melbourne, is the closest downhill ski area to Melbourne, and is a popular destination for both day trippers and families. A ski hut was erected at Mt Baw Baw in 1945 and a ski rope tow was added in 1955.

Mt Stirling is a largely undeveloped and unspoiled alpine summit. It is 230 kilometres from Melbourne and offers a readily accessible 'semi-wilderness' experience for visitors including cross-country skiing, snowshoeing and tobogganing areas.

Lake Mountain is the third most visited cross-country alpine resort in the world, located only 90 minutes from Melbourne.

Falls Creek Alpine Resort, Victoria's largest ski resort, is known for its reliable snow cover, cross-country trails and terrain parks. The highest peak in Victoria, Mt Bogong at 1986 metres, is within the resort. A rope tow was installed at Falls Creek in 1949 and the resort installed Australia's first chairlift in 1957.

Mt Hotham is the highest Victorian ski resort. A hospice was built at Mt Saint Bernard (elevation 1,540 metres) around 1863 along a track developed to link the Victorian



goldfields. Recreational and practical skiing was being practised in the area by the 1880s and 1890s and the first winter traverse of the Victorian Alps was made in 1900, via the hospice and Mt Hotham. The Mt Saint Bernard Hospice operated as a recreational ski location into the 1930s, but was destroyed by bushfire in 1939. A stone cottage was built at Mt Hotham in 1925 and a ski club in 1944. The first ski tow was installed in 1951. Dinner Plain is an alpine village on the highest freehold land in Australia just 10 minutes from Mt Hotham.

Mt Buller is a major downhill skiing resort, with lodges, accommodation and luxury hotels. The first ski lift went into service at Mt Buller in 1949. The Mt Buller Inter-schools event claims to be the largest interdisciplinary snow-sports event in the world. In 2008 it attracted 3,500 participants.

Mt Donna Buang (elevation 1,245 metres) is located close to Warburton. It features a 21-metre high lookout tower at the summit which looks out over Melbourne, the Yarra Valley, Dandenong and Cathedral ranges, Mt Baw Baw and the Alps. In winter, the summit area is used for snow play and three toboggan runs open when there is adequate snow on the mountain.

Horse riding

While Victoria's parks offer many opportunities for riders, with some exceptions, horse riding is not permitted in most national parks and nature conservation reserves. Popular horse riding locations on public land include the beaches of the Mornington peninsula, the Otway ranges, state forest throughout Victoria and the high country.

Mountain and trail biking

Mountain and trail biking trails are available on public land for riders of all skill levels and year-round riding is possible. Trails are found across the state including: throughout the high country (the Delatite River Trail, the Copperhead and Gang Gangs/Picnic Trail Loop at Mt Buller and the High Times McKay on Mt McKay); along the Great Ocean Road; through the Grampians and the Goldfields; in the You Yangs Regional Park; along the Walhalla Goldfields Rail Trail; the Nowa Nowa Mountain Bike Park; Lysterfield Lake and the Yarra Valley and Dandenong Ranges.

Vehicle-based recreation

Many of Victoria's scenic drives pass through public land. Notable routes include the Black Spur, the Great Ocean Road and the Alpine Road. A number of highway parks, adjacent to major roads and highways, provide facilities for travellers.

In addition, Victoria has an extensive and varied four-wheel driving track network. The track network caters for all levels of skill, and the scenery in Victoria's diverse national and state parks is highly regarded by four-wheel drive enthusiasts. Tracks within national and state parks are managed by Parks Victoria and, in addition to these, there are many tracks available in state forests which are managed by the Department of Environment, Land, Water and Planning.

For safety and the protection of the environment, some tracks are closed on a seasonal basis.

Many four-wheel drive enthusiasts belong to clubs. Four Wheel Drive Victoria is the umbrella body for 74 affiliated four-wheel drive clubs, and represents their 6,000 members.

5.3.5 Sports and other community uses of public land

Victoria's population in 1988 was 4.3 million. Now it is 5.9 million with metropolitan Melbourne itself at a population of 4.4 million. The concentration of Victoria's rapidly increasing population in Melbourne has led to the increasing interest in open space and 'liveability', examined in detail in VEAC's Metropolitan Melbourne Investigation (2011).

In addition to increasing population many socio-economic changes have taken place in Australia since 1988 that have influenced community perceptions and uses of public land in Victoria. Stakeholders have reported major changes in leisure pursuits since 1988 resulting initially from the rise in digital technology use and then, to a lesser degree, to a reaction to the domination by online technologies leading to a renewed desire to connect with nature or engage in outdoor adventure activities.

Smaller Crown land reserves in towns and cities, including organised recreation areas, parklands and gardens and historic sites contribute significantly to community wellbeing. Since the early days of the European settlement of Victoria, successive governments have provided community services on public land. As early as 1839 substantial areas of Crown land were allocated for parks and gardens, as emerging ideas about the need for open public land to provide 'breathing space' for rapidly expanding industrial cities were introduced by settlers from Europe.⁴⁸ The contribution of public land to liveability has continued with the ongoing provision of roads, rail, hospitals, schools, open space and other community services on public land.

Community use areas on public land are reserved for recreation, education, parklands or other specific community purposes.

Sports and organised recreation

Many areas of public land are reserved for recreational purposes as racecourses, rifle ranges, showgrounds, facilities for water-based activities, and sportsgrounds. Recreation areas are generally small reserves close to townships with facilities for organised sports (e.g. swimming pools, tennis and netball courts, bowling greens, cricket and football ovals, golf courses), with secondary non-organised and informal recreational uses. Recreation reserves are important for people's health and well-being as well as for the social vitality of local communities. They often have additional heritage or biodiversity values.

Racecourses

Country racing plays a prominent role in Victoria. Country Racing Victoria represents 70 country professional and picnic clubs, ranging from large clubs in the outer

metropolitan areas of Melbourne (such as Werribee, Cranbourne and Mornington) to small clubs in rural areas (such as Edenhope, Manangatang and Towong). There are three metropolitan racecourses: Flemington, Moonee Valley and Caulfield.

Sports

Football, netball, cricket, tennis, athletics, swimming and many other organised sports are conducted on public land. Football is predominantly played on public land and is increasingly important in driving tourism, with growing numbers of people travelling interstate to watch games. Total match attendance for the 2015 Australian Football League (AFL) Premiership season was about 6.3 million with many more Australians watching on television. Club memberships number 836,000, with one in 28 Australians being a member of an AFL club.⁴⁹ A report commissioned by the AFL, estimated the total financial contribution of Australian football to the national economy at \$5.72 billion in 2015. It was also estimated that Australian football supports some 7000 full-time equivalent jobs.⁴⁹

Showgrounds

Showgrounds are predominantly located on public land. They mirror the progress and development of Victoria from the early days of settlement to the present. From the beginning, competitions of skill and enterprise have been a major part of the show and some of these such as woodchop and art, craft and cookery have survived. Livestock judging, amusements and sideshows are part of the show's heritage. The showgrounds have hosted many significant activities over the decades, including the annual Royal Melbourne Show, major music concerts and the support offered to the military in two world wars.

Rifle ranges

Victoria has 109 active rifle ranges, which are predominantly located on public land. In the 1860s, following the formation of the Victorian Rifle Association, the state government made Crown land available for rifle ranges (then more commonly known as butts). Around Melbourne, early rifle ranges were located at Middle Park, Sandridge, Emerald Hill, Elwood and Williamstown. By 1886 there were 225 clubs in Victoria with 6,500 members.

Lifesaving

Since the early 1900s, lifesaving clubs have been part of Australia's coastal and inland waterways. They are often located on public land, with volunteers providing education and training in lifesaving activities, as well as providing patrolled areas. Lifesaving clubs are supported by local communities, and use a network of support services such as helicopters, inflatable rescue boats, offshore rescue boats and other rescue water craft. Lifesaving clubs

extend from Mildura in the north to Mallacoota in the east and Portland in the west, with more than 28,000 volunteer club members. Port Phillip Bay has 26 clubs and there are another 31 clubs along the coast. Life Saving Victoria, as a member of the state's emergency services, also provides out-of-hours emergency response services.

Boating

Some 90 yachting clubs are located along the coast, lakes and rivers. A range of boating activities is also catered for along the coast, lakes and rivers with about 80 boat ramps in the state.

Parklands and gardens

Parklands and gardens include often small intensively used local parks such as Caulfield Park, civic areas and promenades, playgrounds, public barbeque areas and facilities, and ornamental gardens. Parklands and gardens are located within town areas in easy reach of shops and town facilities. They are predominantly managed by local government and most are highly modified, but some retain natural habitat. Some may also have historical values.

Victoria also has a number of major contemporary and heritage parks and gardens on public land, ranging from the Royal Botanic Gardens at both Melbourne and Cranbourne, to botanic gardens in regional centres such as Daylesford, Castlemaine, Horsham, Ballarat and Bendigo, the William Ricketts Sanctuary in the Dandenong Ranges, the Hepburn Mineral Springs Park near Daylesford, and numerous local parks and gardens.

Community use of public buildings

Many public buildings and their associated facilities which have been principally established for community use are located on public land. These facilities are used for a range of community activities including education, recreation, meetings, community information dissemination and tourist advice. Some buildings, such as schools, are use-specific but may also double as multi-purpose buildings for a range of activities. Examples of public buildings used by the community include:

- ✦ public halls
- ✦ community centres
- ✦ galleries
- ✦ museums
- ✦ exhibition centres
- ✦ libraries.

5.3.6 Education

Almost all public land is available for education in broad terms. Environmental education is a key strategy for ensuring the long-term sustainability of natural systems across Victoria and has been an important element of government environmental policy over recent decades. Environmental education is now also a key aspect of the formal school education system as well as being a high profile area in the vocational and tertiary education sectors.

Due to the biophysical focus of formal environmental education, it frequently involves field studies and investigations which require access to areas of public land. In its 1988 statewide review of public land, the LCC summarised its rationale for recommending dedicated education areas — 60 recommendations to that date — to be set aside as reserves of modest size where people, usually students, can study natural ecosystems, observe and practice methods of environmental analysis and field techniques associated with the natural sciences, and conduct long-term experiments. Such areas are usually selected on the basis of whether the area has good access and relatively undisturbed natural vegetation. They may have a range of facilities on site, including buildings for accommodation purposes, which greatly affect how much they are used.

Recommended education areas have seldom been formally implemented as separate reserves, except for school camps and scout camps.

5.3.7 Game hunting

There is significant hunting interest and activity on public land in Victoria. The Game Management Authority (GMA), an independent statutory authority, is responsible for the regulation of game hunting in Victoria. The GMA issues game licences, manages open and closed seasons for game species, enforces game hunting laws and delivers programs to improve and promote responsible hunting in Victoria.

Game species include protected species, such as deer, quail and native ducks, as well as pest (exotic invasive) species, such as wild pigs, rabbits and foxes. The value of hunting includes the experiential value for the licence-holder, the revenue generated for the state government through the sale of licences, the economic value of related product sales and travel-related spending, and the non-commercial value of the meat harvested.

Licences entitle hunters to hunt according to the restrictions specified on the licence, which, depending on the species covered by the licence, may limit the season of hunting, the number of animals to be taken and the accessible areas. Licences are issued for individual game species and hunting type or in combination; these are

referred to as 'entitlements'. Licences are issued for deer hunting by stalking, deer hunting using hounds, duck hunting and hunting for other game bird species (mostly quails). Licences are not confined to hunting on public land.

As at 30 June 2015 there were 47,007 current game licences (which can include a combination of the game species).⁵⁰ The number of licences issued for each game species is given in table 5.14.

Table 5.14
Game licences by species (as at 30 June 2015)

Species	Number of licences
Duck	25,989
Quail	28,890
Deer	30,506

Source: GMA⁵⁰

The Game Management Authority advises that direct revenue from licences for the 2014–15 financial year was \$2.84 million.⁵¹ The costs associated with resource management, compliance activities and revenue collection has not been calculated.

Each year the Game Management Authority conducts surveys to estimate the number of deer, duck and quail harvested in the state.

Between July 2013 and June 2014, telephone post hunting surveys of licensed Victorian game hunters were conducted during the hunting seasons for deer, duck and quail to estimate the total harvest for each game type. The following figures are taken from the 2013–2014 surveys.⁵²

The total number of hunter days during the 2013–14 hunting seasons combined for deer, ducks and quail was estimated to be 304,255 (95 per cent confidence interval (CI): 270,887–341,733). The approach used explicitly accounts for the possibility that not every holder of a game licence will hunt during every survey period.

Deer

On average, each deer game licence-holder hunted on 6.6 days in 2013–14, with an average season harvest of 2.2 deer. This corresponds with an estimated 57,945 (95 per cent CI: 46,382–72,392) deer harvested during the 2013–14 deer hunting season in Victoria. The most commonly harvested species was sambar deer (with an estimated total harvest of 47,129), followed by fallow deer (9,282) and red deer (1,671). Chital, hog and rusa deer were not reported in the survey. More deer hunting occurred exclusively on public land (62.5 per cent) compared with exclusively on private land (27.9 per cent), with similar proportions of deer harvested.

Duck

On average, each duck game licence-holder hunted on approximately 4.6 days during the 2014 duck hunting season, with an average season harvest of 17.3 ducks. This is equivalent to an estimated 449,032 (95 per cent CI: 394,157-511,547) ducks harvested during the 2014 duck hunting season in Victoria. The surveys indicated that duck hunting effort was expended at a slightly higher rate on public land (51.9 per cent) than on private land (47.2 per cent). However, a greater proportion of ducks was harvested solely on private land (48.5 per cent on public land versus 50.5 per cent on private land). The harvested species are given in table 5.15.

Table 5.15
Native duck species harvested

Species	per cent
Australian Wood Duck	29
Pacific Black Duck	28
Grey Teal	28
Chestnut Teal	7
Pink-eared Duck	3
Australian Shelduck	2
Hardhead	1
Australasian Shoveler	<1

Source: GMA⁵²

Quail

On average, each game licence-holder endorsed to hunt quail, hunted on approximately 0.4 days during the 2014 quail hunting season, with an average season harvest of between 1-5 quails. This is equivalent to an estimated 16,243 quail harvested during the 2014 quail hunting season in Victoria (95 per cent CI: 8,699-30,330). This effort occurred predominantly on private land where much of the preferred habitat exists (88.5 per cent of the hunting days), which accounted for 95.3 per cent of the harvested quail.

The confidence limits for quail harvested are impacted by the fact that there is no specific entitlement on a game licence for quail. Rather, the endorsement on a game licence allowing the hunting of quail is generally combined with a deer or duck endorsement. As a result, the total number of people who hold a game licence allowing them to hunt quail is significantly higher than the number of people that actually participate in hunting quail, during normal years.

The annual harvest figures for quail can significantly fluctuate from year-to-year as a result of seasonal environmental conditions that directly impact breeding, recruitment and population indices. In 2014 it was

estimated that 16,243 quail were harvested compared with 184,123 in 2013 and 678,431 in 2011. For example, in 2011 drought conditions broke, environmental conditions led to increased breeding and recruitment, hence the higher take and greater number of hunting opportunities presented to hunters.

Estimates of the economic impact of hunting

The total expenditure for hunting game animals has been estimated to be \$282 million. When pest species (e.g. rabbits, goats, wild pigs, foxes and wild dogs) hunting by game licence-holders is included, the estimate is \$417 million. Of this total, 42 per cent was off-trip expenditure and 58 per cent was on-trip expenditure. Forty per cent of the expenditure occurred in metropolitan local government areas and 60 per cent in regional Victoria.⁵³

The impact of hunting for deer, duck and quail by game licence-holders on direct gross state product in 2013 was estimated to be \$118 million. With flow-on effects of \$177 million, the total contribution to gross state product was \$295 million. An estimated 1,115 jobs (full-time equivalent) were generated directly by hunting-related expenditure with a further 1,268 jobs stemming from flow-on employment, giving a total employment impact of 2,382 jobs.

When pest hunting (by game licence-holders) is included to measure the economic impact of all hunting by game licence-holders, the direct impact is \$177 million, the flow-on impact is \$262 million, and the total impact is \$439 million. In terms of impact on direct gross state product, pest animal hunting is the most significant animal group (\$59 million), followed by deer (\$57 million), duck (\$43 million) and quail (\$18 million).

With a gross state product of \$439 million including flow-on effects, the economic impact of hunting activity by game licence-holders was estimated to make up 0.13 per cent of the Victorian economy. Hunting activity is concentrated in certain areas, with the highest concentration being Mansfield local government area, where hunting accounts for 2.5 per cent of the area's economy. Hunting was also economically significant in Murrindindi and Gannawarra local government areas where it makes up 1.2 per cent and 1.6 per cent of their economies, respectively.

Total hunting-related expenditure in the top 20 towns was estimated to be \$135 million, which accounts for 54 per cent of the total non-metropolitan game hunting-related expenditure (\$250 million). A large proportion of economic activity occurs in the Melbourne region. Among the Regional Development Victoria regions, the largest impacts were estimated for the Gippsland Region where hunting expenditure of \$76 million generated direct gross regional product of \$28 million and direct full-time equivalent employment of 267.⁵³

5.3.8 Recreational fishing

Recreational fishing (fishing for pleasure or competition) is one of the most popular recreational pursuits in Victoria.

It is estimated that approximately 830,000 (2013–14) Victorian adult residents partake in recreational fishing each year.⁵⁴ It should be noted that this estimate includes people 70 years of age or over and those with various concessional cards who do not require a licence. Fishers under 18 years of age are also not required to hold a licence. Anecdotally, Fisheries compliance officers indicate up to as many as 50 per cent of fishers fish legally without a licence.

The Recreational Fisheries Trust account received \$6.3 million in the 2014–15 year from the sale of 288,498 Recreational Fishing Licences (compared with 356,622 fishing licences in 2013–2014).⁵⁵ A Recreational Fishing Licence covers all forms of recreational fishing in all of Victoria's marine, estuarine and inland water, including line fishing, bait collection, gathering shellfish, yabby fishing, prawning and spear fishing.

In 2013–14, recreational fishers are estimated to have made 6.1 million fishing trips across Victoria, with more than half of these trips occurring in regional areas. This is estimated to be equivalent to an economic contribution to Victoria of:

- ✦ \$7.1 billion combined direct and indirect output, including \$2.6 billion direct output
- ✦ \$3.9 billion combined direct and indirect value added, including \$1.6 million direct value added
- ✦ 33,967 combined direct and indirect full-time equivalent jobs, including 16,257 direct jobs.⁵⁴

Fishing trips were estimated to be distributed across waterways as follows: 40 per cent marine, 18 per cent estuarine and 42 per cent inland waters.

In addition to these economic benefits, research undertaken for the Fisheries Research and Development Corporation has found that recreational fishing generates a number of psychological, physiological and social benefits, including promoting general health and wellbeing, reducing stress and improving mental health.⁵⁶ It also encourages exposure to the natural environment.

The costs associated with resource management, compliance activities and revenue collection have not been calculated.

5.3.9 Fossicking and prospecting

Prospecting means searching for minerals or gemstones under a miner's right or a tourist fossicking authority as defined in the *Mineral Resources (Sustainable Development) Act 1990*. Recreational prospecting and fossicking involve the use of hand tools (e.g. metal detectors, pans and sluices) in the search for gold, gemstones and other minerals.

In addition to being a recreational activity, prospecting provides an opportunity to exercise, relax, socialise and connect with Victoria's history, cultural heritage and the natural environment.

Miner's rights and tourist fossicking authorities specify search conditions that must be observed. Generally, all minerals belong to the Crown, even on private land. A miner's right transfers the ownership of any minerals found while prospecting to the holder of the miner's right. Recreational prospectors are expected to seek permission to access land. A miner's right is required even if you are prospecting on your own land.

Approximately 13,900 people are currently authorised to undertake the activity in Victoria, with anecdotal information suggesting that many of these travel from interstate to Victorian sites. Of the current licences as at 1 July 2016, there are 1,419 two-year licences and 12,477 ten-year licence holders. There are currently four active tourist fossicking authorities.

Table 5.16

Number of miner's rights granted and associated revenue (2011–2016)

	2011		2012		2013		2014		2015		2016	
	January - June	July - Dec										
Two-year	427	1,096	939	950	1,334	1,175	1,307	1,419	na	na	na	na
Revenue \$	12,767	33,537	28,733	29,735	41,754	37,717	43,261	46,968	na	na	na	na
Ten-year	416	248	235	291	318	254	342	323	3,852	3,287	2,816	nd
Revenue \$	34,798	21,204	20,092	25,521	27,889	22,835	30,746	29,942	66,254	58,180	57,446	nd
Total revenue	\$102,306		\$104,082		\$130,195		\$150,919		\$124,434		nd	

Source: Earth Resources Regulation, DEDJTR (2016)

Note: The data for 2016 is as at 30 June 2016. Abbreviations: na: not applicable, nd: no data obtained

VEAC recently conducted an investigation into additional recreational prospecting areas in eight national parks and one state park.⁵⁷ VEAC identified eight additional areas in three parks. The investigation highlighted three key themes:

- ✦ the purpose of national parks i.e. their primary focus on permanent preservation and protection of the natural environment, and for the enjoyment and appreciation through activities compatible with that purpose
- ✦ recreational prospecting can result in damage to natural and cultural heritage values, especially in waterways but also in other vulnerable environments
- ✦ the enjoyment, and the health and social benefits gained from prospecting for gold and gemstones.

In determining additional areas for prospecting, VEAC took into account the opportunities already available for prospecting on public land near the parks. Restrictions on the equipment that can be used for prospecting in waterways were also recommended to minimise potential negative impacts.

5.4 Resource uses

Key points at a glance

- Public land provides many valuable natural resources, both renewable and non-renewable, which are important to the Victorian economy.
- Hardwood eucalypt forests make up the vast majority of Victoria's public forests.
- Prior to European settlement forest covered about 90 per cent of Victorian land. Currently, around 900,000 hectares of state forest is available and considered to be suitable for timber harvesting, with less than 10,000 hectares harvested each year.
- The volume of sawlog production, D grade and grades above, has generally declined over the past 10 years.
- The use of public land for plantations has declined as a result of privatisation of softwood and hardwood plantations.
- Forested public land is also used for grazing livestock, apiculture, and providing forest produce such as domestic firewood, eucalyptus oil and seeds.
- Commercial wild-catch fisheries in Victoria's marine and inland waters contribute an estimated \$60 million annually to the state's economy, with abalone and rock lobster the most valuable sectors.
- Victoria's earth resources industry includes production of minerals, brown coal, rock, gravel, sand, and oil and gas from onshore and offshore sources.
- Water from Victoria's public land has high economic value. Major sectors include irrigation and urban water uses.
- Carbon sequestration (the capture and long-term storage of carbon dioxide) including enhancing the storage of carbon in soil and in forests, or storing carbon in underground geological formations, is in its infancy on public land in Victoria.
- Victoria has an abundance of accessible renewable energy resources and there is potential to use public land for wave, wind and solar energy generation.
- There is an estimated 85,000 kilometres of rivers and creeks in Victoria with 170,000 kilometres of frontage, approximately 22,000 kilometres of which are Crown land frontages in largely cleared catchments managed under licence by adjacent landholders.
- Public land is leased or licensed for a variety of telecommunications, pipelines, commercial, industrial and business-related purposes.

In addition to the values described previously (see sections 5.1 to 5.3), public land has many valuable natural resources, both renewable and non-renewable, that are extracted and/or used in production.

Industry sectors important to the Victorian economy which rely on extraction of natural resources include:

- ✦ timber
- ✦ fisheries
- ✦ water
- ✦ minerals and petroleum
- ✦ other earth resources (e.g. rock, gravel, sand)
- ✦ non-timber forest products (e.g. seeds, eucalyptus oils)
- ✦ land and water for grazing cattle and other agricultural uses
- ✦ nectar and pollen for foraging European honey bees
- ✦ geothermal, solar, wind, hydro and wave energy.

At a national level, the Henry Tax Review noted that there are challenges in valuing many of Australia's natural resources. The review commented that:

A market price may not always exist and, where it does, it may not reflect the full value that the community ascribes to the asset — for example, the value of an old growth forest. There are a range of factors that can affect the price of these resources, including government ownership and regulation. In many cases, the prices (implicit or explicit) charged by government for access to the community's natural resources are non-transparent, or at least very difficult to compute.⁵⁸

The following sections describe the value of the natural resources of public land (where available) in terms of the:

- ✦ distribution of the resource
- ✦ policy and regulatory framework governing resource use
- ✦ volume produced and its monetary value
- ✦ return to the state through licence fees, royalties and any other charges.

The monetary value of products and resources from public land can be measured in different ways. Measures include:

- ✦ the value to the economy of the state
- ✦ the value at the point of sale
- ✦ the fees, royalties or dividends accrued to the state (see below).

The following descriptions are not economic valuations. An unpublished economic analysis by Marsden Jacob Associates to the then Department of Sustainability and Environment in 2004 estimated the total net economic

benefit flowing directly from the public land estate (excluding intangibles) at \$2.5 billion, and the benefit cost ratio at a minimum of 3.5.

The costs associated with resource management, compliance activities and revenue collection have not been calculated. In some cases, the costs may exceed the revenue. However, it is noted that cost recovery was implemented in Victoria in 2004 for wild-catch commercial fisheries and aquaculture through a set of fishery-specific fees and levies.

Public land also has monetary (and non-monetary) value for non-resource uses, such as recreation (see section 5.3) and biodiversity conservation (see section 5.1), which also support industry sectors. This section does not include estimates of the value of those sectors. Non-monetary values have not been described.

The most recent data available have been provided by the relevant state government bodies, primarily the Department of Environment, Land, Water and Planning (DELWP), the Department of Economic Development, Jobs, Transport and Resources (DEDJTR), the Game Management Authority, VicForests and Parks Victoria. Combining information from these varied sources, each with their own data collection protocols, has required a degree of estimation in some instances.

5.4.1 Forestry and forest products

VicForests is the state-owned business responsible for the sustainable harvest, regeneration and commercial sale of timber from forests on public land. In addition, VicForests is responsible for the construction of roads to coupes, fire prevention and suppression activities, and forest rehabilitation and regeneration. Until recently, VicForests managed the commercial production of timber in the east of Victoria only. In late 2014, commercial harvesting in the western Victorian forests was transferred to VicForests.

The native forest resource

Hardwood eucalypt forests make up the vast majority of Victoria's public forests. Prior to European settlement in the mid-nineteenth century, forest covered about 90 per cent of Victorian land. Since that time, more than 14 million hectares (60 per cent) of forest has been cleared in Victoria, the highest proportion of all Australian states. The period of greatest deforestation occurred between 1830 and 1880, principally the result of agricultural clearance and settlement by early European explorers and the 1850s Victorian gold rush.⁴⁵

The amount of native forest on public land available for timber harvesting has declined considerably since the LCC's 1988 review of public land. In 1988, timber production was a major permitted use over about 4.4 million hectares, not including substantial areas of mature forest in parks and reserves available for once-off logging.



Today, native forest timber harvesting occurs principally in the approximately 3.2 million hectares of state forest, of which around three-quarters is zoned as available for wood production. The area currently available and suitable for timber production in western Victoria is approximately 100,000 hectares while the area available and considered suitable for harvesting by VicForests in eastern Victoria is about 800,000 hectares. The net productive area is further decreased by stream buffers, slopes and areas with access issues, biodiversity and social protection measures, road corridors and protection of recreation, cultural and other values.

Between 2006 and 2012, the area of state forest zoned for wood production in Victoria decreased by seven per cent. This was mainly associated with the reclassification of about 196,000 hectares of land from state forest to parks or conservation reserves.⁴⁵

Harvesting levels

Harvesting rates in Victoria's forests are at their lowest since the 1980s. VicForests reports that during the 1970s an average of 5180 hectares was harvested each year and in the 1980s an average of approximately 7,470 hectares.⁵⁹ This declined in the 1990s to 6,900 hectares per year. The area of state forest harvested annually between 2006-07 and 2011-12 ranged from 7,900 to 11,600 hectares.⁴⁵

The total volume of production from Victorian state forest (eastern and western Victoria) ranged from 1,762,000 cubic metres in 1996-97 to a peak of 2,247,000 cubic metres in 2000-01 and then decreased to 1,294,000 cubic metres in 2014-15 (table 5.18).

Value of sawlogs, pulpwood and minor products

Information on sawlogs, pulpwood and minor forest products from public land is collected separately for eastern and western Victoria. Over the last decade, the value of timber produced from public land in the west of the state has declined from \$3.4 million in 2006-07 to \$0.7 million in 2014-15. During the same period, the value from the east of the state has increased from \$28 million to \$35 million (see table 5.17).

From 2006-07 to 2014-15, the volume of sawlog production, D grade and above, has generally declined (428,000 to 296,000 cubic metres) as has the volume of pulpwood (1,241,000 to 765,000 cubic metres). In contrast, there has been a slight increase in production over the same time period (124,000 to 233,000 cubic metres) of minor forest products, such as E grade (low grade) logs, cull logs, fencing timbers and residual logs (below sawlog quality and possibly used for firewood, fence posts, poles and garden landscape timber) (see table 5.18).

Table 5.17

Value of wood products from state forest (2006-2007 to 2014-2015)

Year	Value (\$000)			
	Eastern Victoria – mill door value ^A	Eastern Victoria – stumpage ^B	Western Victoria – stumpage ^B	Total stumpage
2006–07	99,117	28,400	3,445	31,845
2007–08	125,767	28,536	2,446	30,982
2008–09	125,335	29,477	1,003	30,480
2009–10	131,588	24,498	441	24,939
2010–11	131,414	31,782	380	32,162
2011–12	116,655	28,986	544	29,530
2012–13	104,474	30,789	536	31,325
2013–14	104,258	31,376	668	32,044
2014–15	107,771	34,812	702	35,514

Source: Reproduced from Victoria's *State of the Forests Report 2013*, Department of Environment and Primary Industries (DEPI) and updated with information from the Department of Economic Development, Jobs, Transport and Resources (DEDJTR).

^A Mill door value includes the sale price of the timber plus harvest and haul costs to the mill door.

^B Stumpage value is the sale price of the wood.

Table 5.18

Volume of total annual production from Victorian state forest (eastern and western Victoria), 1996-1997 to 2014-2015

Year	Volume (cubic metres)			
	Sawlogs ^A	Pulpwood	Other products ^B	Total
1996–97	729,000	1,033,000	na	1,762,000
1997–98	804,000	1,120,000	na	1,924,000
1998–99	821,000	1,165,000	na	1,986,000
1999–2000	820,000	1,403,000	na	2,223,000
2000–01	667,000	1,580,000	na	2,247,000
2001–02	682,000	1,365,000	111,000	2,158,000
2002–03	638,000	1,208,000	117,000	1,963,000
2003–04	530,000 ^C	1,291,000	112,000	1,933,000
2004–05	583,000 ^{D, E}	1,335,000	123,000	2,041,000
2005–06	497,000 ^{D, F}	1,329,000	109,000	1,935,000
2006–07 ^G	428,000	1,241,000	124,000	1,793,000
2007–08	433,000	1,478,000	147,000	2,058,000
2008–09	413,000	1,141,000	158,000	1,712,000
2009–10	443,000	1,250,000	172,000	1,865,000
2010–11	330,000	1,168,000	203,000	1,701,000
2011–12	298,000	967,000	184,000	1,449,000
2012–13	312,000	748,000	217,000	1,277,000
2013–14	304,000	720,000	204,000	1,228,000
2014–15	296,000	765,000	233,000	1,294,000

Source: Reproduced from Victoria's *State of the Forests Report 2013*, DEPI and updated with information from DEDJTR.

^A Prior to 2004–05 sawlog volume is expressed as net volume (gross volume minus allowances for defects). The sawlog classification is D grade sawlog and above. Ungraded salvage sawlog is included in Other products.

^B Other products include E grade (low grade) logs, cull logs, fencing timbers, residual logs (not meeting sawlog quality). The end use of residual logs is not specified, but may include firewood, fence posts, poles and garden landscape timbers. These figures do not include domestic firewood.

^C Includes 118,000 cubic metres fire salvage, normal harvest was 412,000 cubic metres.

^D Gross sawlog volume.

^E Includes 50,000 cubic metres fire salvage, normal harvest was 533,000 cubic metres.

^F Includes 27,000 cubic metres fire salvage, normal harvest was 470,000 cubic metres.

^G Over the six year period 2006–07 to 2011–12 approximately 650,000 cubic metres of D+ sawlog was harvested from areas burnt by fire.

Employment and broader economic benefits

The forest industry estimates that Victoria's native timber industry provides 21,000 direct jobs and 40,000 to 50,000 indirect jobs, many of which are located in rural and regional areas of the state. The industry estimates that it generates an annual income of \$6.7 billion in sales and service (e.g. from local support industries).⁶⁰

Firewood collection

The volume of firewood collected decreased over the period 2001 to 2011. In September 2011, the Victorian government's firewood policy was modified, removing the requirement for a licence to collect domestic firewood from public land. This ended the ability to record data on the activity and, as a result, no figures are available after 2011.⁴⁵

From the most recent figures available, in 2000, Victorian households burned 1.21 million tonnes of firewood (± 0.27 million tonnes).⁶¹ It was estimated that 21 per cent was derived from state forest, which would amount to 253,000 tonnes ($\pm 53,000$ tonnes) or around 500,000 cubic metres

($\pm 100,000$ cubic metres). Licence information collected and reported as part of the 2013 State of the Forests Report indicates that total firewood collection from state forest during 2001–02 was 60,463 cubic metres (see table 5.19).⁴⁵ It is therefore likely that the estimates based on licence information prior to the 2011 policy change significantly underestimate the amount of firewood taken both commercially and domestically from state forest.

A further 4.5 per cent of firewood burned in Victorian households is estimated to have come from other public lands.⁶¹ This is an estimated 109,000 cubic metres (95 per cent confidence limit: 87,000 to 135,000 cubic metres). Since 2000, firewood collection from state forest has declined, making it difficult to assess the true volume of firewood collected.

Given that licences are no longer required for collecting firewood on public land, no fees are collected. The absence of data makes it difficult to estimate the value of the firewood collected from public land to the Victorian community.

Table 5.19

Volume of firewood collected through licences for domestic and commercial in state forest (2001–2002 to 2011–2012)

Year	Volume (cubic metres)		
	Domestic	Commercial	Total
2001–02	48,207	12,256	60,463
2002–03	54,826	16,022	70,848
2003–04	54,454	18,736	73,190
2004–05	56,660	26,980	83,640
2005–06	51,330	14,149	65,479
2006–07	35,926	9061	44,987
2007–08	24,484	12,184	36,668
2008–09	24,365	12,530	36,895
2009–10	33,645	8348	41,993
2010–11	38,981	6106	45,087
2011–12	11652 ^A	6400	18,052
2012–13	Not available	9000	Not available
2013–14	Not available	10,000	Not available
2014–15	Not available	13,000	Not available

Source: Reproduced from Victoria's *State of the Forests Report 2013*, DEPI and updated with information from DEDJTR.

^A The domestic volume recorded in 2011–12 is a measure for approximately half the year as the Victorian government's firewood policy removed the requirement to license domestic collection at the end of 2011.

Plantations

The use of public land for plantations has declined as a result of the corporatisation and subsequent privatisation of softwood and hardwood plantations in the 1990s (see section 2.4.2).

With the sale in 1998 of the Victorian Plantations Corporation to Hancock Victorian Plantations, only small and isolated patches (approximately 3,135 hectares) of plantation remain as public land. They are predominantly school or community plantations.

Minor forest produce and other forest uses

A variety of agricultural activities occur on forested public land, typically adjacent to or within a rural landholding. For example, farmers graze livestock on unused roads, stream frontages or in adjacent forest, and cultivate small areas of public land adjacent to private property (e.g. where a stream has moved into adjacent cultivated land).

In addition, products such as eucalyptus oil and seeds are harvested from forests on public land. The apiary industry is also largely dependent on the use of native forests. The revenue from licences for these activities is discussed later in this section.

Forest grazing

Grazing stock in Victoria's public forests is managed through grazing licences or leases issued under the *Forests Act 1958* and the *Land Act 1958*.

DELWP records indicate that, in 2014–15, 2,900 annual grazing licences/leases were issued: 8 per cent in state forest, 0.2 per cent in parks, and the remaining 91 per cent in other public land. There were also 32 seasonal grazing licences issued: 44 per cent in state forest and 56 per cent for other public land. The Victorian government receives annual revenue of about \$338,000 from these licences. See section 5.4.7 for more information on licensed grazing on public land.

Stock grazing can be detrimental to forest health by changing understorey vegetation composition, inhibiting regeneration, compacting soil and spreading pest plants. Grazing licences assist in minimising forest health impacts by controlling the location and timing of grazing, limiting stock numbers and imposing other management requirements where necessary.⁴⁵

Cattle grazing ceased in the Barmah forest (now Barmah National Park) in 2010 and in the Alpine National Park in 2015 following decades of controversy.

A variety of agricultural, cultivation, and water supply (crossing stream frontages to adjacent private property) licences under the *Forests Act* are issued. DELWP records indicate that, in 2014–15, they numbered 326, yielding annual revenue to the state of about \$96,000.



Eucalypt oils

Australia once supplied all of the world's eucalyptus oil but today produces only five per cent of the total.⁶² The Australian eucalyptus oil industry has declined by about 85 per cent over the last 60 years. Today, the total Australian annual production is less than 150 tonnes and probably in the order of 125 tonnes.⁶³ It is likely that Australian eucalyptus oil harvest will continue to decline due to the establishment of eucalyptus oil plantations in countries such as China and Spain.

Most of the eucalyptus oil presently produced in Australia comes from the blue mallee (*Eucalyptus polybractea*). The major producing areas are the Inglewood and Wedderburn districts in Victoria and near West Wyalong in New South Wales.

The Victorian industry is almost entirely reliant on the use of public land that has been under licence since the early 1900s. Some of this land has been harvested continuously for more than 60 years.⁶³

Victorian eucalyptus oil produced from public land stood at 11.5 tonnes in 2011–12, providing a royalty of \$10,500 to the state.⁴⁵

Seed

Native seed is collected by DELWP, VicForests, DEDJTR and some private collectors. The seed is used for forest regeneration and for growing trees for sale in nurseries. The quantity collected depends on the demand for particular species. Eucalypt species, which make up the majority of commercial seed production, do not set the

same amount of seed every year, thus the quantity and quality of seed available for collection varies over time. The largest quantities of seed harvested are used in state forests for harvesting regeneration and fire recovery operations. Smaller quantities of seed are harvested for commercial tree growing in nurseries and sale.

Royalties are paid for seed collected by those outside state government. The following data are sourced from departmental internal records and are for the sale of seed collected by VicForests and private collectors.

The amount of seed sold annually from state forest has declined over recent years. Only 1.2 tonnes of seed was collected in 2013–14, down from 1.5 tonnes in 2012–13 and 4.4 tonnes in 2011–12 (see table 5.20).

An average of 10 tonnes of seed was sold from 2007–08 to 2010–11. The high level over that period is due to increased fire recovery works following the wildfires in 2006 and 2009. Prior to this, an average of 4.6 tonnes was collected each year, and the 4.4 tonnes sold in 2011–12 reflected a return to routine seed collection patterns.

The average royalty for seed capsules is approximately \$35 per kilogram, and royalties of \$100,000, \$27,000 and \$44,000 were paid in 2011–12, 2012–13, and 2013–14, respectively.

The total yield and revenue generated by seed collection activities that attract royalties from state forest in Victoria by year is shown in table 5.20. The majority of seed is accounted for in the financial year after its collection.

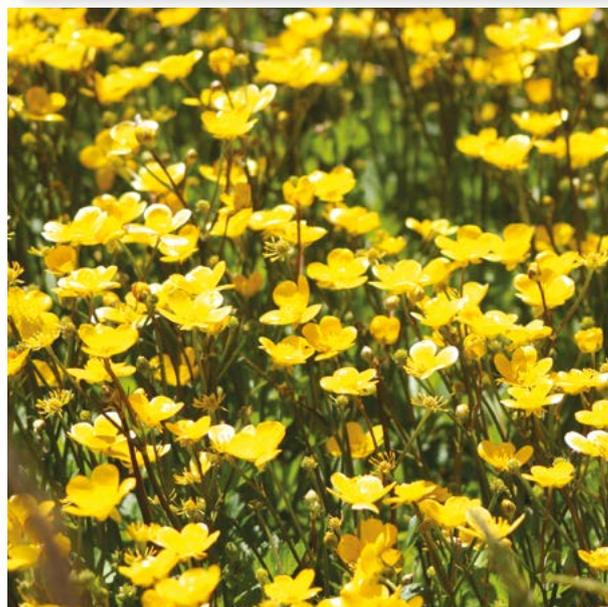


Table 5.20

Total yield and revenue generated by seed collection activities that attract royalties from state forest in Victoria (2011-2014)

Year	Year ending 30 June 2012	Year ending 30 June 2013	Year ending 30 June 2014	
Seed collected (kg)	4,438.27	1,523.89	1,191.64	
Less salvage seed (kg) ^A	-618.11	-95.14	0.00	
Less seed sold to DEPI (kg) ^B	-921.11	-659.65	0.00	
Net seed royalty payable upon (kg)	2,899.05	769.10	1,191.64	
Royalty rate (\$/kg) ^C	34.68	35.63	36.52	
Net royalty payable (\$) before GST	100,539.05	27,403.03	43,518.69	171,460.77

Source: data supplied by the Department of Environment, Land, Water and Planning (2016)

^A No royalty is payable on seed sown on salvage coupes in accordance with schedule 7.1(m) of the DSE Management Procedures 2009

^B No royalty is payable on seed sold to DSE in accordance with 3.2.4 of the Seed Supply Agreement 2010

^C The royalty rate increases by CPI in accordance with section 10. of Seed Collection & Management and Coupe Regeneration agreement

Tree ferns

The Department of Environment, Land, Water and Planning and VicForests advise that they do not issue tree fern permits to remove tree ferns from public land.

Apiculture

European honey bees (*Apis mellifera*) were first successfully introduced into Australia in 1822. They became widespread throughout native forests by the middle of the nineteenth century. Managed hives of European honey bees form the basis of an industry that provides honey and significant crop pollination services around Australia.

Feral European honey bees may out-compete native fauna for floral resources, disrupt natural pollination processes and displace endemic wildlife from tree hollows. However, there is insufficient research about interactions between European honey bees and Australian biota to fully describe their impacts.⁶⁴

Victorian honey production is concentrated in the eucalypt forests of Victoria, and the apiary industry is largely dependent on access to public forests and the flowering cycles of eucalypt species. European Bees are often returned to their approved sites on Victoria's public land to regain condition over the winter and at other times of the year, in preparation for crop pollination and honey production.

In addition to honey production, the apiary industry has other values associated with it, including: providing pollination services to the agricultural, horticultural and forest sectors; selling European honey bees to commercial and domestic/hobby apiarists; and producing beeswax for making candles, furniture waxes and other products.

In 2014, the Australian Bureau of Agriculture and Resource Economics and Sciences determined the gross value of production (GVP) of the beekeeping industry in 2012-13 was \$88 million, with a forecasted GVP of \$92 million in 2013-14.⁶⁵ In 2013, it was estimated that pollination services from honey bees would contribute \$4-6 billion annually to the Australian economy.⁶⁶

It is difficult to determine the Victorian share of the GVP for Victoria alone as Victorian hives pollinate crops in other states and interstate hives pollinate crops grown in Victoria. DEDJTR estimates it to be approximately 15 per cent of the Australian GVP.

The total number of beekeepers registered with DEDJTR previously ranged from 1,700 to 2,000 from 1999-2000 to 2007-08 but has since increased to 4,475 (in 2015-16), and is expected to remain stable at this level. The increase has been partially due to:

- ✦ public awareness that Australia has remained the only continent free of the honey bee pest, the Varroa mite
- ✦ an awareness of the importance of ensuring adequate bee numbers for pollination
- ✦ an increased interest by people in producing their own honey
- ✦ free online registration for beekeepers who register up to five hives
- ✦ the introduction of the Apiculture (beekeeping) on public land policy in 2013, which aimed to provide additional apiary sites on public land.⁶⁷

In 2015-16, there were 268 apiarists with licences or permits to occupy 4,239 apiary sites on public land in Victoria. The number of sites available has increased by approximately 500 since 2013. Victoria's apiary sites on public land are distributed as follows: 47 per cent in state forest, 25 per cent in parks, and the remaining 28 per cent in reserves and other public land.

The number of apiary licences and permits issued in any year (as well as the associated revenue and value of pollination services) fluctuates with: the availability of sites (some sites may be closed for management reasons); the extent and distribution of flowering; and the number of sites with multiple licences issued during a year.

The apiary permits and licences bring annual revenue to the state of about \$310,000.

Previously, European honey bee site licences were issued under three Acts (the *Land Act 1958*, the *National Parks Act 1975* and the *Forests Act 1958*). There were provisions for honey bee farms and range licences, apiary rights and occupation permits under the various acts. However, recent amendments to legislation have formally introduced two new licence categories which replace the above authorisations. The amending legislation means that all European honey bee site licences will now be dealt with under one act – the Land Act.

From 1 January 2017, 10 year licences will be introduced for apiary use on public land. These new licences will replace the shorter term licences and permits currently used.

5.4.2 Commercial fishing and aquaculture

Commercial fishing is an important part of Victoria's food industry and supplies both domestic and export markets. The industry estimates that the commercial fishing industry contributes \$60 million annually to the state's economy, and supports coastal and regional communities.⁶⁸ Aquaculture production in Victoria takes place in a variety of offshore, coastal and inland facilities and produces trout, abalone, blue mussel, aquarium finfish, Murray cod, barramundi and yabby.

Commercial fishers must provide data on catch and effort for fishing activities occurring in Victorian waters, and for fisheries managed by the state outside Victorian waters under an Offshore Constitutional Settlement agreement with the Commonwealth e.g. abalone, rock lobster, scallop.

Fishery catch data has been collected continuously in Victoria since 1911. Catch and effort data for the period since June 1978 are stored in a secure electronic database and are readily accessible for various uses. To preserve confidentiality, data is released only in aggregated form and is not reported if fewer than five licence-holders have contributed to it.

Commercial access licences

A variety of species are fished under commercial access licences: abalone, crab, eel, rock lobster, scallop, sea urchin, wrasse, and fish such as anchovy, Australian herring, Australian salmon, barracouta, bream, carp, eel, flathead, flounder, garfish, herring leatherjackets, luderick, mackerel, morwong, mullet, perch, pike, sardine, snapper, sprat, tailor, trevally, warehou, whiting, wrasse (see tables 5.21 and table 5.22).

A number of aquaculture licences are also issued (including for hatchery production and grow-out production) (see table 5.23). Some licence-holders hold multiple licences.

Catch and production

In 2014–15, 3,802 tonnes of fish (live weight) were caught under licence in Victoria (see table 5.24). This was valued at over \$52 million (an underestimate due to data availability) based on information supplied by several processors and in line with historic information estimated from the Melbourne fish markets. Shark carcasses are recorded for Victorian waters (inside the three nautical mile limit) only.

Table 5.21
Number of fishery access licences

Licence type	Number of licences
Abalone, western zone	14
Abalone, central zone	34
Abalone, eastern zone	23
Bait (general)	12
Giant crab	18
Eel	18
Ocean (general)	185
Purse seine (ocean)	1
Rock lobster, western zone	71
Rock lobster, eastern zone ¹	38
Scallop (ocean)	90
Scallop (dive, Port Phillip Bay)	1
Sea urchin	9
Trawl (inshore)	54
Wrasse (ocean)	22
Total	590
Permits²	9
Bay and inlet fisheries	
Corner Inlet	18
Gippsland Lakes	10
Gippsland Lakes (bait)	9
Gippsland Lakes (mussel dive)	2
Lake Tyers (bait)	1
Mallacoota Lower Lake (bait)	1
Port Phillip–Western Port ³	10
Purse seine (Port Phillip Bay)	0
Port Phillip Bay (mussel bait)	1
Snowy River Fishery (bait)	2
Sydenham Inlet Fishery (bait)	2
Total	56
Total all fisheries	655

Source: data supplied by the Department of Economic Development, Jobs, Transport and Resources – Fisheries (June 2016)

¹ Seven rock lobster licences will be cancelled from 1 July 2017.

² Permits relate to one year permits granted to undertake a new developmental fishery (not the subject of an existing fishery access licence).

³ The Port Phillip Bay netting reduction process resulted in the surrender of 32 Port Phillip/Western Port licences and one Port Phillip (Purse Seine) licence resulting in ten netting licences remaining in Port Phillip Bay. All commercial net fishing will be phased out by 2022.

Table 5.22

Total number of rock lobster pots per zone

Licence type	Number of pots
Western zone	5,162
Eastern zone	2,073
Total	7,235

Source: data supplied by the Department of Economic Development, Jobs, Transport and Resources – Fisheries (June 2015)

Table 5.23

Number of aquaculture licences

Licence type	Number of licences
Freshwater eel	13
Salmonids	20
Warmwater finfish (inland)	19
Yabby	18
Abalone	12
Blue mussel and other molluscs (bivalves)	19
Ornamental fish	10
Other	19
Total	130

Source: data supplied by the Department of Economic Development, Jobs, Transport and Resources – Fisheries (June 2015)

Table 5.24

Victorian fisheries production summary (2012-2013 to 2014-2015)

	2012-13		2013-14		2014-15	
	Weight (live, tonnes)	Value (\$'000)	Weight (live, tonnes)	Value (\$'000)	Weight (live, tonnes)	Value (\$'000)
Molluscs and echinoderms						
Abalone	832	26,424	734	21,474	739	20,200
Squid	37	nd	37	nd	59	nd
Octopus	24	nd	23	nd	21	nd
Scallop	id	nd	id	nd	id	nd
Other	147	nd	133	nd	125	nd
Sub-total	1,040	nd	927	nd	944	nd
Crustaceans						
Rock lobster, southern	307	17,000	312	21,710	289	24,296
Prawn	46	nd	159	nd	156	nd
Crab, giant	10	nd	7	nd	id	nd
Other	27	nd	64	nd	148	nd
Sub-total	390	nd	542	nd	593	nd
Bony and cartilaginous fish						
Australian sardine (pilchard)	1,134	669	1,076	560	863	1,536
Australian salmon	364	200	381	217	211	141
Snapper	152	nd	144	nd	147	1,385
Whiting, King George	104	nd	85	nd	115	2,522
Bream	93	nd	55	nd	66	720
Eel, freshwater	86	1,145	94	1,348	66	930
Garfish, southern (sea)	49	nd	48	nd	34	252
Cartilaginous fish (sharks and rays)	44	nd	43	nd	41	225
Other	1,048	nd	961	nd	722	na
Sub-total	3,074	nd	2,887	nd	2,265	na
Total	4,504		4,356		3,802	

Source: data supplied by the Department of Economic Development, Jobs, Transport and Resources – Fisheries (June 2015)
 Abbreviations: na: not applicable, nd: no data obtained, id: insufficient data to report as less than five licence holders

Aquaculture production

Victorian aquaculture occurs in a range of offshore, coastal and inland facilities, and is managed under the *Fisheries Act 1995*. Table 5.25 provides a summary of Victorian aquaculture production (as available) and aquaculture licence number data is provided in table 5.23.

In addition to these food fish, ornamental fish sales were estimated at about \$3 million in 2014–15.

Table 5.25
Victorian aquaculture production summary (2012–2013 to 2014–2015)

Aquaculture	2012–13		2013–14		2014–15	
	Weight (live, tonnes)	Value (\$'000)	Weight (live, tonnes)	Value (\$'000)	Weight (live, tonnes)	Value (\$'000)
Mussel, blue	866	642	644	nd	1,014	nd
Salmonids	1,063	446	1,186	nd	1,147	nd
Abalones	365	567	431	nd	436	nd
Eels, freshwater	27	nd	13	nd	id	982
Warmwater finfish (inland)	160	809	157	nd	270	nd
Yabby (freshwater)	3	nd	3	nd	3	nd
Total	2,076		2,485		2,433	

Source: data supplied by the Department of Economic Development, Jobs, Transport and Resources – Fisheries (June 2015)
Abbreviations: nd: no data obtained; id: insufficient data to report as less than five licence holders.

5.4.3 Earth resources

Victoria's earth resources industry includes production of:

- ✦ minerals – such as gold, antimony, gypsum, silica, feldspar, rutile, zircon, ilmenite and kaolin, and brown coal – used almost exclusively for power generation
- ✦ 'extractives' – rock, gravel, sand and clay used mainly for building and road construction
- ✦ petroleum (oil and gas) – from onshore and offshore sources
- ✦ geothermal energy (hot rocks) – a source of renewable energy (see section 5.4.6).

In Victoria, all earth resources (below 50 feet) belong to the Crown, even on private land (with the exception of land titles issued before the Torrens system for recording and registering land ownership and interests in Victoria was introduced in 1862).

State revenue (rents, royalties, levies, fees and charges) derived from the earth resources sector totalled \$50.1 million in 2013–14, down from \$57.2 million in 2012–13. This was primarily due to lower royalties which reflects reduced demand and production for the mining and extractive industry sectors. Petroleum royalties remained unchanged for 2013–14, totalling \$0.1 million.⁶⁹

Minerals

Victorian mineral demand and production has fluctuated in recent years; however gold production has remained relatively stable. In 2014–15, 93 applications were granted or renewed for minerals-related licences. Approximately 60 per cent of these were exploration licences. Overall mineral production value (excluding brown coal) fell significantly from \$1,007 million in 2011–12 to \$660 million in 2012–13. The decline continued into 2014–15, though not to the same degree, with the overall mineral production value down to \$567.5 million (table 5.26).⁶⁹

No exploration licences are granted for national, state or wilderness parks or reference areas.

Table 5.26
Mineral production values 2014–2015

Mineral	Value (\$ million)
Gold	286.9
Heavy mineral sands	185.1
Subtotal	472
Other^A	95.4
Total	567.5

Source: Earth Resources Regulation, DEDJTR (2016)

^A Includes antimony (\$75.1 million), Industrial minerals (\$20.2 million) and 'others' (\$0.1 million) and includes a discrepancy of 0.1 due to rounding.

Brown coal

With an abundance of lignite (often referred to as brown coal) occurring in thick seams close to the earth's surface, Victoria is home to one of the largest and lowest cost energy sources in the world.⁷⁰ More recently, global energy prices and clean energy technology developments have created new investment opportunities for the Victorian lignite industry that are not related to power generation, including diesel, fertiliser and methanol. As at 2013–14, brown coal production remained dominated by the electricity generation companies in the Latrobe Valley (Hazelwood, Loy Yang and Yallourn). Alcoa at Anglesea was another major brown coal mining company producing brown coal to generate electricity for its Point Henry aluminium smelter. A small amount of coal was produced at Bacchus Marsh by Maddingley Brown Coal, mainly for fuel and soil conditioning. The total Victorian brown coal production for 2014–15 was 61 million tonnes, up from 58 million tonnes in 2013–14.⁷⁰

Electricity from Victorian brown coal has been found to produce more greenhouse gas emissions than other energy types. Victorian brown coal is typically found to produce 0.363 kilograms of carbon dioxide per megajoule of energy while electricity from Queensland's black coal produces 0.288, natural gas produces 0.069, LPG produces 0.068, diesel produces 0.078 and unleaded petrol produces 0.077 kilograms of carbon dioxide per megajoule of energy.⁷¹

Gold

Gold mining transformed 1850s Victoria. At Ballarat's peak between 1852 and 1853, it was recognised as probably the richest alluvial goldfield in the world.⁷² Today, just four mines produce most of Victoria's gold. In 2014–15, total gold production was 198,387 ounces (table 5.27), compared to 225,148 ounces in 2013–14, and a low of 186,146 ounces in 2010–11.⁷⁰

Table 5.27
Gold production 2014–2015

Producer	Location	Production (ounces)	Estimated value (A\$million)
Fosterville Gold Mine Pty Ltd	Bendigo	116,140	165.6
Mandalay Resources Costerfield Operations Pty Ltd	Bendigo	39,770	58.8
Stawell Gold Mines Pty Ltd	Grampians	38,500	57.2
Maldon Resources Pty Ltd	Mt Alexander	1,640	2.0
Subtotal from top four mines		196,050	283.6
Other		2,337	3.3
Total production		198,387	286.9

Source: Earth Resources Regulation, DEDJTR (2016)

Note: Kilogram is not used when reporting gold production.

Other minerals

Gypsum, kaolin and feldspar are the other significant contributors to mineral production. Gypsum production, which fell by about 8 per cent in the 2010–11 financial year, rebounded in 2011–12, reporting a production increase of more than 117 per cent (from 289,528 cubic metres in 2010–11 to 630,258 cubic metres in 2011–12). Feldspar production went up by 27 per cent in the same time.

In relation to heavy minerals sands production, there was a very slight drop in the production of zircon (less than one per cent), a substantial rise in production of rutile and a drop of nearly half in the production of ilmenite. The overall value of heavy mineral sands production in 2011–12, however, was marginally higher than 2010–11.

Salt (sodium chloride) is produced from inland salinas (salt lakes and pans) in the Murray Basin of northwestern Victoria. Salt production in northwestern Victoria was first recorded in 1866 and has been reported from 25 locations.⁷³ The evaporation of seawater at Corio, near Geelong, was once the largest source of salt in Victoria, but all production is now restricted to the semi-arid Mallee and Wimmera. Deposits are in Quaternary salinas, the largest at Lake Tyrrell, near Ouyen. Salt is harvested both in its naturally occurring form, directly from the lake bed, and from specially prepared crystallising areas. Production from Lake Tyrrell has been supplemented by small intermittent production in the Mildura, Horsham and Kerang areas.

Oil and gas

Victoria's petroleum exploration and production is concentrated in the Otway and Gippsland basins. The Otway Basin (in Victoria and South Australia) was developed in the 1970s, a decade after the Gippsland Basin. The Gippsland Basin is offshore and now only in Commonwealth waters (beyond three nautical miles from the coast). The Otway Basin is predominantly offshore and also now in Commonwealth waters, with onshore (on land)

and inshore (coastal waters) resources being developed and decommissioned in the past. The number and type of current petroleum tenements are shown in table 5.28.

Liquid hydrocarbon resources include crude oil, condensate and liquefied petroleum gas. Total production from the Gippsland Basin as at 2014 was 26,089 petajoules, with a total of 2,964 petajoules remaining. In the Otway Basin, 23 petajoules have been produced with 65 petajoules remaining.⁷⁴

As at 2014, gas production has been 9,120 petajoules from the Gippsland Basin and 850 petajoules from the Otway Basin with 9,253 petajoules and 1,292 petajoules remaining respectively.⁷⁴

Two onshore exploration petroleum drilling activities (exploration wells) took place during 2011–12, one in each basin, taking the total wells drilled in both basins to 638 wells. One intersected a gas column. The other remained to be evaluated at the reporting date.

Table 5.28
Petroleum tenements at 30 June 2015

Type	Location	Number
Petroleum exploration permits	Onshore	11
	Offshore (Vic.)	3
Pipeline licences	Onshore	214
	Offshore (Vic.)	13
Petroleum production licences	Onshore	13
	Offshore (Vic.)	1
Petroleum retention leases	Onshore	3
	Offshore (Vic.)	1

Source: Earth Resources Regulation, DEDJTR (2016)

Unconventional gas

A new feature of the minerals and petroleum sector in Australia since 1988 is the development of unconventional gas: coal seam, shale and tight gas. Conventional gas is natural gas that is easier to access and extract. Coal seam gas (CSG) is extracted from coal deposits, or 'seams', at depths of 300–1000 metres underground.

Exploration for unconventional gas resources in Victoria started in the early 2000s. While tight gas has been found near Seaspray in Gippsland, the existence of coal seam or shale gas in Victoria is yet to be demonstrated. The parts of Victoria with the highest potential for unconventional gas are the Gippsland and Otway basins.

In August 2012, a moratorium was introduced on new onshore CSG exploration licences and all hydraulic fracturing activities. The moratorium was expanded in late 2013 to include all onshore gas exploration while water resource studies and focused community consultation were being undertaken. The Environment and Planning

Committee of Parliament has recently completed an inquiry into onshore unconventional gas in Victoria. The committee tabled its final report on 8 December 2015.⁷⁵ Additionally, the Victorian Auditor-General's Office tabled a report into Victoria's preparedness to effectively respond to potential impacts if an unconventional gas industry proceeds in Victoria.⁷⁶ The report concluded that Victoria is not as well placed as it could be to respond to the environmental and community risks and impacts that could arise if the moratorium is lifted allowing unconventional gas activities to proceed in the state.

Stone and gravel

Extractive industries provide the raw materials for building and construction. The industry operates quarries that produce a range of products, which are grouped into hard rock (e.g. basalt, granite, slate) and soft rock (e.g. soil, gravel, clay). Table 5.29 presents sales by rock type for 2014–15.

In 2014–15, 50 million tonnes of extractive industries products (including aggregate, road base, sand products, limestone products and clay products) were sold with the value of \$752 million.

In 2014–15, 993 quarries were operating in Victoria under the *Mineral Resources (Sustainable Development) Act 1990*, an increase from 884 in 2011–12. Before that, the number of quarries operating in Victoria had been stable since 2003–04. Numbers rose considerably between 2001–02 and 2003–04 because of the licensing of smaller pits in the state.

Of the 993 operating quarries, only 47 (5 per cent) occur on public land, covering only 1 per cent of the permitted land in Victoria.

Table 5.29
Victorian extractive industries production and sales for soft and hard rock (2014–2015)

Product group	Sales – volume (million tonnes)	Sales – value (\$ million)
Hard rock	31.5	513.0
Soft rock	18.5	239.3
Other/Aggregates	0.0	0.1
Grand total	50.0	752.4

Source: Earth Resources Regulation, DEDJTR (2016)

5.4.4 Water resources

The 2016 *Water for Victoria* discussion paper provides an overview of Victoria's water resources and current water management framework and institutional arrangements.²⁶ The following account of the history of water management is drawn from the discussion paper.

Management of Victoria's water resources has a unique history in Australia from early Aboriginal stewardship to the present time. During the 1800s Melbourne saw the construction of its first water supply system, the first irrigation system was established at Keilor, some regional centres were provided with reticulated water supplies and the state took control of water resources. In the 1900s massive irrigation and dam construction projects occurred and the formal sharing of the Murray water resources between states was established. In the 1970s and onwards, the environmental impacts of various water and sewage management approaches emerged and responsive and adaptive water management systems developed. In the late 1990s unprecedented drought conditions in south east Australia necessitated significant water conservation programs. During this period and into the 2000s water resources legislation, governance and management frameworks evolved further in response to increased demand, supply and sharing of finite water resources. The construction of the desalination plant in 2012 is the latest large scale water infrastructure project in the state to provide for additional potable water supply needs into the future.

Victoria's water allocation framework provides the basis for the management of Victoria's water resources. Under the *Water Act 1989*, the Victorian government retains the overall right to the use, flow and control of all surface water and groundwater on behalf of the community. Water is taken for consumptive purposes is done so under entitlements set out in the Act. DELWP oversees the statewide network of authorities which deliver water to:

- ✦ cities and towns for domestic consumption
- ✦ industry
- ✦ agriculture for irrigation and stock
- ✦ manage waste water
- ✦ keep rivers healthy.

Rainfall and water use vary significantly with seasons and weather patterns. For example, annual rainfall in 2013–14 was average or above-average across most of Victoria compared with widespread below average rainfall in 2012–13. Despite the higher rainfall, the dryer catchment conditions resulted in reduced annual streamflow volumes in approximately half the state's basins. At the same time, the total volume of water held in Victoria's major reservoirs during the year saw a small reduction, starting at 72 per cent of capacity and ending at 68 per cent of capacity, but

well above the driest years of the past decade (only 17 per cent of capacity at the end of 2008–09). Groundwater levels in 2013–14 were generally stable or rising. Recycled water availability was higher in 2013–14, partly due to the higher rainfall and subsequently higher volumes of water entering the wastewater treatment systems.

Water (surface and groundwater) and waterways are critical to sustaining populations of native plants and animals, providing opportunities for recreation, protecting cultural values, and supporting Victorian economic development through important industries such as tourism and agriculture.

Surface water

Surface water use in Victoria is regulated through systems whereby water shares give rise to water entitlements (a percentage of the available water) and an allocation of a volume of water. Surface water resources totalled 2,700 gigalitres in 2013–14⁷⁷ and a similar amount in 2014–15.⁷⁸ Of the 2,700 gigalitres, the majority (around 73 per cent) was used for irrigation; about 3 per cent was used by urban customers and about 24 per cent by the environment.

To achieve the most efficient use of surface water across Victoria, the regulated system also allows for water trading. A total of 2,694 gigalitres of allocation was traded in Victoria during 2014–15.⁷⁹ Most of this occurred in northern Victoria (2,673 gigalitres) with small amounts in southern Victoria (13 gigalitres) and western Victoria (8 gigalitres).

The role of the Victorian Environmental Water Holder (VEWH) is to ensure that environmental water entitlements are used to achieve the best environmental outcome with the available water, protecting the environmental values of Victoria's river systems and wetlands by identifying high priority watering actions. In 2013–14, VEWH oversaw the delivery of more than 809,000 megalitres of water to 66 river reaches and 79 wetlands, providing significant benefit to a wide range of water-dependent plants and animals. This water delivery was achieved fully or partially through natural river flows, river operations, or as a direct result of managed environmental releases.⁷⁸

Produce from Victoria's irrigation farming contributed around \$3.7 billion, or 28 per cent of the total gross value of irrigated agricultural production in Australia in 2012–13.⁸⁰

Groundwater

Like surface water, groundwater is allocated for commercial and irrigation purposes under strict licensing arrangements under the Water Act. Victoria's groundwater resources lie beneath all parts of the state and are contained in five major groundwater management basins (Goulburn–Murray, Wimmera–Mallee, Otway–Torquay, Central, and Gippsland), with each basin having several groundwater catchments. The location of aquifers is independent of surface water basins; some aquifers extend beneath several basins.

The groundwater resource varies in size and volume across Victoria, but the water is not always usable. Its potential for use generally depends on salinity and how much water can be extracted (aquifer yield).

Factors influencing development of the resource include the depth to groundwater, groundwater quality and salinity, groundwater accessibility and whether the industry or user (e.g. irrigation, urban, stock) is reliant on groundwater.

Groundwater is used by many industries and is becoming increasingly valuable as water becomes scarcer. Approximately 60 per cent of groundwater is used for irrigation, with a further 39 per cent used for commercial, dairy, urban and stock and domestic uses. Groundwater is also critical for ecological needs, such as groundwater-dependent ecosystems and for stream recharge and healthy waterways.

At March 2014, 85 per cent of the state's licensed entitlement is within areas covered by a groundwater management plan, bulk entitlement or large-scale licence. The plans are reported on annually. Information on groundwater use and trends is also provided in the annual Victorian Water Accounts.⁷⁸

The total volume of groundwater licences traded during 2014–15 was higher than the previous year (17 gigalitres compared to 15 gigalitres of temporary trade; and 9 gigalitres compared to 4 gigalitres of permanent trade). The largest market existed in northern Victoria where about half the trades occurred. Excluding the \$0 price trades (75 per cent of trades), the median price of groundwater licence trade was \$50/megalitre for temporary trade and \$600/megalitre for permanent trade.⁷⁹

Groundwater contributed to the figure given above of around \$3.7 billion in produce from Victoria's irrigation areas in 2012–13.

5.4.5 Carbon sequestration

Carbon sequestration is the capture and long-term storage of carbon dioxide. Sequestration methods include enhancing the storage of carbon in soil and in forests

and other vegetation, or storing carbon in underground geological formations (geosequestration).

Coastal ecosystems are also effective as carbon sinks. Blue carbon refers to the carbon sequestered in vegetated coastal ecosystems, specifically mangrove forests, seagrass beds, and saltmarshes. The storage of carbon and the offsetting of atmospheric carbon emissions is an important ecosystem service provided by coastal ecosystems.⁸¹

Carbon sequestration is in its infancy, with a trial located in the south-west of the state, the CO2CRC Otway Project. Technology innovation could see depleted oil and gas wells used for carbon sequestration. During the first stage of the Otway project, over 65,000 tonnes of naturally occurring carbon dioxide-rich gas was produced and compressed, transported two kilometres by pipeline and injected into a depleted gas reservoir.⁸²

As a use of public land, carbon sequestration was not envisaged in the LCC's 1988 report, nor is it reflected in the current system of public land use categories.

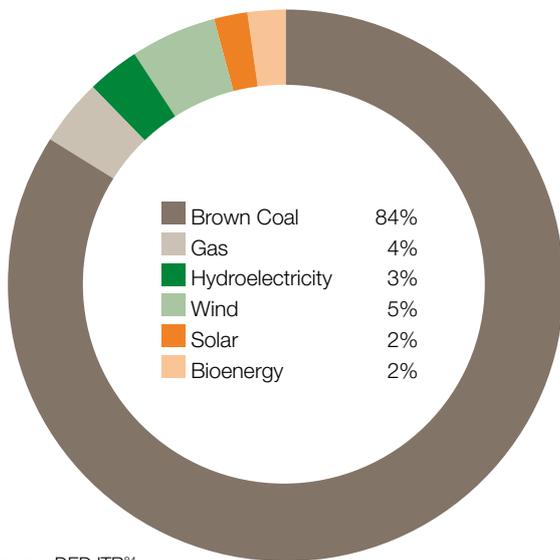
Victoria's *Climate Change Act 2010* recognised the value of sequestered carbon on Victoria's public land and established clear rules under which Crown land can be managed and used for carbon sequestration purposes. The Victorian government may manage its own land or make arrangements with third parties, based on a new instrument known as carbon sequestration agreements. The Crown Land (Reserves) Act was amended in 2010 to provide for a new purpose of reservation — 'carbon sequestration in vegetation and soil'.

In terms of mitigating the effects of climate change by sequestering carbon in forests, the most effective strategy is considered to be protecting existing native forest (with its large stores of carbon locked up in trees), followed by restoring degraded native forest and replanting.⁸³

5.4.6 Renewable energy

Victoria is considered to have an abundance of renewable energy resources, ready access to markets, and an effective operating environment. The Victorian government released its roadmap for renewable energy in August 2015.⁸⁴ Currently Victoria produces 12 per cent of its energy from sustainable sources, an increase from 6 per cent in 2009 (see figure 5.10). The roadmap is intended to provide a framework to further incentivise the growth of renewable energy in Victoria. In June 2016, the state government announced it would aim to produce at least 25 per cent of the state's electricity generation from renewable sources by 2020 and 40 per cent by 2025.

Figure 5.10
Electricity generation mix in Victoria 2014



Source: DEDJTR⁸⁴

Geothermal energy is derived from naturally occurring heat within hot rocks and water reservoirs below the earth's surface. Heat in the ground can be used to directly heat and cool via heat exchangers. Hot water can be directly used for spa tourism as well as industrial, agricultural and aquaculture production.

Very hot water can also be converted into electricity, however, this is generally only economically viable with an active volcanic system that creates large volumes of super-hot water. Victoria's geothermal energy resources are virtually untouched, but with further exploration and improved technology this industry has potential for growth and investment.

Geothermal energy exploration is at an early stage in Victoria. From 2007–2009, following the creation of the *Geothermal Energy Act 2005*, much of the state was taken up for exploration by five companies. From 2010 to 2015 the Victorian government undertook the Geothermal Atlas project to better understand the geothermal potential of the state. A significant amount of basic rock property data and borehole temperature logging was collected and compiled by the Geological Survey of Victoria.⁸⁵

In 2011–12, there were 16 current geothermal exploration permits and private expenditure for the year was approximately \$3 million.

Wind energy has the potential to provide a significant proportion of Victoria's growth in renewable energy generation over the next coming years. Victoria currently has approximately 950 megawatts of operating wind power generation (from 450 wind turbines). An additional 2,600 megawatts (from a further 590 wind turbines) has been approved but is not operational.⁸⁶

A number of wave energy projects are proposed for waters west of Cape Otway, with potential of 20-30 kilowatts/metre.

The Port Fairy Pilot Wave Energy Project involves installation and ocean-testing of a pilot bioWAVE unit, which consists of a 26 metre high steel structure that sways back and forth, largely below the surface of the ocean, through an arc of up to 40 degrees. The pilot project, with funding from both the Victorian and Commonwealth governments, is designed to test this patented technology in the high wave energy environment of the Southern Ocean. It has received funding from both the Victorian and Commonwealth governments.⁸⁷

The bioWAVE pilot was installed in December 2015, and once commissioned, is expected to operate for a 12 month period before being decommissioned. Periodic maintenance and testing will be carried out during the operating period, in order to assess performance.

5.4.7 Licensed uses and leases of Crown land

Using public land for other purposes is generally managed through licences (which provide non-exclusive use over an area or provide for commercial or non-commercial activity) or leases (which grant an exclusive right to occupy a defined area of land). Licences and leases are covered by legislation, including the *Crown Land (Reserves) Act 1978*, *Forests Act 1958*, *Land Act 1958*, *National Parks Act 1975* and *Pipelines Act 2005* (and occasionally by more than one of these Acts).

Table 5.30 summarises the number of and revenue from licences or leases under each Act. Some 45,540 licences and leases are on issue, with a 2015–16 invoiced amount of nearly \$8.3 million. Most licences are issued under the Land Act, with an invoiced amount of \$5.95 million.

Table 5.30
Summary of leases and licences on public land, the number of tenures and associated revenue by Act

Act	Number of tenures	Annual invoiced revenue 2015–16 (\$ exc GST) ^A
Crown Land (Reserves) Act	240	716,835
Forests Act	2,768	1,457,515
Land Act	41,340	5,944,642
National Parks Act	1,082	88,911
Pipelines Act	15	40,432
Water Act	29	3,212
Miscellaneous	65	18,008
Total	45,539	8,269,554

Source: DELWP (2016)

^A Generally, the duration of licences is 1–10 years and for leases, periods of up to 21 years. Therefore, depending on the frequency of invoicing, revenue varies from year to year.

Licences and leases for unused roads, water frontage and apiary-related uses are the most numerous, accounting for 53 per cent, 22 per cent and 9 per cent of the number of licences respectively. However, they account for 8.5 per cent, less than 1 per cent and 3.5 per cent of the total licence and lease fees, respectively.

The seven plantation leases are the most valuable to the Victorian government for a single tenure type, followed by section 134 leases and stratum leases (for air above land and land beneath the surface) under the Land Act. Section 134 leases cover a range of uses, e.g. ferry terminals, fish producers, salt manufacture, waste containment and recreational uses.

Radio, television and telecommunication site licences/leases and section 134 leases provide the greatest revenue as a group.

Average fees tend to be higher for commercial licences and leases than for non-commercial uses. Local rural agricultural uses, such as apiary, grazing and water frontage uses incur the lowest average fees. Community and local uses, such as emergency services, surf lifesaving, scout and/or guide licences and leases also incur lower average fees.

The current descriptions and permissible uses under current licences and leases are more an artefact of history than a system of management. The description, and therefore the authorised uses, is often difficult to understand. Some uses fall under different descriptions and differences between the various Acts mean that different conditions can be attached to similar uses.

Appendix 13 provides data on the different types of licences or leases issued, their numbers and aggregate revenue. The following sections outline lease and licence information for a number of activities that have not already been covered separately earlier in this chapter.

Unused roads

Unused roads were part of the original settlement of Victoria, permitting future access to allotments but were either never made or are no longer used as roads. They typically abut or bisect agricultural land and are usually licensed to adjacent landowners under the Land Act. The unused roads are either fenced and managed as a native vegetation buffer, cultivated or set aside for conservation.

In 2015–16, there were 24,296 unused road licences with an invoiced revenue of about \$705,000.

River and stream frontages

Of an estimated 85,000 kilometres of rivers and creeks in Victoria with 170,000 kilometres of frontage, about 30,000 kilometres have Crown frontages. About 22,000 kilometres of the Crown frontages are within cleared catchments, while the remaining 8,000 kilometres are in larger public land blocks such as parks and state forests. Crown frontage can vary from a few metres wide to kilometres wide, with the average width being about 20 to 40 metres. The total area of Crown frontage in the state is estimated at about 100,000 hectares, which is 0.4 per cent of the state and 1.1 per cent of the total public land estate.⁸⁸

At present, about 17,000 kilometres of the 22,000 kilometres of Crown frontages within cleared catchments are managed by the adjacent landholder under about 9,300 water frontage licences. Most of the licences are for grazing purposes, with a small and diminishing number for the cultivation of crops. These licences are typically renewed every five years, with the next renewal scheduled for October 2019. There are some 10,000 licences which generated invoiced revenue of approximately \$135,000 in 2015–16. The licence fee is calculated on the productive value of the land and discounted based on weed management and other obligations on the licensee.⁸⁸

There are costs associated with grazing of water frontages. Unrestricted stock access to rivers is the principal cause of river degradation and damage to public land water frontages. Since 1988 there has been increased recognition of the environmental values of riparian land and substantial changes in the management of grazing on water frontages. Water frontage licences were traditionally issued for grazing but are now also issued for riparian management to recognise that all or part of the frontage is being managed to protect and improve the riparian environment. In 2015–16 there were 928 riparian management licences, providing annual invoiced revenue to the state of about \$4,160.

Utilities

A variety of pipeline licences are associated with the supply and use of petroleum and water, where public land is the only path for efficient transportation. Examples include the pipelines from the Bass Strait gas fields to the Longford gas plant and the Geelong and Altona refineries, and water supply pipelines in rural areas.

Likewise, a variety of telecommunication (phone, television, radio) licences ensure emergency communications and statewide telephone, television and radio coverage.

In 2015–16, there were 15 pipeline licences, 298 telecommunications licences and 1500 miscellaneous licences issued, providing annual invoiced revenue to the state of about \$2.75 million.

Commercial

A variety of commercial, industrial and business-related licences and leases are issued for public land. In 2015–16 they numbered 650, providing annual invoiced revenue to the state of about \$2 million.

Unauthorised uses

Encroachment onto or annexation of public land occurs when an adjacent private landholder or occupier advances private land use activity into the abutting public land without authorisation.

Approximately 5,000 kilometres of the 22,000 kilometres of Crown frontage are unlicensed, but still used by the adjoining landholder, typically for grazing. This is known as ‘unlicensed occupation’ or ‘unauthorised occupation’. Often this occurs because the landholder is unaware that the riparian land is Crown frontage or because the licence was not transferred when a change in ownership occurred. Encroachment may also occur where stream patterns change, where new riverflats and then stream frontages become incorporated in adjacent property.

It is an ongoing public land management task to address these occupied unlicensed frontages through appropriate management, such as fencing and revegetation, particularly in priority areas and priority waterways. Following these actions, the occupation ceases and a licence is not required or issued.

Over the years there has also been strong public objection to several cases of encroachment of private occupations onto coastal foreshore, bushland reserves and parks. For example, Bass Coast Shire undertook a survey of the Cowes, Ventnor and Silverleaves areas of Phillip Island in 2011, noting removal of native vegetation and incursions of mown lawn, garden, outdoor furniture and sheds into coastal foreshore.⁸⁹ High profile instances of the removal of native vegetation and construction of fences, sheds and swimming pools have gained media attention in nearby Mornington Peninsula Shire. Removal of native vegetation to enhance views of the coast has also attracted media attention in bayside suburbs and rural towns along the coast. In the past, huts, shacks, residences and more have been constructed without permission on a variety of public lands.

5.5 Utilities and government services

Key points at a glance

- Public land supports public utilities and essential services such as transport, energy, water and sewerage, telecommunications and government services (health, education, justice, cemeteries).
- A total of about 660,000 hectares of public land is categorised as services and utilities area, including more than 600,000 hectares of road reserves (7 per cent of terrestrial public land).
- Linear road and rail reserves have significant biodiversity values and reserves and make a major contribution to ecological connectivity.
- Land used primarily for utilities and services often have significant secondary uses, particularly nature conservation and recreation.

Since the LCC's statewide assessment in 1988, public utilities and essential services such as electricity, gas and water supply and services such as transport (road, rail, ports) have been corporatised and in some cases privatised.

Infrastructure and facilities associated with these activities are significant users of public land. In addition, many other functions of government utilise public land, including schools, hospitals, cemeteries, correctional services, and government administration.

Installations associated with some of these activities—pylons, towers, pipelines, masts and beacons—may have considerable visual impact, and their siting and design is sometimes controversial.

Utilities and government services for the purposes of this section of the discussion paper include:

- ✦ transport (roads, railway, ports)
- ✦ water supply, drainage and sewerage
- ✦ waste disposal (domestic and industrial)
- ✦ energy (electricity and gas supply)
- ✦ communications
- ✦ health and human services (hospitals, nursing homes, public housing, cemeteries)
- ✦ education (schools and other institutions)
- ✦ justice and correctional services such as courts, police stations and prisons
- ✦ emergency services
- ✦ survey and navigational aids
- ✦ government administration (offices, depots).

A distinction is made between buildings and facilities used for community purposes, discussed earlier in this chapter in section 5.3.5, and those used to provide government services. Public offices and buildings that deliver a government or public service are not generally available for other wider community access. Public buildings used by the community in cities and towns include public halls, tourist information centres, community centres, galleries, museums, exhibition centres and libraries.

The LCC, ECC and VEAC have made recommendations for areas throughout the state to be set aside specifically for services and utilities functions, many of which have been reserved for a variety of government administrative purposes since the nineteenth century. Recommendations usually specified that existing reserves and easements used for public services and utilities such as transport, electricity and gas, communications, cemeteries, water and sewerage, continue to be used for those purposes. Many of the specific purposes of reservation in section 4 of the Crown Land (Reserves) Act relate to utilities and

government services such as ‘ports, quays, wharves, docks and landing places’, prisons and reformatories’, ‘drainage and sewerage works’, ‘hospitals and institutions ...’and so on.

Other infrastructure associated with utilities occupy small areas of public land in other land use categories under a variety of leases and licences (see section 5.4.7).

Government-accepted recommendations for specific services and utilities areas cover approximately 660,000 hectares including about 600,000 hectares of roads and road reserves.

Some services and utilities areas have secondary uses, primarily nature conservation and, where practical and safe, recreation. For example, recreation trails are often constructed along easements, pipelines or roadsides, and many of Melbourne Water’s 200 retarding basins are used for recreation.

Some of the major services and utilities areas and users are briefly described below.

Roads and railways

The primary purpose of road and rail reserves is to provide access for the transport of people and goods. Often road and rail reserves also contain important infrastructure such as water and gas pipelines, and telecommunications and power poles. Accordingly, ongoing management of road and rail reserves is primarily for public safety, use and maintenance activities associated with transport and utilities.

VEAC’s Remnant Native Vegetation Investigation (2011) found that road reserves (both used and unused) and rail reserves support a significant proportion of the remnant native vegetation in fragmented landscapes. The investigation revealed that these linear reserves make a major contribution to ecological connectivity and, in some landscapes, provide key habitat for many species. VEAC made a number of recommendations to maintain and enhance the contribution made these linear strips, while recognising their primary transport role. In addition, a comprehensive inventory was recommended for used and unused road and rail reserves.

Road reserves form an extensive network across Victoria. Land set aside for roads is mostly Crown land resulting from reservation at the time of land survey for European settlement of Victoria, but also includes some land purchased by VicRoads for specific road construction projects. The width of road reserves varies from one chain (20.1 metres) to three chains depending on their original intended use. In some places, road and railway reserves are five chains wide (100.6 metres).

Unused road reserves are found throughout Victoria wherever land has been surveyed for settlement. As part

of nineteenth-century land-use planning, an extensive network of linear reserves was surveyed and set aside for future roads. Where settlement did not eventuate, roads were never built on many of these reserves, and others that were built may have fallen into disuse as public roads. There are estimated to be about 122,000 hectares of these unused road reserves in Victoria.

Road reserves (used and unused) are estimated at 601,540 hectares or approximately 7 per cent of terrestrial public land in Victoria.

The management and maintenance of Victorian road reserves is shared primarily between local councils, VicRoads, DELWP and Parks Victoria, Transurban and ConnectEast depending on the type of road.

The rail network is made up of railways in use and unused railways with closed tracks. The former includes the extensive metropolitan network, rural transport service (V/Line) and freight service lines that do not carry passengers. Together with roads, railways are integral to the Victorian economy providing for the movement of people, freight and services. Historically, rail transport played a critical role in the growth of Victoria’s economy; however, rail’s significance relative to road transport has decreased in recent decades as the road network has improved. Several rail lines were closed during the 1980s and 1990s and some of these decommissioned lines have remained as public land with rail trails for recreational use or as bushland reserves where natural values have been identified. Significant native vegetation is often associated with rail reserves.

The cumulative length of rail reserve is approximately 7,600 kilometres. About 4,400 kilometres remains in use for rail transport and about 1,000 kilometres is now used as recreational rail trails. Of the remaining 2,200 kilometres, some is retained in public ownership as either Crown land or VicTrack freehold and some has been sold.

VicTrack is the responsible authority for rail reserves which are mostly either Crown land—which may or may not be vested in VicTrack—or VicTrack freehold land (public land under the VEAC Act). VicTrack leases some of this land and various other assets to numerous parties including V/Line, community groups, local councils and farmers.

Ports

Victoria has four commercial ports—Melbourne, Geelong, Hastings and Portland. The Ports of Geelong and Portland were privatised in the mid 1990s, and the Port of Melbourne is currently in the process of being privatised through a 50-year lease.

There are fourteen state-owned local ports between Portland Bay in the west and Mallacoota in the east managed by eight local port managers including local

councils, committees of management and Parks Victoria (in Port Phillip Bay and Western Port, and Port Campbell). Local ports provide services to the commercial fishing industry and recreational fishing and boating, as well as hosting facilities such as slipways and fish processing. Local ports are important tourism destinations and service a wide range of users. They play a key social and economic role in local communities.

Water and sewerage

Water and sewerage services areas comprise water or sewage pipes, channels, or other infrastructure used to convey water or sewage. Public land in this sub-category also includes storages that are part of the reticulation system, storages of water not used for domestic consumption, drainage or flood-protection channels or structures, and sewage treatment or disposal infrastructure.

Sewage treatment plants may have significant biodiversity values, such as Melbourne Water's Western Treatment Plant at Werribee which is one of Australia's most important wetlands for waterbirds, and internationally listed under the Ramsar Convention.

Telecommunications infrastructure

Rapid technological change means that mobile phone network infrastructure, for example, is being built at a rapid rate to deliver new telecommunications services to an increasingly large customer base.

Statutory responsibility for telecommunication networks throughout Australia resides with the Australian government. Installation of freestanding mobile phone towers must also comply with relevant state planning laws. Sites for these structures are favoured on the basis of their elevation and absence of physical barriers to communication frequencies. Consequently, most communication towers or structures are built on prominent hills or high points. Reliable road access and the availability of power to these sites are also important siting factors. Many communication towers and dishes across Victoria are either located on public land or require access across public land.

Electricity and gas

Until the 1990s, Victoria's gas and electricity industries were managed by government-owned monopolies: the State Electricity Commission of Victoria (SECV) and the Gas and Fuel Corporation of Victoria. Gas and electricity utilities were therefore important considerations for the services and utilities public land use category. Freehold land purchased by these state-owned entities for their systems and infrastructure was public land for the purposes of the LCC and ECC investigations.

Victorian electricity generation and supply was restructured in the 1990s along with most of the Australian electricity industry. From 1994 the state government-owned SECV was vertically and horizontally disaggregated, with the disaggregated assets subsequently privatised. Similarly, the Gas and Fuel Corporation was disaggregated and the disaggregated distribution, retail and transmission companies subsequently privatised.

Under these business arrangements the government's role changed from directly owning and managing energy businesses on behalf of the community to one of setting policy objectives and managing the statutory framework governing the energy market. Today, Victoria's energy industry is largely privately owned and operated.

Victoria's 6,500 kilometre high voltage electricity transmission system is owned and maintained by AusNet Services and services all electricity consumers across Victoria.

The corridors of land upon which AusNet Services' network is built are referred to as 'transmission line easements'. More than 17,500 hectares of easements secure a right of way for the safe transmission of power. In most cases AusNet Services does not own the easement land. Ownership of the land remains with the landowner with the easement also allowing access for field crews to maintain the network. Under the easement right AusNet Services may limit the type and scope of activities on the easement, including restriction on what is grown or built on it including easements on public land.

Victoria's 1,900 kilometre Principal Transmission System (PTS) covering Melbourne and central Victoria, is owned by GasNet. The majority of gas is supplied from the Longford facility in the Gippsland basin, with storage facilities that help meet demand during peak demand periods.

As well as the PTS, other gas transmission networks in Victoria include the Eastern Gas Pipeline that transports natural gas from Longford to Sydney, the SEA Gas pipeline from Western Victoria to Adelaide, and the Longford – Tasmania Gas Pipeline.

The primary function of GasNet's infrastructure is to transport gas from Esso's Longford treatment plant in southeast Victoria (which processes gas from offshore Bass Strait gas fields) and from the onshore Otway Basin to areas across Victoria as well as into parts of NSW.

The decade of the 1990s saw a considerable restructuring of the Australian electricity supply sector. Prior to the 1990s, state government-owned authorities dominated the industry. These authorities controlled the generation, transmission, distribution and retail

of electricity. They also carried out general regulatory functions and in some cases even the extraction of raw materials for fuel generation. Since 1991, the industry has been broken up into its constituent parts; a national wholesale market for electricity was created, competition was introduced to the electricity generation sector and to the retailing of electricity. In Victoria, not only was the government-owned State Electricity Commission of Victoria (SECV), which had been responsible for nearly all aspects of the electricity supply industry, broken up by the Victorian Government, but its various constituent parts were subsequently privatised.

Cemeteries

Victoria's religious and secular burial and memorial sites are public cemeteries which are managed by more than 500 cemetery trusts under the *Cemeteries and Crematoria Act 2003*. Cemetery trusts fall under the responsibilities of Department of Health and Human Services. Today, Victoria's cemetery trusts range from small rural trusts that may perform one or two burials a year to large enterprises which manage substantial investment funds.

Some cemeteries, especially those that are smaller and located in areas of declining population, contain areas of relatively undisturbed native vegetation and may be important for the preservation of some plant species or communities, particularly grasslands.

Acronyms

BCS	Bioregional Conservation Status
CAPAD	Collaborative Australian Protected Area Database
CAR	Comprehensive, adequate and representative (relating to protected areas)
CBD	Convention on Biological Diversity
CRG	Community Reference Group
DEDJTR	Department of Economic Development, Jobs, Transport and Resources
DELWP	Department of Environment, Land, Water and Planning
DEPI	Department of Environment and Primary Industries
ECC	Environment Conservation Council
EVC	Ecological Vegetation Class
GIS	Geographic Information System
GMA	Game Management Authority
IBRA	Interim Biogeographic Regionalisation for Australia
IMCRA	Integrated Marine and Coastal Regionalisation of Australia
IUCN	International Union for Conservation of Nature
LCC	Land Conservation Council
MAB	Man and the Biosphere Programme
NES	National Environmental Significance
NRS	National Reserve System
NRSMPA	National Representative System of Marine Protected Areas
TOLMA	Traditional Owner Land Management Agreement
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VEAC	Victorian Environmental Assessment Council
VEWH	Victorian Environmental Water Holder
VPC	Victorian Plantations Corporation

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Appendix 1

Submissions received in response to the Notice of Investigation

Organisations
Anderson Inlet Landcare
Anglesea, Aireys Inlet Society for the Protection of Flora and Fauna (ANGAIR)
Barwon Coast Committee of Management Inc.
BirdLife Australia Victoria Group
Bushwalking Victoria
Environment Victoria
Friends of Banyule
Friends of Somers Foreshore Inc.
Geelong Environment Council
Glen Eira Environment Group Inc.
Glen Eira Residents Association Inc.
Goulburn Broken Catchment Management Authority
Gunbower Landcare Inc.
Hamilton Field Naturalists Club
Kingston Residents Association
Mansfield Shire Council
Melbourne Water
Mid-Loddon Sub-Catchment Management Group
Mid-Murray Field Naturalists Inc.
Mordialloc Beaumaris Conservation League Inc.
North East Catchment Management Authority
Port Phillip Conservation Council Inc.
Prospectors and Miners Association of Victoria Inc.
The Public Land Consultancy
South West Anglers Association Inc.
Strathbogie Ranges Conservation Management Network
Trust for Nature
Unnamed, Concerned residents - Wedderburn
Victorian Aboriginal Heritage Council
Victorian Association of Forest Industries
Victorian Coastal Council
Victorian Farmers Federation
Victorian National Parks Association
Warringal Conservation Society
Wellsford Forest Conservation Alliance
Western Coastal Board
The Wilderness Society Victoria Inc.
Wyndham City Council

Individuals
Margaret Blakers
Dr John Cooke
Caroline Copley
Nina Earl
Chris Hosking
Judith Irvin
Mr Russell Lynch
Dr Geoff Mosley
Bruce Pingo
Mr Tony Smith
Mr Norm Stimson
Jim Walker
Alison Walpole

Appendix 2

Datasets for Victorian area calculations

VMINDEX.FR_FRAMEWORK_AREA_POLY
MARINE1.AMB_COASTAL_WATERS_STATES_POLY

Source: DEWLP corporate digital dataset – short metadata

Resource Name:	FR_FRAMEWORK_AREA_POLYGON
Title:	Framework (Polygon) 1:25,000 - Vicmap Index
Anzlic Id:	ANZVIO803002895
Custodial Program:	Information Services Division (DELWP)
Custodian:	Department of Environment, Land, Water & Planning
Abstract:	This layer represents polygons for the state boundary, zero contour, coastline and the data extent for Vicmap Elevation & Vicmap Features, Vicmap Hydro, Vicmap Transport.
Search Words:	LAND Topography
Nominal Input Scale:	1:25,000
Currency Date:	01 June 2015
Dataset Status:	Completed
Positional Accuracy:	The planimetric accuracy attainable will be the sum of errors from three sources: the positional accuracy of the source material, errors due to the conversion process, errors due to the manipulation process. For topographic base derived data this represents an error of 8.3m on the ground for 1:25,000 data. A conservative estimate of 10m for the standard deviation will be used in any data quality information. Alternate and equal ways of expressing this error are: not more than 10% of well-defined points will be in error by more than 16 m. The worst case error for the data is +/- 30 m. For vertical positional accuracy of points determined from contours there is an expectation that the elevation accuracy (standard deviation) will be half the value of the contour interval.
Attribute Accuracy:	99%
Logical Consistency:	The allowable error in attribute accuracy ranges between 1% to 5% error. Logical consistency is a measure of the degree to which data complies with the technical specification. The test procedures are a mixture of scripts, microstation MGE program and on-screen visual checks.
Data Source:	The line work and points were derived from the Vicmap Digital Topographic (VDT) map base coordinated by LIG. VDT evolved from Victoria's printed 1:25,000 Topographic Map Series program together with the need to supply a control framework for the creation of the rural Digital Cadastral Mapbase. The capture scale is 1:25,000 Statewide and the coverage, except for minor border issues is also statewide.

Appendix 3

Current Victorian land use categories and links to the legislated reservation system

VEAC land use category and sub-category	Legislative basis	Legislated purpose(s)
Terrestrial		
1. National park	<i>National Parks Act 1975</i> Schedule 2	<p>preserve and protect in its natural condition for the use, enjoyment and education of the public</p> <p>preserve and protect indigenous flora and fauna in the park</p> <p>preserve and protect wilderness areas in the park and features in the park of scenic, archaeological, ecological, geological, historic or other scientific interest</p>
2. State park	National Parks Act Sch 2B	<p>preserve and protect in its natural condition for the use, enjoyment and education of the public</p> <p>preserve and protect indigenous flora and fauna in the park</p> <p>preserve and protect wilderness areas in the park and features in the park of scenic, archaeological, ecological, geological, historic or other scientific interest</p>
3. Wilderness park	National Parks Act Sch 2A	<p>preserve and protect the natural environment including indigenous flora and fauna and features of ecological, geological or scenic significance; and features of archaeological or historic significance; and features of scientific significance</p> <p>provide opportunities for solitude and appropriate self-reliant recreation</p>
4. National heritage park	<i>Crown Land (Reserves) Act 1978</i> incl Part 2 of the Fifth Schedule National Parks Act Sch 4	the protection of cultural and natural heritage
5. Other park (conservation)	National Parks Act Sch 3	<p>preserve, protect and re-establish indigenous flora and fauna</p> <p>preserve and protect features in the park of scenic, archaeological, ecological, geological, historic or other scientific interest</p> <p>enable the park to be used by the public for the enjoyment, observation and</p> <p>enable public use for enjoyment, observation and study of the countryside and its pursuits, its flora and fauna, its ecology and geology and other features</p>
Coastal park		as above
NPA Schedule 3 Park		as above
6. Regional park	<i>Crown Land (Reserves) Act</i> incl Part 4A of the Fifth Schedule National Parks Act Sch 3 <i>Forests Act 1958</i> Section 50	<p>(a) to provide opportunities for informal recreation associated with the enjoyment of natural or semi-natural surroundings; and</p> <p>(b) to protect and conserve biodiversity, natural and cultural features and water supply catchments; and</p> <p>(c) for minor resource use that is not inconsistent with paragraphs (a) and (b)</p>
Metropolitan park	<i>Crown Land (Reserves) Act</i> Section 4	public park

VEAC land use category and sub-category	Legislative basis	Legislated purpose(s)
Terrestrial		
7. Nature conservation reserve	Crown Land (Reserves) Act Section 4 (l), (m), (n), (o) Part 1 of Sch 5 National Parks Act Sch 3 and 4 (Langwarrin Flora and Fauna Reserve and Deep Lead Nature Conservation Reserve) <i>Wildlife Act 1975</i> Section 16	the preservation of areas of ecological significance the conservation of areas of natural interest or beauty or of scientific historic or archaeological interest the preservation of species of native plants the propagation or management of wildlife or the preservation of wildlife habitat
8. Coastal reserve	Crown Land (Reserves) Act Section 4 (x), (ze)	areas for public recreation including areas for camping protection of the coastline
9. Historic and cultural features reserve	Crown Land (Reserves) Act Section 4 (m) a Division of Part 4 of the Fifth Schedule	the conservation of areas of natural interest or beauty or of scientific historic or archaeological interest for public purposes, being in particular, the purposes of the protection of historic and cultural features
10. Natural features reserve	Crown Land (Reserves) Act Section 4 (m) and Part 3 of Sch 5	the conservation of areas of natural interest or beauty or of scientific historic or archaeological interest
Cave	section 4 (m)	as above
Natural and scenic features area	section 4 (m)	as above
Geological & geomorphological features area	section 4 (m)	as above
Wildlife area	Crown Land (Reserves) Act Section 4 (l), (m), (n), (o) and <i>Wildlife Act</i> Section 16	the propagation or management of wildlife or the preservation of wildlife habitat
Streamside area		
Stream frontage, bed and banks	Crown Land (Reserves) Act Section 4 (e)	the protection of the beds or channels and the banks of waterways
Bushland area	Crown Land (Reserves) Act Section 4 (m)	
Lake	Crown Land (Reserves) Act Section 4 (e)	protection of the bed and banks of a lake
Highway park		
Mineral spring	Crown Land (Reserves) Act Section 4 (k)	mineral springs

Appendix 3 (continued)

Current Victorian land use categories and links to the legislated reservation system

VEAC land use category and sub-category	Legislative basis	Legislated purpose(s)
Terrestrial		
11. Water production area	Crown Land (Reserves) Act Section 4 (d) a Division of Part 6 of the Fifth Schedule	watersheds and gathering grounds for water supply purposes, the supply and distribution of water and works associated therewith including reservoirs aqueducts pipelines channels and waterways public purposes being, in particular, water supply purposes
Water distribution and drainage		
12. Community use area	Crown Land (Reserves) Act Section 4	
Education area	Section 4 (p)	pre-school centres, State schools and other institutions of public instruction and areas and facilities for the study of the natural environment
Recreation area	Section 4 (za), (j), (x)	show-grounds and race-courses public baths and swimming pools areas for public recreation including areas for camping
Recreation trail		
Shooting range		
Parkland and garden	Section 4 (w), (zf)	public parks gardens and ornamental plantations zoological parks
Building in public use	Section 4 (p), (z)	pre-school centres, State schools and other institutions of public instruction and areas and facilities for the study of the natural environment Buildings in public use including halls libraries museums galleries and war memorials facilities and services for tourists or for the promotion of tourism
13. Alpine resort	Crown Land (Reserves) Act Section 4 (v)	alpine resorts
14. Forest park	Crown Land (Reserves) Act Division of Part 7 of the Fifth Schedule is deemed to be permanently reserved under Section 4	(a) providing opportunities for informal recreation associated with the enjoyment of natural surroundings; (b) protecting and conserving biodiversity, natural and cultural features and water supply catchments; (c) supplying a limited range of natural resource products
15. State forest	<i>Forests Act 1958</i> (reserved forest) <i>Land Act 1958</i> (unreserved Crown land)	not specified
16. Plantation	Crown Land (Reserves) Act Section 4 (t), (ma)	the growth preservation and supply of timber including Government school forest plantations carbon sequestration in vegetation and soil
School plantation	Section 4 (t)	

VEAC land use category and sub-category	Legislative basis	Legislated purpose(s)
Terrestrial		
17. Earth resources		
Mining area		
Stone reserve	Section 4 (u)	the supply of sand gravel stone and other materials for the construction of public roads buildings and other works
Coal production		
18. Services and utilities area	Crown Land (Reserves) Act	
Transport	Section 4 (a), (b), (c)	ports quays wharves docks and landing places roads car-parks tramways and railways aerodromes and landing grounds for aircraft
Electricity and gas		
Communications, survey and navigation		
Municipal buildings and services	Section 4 (j), (r)	municipal buildings and store-yards public buildings including offices halls libraries museums galleries and war memorials
Hospitals, public offices and justice	Section 4 (q), (r), (y),(zc), (zd)	prisons and reformatories public buildings including offices halls libraries museums galleries and war memorials the purposes of health and social welfare hospitals and institutions or services for any other purposes administered by the Minister administering the <i>Health Services Act 1988</i> or conducted by committees registered under the <i>Hospitals and Charities Act 1958</i> bush nursing centres
Water and sewerage services	Section 4 (f)	drainage and sewerage works
Cemetery	Section 4 (zb)	cemeteries and crematoria
19. Uncategorised public land	<i>Land Act 1958</i>	May be unreserved or reserved for an obsolete purpose
Revegetation area		
20. Land not required for public purposes		

Appendix 3 (continued)

Current Victorian land use categories and links to the legislated reservation system

VEAC land use category and sub-category	Legislative basis	Legislated purpose(s)
Marine		
1. Marine national park	National Parks Act Sch 7	<p>preserve and protect the natural environment and indigenous flora and fauna of the park and any features of the park which are of geological, geomorphological, ecological, scenic, archaeological, historic or other scientific interest; and</p> <p>promote the prevention of the introduction of exotic flora and fauna into the park; and</p> <p>provide for the eradication or control of exotic flora and fauna found in the park; and</p> <p>provide for the use, enjoyment and understanding of marine national parks and marine sanctuaries by the public; and</p> <p>promote an understanding of the purpose and significance of marine national parks and marine sanctuaries</p>
2. Marine sanctuary	National Parks Act Sch 8	as above
3. Multiple-use marine protected area	Crown Land (Reserves) Act Section 4 (m), (x) National Parks Act Sch 4	<p>the conservation of areas of natural interest or beauty or of scientific historic or archaeological interest</p> <p>public recreation</p>
4. Coastal waters	<i>Land Act 1958</i>	mostly unreserved
Overlays		
1. Reference area	<i>Reference Areas Act 1978</i>	preserve in its natural state as far as is possible, because the area is of ecological interest and significance
2. Wilderness zone	National Parks Act Sch 5	<p>preserve and protect the natural environment including indigenous flora and fauna and features of ecological, geological or scenic significance; and features of archaeological or historic significance; and features of scientific significance</p> <p>provide opportunities for solitude and appropriate self-reliant recreation</p>
3. Remote and natural area	National Parks Act Sch 6	protect and preserve the natural environment of the area, including indigenous flora and fauna and features of ecological, geological, scenic, archaeological, historic or scientific significance
4. Heritage river area	<i>Heritage Rivers Act 1992</i> Sch 1	<p>(a) ensure that the significant nature conservation, recreation, scenic or cultural heritage attributes of the area are protected</p> <p>(b) subject to paragraph (a), provide opportunities for other recreational activities, landscape appreciation and education within the area; and</p> <p>(c) ensure that that part of the river which is in the area is maintained without further interference with its free flowing state except as otherwise provided in the Act</p>
5. Natural catchment area	<i>Heritage Rivers Act</i> Sch 2	ensure that the area is maintained in an essentially natural condition
6. Aquaculture zone	<i>Fisheries Act 1995</i> Section 88	aquaculture

Appendix 4

Public land classification in Australian jurisdictions

Category	Land manager
SOUTH AUSTRALIA	
<i>National Parks and Wildlife Act 1972</i>	Department of Environment Water and Natural Resources
National park Conservation park Game reserve Recreation park Regional reserve Sanctuary (overlay)	
<i>Wilderness Protection Act 1992</i>	Department of Environment Water and Natural Resources
Wilderness Protection Area Wilderness Protection Zone	
<i>Crown Land Management Act 2009</i>	Department of Environment Water and Natural Resources
Conservation reserve River frontage Dedicated land – recreation, sporting club, school, hospital Crown leasehold land Unalienated Crown land	
<i>Forestry Act 1950</i>	Forestry SA
Forest reserve Native forest reserve (all or part of forest reserve)	
<i>Marine Parks Act 2007</i>	Department of Environment Water and Natural Resources
Marine park	
<i>Fisheries Management Act 2007</i>	Department of Primary Industries and Regions
Aquatic reserve Rock lobster sanctuary	
<i>Natural Resources Management Act 2004</i>	Department of Environment Water and Natural Resources
Road reserve	
Miscellaneous legislation reserving or designating land	
River Murray protection area Adelaide Dolphin Sanctuary Arkaroola Protection Area Shipwreck reserve	

Category	Land manager
WESTERN AUSTRALIA	
<i>Conservation and Land Management Act 1984</i>	Department of Parks and Wildlife
National park Conservation park Marine park Nature reserve Marine nature reserve Marine management area State forest Timber reserve	
<i>Land Administration Act 1997</i>	Minister of Lands, Department of Lands
Class 'A' reserve Class 'B' reserve Reserve Use and benefit of Aboriginal people Mall reserve Railway Recreation, sporting reserve Crown (pastoral) lease Unmanaged reserve Unallocated Crown land	
<i>Fish Resources Management Act 1994</i>	Department of Fisheries
Fish habitat protection area	
<i>Metropolitan Water Supply, Sewerage and Drainage Act 1909</i>	Department of Water
Water reserve Catchment area	
<i>Main Roads Act 1940</i>	Main roads Western Australia, Department of Transport
Main road, highway	

Appendix 4 (continued)

Public land classification in Australian jurisdictions

Category	Land manager
NORTHERN TERRITORY	
<i>Territory Parks and Wildlife Conservation Act 2006</i>	Parks and Wildlife Commission NT
National park	
Nature park	
Desert park	
Marine park	
Recreation park	
Wildlife park	
Park	
Conservation reserve	
Coastal reserve	
Hunting reserve	
Historical reserve	
Reserve	
Conservation area	
Recreation area	
Botanic garden	
Sanctuary (overlay)	
Wilderness zone (overlay)	
Area of essential habitat (overlay)	
<i>Crown Lands Act 1992</i>	Department of Lands, Planning and the Environment
Dedicated reserves	
<i>Fisheries Act 2011</i>	Department of Primary Industries and Fisheries
Aquatic life reserve	
Fish reef protection areas	
<i>Pastoral Land Act 1992</i>	Pastoral Land Board/ Department of Land Resource Management
Pastoral lease	

Category	Land manager
QUEENSLAND	
<i>Nature Conservation Act 1992</i>	Department of National Parks, Recreation, Sport and Racing- Queensland Parks and Wildlife Service
National park	
National park (Aboriginal land, Torres Strait Islander land, Cape York Peninsula Aboriginal land)	
Regional park	
Nature refuge	
Coordinated conservation area	
Forest reserve	
<i>Recreation Areas Management Act 2006</i>	Queensland Parks and Wildlife Service
Recreation area	
<i>Forestry Act 1959</i>	Department of Agriculture and Fisheries
Timber reserve	
State forest	
- State plantation forest	
- Feature protection area	
- State forest park	
- Scientific area	
- Forest drive	
<i>Land Act 1994</i>	Department of Natural Resources and Mines
Dedicated reserve	
Leasehold land	
Dedicated road	
Unallocated state land	
<i>Marine Parks Act 2004</i>	Queensland Parks and Wildlife Service
Marine park	
<i>Fisheries Act 1994</i>	Department of Agriculture and Fisheries
Fish habitat area	
<i>Transport Infrastructure Act 1994</i>	Department of Transport and Main Roads
Rail transport corridor	

Category	Land manager
NEW SOUTH WALES	
<i>National Parks and Wildlife Act 1974</i>	National Parks and Wildlife Service, Office of the Environment and Heritage, within the Department of Premier and Cabinet
National park Nature reserve State conservation area Regional park Aboriginal area Historic site Karst conservation area Wild river (overlay)	
<i>Wilderness Act 1987</i>	National Parks and Wildlife Service, Office of the Environment and Heritage, within the Department of Premier and Cabinet
Wilderness	
<i>Marine Parks Act 1997</i>	Marine Parks Authority, within Department of Primary Industries
Marine park Aquatic reserve	
<i>Brigalow and Nandewar Community Conservation Area Act 2005</i>	National Parks and Wildlife Service, Office of the Environment and Heritage, within the Department of Premier and Cabinet
Community conservation area	
<i>Forestry Act 2012</i>	Forestry Corporation of NSW/other land managers for non-forest uses
State forest Flora reserve Timber or forest reserve	
<i>Crown Lands Act 1989 and other legislation</i>	Department of Primary Industries – Lands
Crown reserves or dedicated land (specific purposes) Travelling stock reserves Western Lands leases Crown roads Submerged lands of Crown waterways Commons	

Category	Land manager
TASMANIA	
<i>Nature Conservation Act 2002</i>	Parks and Wildlife Service, Department of Primary Industries, Parks, Water and Environment
National park State reserve Nature reserve Game reserve Conservation area Nature recreation area Regional reserve Historic site	
<i>Living Marine Resources Management Act 1995</i>	Parks and Wildlife Service, Department of Primary Industries, Parks, Water and Environment
Marine protected area	
<i>Forestry Act 1920</i>	Forestry Tasmania, Department of State Growth
State forest Forest reserve	
<i>Crown Lands Act 1976</i>	Crown Land Services, Department of Primary Industries, Parks, Water and Environment
Public reserve Reserved road	
<i>Land Acquisition Act 1993</i>	Various
Freehold public land	
<i>Local Government (Highways) Act 1982</i>	Local government areas
Local road	

Appendix 4 (continued)

Public land classification in Australian jurisdictions

Category	Land manager
AUSTRALIAN CAPITAL TERRITORY	
<i>Nature Conservation Act 2014</i>	Territory and Municipal Services Directorate
Wilderness area National park Nature reserve Catchment area	
<i>Planning and Development Act 2007</i>	Territory and Municipal Services Directorate
Special purpose reserve Urban open space Cemetery or burial ground Lake Sport and recreation reserve Heritage area	

Category	Land manager
COMMONWEALTH	
Marine park	
<i>Environment Protection and Biodiversity Conservation Act 1999</i>	Department of the Environment/Parks Australia/Australian Antarctic Division
National park Marine reserve Nature reserve Botanic garden	
<i>Great Barrier Reef Marine Park Act 1975</i>	Great Barrier Reef Marine Park Authority
Miscellaneous legislation	
Defence land Public building	

Appendix 5

International examples of public land classification

Category	Land manager
NEW ZEALAND	
National level	
<i>Forests Act 1949</i>	Ministry for Primary Industries
Crown forestry land	
<i>National Parks Act 1980</i>	Department of Conservation
National park - wilderness area	
<i>Conservation Act 1987</i>	Department of Conservation
Amenity area Conservation park Ecological area Government purpose reserve Historic reserve Marginal reserve (20 m) – foreshore, lake, river or stream Nature reserve Recreation reserve Sanctuary area Scenic reserve Scientific reserve Stewardship area Watercourse area Wildlife management area	
<i>Reserves Act 1977</i>	Department of Conservation
Local purpose reserve	
<i>Wildlife Act 1953</i>	Department of Conservation
Wildlife management reserve Wildlife refuge Wildlife sanctuary	
<i>Marine Reserves Act 1971</i>	Department of Conservation
Marine reserve	
Miscellaneous legislation	Ministry for Primary Industries/ Department of Conservation
Benthic protection area Marine mammal sanctuary Mataitai or Taiapure reserve (customary fishing reserve)	

Category	Land manager
CANADA	
National level	
National park National park reserve National historic site National marine conservation area Protected landscape Heritage railway station Heritage lighthouse Federal heritage building	Parks Canada
National wildlife area National migratory bird sanctuary Marine wildlife area	Canadian Wildlife Service (in Environment Canada)
Marine protected area Large ocean management area/integrated area	Fisheries and Oceans Canada
Indian reserve	Aboriginal Affairs and Northern Development Canada (on behalf of First Nations, Inuit, Metis)
National defence land	Canadian Forces
Federal harbour Federal airport Railway	Transport Canada
Heritage river	
Provincial level	
Provincial park	Examples from British Columbia, Nova Scotia, Ontario, Quebec
Conservation reserve	
Fauna reserve	
Conservancy	
Provincial recreational area	
Ecological reserve	
Provincial nature reserve	
Protected area	
Provincial wildlife area	
Enhanced management area	
Territorial park	
Wilderness area	
Provincial protected beach	
Provincial game sanctuary	

Appendix 5 (continued)

International examples of public land classification

Category	Land manager
Provincial wildlife management area	
Natural area	
Heritage rangeland	
Forest reserve	
Grazing reserve	
General use area	
Public road (BC)	
Forest Service road	
Regional and municipal park	
Regional airfield	
Utility (reservoir, power generation and transmission infrastructure)	
UNITED STATES	
National level	
National park	US National Park Service
National monument	
National preserve	
National historical park	
National historic site	
National battlefield park	
National military park	
National battlefield	
National battlefield site	
National memorial	
National recreation area	
National seashore	
National lakeshore	
National river and national wild and scenic river	
National reserve	US Forest Service
National parkway	
National historic park	
National trail	
Marine protected area	
National forest	
National grassland	
National monument	
National preserve	
Purchase unit	
Land utilization project	
Research and experimental area	
National forest wilderness area	
National forest primitive area	

Category	Land manager
National monument	US Bureau of Land Management
National conservation area	
Cooperative management and protection area	
Outstanding natural area	
Wilderness area	
Wilderness study area (overlay)	
National wild and scenic river	
National historic trail	
National scenic trail	
Headwaters forest reserve	
National wildlife refuge	
Wetland management district	
Waterfowl production area	
Co-ordination area	
Marine national monument	National Oceanic and Atmospheric Administration
National marine sanctuary	
Marine national monument	
National estuarine research reserve	US Army Corps of Engineers
National fish and wildlife refuge	
Recreation area or site	Bureau of Indian Affairs
Indian reservation	
Military reservation	Department of Defence
Dam	Bureau of Reclamation
Hydroelectric power plant	
Reservoir	
Recreation area	
State level	
State park	
State beach	
State historic park	
State recreation area	
State natural reserve	
State vehicular recreation reserve	
State historical monument	
State marine park	
State seashore	
Wayside campground	
State cultural reserve	
Underwater recreation reserve	
State forest	
State wildlife area	
State forest park	
State wildlife management area	
State memorial	
State historic site	
State preserve	
State reserve	

Appendix 6

Protected area categories:

examples from South America, Africa, Europe, Asia and the Middle East

Brazil	South Africa	Norway	Japan	Saudi Arabia
Area of relevant ecological interest	Bird sanctuary	Botanical conservation area	National park	Bird sanctuary
Biological reserve	Botanical garden	Habitat management area	National wildlife protection area	HimatTraditional Reserve
Ecological reserve	Forest nature reserve	Marine protected area	Natural habitat conservation area	Inviolable sanctuary
Ecological station	Forest wilderness area	National park	Nature conservation area	Managed nature reserve
Environmental protection area	Marine protected area	Natural monument	Prefectural natural park	Marine wildlife sanctuary
Marine extractive reserve	Mountain Catchment Area	Nature reserve	Prefectural nature conservation area	National nature reserve
Coastal and marine protection area	National heritage site	Protected landscape	Prefectural wildlife protection area	National park
National forest	National park	Wildlife conservation area	Protected water surface	National recreation area
National park	Nature reserve		Quasi national Park	Natural monument
Sustainable development reserve	Private nature Reserve		Wilderness area	Nature reserve
Wildlife sanctuary	Protected environment			Protected area
	Provincial nature reserve			Protected landscape
	Special nature reserve			Reserve
				Wildlife management area

Appendix 7

Land Conservation Council's proposed simplified public land use categories: extracts

The following tables are extracted from the LCC's 1988 report *Statewide Assessment of public land use* (pages 65 and 71-74).

Table 10

PUBLIC LAND USE CATEGORIES

Present categories	Proposed classification
Reference area	Reference area
National park	National park
State park	State park
Wilderness area	Wilderness
Regional park	Regional park
Multi-purpose park	Regional park
Coastal park	Regional park
Marine reserve	Nature conservation reserve
Marine and wildlife reserve	Marine park
Gippsland Lakes reserve	Natural features reserve
Wildlife reserves	Natural features reserve
Wildlife co-operative management area	Natural features reserve
Flora reserve	Nature conservation reserve
Flora and fauna reserve	Nature conservation reserve
Natural features and scenic reserve	Natural features reserve
Water production	Water production
Water supply regulation and drainage	Water production
Education area	Education reserve
Historic area	Historic reserve
Historic reserve	Historic reserve
Coastal reserve	Regional park
Scenic coast	(No equivalent)
Public land water frontage reserve	Natural features reserve
Streamside reserve	Natural features reserve
River Murray reserve	Natural features reserve
Geological reserve (or Monument)	Natural features reserve
Cave reserve	Nature conservation reserve
Bushland reserve	Natural features reserve
Scenic reserve	Natural features reserve
Lake reserve	Natural features reserve
Roadside conservation	Natural features reserve
Highway park	Regional park
Recreation reserves	Community use reserve
Alpine resort	Alpine resort
Hardwood (timber) production	State forest
State forest	State forest
Eucalyptus oil production	State forest
Softwood production	Forest plantation reserve
Forest area	State forest
Minerals and stone	Public utility reserve
Coal production	Public utility reserve
Hydroelectricity production	Public utility reserve
Agriculture	(Government land)
Utilities and survey	Public utilities reserve
Township land	Uncategorized public land
Uncommitted land	State forest
Other reserves and public land	Uncategorized public land
Revegetation areas	Uncategorized public land

Table 11

SIMPLIFIED PUBLIC LAND CATEGORIES

Description	Objects
1. <i>Reference area</i>	
A substantially undisturbed tract of land containing representations of major land systems in the State	protection of natural ecosystems for use as scientific references restricted use for non-manipulative scientific investigation
2. <i>National park</i>	
A substantial tract of land of nation-wide significance because of its outstanding natural environments and features, scenic scenic landscapes, and diverse land types	protection and conservation of native flora, fauna, and natural features and the protection of sites of archaeological and historical significance supply of water and protection of catchments recreation and education associated with the enjoyment and understanding of, and compatible with protection of, the natural environment limited areas of development for more-intensive recreation
3. <i>State park</i>	
A tract of land containing natural environments and features, scenic landscapes, and one or more land types complementing those found in national parks to provide a system representing the major land types of the State	protection and conservation of native flora, fauna, and natural features and the protection of sites of archaeological and historical significance supply of water and protection of catchments recreation and education associated with the enjoyment and understanding of, and compatible with protection of, the natural environment limited areas of development for more-intensive recreation
4. <i>Nature reserve</i>	
An area of land and/or water of particular importance because of its significant floral or faunal values or natural habitat	protection of species of communities of native plants and animals education, scientific study, and limited informal recreation compatible with that protection
5. <i>Wilderness area</i>	
An extensive tract of relatively undisturbed land and/or water offering opportunities for isolated non-mechanized recreation in a challenging natural environment	solitude, and unconfined and challenging forms of non-mechanical recreation in controlled numbers protection and conservation of the natural environment

Appendix 7 (continued)

Land Conservation Council's proposed simplified public land use categories: extracts

Table 11 (continued)

Description	Objects
<p>6. Marine park</p> <p>An area of coastal, intertidal, or subtidal land that, because of its nature or the nature of the waters that cover it or because of its natural environment, is of conservation or scientific significance</p>	<p>protection and conservation of native flora, fauna, natural features, and sites of archaeological or historical importance</p> <p>diverse recreation and education associated with the enjoyment and understanding of natural environments compatible with the protection of park values</p> <p>development of selected areas for more-intensive recreation</p> <p>controlled commercial utilization of natural resources in marine parks</p>
<p>7. Natural features reserve</p> <p>An area of land containing important elements of the natural environment, landscape, and/or geological or geomorphological features that are of scenic or conservation significance</p>	<p>protection and maintenance of the identified landscape and/or other values</p> <p>recreation and education where appropriate and where compatible with the above</p> <p>controlled low-intensity exploitation of natural resources compatible with both the above</p>
<p>8. Education reserve</p> <p>An area of land containing a diversity of land types capable of providing for a range of educational experiences and having safe access</p>	<p>provision of opportunities for students to compare and study the nature and functioning of natural ecosystems and to conduct field analysis and manipulative experiments</p> <p>maintain the integrity of the ecosystem so far as is compatible with the above</p>
<p>9. Historic reserve</p> <p>An area of land containing significant relics and/or artefacts of historical or cultural importance</p>	<p>protection and maintenance of identified historical relics and artefacts</p> <p>recreation and education associated with the understanding of the history of the region, compatible with the above</p> <p>limited exploitation of natural resources compatible with both the above</p>
<p>10. Regional park</p> <p>A tract of land containing indigenous or non-indigenous vegetation readily accessible from urban centres or major tourist routes and capable of providing opportunities for informal recreation for large numbers of people</p>	<p>recreation for large numbers of people associated with enjoyment of the natural surroundings</p> <p>protection and conservation of native flora, fauna, and natural features compatible with the above</p> <p>limited exploitation of natural resources in specified areas and where compatible with both the above</p>
<p>11. Water production</p> <p>An area of land in the catchment of or adjacent to a water supply storage or offtake</p>	<p>protection of the water supply and the operation of the water supply system</p>

Table 11 (continued)

Description	Objects
11. Water production (continued)	<p>restriction of access to protect water quality</p> <p>conservation of the natural environment, landscape, and features of cultural significance where compatible with the first object</p>
12. Community use reserve Land appropriate or developed for particular community use	<p>to promote appropriate use of the land by the community</p> <p>to provide facilities for community use of the land</p> <p>to provide means of access by the general public where compatible with the first management object</p> <p>to conserve the landscape, the natural environment and features of cultural significance where compatible with the first two management objects</p>
13. State forest An extensive area of land supporting native forests and other native vegetation and containing a mosaic of land types, diverse conservation and recreation values, and a range of resources needed to supply community demands	<p>provision of timber and other forest products on a sustainable-yield basis</p> <p>supply of water and protection of catchments.</p> <p>protection and conservation of native flora and fauna, landscape, and other natural values, and archaeological and historical values</p> <p>provide opportunities for public recreation and education and other public services</p>
14. Coastal waters of Victoria An area of intertidal and subtidal land within the jurisdiction of the State of Victoria but not described in any other category	<p>to protect the natural environment and features of cultural significance</p> <p>to provide for the controlled exploitation of natural resources including wildlife and fish</p> <p>to allow for aquaculture activities</p> <p>to provide for the use of land for a diverse range of recreational and educational purposes</p> <p>to provide for the necessary navigational and safety aids and associated facilities for boating and fishing</p>
15. Alpine resort An area of land described in an Order of the Governor-in-Council for the time being in force under Section 19(1) of the Alpine Resorts Act 1983	<p>to use the land, or to promote its use, for establishment and development of alpine resorts, having regard to environment and ecological factors and the safety of the public in such a way as to encourage the use of the land in all seasons of the year</p> <p>to provide for:</p> <ul style="list-style-type: none"> * the orderly establishment of alpine resorts, the orderly continuation of existing alpine resorts, and their orderly continuation and development

Appendix 7 (continued)

Land Conservation Council's proposed simplified public land use categories: extracts

Table 11 (continued)

Description	Objects
15. Alpine resort (continued)	<ul style="list-style-type: none"> * a range of accommodation facilities and services for tourists of a kind that will encourage people, whatever their income, to use and enjoy alpine resorts * for facilities and services for persons who live or work in alpine resorts
16. Forest plantation reserve An area of land supporting a man-made softwood or hardwood forest plantation	<p>to promote the production and utilization of public land produce and the use of intensive silvicultural techniques</p> <p>to provide other goods and services compatible with that</p> <p>to allow for the use of land for a diverse range of purposes, including recreation and education activities and the taking of wildlife and fish</p>
17. Public utility reserve Land appropriate or developed for use for public utilities	<p>to provide for the provision of the public utility for which the land is to be used</p> <p>to protect any area of land minimally affected by the carrying out of activity under the above, and the preservation and conservation of the landscape and natural environment of that area</p> <p>to provide for the controlled exploitation of natural resources, including wildlife and fish, where compatible with those management objects</p>
18. Uncategorized public land Land not included in any of the above categories	<p>to conserve the landscape and the natural environment</p> <p>to provide for limited exploitation of natural resources compatible with that</p> <p>such other objects as are prescribed</p>

Appendix 8

IUCN protected area categories

I(a) Strict Nature Reserve

Category I(a) are strictly protected areas set aside to protect biodiversity and also possibly geological/geomorphical features, where human visitation, use and impacts are strictly controlled and limited to ensure protection of the conservation values. Such protected areas can serve as indispensable reference areas for scientific research and monitoring.

I(b) Wilderness Area

Category I(b) protected areas are usually large unmodified or slightly modified areas, retaining their natural character and influence without permanent or significant human habitation, which are protected and managed so as to preserve their natural condition.

II National Park

Category II protected areas are large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible, spiritual, scientific, educational, recreational, and visitor opportunities.

III Natural Monument or Feature

Category III protected areas are set aside to protect a specific natural monument, which can be a landform, sea mount, submarine cavern, geological feature such as a cave or even a living feature such as an ancient grove. They are generally quite small protected areas and often have high visitor value.

IV Habitat/Species Management Area

Category IV protected areas aim to protect particular species or habitats and management reflects this priority. Many Category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category.

V Protected Landscape/ Seascape

A protected area where the interaction of people and nature over time has produced an area of distinct character with significant, ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values.

VI Protected area with sustainable use of natural resources

Category VI protected areas conserve ecosystems and habitats together with associated cultural values and traditional natural resource management systems. They are generally large, with most of the area in a natural condition, where a proportion is under sustainable natural resource management and where low-level non-industrial use of natural resources compatible with nature conservation is seen as one of the main aims of the area.

Appendix 9

Example of a summary of permitted activities in major land use categories

This table is sourced from an ECC brochure (2001) summarising the activities allowed in the major land use categories recommended in the Box-Ironbark Forests and Woodlands investigation area. It illustrates the complexity of providing

accurate information, given the number of exceptions and conditions that apply – including allowance for the land manager's discretion - in relation to many activities.

ACTIVITY	National park	State park	National heritage park	Regional park	Nature conservation reserve	State forest
Recreation and tourism activities						
Nature observation	✓	✓	✓	✓	✓	✓
Picnicking and barbecues	✓	✓	✓	✓	✓	✓
Camping ¹	✓	✓	✓	✓	✓	✓
Bushwalking or short walks	✓	✓	✓	✓	✓	✓
Car-touring, four-wheel driving and trail bike riding ²	✓	✓	✓	✓	✓	✓
Dogs	✗	✓ ^{3, 4}	✓ ⁴	✓ ⁴	✗ ³	✓
Visiting historic features	✓	✓	✓	✓	✓	✓
Orienteering and regaining ⁴	✓	✓	✓	✓	✓	✓
Car rallies ⁴	✗ ³	✗ ³	✓ ⁷	✗	✗	✓
Horse riding ⁵	✗ ³	✓ ⁴	✓ ⁴	✓ ⁴	✗ ³	✓
Hunting	✗ ⁶	✗ ⁶	✗ ⁶	✗ ⁶	✗ ⁶	✓ ⁶
Prospecting/ metal detecting						
Metal detecting	✗ ^{3, 8}	✓ ⁷	✓ ⁷	✓	✓ ⁷	✓
Gold panning	✗ ⁸	✓ ⁷	✓ ⁷	✓	✗	✓
Gemstone fossicking	✗ ⁸	✗	✓ ⁷	✓	✗	✓
Resource industries						
Mineral exploration	✗ ⁹	✗ ⁹	✓ ^{9,10}	✓ ¹⁰	✓ ¹⁰	✓
Mining	✗	✗	✓	✓	✓	✓
Sawlog and post production	✗	✗	✗	✗	✗	✓
Firewood	✗ ¹¹	✗ ¹¹	✗ ¹¹	✗ ¹¹	✗ ¹¹	✓
Apiculture	✓ ¹²	✓ ¹²	✓	✓	✓ ¹²	✓
Eucalyptus oil production	✗	✗	✗	✗	✗	✓ ¹³
Other uses						
Environmental education	✓	✓	✓	✓	✓	✓
Approved research	✓	✓	✓	✓	✓	✓
Water production/distribution	✓	✓	✓	✓	✓	✓
Stone extraction	✗ ¹⁴	✗ ¹⁴	✗ ¹⁴	✗ ¹⁴	✗ ¹⁴	✓
Grazing ¹⁵	✗	✗	✗	✗	✗	✓
Utilities	✗ ¹⁶	✗ ¹⁶	✗ ¹⁶	✗ ¹⁶	✗ ¹⁶	✓

- 1 Camping may be at designated campsites only, and may be excluded from some smaller reserves
- 2 Only on roads and tracks formed for the passage of four-wheel vehicles; may be subject to seasonal or permanent closure
- 3 Some exceptions
- 4 Subject to certain conditions
- 5 Only on formed roads or specially designated tracks
- 6 Land managers may organise shooting drives to assist in the control of feral animals
- 7 Some areas may be excluded in management plans
- 8 Permitted along Reedy Creek (Chiltern-Pilot National Park)
- 9 Existing exploration or mining licences continue; Government may approve mining following such exploration
Specified park and reserve areas will extend only 100 metres below the surface, allowing new exploration and mining beneath this depth

- 10 Restricted under the *Mineral Resources Development Act 1990*
- 11 Some firewood may be available from ecological management in parks and reserves. Previously felled firewood can be collected from new parks and reserves
- 12 Permitted where an existing use
- 13 Confined to areas used since 1995
- 14 Extraction for local management use only
- 15 Only small areas are suitable for grazing. Light grazing for ecological management may continue in limited areas
- 16 Some existing utilities are within recommended parks and reserves. These will generally continue

Appendix 10

Criteria for bioregional conservation status of EVCs in Victoria

Status	Criteria
Presumed extinct	<ul style="list-style-type: none"> - Probably no longer present in the bioregion. The accuracy of this classification is limited by the use of remotely-sensed 1:100 000 scale woody vegetation cover mapping to determine depletion. Grassland, open woodland and wetland types are particularly affected by this uncertainty.
Endangered	<ul style="list-style-type: none"> - Contracted to less than 10% of former range; OR - Less than 10% pre-European extent remains; OR - Combination of depletion, degradation, current threats and rarity is comparable overall to the above: <ul style="list-style-type: none"> • 10 to 30% pre-European extent remains and severely degraded over a majority of this area; OR • naturally restricted EVC reduced to 30% or less of former range and moderately degraded over a majority of this area; OR • rare EVC cleared and/or moderately degraded over a majority of former area.
Vulnerable	<ul style="list-style-type: none"> - 10 to 30% pre-European extent remains; OR - Combination of depletion, degradation, current threats and rarity is comparable overall to the above: <ul style="list-style-type: none"> • greater than 30% and up to 50% pre-European extent remains and moderately degraded over a majority of this area; OR • greater than 50% pre-European extent remains and severely degraded over a majority of this area; OR • naturally restricted EVC where greater than 30% pre-European extent remains and moderately degraded over a majority of this area; OR • rare EVC cleared and/or moderately degraded over a minority of former area.
Depleted	<ul style="list-style-type: none"> - Greater than 30% and up to 50% pre-European extent remains; OR - Combination of depletion, degradation and current threats is comparable overall to the above: <ul style="list-style-type: none"> • greater than 50% pre-European extent remains and moderately degraded over a majority of this area.
Rare	<ul style="list-style-type: none"> - Rare EVC (as defined by geographic occurrence) but neither depleted, degraded nor currently threatened to an extent that would qualify as Endangered, Vulnerable or Depleted.
Least concern	<ul style="list-style-type: none"> - Greater than 50% pre-European extent remains and subject to little to no degradation over a majority of this area.

Appendix 11

Bioregional conservation status of EVCs in two Victorian bioregions, Highlands – Far East and Monaro Tablelands, and change from 1750 to current extent

Bioregion	EVC	BCS	1750 extent (ha)	Current extent (ha)	Total remaining %	Protected area network %	Other public land %	Private land %
Highlands - Far East	Damp Forest	LC	10,470	10,455	100	9	91	0
Highlands - Far East	Warm Temperate Rainforest	R	441	441	100	49	50	1
Highlands - Far East	Cool Temperate Rainforest/Warm Temperate Rainforest Overlap	R	203	203	100	74	26	0
Highlands - Far East	Valley Grassy Forest	D	27	27	100	0	100	0
Highlands - Far East	Montane Riparian Thicket	LC	37	37	100	12	88	0
Highlands - Far East	Sub-alpine Treeless Vegetation	R	1	1	100	100	0	0
Highlands - Far East	Montane Riparian Woodland	V	29	29	100	25	75	0
Highlands - Far East	Montane Dry Woodland	LC	96	96	100	27	72	1
Highlands - Far East	Riparian Forest	LC	150	150	100	35	65	0
Highlands - Far East	Rocky Outcrop Shrubland	LC	40	40	100	92	8	0
Highlands - Far East	Lowland Forest	LC	150	150	100	65	30	5
Highlands - Far East	Montane Damp Forest	LC	129	129	100	83	17	0
Highlands - Far East	Shrubby Dry Forest	LC	1,211	1,211	100	25	75	0
Highlands - Far East	Tableland Damp Forest	LC	693	693	100	39	61	0
Highlands - Far East	Montane Wet Forest	LC	1,202	1,202	100	77	23	0
Highlands - Far East	Wet Forest	LC	52,973	52,890	100	38	62	0
Monaro Tablelands	Montane Grassy Woodland	V	12,511	5,889	47	2	13	32
Monaro Tablelands	Montane Riparian Woodland	V	4,501	2,594	58	1	20	37
Monaro Tablelands	Sub-alpine Treeless Vegetation	R	411	383	93	32	39	22
Monaro Tablelands	Wet Forest	LC	3,591	3,547	99	13	84	1
Monaro Tablelands	Valley Grassy Forest	D	85	59	69	0	5	63
Monaro Tablelands	Cool Temperate Rainforest	R	37	37	100	74	26	0
Monaro Tablelands	Riparian Forest	LC	28	28	100	0	100	0
Monaro Tablelands	Blackthorn Scrub	R	54	54	100	100	0	0
Monaro Tablelands	Rocky Outcrop Shrubland	R	19	19	100	100	0	0
Monaro Tablelands	Montane Wet Forest	LC	3	3	100	90	10	0
Monaro Tablelands	Grassy Dry Forest	LC	19	19	100	98	2	0
Monaro Tablelands	Damp Forest	LC	3,444	3,302	96	18	54	24
Monaro Tablelands	Sub-alpine Woodland	LC	1,088	1,022	94	35	42	17
Monaro Tablelands	Montane Damp Forest	LC	2,162	2,157	100	35	65	0
Monaro Tablelands	Tableland Damp Forest	LC	4,484	4,430	99	33	64	1
Monaro Tablelands	Montane Dry Woodland	LC	39,055	32,840	84	18	39	27
Monaro Tablelands	Shrubby Dry Forest	LC	3,328	3,319	100	73	26	1

Note: This is a sample showing only two Victorian bioregions. The full data table *Bioregional conservation status of EVCs in 28 Victorian bioregions and change in EVC extent between 1750 and 2015* available at www.veac.vic.gov.au/investigation/statewide-assessment-of-public-land/resources.

Appendix 12

Ecosystem services provided by public land in Victoria*

Type of service	Description of benefits to society and economy	Direct beneficiaries	End users and final beneficiaries
Fresh water (Provisioning)	Water supply catchments on public land capture water and release it to built infrastructure (pipes, channels and water storage facilities) for drinking, food production and small-scale power generation. Forests and wetlands influence the total quantity, quality and seasonal variation of flows; intact ecosystems store water when it is abundant and release it during dry periods. For example, 90 per cent of Melbourne's water supply comes from catchments located in parks.	Domestic and industrial urban water consumers, food producers, energy consumers	Water, food, products and energy consumers
Honey (Provisioning)	Honey and other apiary products (including beeswax, pollen, propolis and royal jelly) are produced from European honey bee sites located on public land. The majority of Victorian European honey bee sites are on public land and occur predominantly in parks and state forest. Bees also provide the regulating service of pollination to agricultural crops and native vegetation. For more detail on the apiary industry, see section 5.4.1.	Producers of apiary products	Apiary consumers and businesses
Unfarmed animals for food (Provisioning)	A range of game animals (deer, duck and quail) are hunted on public land by licensed hunters within defined seasons and bag limits, and many species of fish and other marine organisms are taken by licensed recreational fishers. In addition to providing food and other products (like skins and trophies) to hunters and fishers, harvesting unfarmed animals from public land also provides opportunities for recreation. See section 5.3.7 for more detail on hunting game and pest animals, and section 5.3.8 for more detail on recreational fishing.	Hunters and fishers	Hunting and fishing industries
Timber and fuel (Provisioning)	Forested public land (e.g. state forests) is a source of valuable timber for a range of uses including firewood, saw logs, pulpwood, fence posts and landscaping timbers. For more detail about timber harvesting on public land, see section 5.4.1.	Producers of timber products	Timber consumers and businesses
Genetic material (Provisioning)	Genetic material from a wide variety of animal, plant and microbial species contributes significantly (and often on a global scale) to commercial products in industries including pharmaceuticals, botanical medicines, crop protection, cosmetics, horticulture, agricultural seeds, environmental monitoring, manufacturing, and construction. While much of this genetic material has been harvested from species-rich ecosystems like tropical forests, Victoria's temperate forests and grasslands, semiarid lands, freshwater ecosystems, montane regions, and cold oceans have much to offer. The maintenance of these ecosystems on public land therefore has the potential to contribute significantly to these industries. The genetic diversity conserved on public land also has an important role in providing supplementary founder individuals for captive breeding programs for threatened plant and animal species.	Medical, cosmetic, agricultural, horticultural, manufacturing and construction industries; captive breeding organisations	Global community

*Unless otherwise specified, information sourced from Millennium Ecosystem Assessment²¹ and Parks Victoria & DELWP²³

Appendix 12 (continued)

Ecosystem services provided by public land in Victoria

Type of service	Description of benefits to society and economy	Direct beneficiaries	End users and final beneficiaries
Water purification (Regulating)	Clean water is critical for human health and is also essential for water-based recreation. Forests, woodland and wetlands on public land improve water quality by filtering water, thereby reducing the amount of soil sediment, pollutants and organic matter that would otherwise be released into our waterways and bays. When ecosystems are degraded or disturbed (through loss of vegetation cover, trampling, overgrazing, introduction of pathogens or disease, large-scale fires), water quality is often reduced. For example, large-scale fires in forested catchments profoundly reduce water yield for decades while the forest regrows, consuming vast quantities of water in the process. Maintaining or improving catchment condition can significantly lower water treatment costs.	Water, energy and food producers	Water, food and energy consumers and businesses
Flood protection (Regulating)	Healthy vegetation and soil absorb rain, regulating water movement within a catchment by releasing water into waterways at more natural velocities and volumes. This also contributes to reduced soil loss and erosion during rain events. Within metropolitan areas, the permeable surfaces of much public land play an important role in reducing the volume and velocity of stormwater reaching waterways, which in turn reduces the amount of physical infrastructure and stormwater management actions that are needed.	Home owners, local councils, Victorian government	Victorian communities and businesses
Coastal asset protection (Regulating)	Approximately 19 per cent of Victorians live by the coast, and many of these coastal communities rely on stable and healthy coastal ecosystems to avoid the inundation of homes and assets from storm and tidal surges. Coastal and marine habitats including mangrove, salt marsh, seagrass and coastal dune systems absorb wave energy, which helps buffer shoreline areas from storm damage, inundation and erosion. Without these intact ecosystems, physical infrastructure like sea walls and breakwaters would be required to provide such protection.	Local councils, Victorian government	Victorian communities and businesses
Soil quality, stability and fertility (Regulating)	Soil organisms modify soil physical structure and hydraulic properties, which in turn drive nutrient cycling, soil organic matter formation, decomposition and soil carbon sequestration. Healthy ecosystems on public land are therefore likely to play an important role within the broader landscape by maximising soil health and productivity and minimising the volume of soil lost through soil erosion. Furthermore, many pollinators and natural enemies of agricultural pests spend part of their lifecycles in the soil.	Agricultural producers	Consumers of agricultural products and businesses
Air quality (Regulating)	Native vegetation and waterways on public land filter airborne particulate matter, which otherwise causes health problems like asthma. Vegetation also absorbs other pollutants like carbon monoxide, sulphur dioxide and nitrogen dioxide, improving air quality and human health.	Urban communities	Victorian communities

Type of service	Description of benefits to society and economy	Direct beneficiaries	End users and final beneficiaries
Carbon storage and sequestration (Regulating)	Intact terrestrial, wetland and marine ecosystems sequester carbon dioxide from the atmosphere during photosynthesis and store it as organic carbon in plant biomass (trunks, branches, foliage, roots) and soil. While forests and woodlands (predominantly in the east, north east and southern coastal forests in Victoria) are particularly important terrestrial ecosystems for carbon storage and sequestration, ⁹⁰ recent evidence shows that Australia's coastal wetland ecosystems (seagrass, tidal marshes and mangroves) store five times more carbon in their soils and sequester carbon at rates of up to 66 times faster than terrestrial ecosystems (including forests) on a per hectare basis. ⁹¹ When vegetation in these systems is destroyed or degraded, stored carbon is emitted back into the atmosphere. Vegetated public land therefore plays three key roles in climate regulation: protecting large carbon stores in mature ecosystems, sequestering carbon in maturing ecosystems, sequestering carbon through direct revegetation and habitat restoration (e.g. feral and native grazer control).	Farmers and land managers	Global community
Urban cooling (Regulating)	The vegetation of urban parks and other public land can regulate the local climate by minimising the urban heat island effect. The heat island effect is where temperatures increase in urban areas due to the absorption of solar radiation on paved and dark surfaces. The temperature in parks can be several degrees cooler than in surrounding built areas, as the vegetation provides shade, cooler environments and traps moisture. Such urban cooling protects human health and reduces our demands for energy on hot days.	Urban communities	Victorian communities
Pollination (Regulating)	Native vegetation on public land provides habitat for native and introduced pollinators including insects, bats and birds. These species pollinate a range of fruits, vegetables and seeds grown by the agricultural industry for human use. For example, 65 per cent or horticultural and agricultural crops introduced in Australia require honeybees for pollination to some extent. ⁹² Apiarist's hives on public land adjacent to agriculture are important pollinators for crops and orchards. Pollination services also support the maintenance of genetic diversity in native vegetation.	Agricultural producers	Consumers of agricultural products and businesses
Pest and disease control (Regulating)	Larger intact parks and smaller reserves on public land may provide a reservoir of natural enemies of pests and insect-borne diseases in crops. Populations of native insectivorous bats, other mammals, birds, reptiles and spiders consume millions of insects annually. These species can act as natural pest and disease controllers for nearby agricultural land to improve productivity. Furthermore, native birds of prey assist in controlling populations of pest species like mice, rats and rabbits.	Agricultural producers	Consumers of agricultural products and businesses

Appendix 12 (continued)

Ecosystem services provided by public land in Victoria

Type of service	Description of benefits to society and economy	Direct beneficiaries	End users and final beneficiaries
Maintenance of nursery habitats (Regulating)	The seagrass, mangrove and reef habitats that occur on marine and coastal public land are important nursery habitats for the spawning and recruitment of juvenile fish species used in both commercial and recreational fisheries. These ecosystems provide both the physical habitats and nutrients required to support and maintain populations of fish that move outside of protected areas and are then available for capture.	Maricultural producers	Consumers of maricultural products and businesses
Waste treatment (Regulating)	Ecosystems vary in their ability to absorb and detoxify wastes. Some contaminants, such as organic chemicals and pathogens can more easily be converted to harmless materials, whereas others like metals and salts cannot be degraded to harmless compounds. The soils, intact vegetation and freshwater on public land play a key role in this process. Bioremediation is an emerging industry which capitalises on the action of beneficial microorganisms to assist in the remediation of former industrial sites by transforming pollutants into less harmful derivatives or sequestering them from other species in the ecosystem. ⁹³	Waste producers and processors (multiple industries)	Victorian communities
Recreation opportunities (Cultural)	Open space on public land provides diverse opportunities for nature-based recreation. The direct benefits include personal enjoyment and appreciation of nature, which has flow on benefits for physical/mental health and the economy through tourist visits to terrestrial, aquatic and marine parks and reserves. For more details on recreation on public land, see sections 5.3.3-5.3.9.	Locals and tourists visiting parks and reserves	Victorian and global communities
Information and knowledge (Cultural)	The unique ecosystems found on parks, reserves and some other public land offer opportunities for scientific research. The findings of such research contribute to the broader knowledge of the community about natural and cultural heritage, as well as informing better management practices. Many parks and reserves also have formal and informal education and interpretation programs.	Researchers, students, general public	Victorian and global communities and businesses
Landscape or neighbourhood amenity (Cultural)	Parks and other open space on public land provide enjoyment and mental health benefits to surrounding residents, particularly those near urban and peri-urban parks in Melbourne and regional cities. Residents surrounding parks and reserves benefit from having closer access to green open space, enjoy better physical and mental health from viewing nature and wildlife, and satisfaction in knowing that nature is being conserved near to them. Parks and open space also have a positive impact on nearby house prices.	Residents surrounding public land	Victorian communities
Opportunities for cultural connection (Cultural)	The natural and cultural (both Aboriginal and non-Aboriginal) assets maintained on Victoria's public land estate offer opportunities for cultural connection to significant places. For more detail on Aboriginal heritage, see section 5.2.1; non-Aboriginal cultural heritage, see section 5.2.2; and spiritual/experiential connection to nature, see section 5.3.1.	Traditional Owners, population valuing non-Aboriginal heritage	Indigenous, Victorian, Australian and international communities

Type of service	Description of benefits to society and economy	Direct beneficiaries	End users and final beneficiaries
Social cohesion and sense of place (Cultural)	Many people value the 'sense of place' that is associated with particular features of their local environments, including aspects of those ecosystems. Furthermore, parks and reserves offer significant volunteer opportunities through formal (e.g. committees of management) and less formal (e.g. Clean Up Australia Day) structures. Volunteers can enjoy social connection, a sense of community and physical/mental health benefits through their activities.	Communities connected through sense of place from natural places	Victorian and Australian communities
Non-use services (Cultural)	Non-use ecosystem services are values that people hold for environmental assets, irrespective of whether they use them. This concept is similar to intrinsic value, which is the value of something in and for itself, irrespective of its utility for someone else. For example, many people gain satisfaction simply from knowing that a species, natural environment or ecosystem exists. Maintenance of this service also provides ecosystem capital for future generations of ecosystem services.	Population valuing the preservation of ecosystems for current and future generations	Victorian, Australian, and international communities
Maintenance of habitats (Supporting/intermediate)	One of the key purposes of the Victorian parks and reserves network on public land is to protect and conserve representative ecosystems (including terrestrial, marine and coastal and other aquatic ecosystems) and the biodiversity contained within them. This biodiversity includes diversity within species, between species and between ecosystems. These ecosystems and their species, functions and processes have a fundamental intrinsic value in addition to being the foundation for a wide range of additional ecosystem services.	Ecosystems and native species	Victorian, Australian, and international communities
Nutrient cycling (Supporting/intermediate)	Approximately 20 nutrients essential for life (including nitrogen and phosphorus) cycle through ecosystems and are maintained at different concentrations in different parts of ecosystems. These nutrients underpin all other ecosystem services. Intact ecosystems on public land are crucial for regulating the flows and concentrations of these nutrients through process where these elements are extracted from mineral sources (in the atmosphere, hydrosphere or lithosphere) or are recycled from dead organic matter.	Ecosystems and native species	Victorian, Australian, and international communities

Appendix 13

Types of leases and licences on public land, the Act applied, number of tenures and associated revenue (2015-2016)

Public land lease/ licence description	Act applied	Number of tenures	Annual invoiced revenue 2015-16 (\$ exc GST)
Industrial/commercial licence	Crown Land (Reserves) Act	10	
Recreation/amusement licence	Crown Land (Reserves) Act	11	
Jetty licence	Crown Land (Reserves) Act	18	
Rubbish depot licence	Crown Land (Reserves) Act	7	
Radio/TV/telecom licence	Crown Land (Reserves) Act	13	
Emergency services use licence	Crown Land (Reserves) Act	4	
Miscellaneous (general) licence	Crown Land (Reserves) Act	54	
Radio/TV/telecom lease	Crown Land (Reserves) Act	26	
Recreation/amusement lease	Crown Land (Reserves) Act	12	
Commercial lease	Crown Land (Reserves) Act	9	
Other/Miscellaneous lease	Crown Land (Reserves) Act	21	
Reserve section 17 (not extractive)	Crown Land (Reserves) Act	49	
Extractive material 17b/17d	Crown Land (Reserves) Act	6	
Sub-total Crown Land (Reserves) Act		240	716,835
Radio/TV/telecom lease	Forests Act	63	
Miscellaneous lease	Forests Act	10	
Grazing licence	Forests Act	223	
Grazing licence – non primary producers	Forests Act	1	
Bush grazing – seasonal	Forests Act	15	
Alpine grazing licence	Forests Act	30	
Alpine contiguous grazing	Forests Act	2	
Recreation lease	Forests Act	2	
Plantation lease – native state for.	Forests Act	1	
Bee farm and range licence	Forests Act	407	
Apiary right	Forests Act	1,579	
Residence licence	Forests Act	6	
Industrial/commercial licence	Forests Act	18	
Recreation/amusement licence	Forests Act	27	
Rubbish depot licence	Forests Act	10	
Radio/TV/telecom site licences	Forests Act	61	
Extractive material licence	Forests Act	22	
Emergency services use licence	Forests Act	2	
Scout and/or guide use licence	Forests Act	4	
Cultivation/garden licence	Forests Act	7	
Water supply licence	Forests Act	201	
Miscellaneous (general) licence	Forests Act	75	
Temporary apiary right	Forests Act	2	
Sub-total Forests Act		2,768	1,457,515

Note: Generally, the duration of licences is 1–10 years and for leases, periods of up to 21 years. Therefore, depending on the frequency of invoicing, revenue varies from year to year.

Public land lease/ licence description	Act applied	Number of tenures	Annual invoiced revenue 2015-16 (\$ exc GST)
Surf lifesaving lease	Land Act	14	
Grazing licence	Land Act	2,616	
Grazing licence - non primary producers	Land Act	35	
Grazing - softwood plantation operations	Land Act	2	
Grazing licence (cropping approved)	Land Act	40	
Bush grazing - seasonal	Land Act	19	
Alpine grazing licence	Land Act	21	
Alpine contiguous grazing	Land Act	3	
Unused road licence - primary production	Land Act	23,484	
Unused road licence - non productive	Land Act	465	
Unused road licence - afforestation	Land Act	158	
Unused road licence - blue gum plantation	Land Act	178	
Unused road licence – commercial/ industrial	Land Act	1	
Unused road licence - residential	Land Act	1	
Unused road licence - non primary production	Land Act	9	
Water frontage licence - primary production	Land Act	8,952	
Water frontage licence - box iron bark	Land Act	2	
Water frontage licence - non production	Land Act	153	
Riparian management licence	Land Act	928	
Water frontage licences	Land Act	3	
Stratum lease	Land Act	50	
Radio/TV/telecom lease	Land Act	86	
Recreation/amusement lease	Land Act	36	
Section 134 leases	Land Act	82	
Aquaculture lease	Land Act	89	
Miscellaneous lease	Land Act	31	
Industrial lease	Land Act	4	
Industrial purchase lease	Land Act	1	
Residence licence	Land Act	18	
Industrial/commercial licence	Land Act	106	
Recreation/amusement licence	Land Act	94	
Jetty licence	Land Act	366	
Rubbish depot licence	Land Act	108	
Radio/TV/telecom site licences	Land Act	36	
Extractive material licence	Land Act	70	
Conservation licence	Land Act	134	
Emergency services use licence	Land Act	79	
Scout and/or guide use licence	Land Act	39	
Cultivation/garden licence	Land Act	60	
Water supply licence	Land Act	151	
Miscellaneous (improvement) licence	Land Act	17	
Miscellaneous (general) licence	Land Act	1,231	
Stratum licence	Land Act	32	
Bee farm & range licence	Land Act	110	
Temporary apiary right	Land Act	5	
Apiary right	Land Act	1,090	
Plantation lease - native state for.	Land Act	4	
Plantation lease - s/wood plant ops	Land Act	3	
Residence area right	Land Act	3	
Residence area purchase lease	Land Act	21	
NW Mallee perpetual lease	Land Act	2	
Agricultural college lease	Land Act	3	
Perpetual lease	Land Act	94	
Auriferous licence	Land Act	1	
Sub-total Land Act		41,340	5,944,642

Appendix 13 (continued)

Types of leases and licences on public land, the Act applied, number of tenures and associated revenue (2015-2016)

Public land lease/ licence description	Act applied	Number of tenures	Annual invoiced revenue 2015-16 (\$ exc GST)
Water supply licence	National Parks Act	8	
Radio/TV/telecom lease	National Parks Act	1	
Temporary apiary right	National Parks Act	2	
Miscellaneous (general) licence	National Parks Act	5	
Grazing licence	National Parks Act	4	
Occupancy - hut	National Parks Act	2	
Occupancy - miscellaneous	National Parks Act	1	
Jetty licence	National Parks Act	3	
Recreation/amusement licence	National Parks Act	2	
Radio/TV/telecom site licences	National Parks Act	1	
Extractive material licence	National Parks Act	1	
Scout and/or guide use licence	National Parks Act	1	
Apiary occupation permit	National Parks Act	1,051	
Sub-total National Parks Act		1,082	88,911
Pipeline Licence	Pipelines Act	15	
Sub-total Pipelines Act		15	40,432
Grazing licence	Water Act	27	
Miscellaneous lease	Water Act	1	
Miscellaneous (general) licence	Water Act	1	
Sub-total Water Act		29	3,212
Radio/TV/telecom site licences	Miscellaneous	11	
Miscellaneous (general) licence	Miscellaneous	30	
Permissive occupancy (not jetties)	Miscellaneous	15	
Jetty licence (permissive occupancy)	Miscellaneous	2	
Crown improvement lease	Miscellaneous	7	
Sub-total Miscellaneous		65	18,008
Grand Total		45,539	8,269,554



