National Estate Identification and Assessment in the West Region of Victoria

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Prepared by officials to support the West Regional Forest Agreement Process

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Foreword

This report provides information on the results of the assessment of national estate values related to forest environments. The information contributed to the comprehensive regional assessment of the West Region of Victoria. Places with national estate value are components of the natural or cultural environment that have aesthetic, historic, scientific or social significance, or other special value for future generations as well as the present community.

The comprehensive regional assessment of the West Region has examined environment and heritage, and social and economic values. Information on the range of these values with the exception of national estate values, is contained in the two volumes of the *West Victoria Comprehensive Regional Assessment Report*, published in July and October 1999.

The information gathered in the comprehensive regional assessment projects including the national estate studies will be used in the development of a Regional Forest Agreement for West Victoria. Further information on the approaches to the development of the Regional Forest Agreement will be provided in the public consultation paper *West Regional Forest Agreement Consultation Paper*, to be published soon.

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This report presents the outcomes of the national estate component of the Comprehensive Regional Assessment of the native forests of Victoria's West region. It will contribute to the development of a jointly agreed Victorian - Commonwealth Regional Forest Agreement for West Victoria.

Areas identified in this report as having potential national estate value are indicative only and are not necessarily the delineated forest areas that may be listed in the Register of the National Estate. The report documents the natural and cultural values that need to be taken into account in determining national estate places; with the data in the report forming the basis of that determination by the Australian Heritage Commission. The data layers and identified areas will remain indicative until they have been considered by the Australian Heritage Commission.

Over 125 sites and areas were identified as indicative national estate areas of social, aesthetic, and historic value. Indicative national estate areas of natural value are identified in value maps covering natural landscapes, undisturbed catchments, old-growth, wilderness, flora, fauna and natural history.

The national estate component of the Comprehensive Regional Assessment has greatly enhanced the knowledge of the occurrence of national estate values in the forests of Victoria's West region.

It is expected that the Regional Forest Agreement between the Victorian and Commonwealth Governments will include specifications for a jointly agreed national estate outcome in terms of both the listing of places, including a review of places currently listed or interim-listed in the Register of the National Estate, and the long-term management of national estate values in forests.

Chapter 1: Introduction

There are a number of stages in the development of the West Regional Forest Agreement (RFA) between the Victorian and Commonwealth Governments. The first stage, which follows the signing of the Scoping Agreement, is the Comprehensive Regional Assessment (CRA). Both Governments, in collaboration with experts, have been involved in a wide range of projects designed to provide the information necessary for the analysis and identification of values and the determination of possible approaches for the West RFA. Subsequent stages include the integration of environment, heritage, social and economic values in the Region, the development of a public consultation paper, and the drafting of the RFA.

This report presents the results of the assessment of natural and cultural national estate values, carried out as part of the CRA, and identifies indicative areas of national estate value in the Region. The values documented in this report will be taken into account in delineating national estate places. Areas endorsed by the Australian Heritage Commission (AHC) will be interim listed in the Register of the National Estate. The interim listing of areas will then be advertised and subject to the statutory period of three months allowed for objections and public comment. It is anticipated that interim listing of areas identified through this process will occur after the West Victoria RFA is signed.

There are five RFA study areas in Victoria; East Gippsland, Central Highlands, North East, Gippsland and West Victoria. Agreements for the two latter Regions are yet to be signed.

1.1 The National Estate

The national estate is defined in the *Australian Heritage Commission Act 1975* as:

> *those places, being components of the natural environment of Australia, or the cultural environment of Australia, that have aesthetic, historic, scientific or social significance or other special value for future generations as well as for the present community.*

The Australian Heritage Commission's responsibility is to identify the national estate and, under section 30 of the Act, to advise the Commonwealth Government on the protection of national estate places and the potential impact on national estate values of Commonwealth decisions relating to those places. The Act also requires the establishment of the Register of the National Estate (RNE). The Register includes places of importance at a local, regional or national level. The identification and assessment of places for listing in the Register is guided by the national estate criteria (Appendix A). There are eight criteria in the Australian Heritage Commission Act. These are referred to by letter codes A - H. Sub-criteria are written for all of the criteria and referred to by number such as A1, A2, D1, D2.

When making decisions about the use of forests that contain places of national estate significance, for example decisions on whether to grant woodchip export licences, the Commonwealth must consider any potential adverse effects on the national estate.

In the past, the lack of detailed information in a regional context about the national estate values of forests has made it difficult for the Australian Heritage Commission to identify and

register places of national estate significance and to provide the Commonwealth Government with detailed advice about the protection of those places. The lack of information has also contributed to uncertainty for forest-based industries and for State governments about which places will be listed in the Register of the National Estate, and what advice the Commission would give on the protection of those places.

In recognition of these problems, the Commission has developed a methodology for the regional assessment of national estate values which focuses on systematic surveys to identify areas of national estate significance coupled with appropriate management to protect identified values, using a regional framework as the basis for decision-making. A systematic regional approach to the assessment of national estate values ensures that information on the distribution and regional protection of values is available to provide an appropriate context for the Commission to develop its advice to the Commonwealth Government. It also ensures that all stakeholders and the general community are aware of the places of national estate significance in the Region.

In providing advice on the protection of national estate values identified through CRAs, the Commission has developed a policy which recognises the implementation, through the RFA process, of the nationally agreed criteria for a Comprehensive, Adequate and Representative (CAR) reserve system for forests (the JANIS criteria). In summary, the Commission's current policy on the listing and protection of national estate values in a CAR reserve system is that where a RFA has substantially met the various attributes and expectations of the Commission, then it is appropriate to list all places identified through the RFA as containing national estate values which are protected by reservation, by reserve management prescription, by site exclusion, by consultation processes or other measures appropriate to the value, or places that are robust and not affected by timber harvesting or other off-reserve management activities.

Some of the areas identified in this assessment occur within places already listed or interim-listed in the Register of the National Estate (Appendix B and Map1). In addition to the identification of new indicative areas of national estate significance, some places previously listed in the Register may not have retained their national estate values. Places already listed or interim-listed in the Register of the National Estate will be updated in the light of the information gathered during the CRA.

1.2 The National Estate Assessment

The RFA process is designed to comply with a range of Commonwealth and State statutory obligations in relation to the management of forests, including the identification of and provision of advice on the protection of national estate values required under *the Australian Heritage Commission Act 1975*. A regional assessment model for identifying the National Estate was developed in 1991-92 by the Australian Heritage Commission (AHC), in cooperation with the Western Australian Department of Conservation and Land Management (CALM), for the southern forest region of south-west Western Australia (AHC and CALM, 1992). The model was refined in 1993 for regional assessments in Victoria's East Gippsland and Central Highlands RFA regions, with similar assessments later completed for CRAs in Tasmania, and Western Australia. The Victorian model was further refined during the RFA process.

The West national estate assessment research was undertaken in 1998 - 1999. The cultural assessments were directed by the process developed by the technical advisory committee

consisting of the Victorian Department of Natural Resources and Environment (NRE), Environment Australia and observers from the Environment Conservation Council (ECC) (formerly Land Conservation Council), Heritage Victoria and Aboriginal Affairs Victoria (AAV). The natural assessments were undertaken by Environment Australia officers, with input from NRE.

Copies of consultancy reports which have contributed to the national estate assessment are available for inspection in Melbourne and Canberra:

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This report has been prepared by the CRA project team including officers of Environment Australia and the Victorian Department of Natural Resources and Environment, with the assistance of a number of other agencies, organisations and individuals.

Chapter 2: National Estate Cultural Values

2.1 Introduction

Cultural heritage refers to qualities and attributes possessed by places that have Aboriginal, social, aesthetic, historic or scientific value for past, present or future generations. These values may be seen in a place's physical features, but can also be associated with intangible qualities such as people's associations with or feelings for a place. Documentary and community-centred research reveals a wide range of cultural places within or related to the West forests, indicative of the history of human interaction with these forests.

The national estate cultural studies component of the CRA has considered forest and forest-related cultural places within the study area across all land tenures. Cultural heritage places have mainly been identified on public lands. In the instances where places of indicative national estate heritage value are located on private land, it is the policy of the Australian Heritage Commission to undertake detailed consultation with all relevant land owners and other parties to verify the significance of the place prior to any action being taken in relation to its listing in the Register of the National Estate. No action towards national estate listing for any places on private land identified in this report will be taken until such consultation has occurred.

During 1997 the Environment Conservation Council (the project was commenced by the former Land Conservation Council) commenced a study of Victorian Box-Ironbark forests. As the area of investigation overlapped the initial West RFA region, cultural heritage projects were commenced in the Box-Ironbark Investigation area to provide data for that study on the understanding that the research and assessments would also be used for the RFA projects. Since then the Commonwealth and State governments agreed to separate the Box-Ironbark Investigation area from the West RFA region.

Within the CRA process for the West RFA Region, the cultural heritage studies assessed social, aesthetic, and historic values. The cultural projects were structured in a way that built on the methods developed in 1993 for the East Gippsland and Central Highlands RFA region, and in 1998 for the North East RFA. The methods are outlined in *Method Papers: East Gippsland and Central Highlands Joint Forest Projects, Volume two - Cultural Values* (AHC and CNR 1994b) and National Estate Identification and Assessment in the North East Region of Victoria (Commonwealth and Victorian Regional Forest Agreement Steering Committee 1999 a). A new approach for Aboriginal cultural heritage was developed for the North East region and is being implemented in the West and Gippsland RFA studies. This approach is described in Section 2.2.

The West region covers approximately 5.8 million hectares of Victoria, from the western outskirts of Melbourne to the Victoria-South Australia border. The Great Dividing Range forms much of the northern boundary. The Land Conservation Council undertook an extensive study of historic places in south-western Victoria in 1996**.**

For the West region a range of forest themes and place types could be determined from the 1993 studies and other historical sources. The national estate cultural places sought were described as forest-related places located within forests, be they on private or public land,

distinct places that continue through forested areas such as tracks, or places that may be located outside forest areas with a strong forest theme such as a timber mill.

A recent comprehensive study by Bannear (1994, 1995,1997 a) on gold mining sites has meant that further investigation of places representing the gold mining theme was not required. The study by Bannear categorised places for potential significance and proposed places of national, state and national estate significance for entry in the Victorian Heritage Register. The Australian Heritage Commission has a Memorandum of Understanding with Heritage Victoria to share listing information.

Cultural heritage data audits and analyses were commissioned (Marshall, B and Jones, R 1997) for the initial West region and the Box Ironbark Investigation Area to provide a preliminary appraisal of the quality of available data in the region, the representation of place types and historic themes, and the geographic extent of existing data for Aboriginal and non-Aboriginal places.

A range of cultural heritage projects were designed and undertaken to fulfil the requirements for the National Estate component of the CRA (Appendix C). The cultural heritage value assessments involved preliminary identification of places from research, or from community heritage workshops; classification of known historic places according to themes and types; preliminary selection of places of potential national estate significance using significance indicators and field checking and site recording of selected places. This was followed by assessment of places against thresholds developed from both the Australian Heritage Commission Criteria and the collected data leading to the final preparation of place assessments in a database format.

Themes of human history (following the framework of the Principal Australian Historic Themes) relating to the West forest region helped direct research for the national estate historic values studies. A brief description of the themes follows.

2.1.1 Themes of human history

Aboriginal occupation

The Aboriginal people of Western Victoria had a clearly defined spatial organisation, with clans having distinct territories and boundaries that related to concepts of identity and land tenure (Clark 1990). According to the reconstruction by Clark (map 1996) the Aboriginal language groups existing in or overlapping with the West region consist of Woi wurrung, Gulidjan, Gadubanud, Djargurd wurrung, Girai wurrung, Djab Wurrung, Jardwadjali, Dhauwurd wurrung and Baundig.

Aboriginal people had a dynamic relationship with the environment. Forest resources such as timber and bark were traditionally used to make shelters, weapons and tools. In the Stony Rises and Lake Condah area, shelters of wood with stone foundations were constructed. The forests resource included food such as emus, koalas, wallabies, possums, starch from tree ferns, and material for weapons and other purposes. Fire was used to encourage regeneration, particularly of the edible plant foods.

Fighting for the land

Possibly the earliest contact between Europeans and the Aboriginal peoples in the West was in 1802, when Lieutenant John Murray explored part of the land of the Watha Wurrung. In 1810, sealers and whalers began working in the Portland area, and made seasonal contact with the Dhauwurd wurrung, bringing with them disease and violence (Clark 1995).

During the 1830s, as squatters pushed into the West, grazing conflicted with indigenous land tenure resulting in violence against Aboriginal people. In the late 1830s and 1840s many clans put up resistance to this invasion. The Eumaralla War was fought during the 1840s between the Dhauwurd wurrung and the early settlers. During this conflict, Mount Eccles was a major focus of Aboriginal resistance and a place of refuge (LCC 1996 b). Sustained guerilla warfare characterised the relations between many of the Aboriginal groups and the Europeans, escalating during times of drought such as the years 1838-39. The occupation of land by Europeans was rapid and by the beginning of 1846, 99% of Djab wurrung land had been occupied (Clark 1990).

Peopling the continent

The Land Acts of 1860, 1862 and 1865, allowed for six million acres of Victoria to be alienated. Of this, eighty percent was on the western plains and the central and north-eastern gold districts. The Land Act of 1869 allowed selection 'before survey'; thus opening up areas that had been unsettled or had remained in the hands of pastoralists. The northern plains were rapidly turned into wheatfields in the latter part of the 1870s. As selectors usually chose the 'better' land, areas with poorer soils and forests were left in the public domain.

A large part of early settlement was by squatters and prospective pastoralists. Reports from the expedition by Major Mitchell into the West in 1836, led to a huge influx of settlers from New South Wales, Melbourne and Van Diemen's Land (Tasmania) seeking more promising runs. The earliest pastoralists were set up in the south of the region, around the coast at Portland and between Melbourne and Geelong.

Farming practices established were similar to those in other regions. However in the Stony Rises area, the abundant volcanic stone resources covering the plains were used to construct stone barriers to defeat the rabbit plague, creating a patterned landscape with hundreds of kilometres of skilfully crafted stone walls.

Displacing Aboriginal people

The Port Phillip Protectorate was established in 1839. It sought to protect the Aborigines from any encroachment on their property, and from acts of cruelty, oppression and injustice. But although establishment of the Protectorate was acknowledgment that the condition of the Aborigines had greatly deteriorated, with greatly decreased population numbers, the protectorate was abolished in December 1849, and no coherent policy immediately replaced it (Clark 1990).

Throughout the 1850s, Aboriginal people received no government assistance, and their population numbers continued to decrease. A Select Committee in 1858 recommended that reserves be formed for the various tribes on their traditional hunting ranges where they would be able to combine agriculture and the grazing of livestock. The Victorian Government established a Central Board in June 1860 to develop reserves, and a system of Local Guardians that distributed foodstuffs, clothing and other items to Aboriginal people in their vicinity. This resulted in a number of reserves being set aside in western Victoria and where reserves were not on a group's land, people were catered for by the Local Guardians (Clark 1990).

The Church largely ran these Reserves, such as the first Aboriginal Mission in the Western District, formed by the Church of England in 1865 at Framlingham, in *Girai wurrung* country. In 1867, 2,043 acres of land at Lake Condah was reserved for Aboriginal people.

In 1886, the Victorian Parliament passed the *Aborigines Protection Law Amendment Act.* This Act redefined the legal definition of Aboriginality. Aboriginals of mixed descent under the age of 35 were now legally seen as 'Europeans' and 'non-Aborigines'. The purpose of the act was to reduce expenditure and assimilate Aborigines into 'White society'. Aboriginal people, whose legal identity had been changed, were forced to leave the Missions and Reserves. In 1910, the 1886 Act was amended so those Aborigines of mixed descent could receive aid through Aboriginal stations and missions. During the early part of the twentieth century, most of the reserves were closed, and a large extent of reserve land revoked and sold to pastoralists. People were sent to reserves in areas with which they had no association. There was strong resistance by many groups to this action. In 1951 land belonging to the Lake Condah Reserve, except for 3 small areas, was revoked and handed to the Soldiers Settlement Commission (Critchett 1995).

Utilising forest resources

- extracting and processing timber

The first forest-based sawmilling operation in Victoria was established in the West region on the lower slopes of Mount Macedon around 1839. The timber in the area was good for building and forests were in easy reach of Melbourne. The construction of the railway to Bendigo in 1862 allowed for the expansion of sawmilling in this area.

The demand for timber grew in the West with the rapid expansion of mining. The emergence of mechanised mining in Bendigo and Ballarat, and around Daylesford and Ararat intensified the demand for timber and the first large-scale sawmilling operation in Victoria developed in the western Wombat Forest (known locally, the Bullarook Forest). Wombat Forest was where Victorian timber tramway technology (tramway haulage by steam locomotive) was largely developed and tested.

Further west, in the Mount Cole and Pyrenees forests, the timber industry consisted mainly of small spot mills owned by not more than half a dozen owners. The red gum forests growing on the flood plains and adjacent swamps and along major rivers also attracted small highly mobile sawmilling industries. Sawmilling in the Otway Ranges was most active in the first part of the twentieth century as it depended largely on railways.

Due to the relative accessibility of much of the West region, and as a result of the demands from mining and clearance for agriculture, much of the land had been selected and cleared of its timber before the importance of State forests and timber reserves was formally recognised. In 1869, the Assistant Commissioner for Crown Lands began to set aside timber reserves in the vicinity of the goldfields, and State forests were reserved in these areas for future timber supplies.

-developing minor forest industries

The wattlebark industry in the West began in the 1830-40s (Bannear 1997 a), and became very important in the Grampians, and in the Mount Cole/St Arnaud District with selectors often using the resource to supplement their income (Barnard 1996). Wattle plantations for tanbark production were established at Mount Beckworth near Clunes and the Victoria Valley in the Grampians (Barnard 1996). In Portland in the late 1860s, the industry employed large numbers of men and in the 1870's the town became known as 'Barkopolis'.

Eucalyptus oil distillation was an activity that farmers and former gold miners engaged in to supplement their income (Barnard 1996). By 1917, eucalyptus production had become one of Victoria's most useful minor forest industries (FCV Annual Report 1917 in Barnard 1996).

Charcoal production was extensively carried out on a small scale in the West region, for individual needs. The best timbers for charcoal production were found in central Victoria, near Beaufort, Trentham, Lyonville and Macedon (Barnard 1996). During the Second World War, State-organised charcoal burning was conducted on a large scale to compensate for petrol shortages, especially in the Bealiba, Stawell, Heywood and Otway West Forest Districts (Bannear 1997 a).

-sustaining forest resources

The first government plantations were established in the 1880s and were largely sown with seeds from native trees, especially wattle. The original plantations were located in the Majorca State Forest, You Yangs State Forest and Havelock State Forest. Many of the earliest plantations were located on old mining land, and other areas where trees were scarce (Bannear 1997 a).

Following the First World War, there was large scale planting *of Pinus radiata* plantations, to increase the State's softwood potential and to provide work for returning soldiers. The plantations covered large tracts of old auriferous land including Anglesea and Port Campbell in the Otways, Scarsdale and Castlemaine. (Bannear 1997 a: 20). Pine plantations in the South West were expanded in the 1930s.

Moving goods and people

The routes of the early country railways were largely influenced by the needs of gold mining and associated commerce, or pastoralism. The rail route largely influenced the areas where sawmillers could set up, as the industry never attained the size or economic importance to influence rail construction in its own right. Rail construction was halted by the depression of the 1890s.

An extensive network of forest roads and tracks was constructed following World War II to provide work for returning soldiers and to provide access for fire protection purposes and timber extraction. (Bannear 1997 a).

Utilising mineral resources

Gold mining is a significant historic theme in the West, as the region contained some of the richest goldfields in the colony. In the 1850s, the West was studded with major and minor goldfields and the colonial government of Victoria actively encouraged the search for gold.

The industry was largely characterised by individuals or small parties of miners, most of whom were inexperienced and who moved from field to field as new of discoveries were made. Some of the centres of mining such as Ballarat, Bendigo, Castlemaine, Avoca and St Arnaud developed into permanent towns and cities in the 1860s, whilst other settlements dwindled away into small rural settlements or completely disappeared. Scattered though the forests of Central Victoria are abandoned mines, mullock heaps, water races and the sites of former settlements, records of the extent to which gold mining modified the landscape.

A range of minerals, including antimony and jarosite, were also mined in the West.

Engaging in primary production

Up until the 1850s agriculture was virtually non-existent. The goldrushes of the 1850s stimulated the development of agricultural holdings around the gold-mining centres in the area such as Stawell. The discovery of gold (largely in the 1850s) brought some employment to the Aboriginal people on the stations and pastoral properties as the station hands left to join the gold rushes.

In 1854-55, the acreage in Victoria under crop rose from 55,000 to 115,000 acres and this area was mainly on or near the goldfields (Barnard 1996). Land in the goldfield districts was surveyed and sold in 1853 and much of it was used for agricultural purposes. The *Selection Acts* of the 1860s and 1870s also help to open up more land in Victoria to small agricultural holdings. Farming flourished as the rising demand for foodstuffs forced prices up.

Grazing in forests

Squatters frequently moved their flocks off their own runs onto Crown Land or runs held by other leaseholders as they searched for better pastures. From the 1870s, graziers were able to graze livestock on State forests or reserves through a license or leasing system (Barnard 1996).

Graziers also used the practice of firing to improve grazing conditions for their livestock. "In Forest Commission Annual Reports of the 1920s graziers were continually named as a major cause of forest fires" (Barnard 1996: 4). They also felled or ring-barked trees to improve the grazing quality of Crown Land. Even in State forests, squatters continued their practice of 'firing', both to improve grazing and with the aim of clearing undergrowth in order to minimise the dangers of wildfire. As a consequence fires occurred frequently in the West. The Black Thursday fire of 1851 was perhaps the most severe. A serious fire in Otways 1919 destroyed 50,000Ha.

Aboriginal self-determination and self-management

From the 1970s Aboriginal people have wanted a greater say in their affairs and in dealing with the management of land. In 1975 the Aboriginal Affairs functions of the State were transferred to the Commonwealth. Aboriginal organisations and community co-operatives were established across the State. These organisations provide a range of services such as health, housing and cultural education. Aboriginal cultural heritage officers are based at the centres. The Commonwealth passed legislation in 1987 which passed title to the Kerrupjmara Elders Corporation for Lake Condah Reserve and the Kirraie Whurrong Community for Framlingham Station (Caldere & Goff 1991). The south-western Victoria study of historic places (LCC 1996 a,b,c) identified a number of historic places relating to this theme and other Aboriginal place themes.

Developing recreation and tourism industry

Tourism and recreation themes in the region include; gold mining at Ballarat in the form of Sovereign Hill and the Gold Museum, sight seeing and beach activities along the surf coast and the Great Ocean Road and the guest houses, mineral springs and historic buildings at Daylesford-Hepburn Springs. Daylesford has been a tourism centre since mineral springs were discovered in 1836. The opening of the Carlsruhe to Daylesford line in 1880 boosted tourism and with the construction of the Hepburn Springs spa complex and numerous guest houses, the area became a popular tourist resort in the early twentieth century

Experiencing the natural environment
The recreation of experiencing forest environments is popular in the Lower Glenelg National Park, Otway National Park, Grampians National Park and in Angahook-Lorne and Carlisle State Parks. Other popular sites include the volcanic formations of Tower Hill Wildlife Reserve and Mount Eccles and the Wannon and Nigretta Waterfalls.

2.1.2 Assessment criteria for cultural values

Assessing the significance of national estate cultural heritage values in a regional context is a process that begins in the early stages of place identification and documentation. National estate values are set by the Australian Heritage Commission Criteria, specified in the *Australian Heritage Commission Act 1975* and are listed in Appendix A. The assessment of cultural heritage values involves developing significance indicators from each criterion to direct the identification of places of potential national estate value, and developing thresholds to determine if the value meets an appropriate level of significance.

By suggesting types of places that may contain national estate values, significance indicators direct research to derive lists of places for further assessment. Significance indicators may include consideration of the integrity of a place, the representativeness and distribution pattern of historic themes, the representativeness and distribution of types of places, and the attributes and features of places likely to be strongly valued by communities. The indicators depend on knowledge of regional history and its major themes, the range of types of cultural places, and the regional storylines.

A threshold is the measure for determining if a value is of national estate significance. Thresholds are established by factors such as; the ability of the place to demonstrate the value, the strength and length of community appreciation, the strength of comparative values; and the rarity of the value expression. The level set by the threshold also involves consideration of the integrity and quantity of available regional information, expert opinion, and consideration of existing national estate places.

A national estate threshold is not graded: a place will either meet the threshold or not. Places may be significant against more than one national estate criterion, although a place need only be significant against one criterion to warrant listing in the Register of the National Estate. As the RFA uses a regional perspective for its assessment, a more comprehensive knowledge base for assessing places and for applying the thresholds for national estate significance can be applied.

For Aboriginal cultural values, identification and assessment of places was not undertaken. Section 2.2. describes the Aboriginal heritage values program.

2.1.3 Community consultation

Communities provide important information for the identification of cultural heritage places. In addition, community involvement is essential for the assessment of aesthetic and social value significance because the national estate criteria (AHC Criteria E and G) used to assess these values, specify that they must be of significance to a community or cultural group. For the purpose of this study 'the community' refers to any group of people with a common

ground. The cultural heritage assessments undertook consultation with the communities as follows:

- workshops for local community groups in regional locations;
- a workshop for State-wide stakeholder and user groups in Melbourne in 1997;
- workshops with forest and park officers (also referred to as forest critics);
- rounds of meetings with the West Aboriginal communities in Horsham, Halls Gaps, Heywood, Portland, Framlingham, Otways, Geelong and Ballarat;
- local community based social value research; and
- a community review process of the community derived cultural value data.

The workshops provided a venue to introduce the comprehensive regional assessment process and to engage local communities and major State-wide stakeholder and user groups in the identification of places with heritage value in the region. The workshops brought a variety of stakeholders together in discussing heritage issues. At the workshops participants identified other issues relating to forests, other than heritage concerns which could then be directed to the appropriate agency. All information relating to places gathered from the community source, is to be returned to public repositories in the form of an Inventory of Community Heritage Places.

2.2 Aboriginal Heritage Values

2.2.1 Background

Aboriginal national estate values theoretically and in practice, usually refers to attachment to land, based on a wide range of traditional and contemporary land uses. Interwoven with this is the issue of Native Title land claims, which could involve values, considered to overlap with national estate heritage values. Aboriginal heritage values are generally assessed against the national estate Criterion G:

> *strong or special association with a particular community or community group for social, cultural or spiritual reasons*

A number of issues relating to the conventional place assessment of indigenous values had surfaced during the Victorian East Gippsland, Central Highlands, and Tasmanian RFA national estate assessment projects:

- The timeframe and resources for the RFA assessments did not allow for the appropriate consultation and involvement for comprehensive identification.
- Aboriginal people are concerned about losing control of the information about places by allowing them to be identified and listed in a national register.
- Aboriginal people are also concerned about many other forest issues, particularly their participation and involvement in forest planning and management.
- Aboriginal people have indicated that they want a greater say in how they participate in the RFA process and do not want their participation restricted to national estate identification.

As a result of these issues, conventional assessments have not been pursued and the Australian Heritage Commission has accepted the shift in focus from identification of places of archaeological, historical or traditional significance to an ongoing participative and

consultative process for Aboriginal heritage management. As part of the West RFA, it is proposed to give greater recognition to Indigenous concepts of cultural heritage and other interests which needed to be addressed in order to develop effective consultation and conservation processes that reflect Indigenous concerns.

Cultural Data Audit
A review of the existing knowledge of Aboriginal heritage places in the West region was undertaken as part of the cultural data audit (Marshall and Jones 1997), in the general preliminary work for the RFA. This study determined that there had been little or no systematic survey for Aboriginal sites in the forested areas. The existing record of Aboriginal sites in the West Forest area as kept by Aboriginal Affairs Victoria and the Register of the National Estate is poor, although there has been high identification of heritage places in the coastal areas.

The cultural data audit concluded that within the West region, systematic surveys of forested areas had covered only small areas of land. The study also noted that not all landforms are equally surveyed and that precontact sites were difficult to locate so that even with intensive surveys not all sites will be known.

It was noted that a number of places of Aboriginal historic heritage had been identified and that in the South West historic places study (Critchett 1995) a number of identified Aboriginal historic places were noted and categorised by themes. However given the inadequacy of a comprehensive data record across the West RFA region, a thematic analysis was deemed inconclusive.

Aboriginal Historic Places Program
Aboriginal Affairs Victoria is involved in an Aboriginal Historic Places and Sites Program. This program is concerned with places and sites which date from first contact between Aboriginal and non-Aboriginal people, through to the present.

A major study, *Aboriginal Contact and Post-Contact History and Places* (Critchett 1995) was prepared for the LCC as part of the south western Victoria study. This study provides a narrative of Aboriginal contact and post-contact history and a gazetteer of historic places organised by themes. Some of these places are in forest environments.

2.2.2 Aboriginal heritage values - the approach

The general aim of the Aboriginal heritage program for the West RFA is to commence the development of an Aboriginal heritage management system for the forest landscapes of the region, with the support and agreement of relevant Aboriginal communities. The approach is to engage in regular communication with regional Aboriginal communities and with them develop the ongoing Aboriginal heritage management system for the forest landscapes of the West RFA region. The system will address the concerns Aboriginal people have regarding the management of their heritage places.

As a starting point community groups located in or associated with extensive land areas in the West region were approached. Initial contact was made with groups through the Coordinator of the South West & Wimmera Cultural Heritage Program and then through the co-operatives: Ballarat District Aboriginal Co-operative Ltd., Goolum-Goolum Aboriginal Co-

operative, Brambuk Incorporated, Winda-Mara Aboriginal Corporation, Framlingham Aboriginal Trust, Wathaourong Co-operative. Contact was also made with the Gournditch-Mara Native Title claimants initially at a community forum and then through Mirimbiak Nations Aboriginal Corporation. Participants at the meetings are listed in Appendix D.

Stage one of the program consisted of a first round of meetings in June held with Aboriginal communities to; introduce and explain the RFA process; identify issues related to current heritage management in the forest and explain tools that can be developed to assist in heritage management such as a zoning plan and cultural guidelines. Many issues raised reflected concerns similar to those noted in the meetings held as part of the East Gippsland RFA consultations. Some issues were beyond the scope of the heritage program and were passed to the RFA Steering Committee. The Heywood community made a strong statement that they wanted no more logging at all in the forests of the south-west.

Stage two of the program was a second round of meetings with Aboriginal communities held in September to further review the issues; commence developing strategies from issues for ongoing participative management; discuss undertaking a zoning plan; and provide an overview of forest management in the region. Preliminary strategies were developed from the identified issues and they will be further refined in the ongoing consultation program. These are as follows:

1 Communication and Consultation

Regular communication between Aboriginal people and forest managers is to be established through regularly programmed formal meetings each year with other meetings as required.

The meetings are to be organised by NRE through their Cultural Heritage Officer. The Aboriginal communities may choose to establish a Forest liaison committee. At the meetings other strategies such as access arrangements can be further developed, and proposed forest planning matters such as Wood Utilisation Plans and Forest Fire Operations Plans can be explained and discussed.

2 Cross Cultural Awareness

Awareness training on Aboriginal cultural values for all forest workers is to be built into other training courses. Local Aboriginal people are to be involved as tutors in these courses.

3 Management of Heritage Places

Develop a collaborative approach between Aboriginal people and land managers to manage known forest heritage places.

4 Protection of Known and Unknown Heritage Places

Tools such as (i) a sensitivity zoning plan can be developed to help direct surveys and supplement other place protection mechanisms and (ii) cultural heritage guidelines will be developed to assist in directing management and protection of heritage places.

5 Employment and High Level Involvement

The government and forest industry should encourage and promote employment of Aboriginal people. Government and industry should ensure that Aboriginal people are

represented on high level decision making bodies such as Forest Management Plan boards.

6 Access to Forests
A process for access to forests by traditional custodians is to be agreed with land managers.

2.2.3 The ongoing program for Aboriginal heritage

Cultural heritage management project
A model for Aboriginal heritage management was prepared for the North East region (Hughes and Buckley 1999). Major components of that project were a model for an archaeological sensitivity zoning plan to produce landscape zones of sensitivity, as well as an Aboriginal heritage management framework that could apply to all Victorian forests. In establishing priorities for the ongoing assessment, the model takes into account the nature of prior disturbance and the potential for future impacts from forestry activities such as roading.

A project has been developed to undertake a heritage management program using the model developed for the North East study. The project will involve developing sensitivity zoning plans for the other RFA regions including the West and adapting the model's management framework for the West.

It is anticipated that a sensitivity zoning plan will allow land managers to plan ground disturbing activities in least sensitive zones where they are less likely to disturb Aboriginal cultural heritage sites and places. Where this cannot be avoided, the sensitivity zoning plans alert land managers to the possibility of site and place disturbance and appropriate actions can be undertaken to minimise or avoid disturbance.

The process for ongoing heritage management must have agreement by relevant Aboriginal communities and their continual participation. The sensitivity zoning is to have accompanying guidelines for general management for each delineated zone. The zoning is to be field checked by reconnaissance surveys with representatives of relevant Aboriginal groups.

Cultural Heritage Guidelines
A project for Statewide Guidelines for Cultural Heritage Management has been developed. It is intended that the guidelines will be used by planning and field staff of NRE and Parks Victoria, to assist in meeting their obligations for the protection of places of Aboriginal and non-Aboriginal cultural heritage value on public land. Guidelines have already been prepared for East Gippsland (NRE 1997) as part of the RFA process for that region and these are currently being used as interim statewide guidelines.

The Statewide Guidelines will outline procedures for staff to follow in identifying and managing Aboriginal heritage, including Aboriginal community consultation and Aboriginal participation in the heritage management process.

The strategies create the framework which will be the Aboriginal Heritage Management System for the forest of the West region. Communication and consultation as strategy one is

fundamental to the management of Aboriginal heritage values and underpins all other strategies.

2.3 Social Value Assessment

The identification and assessment of places of national estate significance for social value in the West Forest Region was based on national estate Criterion G, which recognises places that have:

> *strong or special association with a particular community or community group for social, cultural or spiritual reasons (AHC Criteria, Appendix A).*

A place significant to the community may be where a memorable event has occurred, be it in the distant past or as a more recent event. These events might be a local disaster which affected much of the community such as a flood or bushfire or a place of community celebration. A local landmark may be a waterfall, a hill or mountain, an area of forest or a single tree. Other places of attachment may be those associated with local history or folklore such as a mountain hut or track. Such places are considered important because they form a part of the community's identity.

Very few places having national estate social significance had been previously identified in the region. The information gathered during the CRA process, which enhances our understanding of the importance of this value, will be amalgamated with existing information on places already in the Register of the National Estate.

2.3.1 Data sources

The communities of the West Forest Region provided the primary source of data for identifying and assessing places of indicative national estate social value during the CRA. Individuals and representatives from a range of organisations attended community workshops to nominate places important to them, to provide information on why those places were important, and to map the location of each place. Eight community workshops were held throughout the Region and one in Melbourne. The workshops were designed, organised and facilitated by consultants Context Pty Ltd (1999 a) in collaboration with Commonwealth and State Government RFA project officers.

Information obtained through the social values community workshop process was also used as a primary source of data for assessing places of aesthetic and historic value in the Region (see Sections 2.4 and 2.5).

2.3.2 Methodology

Identifying the range and extent of places of social value in the Region required a group-based social research method that would draw together a wide range of people willing to share their knowledge, opinions and feelings. From the range of community consultation methodologies available, the workshop method was selected as the most efficient because it could achieve a number of goals. It could:

- involve a large number of people and maximise their input;
- cater for a wide range of community interests and perspectives;
- engage participants in identifying and expressing shared values;
- facilitate comparison between the range of places valued by a community;
- enable a regional and a local focus concurrently;
- be applied in a consistent manner across the Region;
- provide results within the available timeframe;
- allow for the broad dissemination of information about the RFA generally and provide an opportunity for public question time with government officials, and
- provide consistency with methodologies used in the assessment of social value in RFA regions in other States.

Workshop locations
The choice of locations for workshops was based on a range of demographic, geographic and social information. Factors included the accessibility of workshop locations to major community catchment areas and the distance participants would be required to travel. Seven workshops were held at; Avoca , Daylesford, Rushworth, Heywood, Hamilton, Camperdown, and Apollo Bay; these were held in the evenings during the working week to enable as many people as possible to attend. One workshop was held in Melbourne to enable state-wide stakeholder and user groups to participate. Workshop locations and some community groups were identified with the assistance of local coordinators.

Identifying potential workshop participants
A local coordinator was appointed for each sub-regional area to provide a local focus, to identify and encourage organisations and individuals to attend the workshops. Invitations with background information on the aims and context of the workshop, were sent to people with interests in local government, business, timber industry, mining, primary industries, community service, conservation, history, tourism and recreation (refer Appendix E). A total of 578 organisations potential participants were identified, from which 188 attended the workshops (refer Appendix F).

Workshop design and process
Each workshop lasted approximately three hours and was structured into four phases. The first phase, involving all participants, provided information about the RFA process, the aims of the workshop, the meaning of cultural heritage value to each participant, and the types of places that might have those values. The second phase involved smaller groups of participants in compiling lists of places of possible cultural heritage value through discussion and sharing of ideas. In the third phase participants provided detailed information (including a description of the place, its history, location and boundaries, and its importance) by filling in data forms. In the fourth phase participants located and marked on 1:100 000 topographic maps places they had described, where known.

A total of 935 places were identified through the workshop process and entered in a database. All workshop participants were sent a summary report of their workshop and a list of the places identified. The information on the workshop places was compiled into an Inventory of Community Heritage Places which will be returned to a number of public repositories in the West region.

Community concerns
Workshop participants used the workshops to raise many RFA issues which were beyond the heritage assessment project. These included worries about the RFA process, the ability for community to input into the RFA, concerns about remnant woodlands, concerns about harvesting in the Cobboboonee Forest, confusion about the RFA's relationship to the Box-Ironbark study and multiple uses of the Box-Ironbark forest; the impacts of forest harvesting on water quality and access to forests for recreation.

Identifying places of indicative national estate social value
After the workshops were held, places were then assessed for national estate social value (Context 1999 b) according to the following six steps:

Step 1 - Classification and preliminary sieve. The consultants reviewed the workshop data for evidence of social value using three significance indicators:

- importance to a community as a landmark, marker or signature;
- importance as a reference point in a community's identity or sense of itself; and
- strong or special community attachment developed from use and/or association.

Step 2 - Research. The consultants went to ten towns, Maryborough, Daylesford, Ballarat, Rushworth, Bendigo, Portland, Hamilton, Camperdown, Colac and Apollo Bay where they conducted community research with questionnaires to further examine the social value of each place. This information was considered along with the community association noted at the workshops, the number of workshop locations in which the place was identified, and the number of workshop groups identifying particular places along with the number of votes the places received.

Step 3 - Preliminary Assessment. The consultants examined the adequacy and completeness of the data to enable an assessment to be made against the criterion. This resulted in a list of potential national estate places. In particular, the examination looked at whether there was:

- an identifiable community that is associated with the place;
- sufficient data to determine the location and boundary of the place; and
- sufficient data available to assess its significance.

Step 4 - Completeness and Site Validation. The consultants then established indicative boundaries, through field work and other research.

Step 5 - Final Assessment and Documentation. The thresholds were refined and applied to identify the nature of a place's social significance and to gauge the strength and endurance of this value. Table 2.1 shows the relationship between significance indicators, the threshold indicators and the thresholds. Following the final assessment the national estate database documentation was completed.

In assessing a place against criterion G, a place reaching the threshold required the following:

- to be identified by a community, which is in continued existence as a definable entity today;
- a continuity of use or association, meanings, or symbolic importance over a period of 25 years or more (representing transition of values beyond one generation); and

- an existence of an attachment or association with a place by a defined community, including evidence of use developing into deeper attachment that goes beyond utility value.

Step 6 - Return Data to Community. All the data about places identified at the community heritage workshops was reassembled, combining the original data with the consultant's assessments into a single inventory of places. The inventory was released as a draft for public comment, following the amendments and inclusions resulting from the consultation, a final inventory of places will be lodged in selected public repositories.

2.3.3 Results

Of the 935 places identified through the workshops, 608 demonstrated social value, 166 indicated predominantly social value, 65 of these places were assessed in detail, with 41 judged to be above threshold for social value significance and worthy of consideration for the Register of the National Estate. Places identified with indicative national estate social value are listed at Appendix H and their location shown on Map 2.

Many of the social value places had overlaps with the aesthetic value places, particularly the icon areas of the Grampians National Park and the Great Ocean Road. The community demonstrated their attachment to numerous picnic areas and one fossicking reserve. Forest areas in the Otway Range perceived by the community to be "old growth" or "rain forest" were also judged to be of social value significance.

Table 2.1: Thresholds for National Estate Social Value Significance

Significance indicator	Threshold Indicators			
	Threshold	**Relative strength of association**	**Length of association**	**Relative importance to the identified community**
Important to the community as a landmark, marker or signature	Above threshold	Key marker or signature used by a regional or district community to define itself and/or the locality[1]	Longevity and continuity of recognition from past to present	Singular defining landmark, feature or icon for a community
		A well known feature within a defined or local community[2]	Long association, but some discontinuity.	Well-known landmark, marker or signature
	Below threshold	Key marker not widely known beyond the bounds of a small community Little known feature within defined community	Recent association	One of many landmarks; not outstanding to the associated community
Important as a reference point in a community's identity or sense of itself	Above threshold	Represents fundamental community meanings widely recognised throughout a regional or district community	Longevity and continuity of association	Singular or outstanding place Profound meanings Seminal in shaping community identity
		Represents important community meanings widely recognised throughout a defined or local community	Long association, but some discontinuity	Important
	Below threshold	Represents other meanings of lesser/minor importance or less widely recognised Little known feature within defined community	Recent association	Minor importance One of many places providing same connection to identity
Strong or special community attachment developed from use and/or association	Above threshold	Places representing fundamental community attachments developed from long use or association widely recognised throughout a regional or district community:	Longevity and continuity of community use and/or access	Strong attachment shared across community
		Places representing important community attachments developed from long use or association for a defined or local community.	Long association, but some discontinuity	
	Below threshold	As above but not widely known beyond the bounds of a small community.	Recent association	Places representing attachment of minor importance to community
		Functional association without demonstrated attachment Little known or used	Lack of any continuity to the present	One of many similar places with equal and minor attachment

[1] *Regional community* means the West Forest Region; *District community* means a workshop catchment.
[2] *Defined community* means a community defined by its shared culture, beliefs, ethnicity, activity, experience (rather than locality); *Local community* means the community of a town or rural area.

2.4 Aesthetic Value Assessment

The identification and assessment of aesthetic value in the West Forest Region was based on national estate Criterion E, which recognises places that have:

> *importance for a community for aesthetic characteristics held in high esteem or otherwise valued by the community.*

The working definition for 'aesthetic value' used for the regional assessments in Victoria is:

> *Aesthetic value is the response derived from the experience of the environment or particular natural or cultural attributes within it. This response can be to either visual or non-visual elements and can embrace emotional response, sense of place, sound, smell and any other factors having strong impact on human thought, feelings and attitudes (AHC Technical Workshop Series No 7, 1993)*

The types of places having aesthetic value include landscapes, scenic drives, mountains, hills, recreation areas, forest areas, rivers, lakes and waterfalls.

2.4.1 Data sources

Scenic value assessments had been undertaken by NRE as part of the Visual Management System, by LCC in a number of studies particularly of rivers and streams, and by the National Trust of Australia (Victoria) in several heritage landscape assessments in the region. Although these data sources contributed to the research they could not provide an adequate assessment of national estate aesthetic value across the region.

2.4.2 Methodology

The complex nature of aesthetic value, as shown by its definition above, prompts the need for a multifaceted approach to its assessment. Using Criteria E and the definition (described above) a set of significance indicators were used to assist in identifying places with potential national estate aesthetic value as follows:

- natural features and landscapes recognised by experts (forest critics) or community groups as having outstanding scenic and evocative qualities;
- cultural features or landscape with outstanding scenic, evocative or other meaning;
- places having aesthetic attributes or quality that has inspired art, poetry , literature, or tourism promotion;
- aesthetic quality that promotes popularity of a place;
- unusual or rare landform phenomena;
- prominent distinctive landform feature; and
- a place having community recognition as a landmark.

Robin Crocker & Associates (1997) undertook the project that consisted of researching and compiling datasets from workshops (primary sources) and focused surveys (secondary sources), combining the data and assessing the value. The datasets are described as follows.

Community heritage workshop dataset
Community heritage workshops as described in the previous section (Section 2.3.2) were held across the region to collect information for both the social, historic and aesthetic value assessments. Around 63% of the places identified at the workshops were recorded as having aesthetic value.

Forest critics workshop dataset
The term 'forest critics' is used for forest officers and parks officers who have a sound knowledge of forest systems and particular forest areas and who could critically evaluate the aesthetic qualities of the landscape. Officers from the region, particularly from the more remote areas, participated in order to provide coverage of the whole study area. Forest Critics Workshops were held at Daylesford, Hamilton and Colac (refer Appendix G). The workshops involved each officer nominating potential aesthetic places, then the group identifying gaps and overlaps, sieving places to eliminate minor sites, collectively ranking places, completing place questionnaires, and marking places on 1:100,000 map sheets.

Art and literature survey
The aesthetic importance of places is often depicted in art and literature, giving a place both popularity and a role in understanding the aesthetic value of societies. A specialist research consultant (David Young with Robin Crocker & Associates) undertook a survey of literature, fine art, film and photography related to the West region. Relevant experts were consulted and primary and secondary sources reviewed. Material obtained from the survey was combined and ranked for significance based on:

- frequency of association, that is the number of times a place has been recorded in any art media;
- public recognition of the artists depicting the forest place;
- public recognition of the individual artworks; and
- public recognition of the place depicted.

A total of 84 places in the region were identified in the research with varying degrees of recognition. As this study was undertaken in 1997 the region included the Box-Ironbark special investigation areas. Well known early Victorian artists and photographers such as Eugene Von Guerard, Arthur Streeton, Fred McCubbin, Henry Nankin, Richard Daintree and Nicholas Caire painted and photographed popular landmarks and landform phenomena, and captured the colours and textures of the region. In more recent years the works of artists and photographers such as Arthur Boyd, Fred Williams, David Tatnel, Steve Parish have celebrated the landscape while writers and poets used the landscape as a setting for their work. The landscapes of the Grampians and the Otways together have been the subject or setting for more than 36 well known works.

Tourist publications survey
Literature generated by the tourism industry both reflects and generates public knowledge and place recognition by encouraging visitation. The availability of information on forests and natural areas was discussed with staff from tourism and conservation organisations, and tourist information outlets, and publications were reviewed. Assessments concentrated on high quality, full colour publications with moderate to large print runs and broad distribution, based on the understanding that they have the greatest impact on existing and potential visitors to the forested areas. The publication categories were state, regional and local tourism brochures, statewide and regional park and forest brochures, guidebooks and directories, posters and a selection of periodicals and large format heritage books. Sites in forested settings were recorded and a scoring system used to measure the level of community exposure to the image (based on print run and distribution) and the number of times a place was depicted.

Other published sources survey
Information concerning previously identified places of aesthetic value within the West Forest Region was reviewed and considered in the compilation of data for the assessment of national estate aesthetic value. Sources accessed included government reports and reports by non-government organisations, such as the National Trust of Australia (Victoria), lists and databases and other relevant publications.

The methodology for the CRA aesthetic value assessment was designed to achieve the best practicable understanding of the range and distribution of aesthetic places in the West Forest Region within the available timeframe. The assessment process was organised in the following steps:

Step 1 Preliminary Assessment. Information from the datasets was combined into a matrix table and examined for adequacy and completeness of place data. Places were selected for further assessment using the following selection criteria:

- identified at two or more community workshops; or
- identified at one community workshop and in at least one other source; or
- identified at a forest critics workshop and in at least one other source; and
- located in a forest setting.

Step 2 Review and site verification. Places meeting the criteria for preliminary assessment were subject to more rigorous assessment as follows:

- quantitative and qualitative review of all information with an emphasis on community and forest critic derived places;
- field reconnaissance surveys which involved consideration of the extent of selected places and their comparative landscape-character-type scenic quality;
- consideration of the remoteness of places; and
- consideration of the values weighting from the secondary source information

Step 3 Final Assessment. To finalise the assessment, places had to meet one of the following thresholds:

- strongly identified by a number of primary community sources for having aesthetic value;
- identified by community sources and supported by information from forest critics, scenic landscape-character-type comparisons or secondary aesthetic value sources; or
- remote places strongly identified by forest critics as having high aesthetic value in the region and supported by secondary aesthetic value source, or by expert corroboration.

Final documentation for the national estate database was then completed.

2.4.3 Results

In the West Forest Region 37 places were identified as meeting an appropriate threshold of national estate aesthetic significance as a result of studies carried out for the CRA. These places incorporated numerous individual places identified in the original data sets, with some places amalgamated where appropriate with larger places, such as national and state parks. The assessment process showed that the majority of places were below the national estate aesthetic threshold, in some cases because of the lack of supporting data. Places identified

with indicative national estate aesthetic value are listed at Appendix I and their location shown on Map 3. The 37 aesthetic places above threshold were drawn from:

- places identified with aesthetic value from the community heritage workshops;
- places from the forest critics workshops;
- places from the art and literature survey;
- sites from the tourism literature review; and
- places from other published sources.

The aesthetic value research undertaken for the CRA stressed that communities greatly value the aesthetic quality of the regional, state and national parks, identifying numerous features within the parks as well as the full extent of the park landscapes. In particular the Grampians and Otways National Parks are highly valued. Some mountains, waterfalls and lakes were also identified. Only 3 cultural places were noted, the Mount Macedon Memorial Cross, the Cape Otway Lighthouse Reserve and Hepburn Regional Park.

2.5 Historic Value Assessment

Historic value reflects how a place reveals information about past events, practices and people. Australian forests have a long human history with the West region revealing a rich historic heritage arising from a diverse colonial and post-colonial history. Settlement histories are dominant with many other historic themes strongly represented in its forested areas, including, sawmills and tramways and, the more recent theme of recreation and tourism (described in Section 2.1.1).

Places with historic value in the West region were assessed for national estate significance against the Australian Heritage Commission Criteria A3, A4, B2, C2 D2, F, and H, (refer Appendix A). Aspects of heritage significance covered by these criteria are:

- richness and diversity of cultural features (A3)
- important in the course and pattern of history (A4)
- rarity of historic features (B2)
- research potential relating to human history (C2)
- important example of a type of place (D2)
- technical or creative achievement (F)
- association with the life or works of an important person or group (H)

2.5.1 Data sources and data audit

The data audit provided a bibliography of the main sources of heritage place information, an assessment of existing site databases and reports based on minimum data requirements, a list of historic themes and site types, an indicative list of heritage places within forests, and a geographical and thematic data gap analysis. Data bases with useful place records in the region were the Register of the National Estate, the NRE Historic Places Section database, Heritage Victoria Register, Heritage Victoria Archaeology Database and the National Trust of Australia (Victoria).

The audit included all sites which fell within forested areas on both public and private land. Coverage was generally inadequate for forests on private land throughout the study area. Limitations were found to exist in accurately locating whether places were in forested areas or not, because no GIS material was available for any of the historical datasets.

Broad regional studies (LCC Special Investigation, LCC consultants' reports and conservation studies) have examined the entire West study area. In addition a study has concentrated specifically on sites in Wyperfield National Park. Other small scale specific studies supplying limited information have examined sites in other parks in the Mallee and Otways. Although regional conservation studies of Geelong and Mildura areas have favoured the identification of sites in the built environment the same areas have also been re-examined by more recent LCC consultants' studies which identify many sites in forested areas.

Areas identified for further research by the data audit were the forests of the far South West, such as the Lower Glenelg National Park and surrounding forests, the Angahook-Lorne State Park and adjacent forest areas outside the LCC South West Study area, and the Brisbane Ranges and adjacent forest excluding Steiglitz.

2.5.2 Historic places research

An assessment by Natural Resources and Environment, and Environment Australia of the West Cultural Heritage Data Audit recognised the need for the following historic studies to be undertaken to provide adequate information for a comprehensive regional assessment of cultural values:

- Sawmill and Tramway study, for places directly associated with timber harvesting such as sawmills, tramways, mill settlements and kilns;
- Historic Forest Activity study, to cover places associated with minor forest production such as silviculture, fire protection, charcoal production, eucalyptus distillation, wattle barking, and firewood provision, as well as sites associated with forest management such as arboreta, camps and fire towers;
- Selected Historic Themes study, to cover places associated with all other historic themes including places related to pastoralism, agriculture, settlement and people, moving goods and people, mining activities (other than gold mining) and, recreation and tourism.

The studies were undertaken by Peter Evans (1999), David Bannear (1997 a) and Graeme Butler & Associates (1999) respectively.

Studies and investigations which were conducted in the Box-Ironbark region throughout 1996, 1997, and 1998 identified some places which fell within the northern part of the West region. These assessments were; Butler (1997), Bannear (1997 b), Marshall, Jones and Jordan (1996), and Keating (1997). The Community Heritage Workshops which were conducted in the West region in 1998 included workshops within the Box-Ironbark, summarised in, "Context, Workshop Overview Report, (1999 a)". All places identified by these investigations, studies and workshops which overlapped with the West region were included for consideration as part of the West's assessment.

2.5.3 Methodology

The methodology of the three historic studies varied due to the focus of each study and the information resources available but the general approach taken by the studies is as follows.

The first stage of the assessment was a comprehensive investigation of primary and secondary historical sources and datasets. This was followed by on site inspections and recording of sites.

As a regional assessment covers a vast area, it requires a methodological selection process. The selection may be based on the representativeness of the themes or types of place, the availability of data, or the condition and integrity of the place. The sawmill and tramways study and the forest activities study were specific theme studies with selections of places being based on typologies, condition and integrity. The typology studies were able to analyse substantial government records to research places and to augment that information through consultation with forest officers to ascertain condition and integrity.

The selected historic themes study covered an array of themes and types of places and required a thematic and geographic gap analysis using the cultural data audit and community workshop data as a first step to direct priorities for research. These recommended the rationale for the selection of places for assessment which included; timber extraction, routes of human movement, places associated with recreation and tourism, and water and fire management.

Each of the historic studies developed sets of significance indicators to determine the lists of places to be surveyed. For the final assessment they established thresholds to determine which places met the AHC criteria.

Sawmills and tramway places
The data from the community heritage workshops was not available for the West region at the time of the sawmills and tramway survey. Input was sought from local informants wherever possible during the site survey and proved to be extremely valuable. The sites discovered during the typological study were checked against the Australian Heritage Commission criteria as listed in Appendix A. If places had the potential to meet the threshold for two criteria they were listed for field checking.

After field surveys, places were comparatively assessed against the national estate criteria in terms of their ability to represent any of the following:

- development of sawmilling, sawmills and transportation networks;
- economic importance of the industry;
- community development;
- a major event occurred at the site;
- discovery of new seasoning techniques;
- demonstration of a range of occupations and skills in sawmilling;
- demonstration of methods for harnessing landforms;
- distinctive mill layout;
- a high degree of archaeological potential, or potential for education;
- comparative richness of site-types, or unusual mix of site types;
- an association with a renowned or influential person;
- demonstration of change of technology and engineering achievement; and

- range of products produced.

In each instance the place needed to amply demonstrate one or more of the features above, and be one of the best of its type in the study area in order to meet the threshold level for a place of potential national estate value.

Forest activities places
A detailed analysis of historic records identified potential forest activity sites on public land and following community consultation it was found that most of these no longer existed. The remaining sites were assessed against the following significance indicators to determine those of potential national estate value:

- the role the place played in respect to the Forests Commission's strategic priorities, and the historical development of the region and State's timber industry;
- the scientific importance of the data represented in the features of a place and the degree upon which the place may contribute further substantial information;
- the degree to which the place can be demonstrated as having historical integrity and/or rareness in its intactness or condition better than any other similar place;
- the measure of the awareness in the local community of the site and its role in the history of the locality; and
- the degree to which the setting of the place had been modified.

Site inspections were conducted for all places assessed as having potential National Estate values.

Selected forest theme places
The research stage of the forest themes study identified over 2149 potential places. Some places came from the thematic and geographic gaps analysis (Marshall & Jones 1997), from the community heritage workshops and from other databases and sources. Sites were then listed and classified according to type, theme and potential significance. From that list, places were considered to indicate potential national estate significance if they had:

- a heritage value (provided by previous studies) where the place has an identified value to the locality, region, State or nation;
- no known statutory heritage status; and
- no known statement of significance.

Following further investigation it was recognised that many sites had been already assessed as part of the LCC South West Historic Places Investigation and were therefore not assessed further.

Places were assessed for national estate significance using thresholds based on:

- exceptional richness or diversity of features relating to the theme, or theme/storyline combination;
- regional comparisons with other places in the region relating to the representation on theme type, or a particular event;
- known as a research or teaching place or with exceptional regional potential for public education;
- integrity for demonstrating a type of place; and
- the importance of association with a person or group of regional or state importance.

2.5.4 Results

In the Sawmills and Tramways study by Evans (1999), 24 places were considered to meet the threshold for national estate significance, the majority of these were mills, tramways and log chutes. The study also recommended three sites be added to the Register of the National Estate from the Land Conservation Council's South-West special investigation, LCC (1996 a), these were; *Marchbank's sawmill, tramway and double incline (A10), Knott's No.3 sawmill, Wylangata (A11)* and*; Henry and Sanderson's sawmills and features, Barramunga (A12).* The West study area supplied evidence of the earliest phases of Victorian forest-based sawmilling, particularly on the slopes of Mount Macedon.

Of the Forest Activity Places, Bannear (1997 a), four places were considered to meet the threshold for national estate significance. (Seven additional places were included which came from Bannear's (1997 b), Box-Ironbark assessment. These were included because they fell within the boundary of the West Region.) The sites ranged from; distilling sites, charcoal kilns, and forest worker camp sites. The majority of the sites identified related to the Forests Commission from the 1930s. These were camps for forest workers drawn from the ranks of the unemployed, 'enemy aliens' and post-Second World War immigrants. Small scale private charcoal burning was extensively carried out in the South West of Victoria, with state-organised charcoal burning enterprises conducted on a large scale during the Second World War.

In the Study of Places Relating to Selected Historic Forest Themes, Butler (1999), a total of 12 of the assessed places met the threshold for national estate significance. The assessed places in the West reflected the remote forest setting for both gold and timber extraction operations, as well as the transport means which aided development in the marginal country opened up for special government resettling projects. Still evident in the region are the early transport routes which served gold extraction, timber cutting and farming.

Places identified with indicative national estate historic value are listed in Appendix J and their location shown on Map 4.

During the course of the West study the boundary of the region was changed to its present extent through the agreement of the Victorian and Commonwealth Governments. At the time the consultants were undertaking their studies their brief was based on the original, larger region. The result of the boundary change was that a few places identified as above threshold by consultants now occur outside the final West RFA region.

In the Sawmills and Tramways study, one place, *Cameron's Sawmill, Reedy Lake, Nagambie* is outside of the West RFA boundary.

In the Historic Forest Activity study, three places; *Carapooee West Boy's Camp, The Gap Charcoal Pits and Wail Plantation* are outside of the West RFA boundary.

In the Selected Historic Forest Themes study, two places; *Mortarless Culverts – Fells Gull Road and Stone Creek School Site* are outside of the West RFA boundary.

Chapter 3: National Estate Natural Values

3.1 Introduction

Natural values for the West RFA Region were assessed against the relevant national estate criteria. They range from values covering some thousands of hectares to values confined to single small sites. Identification and treatment of natural values follows three broad subdivisions:

- extensive natural values;
- localised natural values (flora, fauna); and
- other natural values, including those relating to geology and geomorphology.

As was done for the cultural values assessment, the natural values assessment considered places within the study area across all land tenures. It did not, however, limit itself to forest and forest-related species or places, largely because the distinctions are often not clear. The policy of the Australian Heritage Commission regarding places of indicative national estate heritage value located on private land is described in Section 2.1.

3.1.1 Assessment criteria for natural values

In the regional context, assessment of national estate values requires a comparative appraisal of the significance of places having one or more attributes or values. The values are derived from the national estate criteria listed in Appendix A.

Indicators of significance vary across the national estate natural values and include:

- rarity or threat;
- distribution pattern;
- condition and integrity;
- diversity or richness;
- outstanding example.

The development of thresholds for national estate significance will vary depending on the level of current knowledge about the nature and extent of natural values and their distribution in the landscape at a local, regional or national level. A regional evaluation involves building and interpreting a more comprehensive and integrated knowledge base for assessment of significance than would be possible in considering a place, or places, in isolation.

As with national estate cultural values, a threshold is set in relation to the significance indicators and this threshold is specific to each national estate value. Thresholds of significance for each value were largely based on those used for the North East National Estate Assessment (VicRFASC 1999a), which in turn were adapted from the Central Highlands Joint Forests Project (AHC & CNR 1994a) and the East Gippsland National Estate Assessment (AHC & NRE 1996).

The resultant products are indicative national estate value layers. Individual sub-units within each layer are not graded in significance as they either reach the threshold or they do not. Boundaries of some indicative layers have been rationalised in an ecological or topographic sense, while others have not.

All mapped indicative national estate natural areas have been digitised and are held in ARC/INFO format on a GIS platform held by both Environment Australia and NRE.

3.1.2 Major biophysical characteristics of the Region

Detailed biophysical characteristics of the West RFA Region are provided in the 2-volume CRA Report for the Region (VicRFASC 1999b, VicRFASC 1999c). A brief summary is presented here.

Biogeography
The Region covers approximately 5.8 million hectares in the south-west of Victoria. The two main IBRA Regions (*An Interim Biogeographic Regionalisation of Australia*, Thackway and Cresswell 1995) represented are the Victorian Volcanic Plain and Victorian Midlands, with smaller areas of the South East Coastal Plain, South Eastern Highlands, Murray-Darling Depression and Naracoorte Coastal Plain.

Landscape
Western Victoria is generally lower in elevation and relief than the east of the state, and the landscape is undulating to hilly. The Region is distinguished by the western volcanic plains, which form an area of low relief between the dissected and undulating terrain of the Otway Ranges and the uplands to the north. Major peaks include Mt William (1167m) in the Grampians National Park and Mt Macedon (1001m).

Climate
The Grampians and Otway Ranges are the dominant landform features in the Region and have a significant influence on weather patterns. The Otways generally receive over 2000 mm of rainfall per annum. However, a distinct rain shadow effect is produced to the north and east of these ranges where markedly lower average rainfalls occur. A similar pattern exists east of the Grampians. Summers tend to be relatively hot and windy in these rain shadow areas. Temperatures in the Region vary according to proximity to the coast and altitude. Mean summer maximum temperatures range from the low 20s near the coast and at higher elevations to the low 30s in the north. Average winter maximums range between 10°C and 15°C. Strong winds are a regional feature, often producing 'windswept' vegetation patterns.

Water Resources
The West RFA Region is partially within the Australian Water Resources Council South East Coast and Murray-Darling Drainage Divisions, covering sections of 16 river basins. Basins in the Murray Darling Division drain northward to the Murray River and rivers in the South East Coast Division flow to the ocean. Rivers in the west of Victoria generally have very low annual flow. Numerous aquifer systems, including mineral springs, occur within the Region's groundwater provinces.

Vegetation
Ecological Vegetation Classes (EVCs) are the basic mapping unit used for forest ecosystem assessments, biodiversity planning and conservation management at the regional scale in Victoria. A total of 394 EVCs (including a number of mosaics and complexes) have been

identified as currently occurring in the West. Most of these are classified as rare, vulnerable or endangered according to the National Reserve criteria (JANIS 1997). Those which were most widespread prior to European settlement are Plains Grassy Woodland and Plains Woodland. A total of approximately 2,000 species of vascular plants have been recorded for the Region, including at least 399 species of conservation significance.

Fauna
The faunal assemblage of the West is also diverse, reflecting the range of environments and habitats represented. A number of species, including the Spot-tailed Quoll (*Dasyurus maculatus*), Brush-tailed Phascogale (*Phascogale tapoatafa*), Red-tailed Black-Cockatoo (*Calyptorhynchus banksii graptogyne*) and Powerful Owl (*Ninox strenua*) have important populations in the Region, particularly in the fragmented forested environments.

3.2 Extensive Natural Values

The two sub-criteria of relevance to the assessment of extensive natural values are:

Sub-criterion A2: **Importance in maintaining existing processes or natural systems at the regional or national scale; and**

Sub-criterion B1: **Importance for rare, endangered or uncommon flora, fauna, communities, ecosystems, natural landscapes or phenomena, or as a wilderness.**

These are inclusive values, extending broadly across the landscape rather than being confined to single vegetation types, landforms or localities. The values considered in this aspect of the West Region assessment are:

- natural landscapes;
- undisturbed catchments;
- wilderness; and
- old-growth forest.

Assessment of these values resulted in the identification of indicative places of importance for the maintenance of natural processes (such as hydrological processes) at regional and national scales, and places that are of regional importance for maintaining specific natural systems (such as remnant vegetation).

Biophysical Naturalness
Biophysical Naturalness is one of the indicators developed for the assessment of wilderness values, using the National Wilderness Inventory (NWI) criteria (Lesslie and Maslen 1995). It is also integral to national estate assessments for natural landscapes and undisturbed catchments. Biophysical Naturalness (BN) is based on the assumption that the degree of change sustained by an ecosystem is directly related to the intensity and duration of interference.

The types of disturbance information used to derive the BN layer are dependent on the available range of reliable data sets. Information used to derive the BN layer for the West RFA Region included old-growth coverage and records of timber harvesting, agricultural clearing and plantation establishment. Grazing disturbance was also applied in the BN ruleset and was derived from grazing lease history, slope and EVC palatability. Wildfire is considered a natural process and the effects of wildfire did not influence BN rating.

The BN index provides a six-class rating from a value of 0 (most disturbed) to 5 (most natural). A description of the decision rules used to derive each of the classes is given in Table 3.1.

Table 3.1: Biophysical naturalness code decision rules.

Land Cover/Old Growth Grazing disturbance	No Rec. Logging	Agric. Clear.[1]	Logging		Historic Site	Plantation	
			Selective	Clearfell		HW[2]	SW[3]
Old Growth							
No Grazing disturbance	5	5	3	1	1	1	0
Other Natural[4] - Public Lands							
No Grazing disturbance	5	4	3	1	1	1	0
Grazing in Lease	2	2	2	1			
Grazing Possible	4	2	2	1			
Other Natural - Private Lands							
No Grazing disturbance	2	2	2	1	1	1	0
Grazing in Lease	1	1	1	1			
Grazing Possible	2	2	2	1			

Notes:
1. Cleared at some time (1800-1999).
2. Hardwood (Eucalypt).
3. Softwood (Pine & other).
4. Based on previously existing National Wilderness Inventory data.

It should be noted that the absence of comprehensive disturbance information and the nature of regrowth in the West Region forests means that the application of the BN modelling rules overstates the extent of areas with high BN. For national estate assessments that use biophysical naturalness as an indicator or for thresholding, further validation of areas with indicative national estate significance should be considered.

3.2.1 Natural Landscapes

Natural landscapes are large, relatively undisturbed areas with topographic and catchment integrity where natural processes continue largely unmodified by human intervention. Natural processes include:

- energy flows;
- nutrient cycling;
- hydrological processes;
- ecological processes such as succession; and
- evolutionary processes such as speciation and extinction.

At a national level, ‘natural landscapes’ are considered rare, and in national estate assessments for Regional Forest Agreement regions they have generally been assessed under sub-criterion B1.

Method
The following measures were used to identify areas of potential natural landscape value:

- naturalness (or level of disturbance indicated by the BN index);
- size; and
- integrity in the landscape.

Boundaries were drawn around contiguous areas of high biophysical naturalness. Rivers, ridge lines, roads and tenure boundaries were used to guide manual delineation of boundaries. Highly irregular boundaries and small narrow fingers were smoothed off or clipped to reduce edge to area ratios and increase overall integrity. In order to rationalise the identification of areas, identified areas could contain fragmented but not significant areas of disturbance.

Threshold
Only areas greater than 3,000 ha and with at least 95% class 5 BN were considered above threshold. Three thousand hectares was considered to be an appropriate threshold after reviewing the representation of potential natural landscapes across the Region while at the same time ensuring viability within the landscape.

Results
Twenty two natural landscape areas of indicative national estate significance were identified. These areas cover a total of 252,884 ha and range in size from 3,139 ha (Cumberland) to 46,870 ha (Serra). Delineated areas of natural landscapes are listed in Table 3.2 and shown in Map 5.

Table 3.2: Indicative natural landscape areas.

Natural Landscape		**Area (ha)**
No.	**Name**	
1	Serra	46,870
2	Victoria	28,339
3	Rosneath	16,132
4	Angahook	13,565
5	Glenelg	13,249
6	Drajurk	12,838
7	Tremarne	11,429
8	Dergholm	11,297
9	Lerderderg	11,012
10	Black Range	10,930
11	Difficult Range	10,000
12	Weecurra	9,405
13	Jilpanger	7,994
14	Enfield	7,327
15	Brisbane Ranges	7,017
16	Barham	6,599
17	Pyrenees	6,367
18	Pyrites	5,255
19	Carlisle	5,058
20	Richmond	4,701
21	Rocky Creek	4,361
22	Cumberland	3,139
	Total Area	**252,884**

3.2.2 Undisturbed Catchments

'Undisturbed catchments' are catchments where natural hydrological processes remain essentially unmodified and unimpeded.

Method
The identification of undisturbed catchments was based on an analysis of river flow impediments and the naturalness of the area within the catchment. The assessment is derived using the River Disturbance Index database that was developed for the Australian Heritage Commission's Wild Rivers project (Stein et al. 1998).

The River Disturbance Index (RDI) is a measure of river/stream quality across sub-catchment areas and is based on calculating scores for sub-catchment condition and flow regime indicators. An RDI database has been constructed by establishing a grid across a primary database containing geographical data and information on watercourses, settlement and infrastructure features (such as built-up areas, reservoirs and canals), the extent of non-natural land cover and an index of biophysical naturalness. The database delineates a separate modelled sub-catchment for each stream segment, as defined on the AUSLIG 1:250,000-scale hydrography theme database. The RDI rates sub-catchment areas on a scale from undisturbed (0) to disturbed (1).

Threshold
Highly undisturbed catchments occur in the RDI range less than or equal to 0.01 and all sub-catchments falling within these parameters were deemed to be above threshold for this value. Maintaining consistency with similar processes carried out for other CRAs, the threshold was further set to areas of high biophysical naturalness (BN equals 4 or 5) and with an area of 1,000 ha or greater.

Undisturbed catchments that were below 1,000 ha along the boundary of the RFA Region were investigated to see whether such units were part of a larger undisturbed catchment that extended beyond the Region. No such units were evident.

Results
No undisturbed catchments were identified in the Region.

3.2.3 Wilderness

Wilderness quality is essentially a measure of the extent to which a location is remote from and undisturbed by the influence of modern technological society (Lesslie and Maslen 1995). This assessment of wilderness quality is considered under sub-criterion B1 as the value is held to be rare when viewed from a continental perspective.

The West RFA Region has been covered by two previous wilderness assessments. The first of these, *A Survey of Wilderness Quality in Victoria* (Preece & Lesslie 1987), was funded and prepared for the Australian Heritage Commission and the Victorian Ministry for Planning and Environment. The Victorian Land Conservation Council subsequently undertook a special investigation of wilderness across the whole of Victoria (LCC 1991).

Because more recent and detailed disturbance information compiled by NRE is now available, it was decided to re-assess wilderness quality in the Region for national estate purposes.

Method
The National Wilderness Inventory (NWI) methodology, developed by the Australian Heritage Commission, has been adopted as the standard approach to the assessment of wilderness in RFAs throughout Australia. The current national estate assessment of wilderness quality in the West uses this methodology, which is identical to that applied in other regions of Victoria.

The NWI methodology produces a database of 'wilderness quality' across the Region. This is achieved by measuring the variation in wilderness quality across the landscape using wilderness quality 'indicators' that represent the two essential attributes of wilderness: remoteness and naturalness. The indicators are:

- **Remoteness from Settlement** - remoteness from places of permanent occupation;
- **Remoteness from Access** - remoteness from established access routes;
- **Apparent Naturalness** - the degree to which the landscape is free from the presence of permanent structures associated with modern technological society; and
- **Biophysical Naturalness** - the degree to which the natural environment is free from biophysical disturbance caused by the influence of modern technological society.

The data used in the analysis were those used in the NWI and come from many sources. The distance-related indicators (settlement, access and apparent naturalness) are essentially current AUSLIG digital mapping data updates.

The index of wilderness quality derives from a summing of the component indices (each ranging from 0 to 5) and is represented by a range from zero to 20. To identify areas with high wilderness quality, the criteria used in this assessment were areas with a NWI wilderness quality of at least 12. Although no wilderness areas have been delineated as part of this assessment, they are most commonly defined as being areas of high wilderness quality (12 and above) occupying at least 8,000 ha (JANIS 1997, VicRFASC 1996).

Results
Based on the most currently available information, the distribution of wilderness quality in the West RFA Region is shown in Map 6. Most of the area shown with high wilderness quality is either too small or too fragmented to justify consideration as potential wilderness areas.

The largest contiguous area of high wilderness quality in the Region, based on the current assessment, occurs in the Victoria Range section of the Grampians National Park, occupying approximately 12,800 ha. The Preece and Lesslie (1987) and LCC (1991) assessments both rated this area (and other areas in the Grampians) as having only moderate wilderness quality. The only reasonably large areas of high wilderness quality identified outside the Grampians are an area of approximately 5,500 ha near the Jilpanger Flora and Fauna Reserve and another area of about 3,900 ha occupying most of the Black Range State Park (both in the north-west of the Region).

3.2.4 Old-growth forest

Old-growth forest is considered important for maintaining existing natural processes (sub-criterion A2). It is characterised by having the oldest possible growth stage and by being negligibly disturbed. The West RFA Region old-growth forest study (report in prep.) used the

same definition of old-growth forest applied in all other Comprehensive Regional Assessments of old-growth forest studies in Victoria:

Old-growth forest is forest which contains significant amounts of its oldest growth stage in the upper stratum – usually senescing trees – and has been subjected to any disturbance, the effect of which is now negligible (Woodgate et al., 1994).

Method
The old-growth forest identified in the West RFA Region old-growth forest study was used as the primary data set for identification of indicative national estate old-growth forest values in the study area. Details of the methodology used to delineate old-growth forest are summarised in the West CRA Report (VicRFASC 1999c).

It should be noted that the absence of comprehensive disturbance information and the nature of regrowth in the West Region forests means that the application of the old-growth modelling rules overstates the extent of old growth. Candidate old growth in the modelling process requires validation against disturbance and growth stage information (VicRFASC 1999c).

Areas of indicative national estate old-growth forest significant for ecological processes are considered to be those that have high integrity and natural context (as identified by the NWI BN index) and above a minimum size threshold to ensure the viability and quality of the forest stand.

Threshold
The context in which the old-growth forest areas were located was seen as important in determining minimum size. Old-growth within large areas of high biophysical naturalness functions ecologically within a larger, relatively undisturbed landscape framework. For areas within natural landscapes (comprising at least 95% BN 5), a minimum patch size of 10 ha was selected as the threshold.

Old-growth outside large areas of high biophysical naturalness is more susceptible to unnatural disturbances such as land clearance and timber harvesting, and effects related to this disturbance, particularly edge effects. The minimum area for old-growth forest in these areas was therefore set at 100 ha to allow for potential edge effects.

Results
A total of 106,304 ha of old-growth forest was identified as above threshold (see Map 7). This represents 86% of all candidate old-growth forest in the Region.

3.3 Flora

Flora values in the West Region were assessed against national estate sub-criteria A1, A2, A3, B1 and D1 (Appendix A).

Sub-criterion A1: Places demonstrating evidence of past processes

The assessment of flora values under this sub-criterion involved the identification of places where the present distribution and ecology of the West RFA Region flora reflect the influence of evolutionary, climatic and environmental processes. Key indicators of places important in

demonstrating these processes on native flora in the Region were identified as places containing:

- endemic flora;
- flora at the limit of their range;
- flora with disjunct distributions;
- relictual Ecological Vegetation Classes;
- refugia from climatic change; and
- relictual and primitive flora.

Methods for the assessment of endemics, limit-of-range flora and disjunct populations were based on the methods used for national estate assessments for the Central Highlands (AHC & CNR 1994a), East Gippsland (AHC & NRE 1996) and North East Victoria (VicRFASC 1999a) and involved the following steps:

- selection of taxa relevant to each national estate value;
- selection of appropriate points using Geographic Information System (GIS) coverages based on the Department of Natural Resources and Environment's (NRE) Flora Information System (FIS) data; and
- identification of places where major concentrations of relevant records occur.

The perceived natural geographic distribution for each species was used to identify disjunct and limit-of-range populations. Where possible recent human activities (such as land clearing), sampling intensity and environmental parameters were taken into account. This nominal distribution was based on data from the FIS and information contained within the *Flora of Victoria* (Walsh & Entwisle 1993-96), *Flora of New South Wales* (Harden 1990-93), and *Flora of South Australia* (Black 1986). All FIS records were used in the identification of values but grid records were not used in creating the final point coverages due to their limited spatial accuracy – an actual site could be anywhere within the 10' grid (approximately 15 by 18 km).

3.3.1 Endemic flora

Endemic flora were defined as:

- those taxa whose natural distribution is wholly confined to the West Region (E1);
- those taxa whose natural distribution extends beyond the West Region, but >50% of the nominal distribution is within the Region (E2).

Method
Endemic taxa were identified using the NRE FIS, *Flora of Victoria, Flora of South Wales* and *Flora of South Australia*. All occurrences of these taxa within the West were plotted.

Areas containing concentrations of endemic taxa were also identified. This was done by assessing the number of endemic taxa which have records within a 5 km radius of each endemic taxa point locality. Three different levels of endemic flora species concentration were applied – 6-13, 14-21 and 22 or more taxa recorded within a 5 km radius. For every point locality above arbitrary thresholds, a 2.5 km radius circle was used to delineate a boundary indicating an area with a relatively high concentration of this value. Where these boundaries overlapped, the internal boundaries were removed leaving polygons based on the external boundaries of areas identified as above each concentration level.

Threshold
Each individual point record for all species identified as endemic against either of the endemicity levels was considered to be above threshold. The spatial analysis identifying concentrations merely provides an additional visual tool showing those areas with high species richness for this value.

Results
One hundred and twenty four taxa were identified as endemic to the West (see Appendix K and Map 8), with over a third of these belonging to the *Caladenia* (orchid), *Eucalyptus, Grevillea* and *Pultenea* (Bush-pea) genera. Seventy eight of the taxa have not been recorded outside the Region. The analysis of records to highlight concentrations clearly indicates the significance of the Grampians as the major centre for endemic flora in the West Region.

3.3.2 Flora at the limit of their range

Places where a species occurs at the edge of its natural geographic range are considered important as these locations reflect one or more environmental / biophysical features which limit the further expansion of the species' range. Under natural circumstances these features may indicate past environmental change and/or evolutionary processes, but given the recent pattern of human occupation they may also reflect activities such as land clearance, introduction of competitors, etc.

Method
For the purposes of this assessment records identified as representing a limit-of-range were restricted to the extreme geographic limit of the main core of each taxon's range. The extreme limit refers to the noticeable protrusions away from the distribution of the main core, although clearly in some instances these were not always obvious, and in other cases extreme limits were not a characteristic of the species distribution given the sparse distribution and hence ill-defined core. Where isolated populations occurred well beyond the limit of the main core, these were considered to be better represented under the disjunct population criterion. Likewise, where species distributions extend into Tasmania these were by and large considered as a disjunct and separate part of the taxon's distribution.

It is recognised that limits of range are defined by a much greater complexity of environmental factors than just extreme geographic limits. Further modelling incorporating data such as topography, climatic bands, soils, geology and vegetation communities would enhance the simple model produced here. The model presented here is likely to be a very narrow implementation of the limit-of-range concept.

Limit-of-range taxa were identified using the NRE FIS, *Flora of Victoria, Flora of New South Wales* and *Flora of South Australia*. Only the specific record(s) of each taxon that were at, or close to, the limit-of-range were selected. Limit-of-range records for all taxa were combined and concentrations were identified using the same method as described in the endemic flora analysis (see above). Two different levels of limit-of-range flora species concentrations were applied – 4-5 taxa, and 6 or more taxa recorded within a 5 km radius.

Threshold
Each individual point record identified as being at the limit-of-range was considered to be above threshold. The spatial analysis identifying concentrations merely provides an additional visual tool showing those areas with high species richness for this value.

Results
One hundred and fifty eight taxa were identified as having limits of geographic range in the RFA Region (see Appendix K & Map 9), including 23 Eucalypts. Concentrations of flora at their limit of range occur around the Grampians, Mt Cole, around the Crawford River near Dartmoor, and at a number of other localities.

3.3.3 Flora with disjunct distributions

Places where disjunct populations occur are considered important from an evolutionary point of view due to their isolation from gene flow. This disjunction may have arisen due to mechanisms such as a break in a formerly continuous distribution, or to long distance dispersal over a barrier.

Method
Disjunct populations were defined as those outlying populations separated from the main core of a taxon's distribution. Whether a record was considered disjunct depended on its relative separation from the main core, the overall pattern of the distribution of the taxon in question, and where possible the impact of land clearing.

Taxa with disjunct populations were identified using the NRE FIS, *Flora of Victoria*, *Flora of New South Wales* and *Flora of South Australia*. Where a number of records occurred in a tight cluster away from the main distribution, all records within the cluster were considered disjunct. The determination of whether a population, or cluster of populations, was disjunct was based on the relative isolation from the main core, rather than on the basis of any set distance, given the variation in geographic range of taxa from regional to national. Concentrations of disjunct taxa populations were identified in the same manner described in the earlier assessments for endemicity and limit of range. Three different levels of disjunct populations of flora species concentrations were applied – 6-13 taxa, 14-21 taxa, and 22 or more taxa recorded within a 5 km radius.

Threshold
Each individual point record identified as being disjunct from the main core of the species range was considered to be above threshold. The spatial analysis identifying concentrations merely provides an additional visual tool showing those areas with high species richness for this value.

Results
One hundred and eighty three taxa were identified as having disjunct populations in the West (see Appendix K and Map 10). The Otway Ranges support the highest concentrations of disjunct flora populations in the Region with other significant concentrations occurring in the Grampians, Mt Cole area, and in forest areas around Bacchus Marsh.

3.3.4 Relictual Ecological Vegetation Classes

Relictual Ecological Vegetation Classes (EVCs) are those classes whose floristic composition carries a relatively high proportion of primitive, relictual and phylogenetically distinct

species. Such species are important as indicators of evolutionary history, past or current population movements, evidence of past or current speciation and for evidence of past or current decline. The diverse range of habitats and the presence of long-term stable landscapes such as heath and rainforests in the West all contribute to the likelihood of persistence of such species in the Region.

Method
EVCs were identified as relictual on the basis of carrying a higher proportion of flora taxa from phylogenetically Gondwanan or primitive groups (such as ferns and rainforest bryophytes and lichens). Identifications were made by NRE experts.

Threshold
With the exception of the Wet Forest EVC, all occurrences of the identified EVCs were considered important for the maintenance of the relictual species occurring within them and were taken as being above threshold. Of those EVCs above threshold, only Wet Forest is subject to potentially significant logging disturbance, which in turn can affect the maintenance of component relictual species. Because of this, only the less disturbed (BN 4,5) areas of Wet Forest were considered above threshold.

Results
The following EVCs were identified as containing a high incidence of relictual flora:

- Cool Temperate Rainforest;
- Wet Forest; and
- Wet Heathland.

They have a relatively restricted distribution across the Region and are generally associated with protected wet environments. The most extensive occurrences of relictual EVCs are of Cool Temperate Rainforest and Wet Forest in the Otway Ranges, and Wet Heathland around the Lower Glenelg National Park area (see Map 11). These EVCs occupy a total area of 43,400 ha within the West.

3.3.5 Phylogenetically significant flora

There are two criteria by which flora may be considered phylogenetically significant. Firstly, a taxon may be significant if it has a long fossil record, having also ostensibly remained unchanged, eg Wollemi Pine (*Wollemia nobilis).* A flora taxon may also be significant if it is one of the last remaining living representatives of an old lineage.

The earliest land plants, the *Lycopods* (the Baragwanathia flora) and *Psilophytes* (the Cooksonia flora), evolved around 420 – 385 million years ago from the late Ordovician to early Devonian Periods. In Victoria, the Cooksonia flora is represented by the highly restricted Skeleton Fork-fern (*Psilotum nudum*) and by four other Fork-ferns belonging to the genus *Tmesipteris*. The Baragwanathia flora is represented in Victoria by living Club Mosses (*Lycopodium* spp, *Huperzia* spp and *Phylloglossum* spp).

There are no living representatives in Victoria of the early seed plants that evolved around the late Devonian and early Carboniferous Periods, 385-325 million years ago. There are also no living relatives of the Coal Swamp Flora (Giant Club Mosses, Seed Ferns and Giant Horsetails) of the Carboniferous Period (355-290 million years ago). Quillworts (*Isoete*s), which are distant relatives of the Giant Club Mosses, are significant as they have a lineage that goes back to the Triassic Period (245-208 million years ago).

After the Ice Age of the Late Carboniferous and earliest Permian times, there was a rapid evolution of a rich flora characterised by Glossopterid plants (White 1986). However, there are no living representatives in Victoria of these early Gondwanic flora, such as Ginkgos and Conifers, which were evident during the Permian (290 to 250 million years ago). Modern conifers, i.e. Plum Pines (*Podocarpus* spp), were prominent in the Cretaceous Period (144-66 million years ago) and *Callitris* is a prominent component of Tertiary fossil flora (66 –1.6 million years ago) in south-eastern Australia.

Victoria's more recent phylogenetically significant flora include several primitive angiosperms from the early Cretaceous Period. Lineages dating to the early Cretaceous include the Magnoliid taxa, such as the Southern Sassafras (*Atherosperma moschatum*), the Pepper Plants (*Tasmannia spp*), Dodder-laurels (*Cassytha* spp), Austral Mulberry (*Hedycaria*) and Bolwarra (*Eupomatia laurina*), the latter being one of the most primitive flowering plants in Victoria. Myrtle Beech (*Nothofagus cunninghamii*) reflects the dominant vegetation of the late Cretaceous Period of Gondwana, when New Zealand, Australia and South America were still joined to Antarctica. Myrtle Beech persisted through to the middle Tertiary when it was largely replaced by mainly sclerophyllous flora.

Method
All phylogenetically significant flora taxa were identified using expert advice (A. Drinnan Melbourne University, pers. comm.) and all point records above threshold were plotted using information contained in the Flora Information System.

Threshold
All point records of taxa identified as significant for this value and which are listed as Victorian Rare or Threatened Species (VROTS) were considered above threshold. Because a number of the significant taxa are not on the list of VROTS, with some of these being very common, only point records falling within natural landscapes were considered above threshold for non-VROTS species.

Results
All species with point records above threshold are listed in Table 3.3 and all records above threshold for these species are shown in Map 12.

Table 3.3: Phylogenetically significant flora.

Scientific Name	Common Name
Callitris glaucophylla	White Cypress-pine
Callitris gracilis	Slender Cypress-pine
Callitris rhomboidea	Oyster Bay Pine
Cassytha glabella	Slender Dodder-laurel
Cassytha melantha	Coarse Dodder-laurel
Cassytha pubescens s.s.	Downy Dodder-laurel
Hedycarya angustifolia	Austral Mulberry
Huperzia varia	Long Club Moss
Isoetes drummondii	Plain Quillwort
Isoetes drummondii ssp. *anomala*	Plain Quillwort
Lycopodium deuterodensum	Bushy Club Moss
Nothofagus cunninghamii	Myrtle Beech
Phylloglossum drummondii	Pigmy Club Moss
Psilotum nudum	Skeleton Fork-fern
Tasmannia lanceolata	Mountain Pepper

Tmesipteris elongata ssp. *elongata*	Slender Fork-fern
Tmesipteris obliqua	Long Fork-fern

3.3.6 Refugia from climate change

The major trend in climatic change in Victoria since the last Ice Age (some 10,000 years ago) has been a decrease in water availability. Refuges were identified as places within the landscape with environmental conditions that have allowed the survival of vegetation characteristic of the last glacial period. Such areas in general tend to be characterised by lower average ambient temperatures and/or greater water availability and a concomitantly lower fire frequency.

Environmental change over the terminal Holocene and even Pleistocene has also been characterised by periods of dryness. It is possible that core dry areas acted as refuges for species dependent on higher fire frequencies than were typical during the mid-Holocene climatic optimum. At present, however, the environmental history of the Region is not sufficiently documented to enable the delineation of potential 'dry refugia', unlike the situation for identification of 'cold' and 'wet' refugia.

Method
A combination of expert knowledge of the current structure and floristics along with topographic information was used to identify refugia and the particular EVCs that typify habitat of cold and the most fire intolerant communities. The EVCs identified as refugia are presented in Table 3.4. All areas of these EVCs in the Region were mapped.

Table 3.4: EVCs identified as refugia from long term climate change.

Environment	EVCs that qualify
Montane	Montane Grassy Woodland Montane Rocky Shrubland
Rainforest	Cool Temperate Rainforest

Threshold
All occurrences of the EVCs in Table 3.4 were considered above threshold for this value.

Results
All areas above threshold as refugia from long term climate change occur in the Grampians and Otways and are shown in Map 13.

Sub-criterion A2: Places demonstrating existing natural systems

3.3.7 Contemporary flora refugia

For this assessment, a flora refuge is defined as a place that provides protection for flora species during shorter-term climatic changes and environmental disturbances such as frequent

fire and/or drought. Areas that are refuges from long-term climate change (i.e., the last Ice Age) are addressed under sub-criterion A1 (see Section 3.3.6).

Method
All EVCs occurring in the West and having potential to act as flora refuges (being infrequently burnt and/or protected from the effects of drought) were identified. Those for which appropriate information was available were mapped.

Threshold
Those EVCs considered to offer potential flora refuge habitat are listed in Table 3.5.

Table 3.5: Refuges from frequent fire and drought.

EVCs that qualify	Drought refuge type			Fire refuge
	Wetland	Riparian environment	Water-dependent dryland environment	
Wet Heathland			✓	
Coastal Saltmarsh				✓
Estuarine Wetland	✓			
Riparian Scrub Complex			✓	
Riparian Forest			✓	✓
Riparian Shrubland			✓	
Damp Forest			✓	
Wet Forest			✓	✓
Cool Temperate Rainforest			✓	✓
Swamp Scrub	✓		✓	
Floodplain Riparian Woodland		✓	✓	
Rocky Chenopod Woodland				✓
Creekline Grassy Woodland			✓	
Wetland Formation	✓		✓	
Swampy Riparian Woodland		✓		
Riverine Grassy Chenopod Woodland			✓	
Lignum Wetland			✓	
Grey Clay Drainage Line Herbland/Sedgeland			✓	
Plains Grassy Wetland	✓		✓	
Swampy Riparian Complex		✓	✓	
Sedge Wetland	✓			
Mangrove Shrubland	✓			✓
Creekline Herb-rich Woodland		✓	✓	
Riparian Scrub		✓	✓	
Seasonally Inundated Shrubby Woodland		✓	✓	
Seasonally-inundated Sub-saline Herbland				✓
Sedgy Riparian Woodland		✓	✓	
Shallow Freshwater Marsh			✓	✓
Shrubby Wet Forest			✓	✓
Wet Sands Thicket			✓	✓
Floodplain Thicket		✓	✓	
Sedge-rich Wetland		✓	✓	
Claypan Ephemeral Wetland			✓	
Dry Creekline Woodland		✓	✓	
Cane Grass Wetland			✓	
Red Gum Wetland			✓	
Reed Swamp			✓	
Brackish Lake			✓	✓
Creekline Sedgy Woodland		✓	✓	
Riparian Woodland		✓	✓	
Brackish Drainage Line Herbland/Sedgeland		✓	✓	
Plains Sedgy Wetland			✓	✓
Plains Swampy Woodland			✓	
Aquatic Herbland			✓	
Lignum Cane Grass Swamp			✓	
Brackish Wetland			✓	
Freshwater Lignum Shrubland			✓	

Plains Riparian Shrubby Woodland		✓	✓	
Black Box Lignum Woodland		✓	✓	
Dune Soak Woodland			✓	
Sandy Stream Woodland			✓	
Salt Paperbark Woodland				✓
Inland Saltmarsh				✓
Drainage Line Woodland		✓	✓	
Freshwater Meadow				✓
Deep Freshwater Marsh	✓		✓	✓
Semi-permanent Saline				✓
Permanent Saline				✓
Basalt Creekline Shrubby Woodland		✓	✓	
Sedgy Swamp Woodland			✓	
Damp Heathland			✓	
Damp Heathy Woodland			✓	
Stream-bank Shrubland		✓	✓	
Floodplain Reedbed		✓	✓	
Spray-zone Coastal Shrubland				✓
Plains Brackish Sedge Wetland			✓	
Escarpment Shrubland				✓
Cane Grass-Lignum Halophyllic Herbland			✓	
Plains Freshwater Sedge Wetland			✓	

All occurrences of these EVCs (greater than or equal to 1 ha) were considered above threshold.

Results
The EVCs listed above had areas above threshold totalling 161,500 ha (see Map 14).

3.3.8 Successional stages

Succession occurs when one vegetation stage or class replaces another over time. Succession is the directional and continuous pattern of colonisation and extinction on a site by populations of a species. The time scales for succession may vary widely, reflecting the range of underlying causes.

Where an unvegetated landform has not previously been colonised by a community, the sequence of species is referred to as a primary succession.

Secondary succession describes the sequence of species where disturbance has caused partial or complete removal of vegetation but where well-developed soil and seeds and spores remain from which the earlier vegetation class re-emerges. That is, there is a reversion to the prior EVC after disturbance. Secondary succession may occur after major natural disturbances such as fire, flood and windfall.

This value is associated with National Estate sub-criterion A2, which relates to places important for the maintenance of existing processes.

Method
This assessment was unable to be completed due to constraints on time and data availability. A methodology and possible thresholds are described below for future consideration.

Those EVCs, or parts thereof, considered to exhibit primary and secondary succession as outlined above were identified using expert knowledge (D. Frood, pers. comm.). All examples of EVCs, or parts thereof, above threshold should be plotted.

Threshold
Whilst primary succession may occur over a relatively short time span, such as on destabilised sand dunes, the time span for some vegetation types to move through primary succession is much longer. EVCs identified as potentially capable of relatively rapid change, i.e. within a few hundred years, as well as those possibly thousands of years old with the potential to undergo primary succession, were all considered above threshold. The entire range of EVCs identified as potentially capable of demonstrating secondary succession were also considered above threshold.

For primary succession, the threshold in most instances is the inclusion and plotting of all of that EVC from which the primary successional phase develops. In other instances, only those parts of an EVC with a particular rainfall and/or aspect are considered likely to move through primary succession to another EVC. For example only the wettest margins of Wet Forest might have the potential to succeed to Cool Temperate Rainforest due to the maintenance of a requisite water regime and greater likelihood of protection from fire. Identifying parts of an EVC that may give rise to another should be based on identifying the elements of existing derived EVCs that are shared with those that may give rise to it.

Results
Patterns of primary and secondary succession evident in Gippsland are described in Table 3.6.

Table 3.6: Patterns of primary and secondary succession in the West.

Primary Succession Sequence →		**Secondary Succession Pattern cause**
Coastal Dune Scrub Mosaic	Sand Heathland	← absence of fire
Coastal Saltmarsh (potentially all, but most likely to be patches)	Coastal Tussock Grassland/Estuarine Swamp Scrub	
Estuarine Wetland (potentially all, but most likely to be patches)	Swamp Scrub	
Riparian Scrub Complex (ca 3rd order streams and above)	Riparian Forest	← Fire
Riparian Forest (over 1,000mm rain, Otways)	Cool Temperate Rainforest	← Flood (scour)
Wet Forest (over 1,000mm rainfall)	Cool Temperate Rainforest	← Fire
Coastal Saltmarsh Complex (mangrove component, potentially all, but most likely to be patches)	Coastal Saltmarsh	← Storm
Swamp Scrub (Volcanics)	Plains Swampy Woodland (patches)	← Fire
Wetland Formation (mostly coastal dune swales and floodplains, elsewhere very slow)	Dryland Vegetation Types	
Grey Clay Drainage Line Herbland/Sedgeland (all due to scarcity and lack of mapping despite being slow)	Swamp Scrub	
Plains Grassy Wetland (all plus Corrick system for ARI mapping of Freshwater Meadow on tertiary or volcanic soil)	Plains Grassland/Plains Grassy Woodland	
Sedge Wetland (all but very slow plus Corrick system for ARI mapping of Shallow Freshwater Marsh on volcanic and tertiary soil)	Sedgy Swamp Woodland/Damp Heathy Woodland	
Mangrove Shrubland (as per Coastal Saltmarsh)	Coastal Saltmarsh	

Coastal Dune Scrub (from back of foredune - 50 m inland)	Damp Sands Herbrich Woodland through to Sand Heathland	← (various coastal processes)
Coastal Tussock Grassland (potentially all - slow process)	Coastal Dune Scrub	← (various coastal processes)
Shallow Freshwater Marsh (of Coastal Dune Swales, Floodplains)	Freshwater Meadow	
Floodplain Thicket (all, but slow)	Plains Grassy Woodland	
Sedge-rich Wetland (all, very scarce)	Sedge Rich-woodland	
Claypan Ephemeral Wetland (all but slow)	Seasonally Inundated Shrubby Woodland/Plains Sedgy Woodland	
Cane Grass Wetland (all but slow)	Lignum Canegrass	
Red Gum Wetland (all but slow)	Plains Woodland	
Reed Swamp (all above 650 mm rainfall)	Swamp Scrub	
Cinder Cone Woodland (all but very slow)	Plains Grassy Woodland	
Deep Freshwater Marsh (all)	Shallow Freshwater Marsh	
Damp Heathland (all but slow)	Damp Heathy Woodland	
Coastal Landfill / Sand Accretion (all)	Coast Dune Scrub/Coast Saltmarsh	← (various coastal processes)
Stream-bank Shrubland	Riparian Woodland	← Flood (scour)
Floodplain Reedbed (all)	Riparian Woodland/Swamp Scrub	
Plains Brackish Sedge Wetland (all but slow)	Damp Heathy Woodland	

3.3.9 Remnant vegetation

Remnant vegetation comprises those floristic communities which have been severely depleted. Remnants form important present-day refuges and recruitment areas for both flora and fauna. The primary mechanisms for depletion are agricultural development and other land uses which result in permanent clearing. Consequently, many remnants are in close proximity to private lands.

Method
All occurrences of EVCs identified as having remnant status in the Region were plotted.

Threshold
EVCs were identified as having remnant status where less than 30% of their pre-1750 extent remained. This was determined from information contained in the West CRA reports (VicRFASC 1999b,c).

Results
Of the 394 EVCs identified as still occurring in the West Region, 115 were found to have been depleted to below 30% of their pre-1750 coverage. The great majority of these remnants occur on private property within cleared lands, although the largest single units include areas of Stoney Rises Woodland, Herb-rich Foothill Forest and Plains Grassy Woodland on mainly public land. All occurrences of these EVCs are identified as having national estate value and are shown on Map 15.

There is little information about the relative quality of these remnants. Further research is warranted to clearly identify those areas whose quality, and security from external threatening processes such as rising saline ground water, justify continued recognition of their national estate value.

Sub-criterion A3: Places of unusual richness

3.3.10 Modelled flora richness

The aim of the A3 diversity of flora communities assessment is to identify locations which exhibit a high diversity of flora. Assessments of this value for East Gippsland and the Central Highlands relied on linking a list of character flora species to each EVC. The resultant total number of character species within a 2 km grid cell was used as a rating or index of flora richness. This method effectively uses EVC richness as a surrogate measure of flora species richness.

Method
The above approach was modified for use in the North East national estate assessment and repeated for the Gippsland and West Region assessments. Character species were not used and analysis was based solely on EVC richness per unit area. A Flora Richness Index (FRI) was determined based on the number of EVCs within a 2 km grid cell. The FRI allocated one unit per EVC with the exception of mosaics and complexes, which were allocated a value dependent on the number of component EVCs. Where mosaics or complexes occurred within an area with a particular EVC already recorded in that area, that EVC was not counted twice. Non-natural EVCs (plantations, cleared areas) had no impact on the FRI.

A 2 km grid was used as a sampling technique. To avoid inconsistencies associated with the location of the source of the grid, 16 sampling iterations were conducted. Iterations involved 500 m source point shifts in a 4x4 matrix. The end result was an effective cell size of 500 m x 500 m, with each cell containing a mean FRI value based on all 16 iterations.

Threshold
All grid cells making up the highest 5% of FRI scores across the Region were considered above threshold.

Results
The Grampians occupy well over half of the total area of high modelled flora richness identified in the Region (see Map 16), partly reflecting the large topographic variation found in the area. Most other areas above threshold are in the far west of the Region, with smaller scattered concentrations in the south-east near the Otways and around the Brisbane Ranges and Mt Cole.

Sub-criterion B1: Places of rare and threatened flora

3.3.11 Rare or threatened flora

For the purposes of this assessment, rare or threatened taxa included:

- taxa listed on the Victorian Rare or Threatened Species list for plants (VROTS);
- taxa listed on the list of Rare or Threatened Australian Plants (ROTAP) (Briggs and Leigh 1995);
- taxa listed as threatened under the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act); and

- taxa listed under the Commonwealth *Endangered Species Protection Act 1992* (ESP Act).

Method
All non-grid records of threatened flora on the Victorian Flora Information System occurring in the study area were plotted on a GIS. Concentrations of rare or threatened taxa were identified in the same manner described in the earlier assessments for endemicity, limit of range and disjunct flora. Three different levels of concentration were applied – 8-15, 16-23 and 24 or more taxa recorded within a 5 km radius.

Threshold
Each individual point record for all species identified as rare or threatened were considered to be above threshold. The spatial analysis identifying concentrations merely provides an additional visual tool showing those areas with high species richness for this value.

Results
A total of 399 threatened taxa were identified as being above threshold for this sub-criterion in the Region (see Appendix K and Map 17), including 58 species or sub-species that are nationally endangered or vulnerable. The Grampians support the largest concentration of threatened flora in the Region, with high concentrations also occurring around Stawell, Anglesea and Sunbury.

3.3.12 Rare Ecological Vegetation Classes

The aim under this environmental characteristic is to identify EVCs where there is clear evidence that the EVC has become nationally rare either through severe depletion or due to natural constraints on extent.

The identification of nationally rare EVCs proved too difficult and this assessment was unable to be completed. This was largely due to two factors: firstly, the EVC classification is not used nationally and equivalents are not necessarily recognised as discrete types; secondly, obtaining data on the extent of depletion or natural rarity of vegetation types on a continental scale is difficult.

The National Vegetation Information System (NVIS) may eventually overcome this problem. The NVIS, currently in a pilot phase, is an initiative of the National Land and Water Resources Audit (a National Heritage Trust Program). It intends to collate all existing vegetation information across Australia into a standardised system based on a set of core attributes agreed by all Australian governments.

3.3.13 Rare old-growth forest

Old-growth forest is considered a regionally and nationally rare phenomenon. Rare old-growth is in even more need of protection.

Method
Old growth was considered rare if it met one or more of the following criteria:
- its extent was less than 10% of the total EVC extent;

- the old-growth representation of an EVC was less than 300 ha;
- it was old-growth of an EVC considered rare, vulnerable or threatened under JANIS criteria (see West CRA Report).

Threshold
Areas identified as 'rare old-growth' were all considered above threshold.

Results
Rare old-growth is scattered in generally small parcels across most remaining forested parts of the Region, particularly in the Grampians, Otways and Brisbane Ranges, occupying a total area of 19,400 ha (see Map 18).

Criterion D: Importance in demonstrating principal characteristics of class

3.3.14 Principal characteristics of Ecological Vegetation Classes

Under this criterion EVCs were identified on the basis of their condition and integrity for the purpose of representing the principal characteristics of their class across the project area.

The principles of Comprehensiveness, Adequacy and Representativeness (the CAR principles put forward in the 1992 National Forest Policy Statement) need to be considered across the geographic range within the West RFA Region. Within each ecosystem there is diversity of the floristic communities over the geographic range, often influenced by environmental factors such as climate and soil types.

Method
EVCs were divided into two groups on the basis of rarity; those considered as rare, vulnerable or endangered under the JANIS criteria, and other EVCs. Natural landscapes were used for the purpose of ensuring an appropriate distribution of above-threshold areas of the EVCs throughout their range.

Threshold
Since the majority of the rare, vulnerable and endangered EVCs are very limited in their extent and/or area, it was considered that all remaining examples of these EVCs should be above threshold for this value. Examples of all 'other' EVCs were considered above threshold where they occurred within natural landscapes. Where these 'other' EVCs were poorly represented within natual landcapes (below 5% of pre-1750 extent), additional examples were selected from other parts of the Region (preferably with high biophysical naturalness) across their range.

Results
Of the 'other' (non rare, endangered, vulnerable) EVCs, most achieved at least 5% of pre-1750 representation within natural landscapes. Additional examples of the remaining 'other' EVCs were selected from other areas across the Region with good biophysical naturalness. All areas above threshold for this value are represented in Map 19.

3.4 Fauna

Fauna values were assessed against national estate sub-criteria A1, A2, A3 and B1.

The methods and thresholds applied to the following fauna assessments are based largely on those used in the assessment of national estate values for the Central Highlands (AHC & CNR 1994a), East Gippsland (AHC & NRE 1996) and North East Victoria (VicRFASC 1999a). However, some modifications have been made on the basis of expert workshop outcomes, methodologies used for RFA national estate assessments in other states, and differences in datasets and assessment timelines.

3.4.1 Data sources

The following are the main sources of locality and distributional data used for assessing fauna values:

- Atlas of Victorian Wildlife. This is the principal fauna database maintained by NRE's Flora and Fauna Branch. It contains species and locality data for almost 2,000,000 records of mainly birds, mammals, reptiles and amphibians. Freshwater fish and threatened invertebrates are also represented but with relatively fewer records. These data are derived from:
  - -fauna surveys conducted by the Flora and Fauna Branch since 1972;
  - -fauna surveys conducted specifically for the RFA process;
  - -fauna surveys conducted by educational institutions and field naturalists clubs;
  - -Atlas of Australian Birds project records;
  - -Museum of Victoria specimen records; and natural history journals.

- Atlas of New South Wales Wildlife. This is the principal fauna database maintained by the NSW National Parks and Wildlife Service. It contains species and locality data for birds, mammals, reptiles and amphibians. Access to this database was necessary for analyses relating to endemicity and populations that are disjunct or at the limit of their range.

- Zoologists familiar with the project area and/or the species within it.

- Standard fauna texts and various fauna survey and assessment reports.

All species with records in the Atlas of Victorian Wildlife since 1970 and with an accuracy of 2' or better were considered in the following assessments. The full list of species is provided in Appendix L. Fish and invertebrate species were only considered where sufficient data or information was available. The absence in the New South Wales Wildlife Atlas of records for these two groups, and the unavailability of an equivalent database of South Australian fauna, further limited the assessments that could be undertaken for them.

Sub-criterion A1: Importance in the evolution of Australian fauna

The assessment of fauna values under this sub-criterion involved the identification of places where the present distribution and ecology of the West Region fauna reflect the influence of past evolutionary, climatic and environmental processes. Key indicators of places important in demonstrating these processes on native fauna in the Region were identified as places containing:

- endemic fauna;
- fauna at the limit of their range;
- fauna with disjunct distributions;
- refuges from climatic change; and
- relictual and primitive fauna.

3.4.2 Endemic fauna

Endemic fauna were defined as:

- those taxa whose natural distribution is wholly confined to the West RFA Region (E_1); or
- those taxa whose natural distribution extends beyond the West RFA Region, but >50% of the nominal distribution is within the Region (E_2).

Method
All endemic taxa were identified using mainly Victorian and New South Wales Wildlife Atlas records. A point coverage was created of all records (post 1970 with at least 2' accuracy) of these taxa in the West.

Some additional information on endemic invertebrate species was obtained from CSIRO (P. Greenslade, pers. comm.), however, detailed locality information was not available for these.

Areas containing concentrations of endemic taxa were also identified. This was done by assessing the number of endemic taxa that have records within a 5 km radius of each endemic taxa point locality. For every point locality above a relatively arbitrary species concentration level (in this case, 2 different taxa within the 5 km), a 2.5 km radius circle was used to delineate a boundary indicating an area with a relatively high concentration of this value. Where these boundaries overlapped, the internal boundaries were removed leaving polygons based on the external boundaries of areas identified as above the arbitrary concentration level.

Threshold
Each individual point record for all species identified as endemic against either of the endemicity levels was considered to be above threshold. The spatial analysis identifying concentrations merely provides an additional visual tool showing those areas with high species richness for this value.

Results
Twenty four taxa (including seven crayfish species) were identified as meeting the criteria for endemicity in the West RFA Region (see Table 3.7 & Map 20). The large number of records in the west and north-west of the Region are mostly Red-tailed Black-Cockatoos, with this threatened sub-species having been the subject of intensive research in the area. It should be noted that the identified boundaries of concentrations are not in any way ecologically

meaningful and that such areas nominated for national estate listing should be delineated according to appropriate landscape features. The Otway Ranges area represents the largest concentration of fauna species that are endemic to the Region.

Table 3.7: Fauna taxa exhibiting endemism.

Scientific Name	Common Name	Endemicity	
		E_1	E_2
Antechinus swainsonii insulans	Dusky Antechinus	✓	
Calyptorhynchus banksii graptogyne	Red-tailed Black-Cockatoo		✓
Dasyornis broadbenti broadbenti	Rufous Bristlebird		✓
Neophema chrysogaster	Orange-bellied Parrot		✓
Edelia obscura	Yarra Pigmy Perch		✓
Nannoperca variegata	Ewens Pigmy Perch		✓
Amarinus lacustris	Freshwater crab		✓
Engaeus fultoni	Otway Burrowing Cray	✓	
Engaeus merosetosus	Western Burrowing Cray	✓	
Engaeus sericatus	Hairy Burrowing Cray	✓	
Engaeus strictifrons	Portland Burrowing Cray	✓	
Euastacus bispinosis	Glenelg River Crayfish		✓
Geocharax falcata	Western Cray	✓	
Geocharax gracilis	Otway Cray	✓	
Hyridella glenelgensis	Glenelg Freshwater Mussel	✓	
Hesperilla flavescens flavescens	Altona Skipper		✓
Eusthenia nothofagi	Otway Stonefly	✓	
Victaphanta compacta	Otway Black Snail	✓	
*Brachystomella disputa**	Springtail	✓	
*Brachystomella pastoralis**	Springtail	✓	
*Brachystomella ultima**	Springtail	✓	
*Phradmon maralali**	Springtail	✓	
*Australonura redita**	Springtail	✓	
*Australonura meridionalis**	Springtail	✓	

E_1 - Wholly endemic to the West RFA Region
E_2 - Mostly endemic to the West RFA Region (>50% of nominal distribution)
* - Information provided by P. Greenslade (CSIRO), but no Wildlife Atlas records.

3.4.3 Fauna at the limit of their range

Places where species occur at the limit of their natural biogeographic range are considered important when the location reflects some past environmental change and/or evolutionary process. Species at the limit of their biogeographic range were defined as those whose accepted regular distributions terminate within the RFA Region.

Method
For each species covered by the Victorian Wildlife Atlas, all site records were plotted. Identification of limit of range was not confined to the cardinal axes of the compass, although for many species these directional limits were appropriate. Where, for example, a species is shown to have a "sausage" shaped distribution, only those points at the end of the "sausage" (as opposed to other edges) were considered to be at the species' limit of range. For birds, both their full distributions as well as just their breeding ranges (using Emison et al. 1987)

were taken into account. Records of species whose range limits appeared to be artefacts of inadequate fauna survey were excluded. Only the specific records of each species that were at, or close to, the limit of range were selected. Limit of range records for all species were combined and concentrations were identified using the same method as described in the endemic fauna analysis (see above).

Threshold
All species with a limit of range, or of breeding range, in the project area were considered to be above threshold. Only the specific records of each species which were at, or close to, the limit of range were considered to be above threshold. Identified concentrations show those areas with high species richness for this value.

Results
Forty eight taxa were identified as having limits of range in the RFA Region (see Table 3.8 & Map 21) – with most taxa groups represented by several species or sub-species. The main concentrations or records for different species at their limit of range occur in the Grampians and in the Wombat State Forest.

Table 3.8: Fauna taxa at a limit of their biogeographic range.

Scientific Name	Common Name	Scientific Name	Common Name
Mammals		***Reptiles***	
Antechinus swainsonii mimetes	Dusky Antechinus	*Amphibolurus norrisi*	Norris's Dragon
Falsistrellus tasmaniensis	Great Pipistrelle	*Aprasia striolata*	Striped Worm-lizard
Mormopterus sp.	Southern Freetail Bat (Eastern form)	*Ctenophorus pictus*	Painted Dragon
Perameles nasuta	Long-nosed Bandicoot	*Egernia saxatilis intermedia*	Black Rock Skink
Petauroides volans	Greater Glider	*Hemiergis peronii*	Four-toed Skink
Petrogale penicillata	Brush-tailed Rock-wallaby	*Nannoscincus maccoyi*	McCoy's Skink
Pseudomys fumeus	Smoky Mouse	*Niveoscincus coventryi*	Coventry's Skink
Pseudomys novaehollandiae	New Holland Mouse	*Niveoscincus metallicus*	Metallic Skink
Pseudomys shortridgei	Heath Rat	*Pseudemoia pagenstecheri*	Tussock Skink
Sminthopsis leucopus	White-footed Dunnart	*Pseudemoia rawlinsoni*	Glossy Grass Skink
Trichosurus caninus	Mountain Brushtail Possum	*Pseudemoia spenceri*	Spencer's Skink
Birds		*Rhinoplocephalus nigrescens*	Eastern Small-eyed Snake
Alcedo azurea	Azure Kingfisher	*Saproscincus mustelinus*	Weasel Skink
Alisterus scapularis	Australian King-Parrot	*Tympanocryptus diemensis*	Mountain Dragon
Cacomantis variolosus	Brush Cuckoo	***Fish***	
Chthonicola sagittata	Speckled Warbler	*Galaxias cleaveri*	Australian Mudfish
Climacteris erythrops	Red-browed Treecreeper	***Invertebrates***	
Dasyornis broadbenti whitei	Rufous Bristlebird	*Antipoda chaostola chares*	Heath Sand-skipper Butterfly
Manorina melanophrys	Bell Miner	*Engaeus cunicularius*	Granular Burrowing Cray
Ninox strenua	Powerful Owl	*Engaeus lyelli*	Upland Burrowing Cray
Ptilonorhynchus violaceus	Satin Bowerbird	*Engaeus quadrimanus*	Lowland Burrowing Cray
Amphibians		*Euastacus yarraensis*	Southern Victoria Spiny Cray
Geocrinia laevis	Southern Smooth Froglet	*Hyridella australis*	Coastal Freshwater Mussel
Geocrinia victoriana	Victorian Smooth Froglet	*Hyridella drapeta*	Coastal Freshwater Mussel
Limnodynastes dumerilii variegatus	Southern Bullfrog	*Hyridella depressa*	Coastal Freshwater Mussel
Litoria lesueuri	Lesueur's Frog	*Hyridella narracanensis*	Southern River Mussel

3.4.4 Fauna with disjunct distributions

Species with disjunct distributions were defined as those with resident populations in the project area that are substantially separated from, and would not be expected to interbreed

with, other populations of the same species. It should be noted that many species' distributions have become fragmented into disjunct populations by clearing and other activities since white settlement - these disjunctions are not relevant under Criterion A.

Method
Species were considered for analysis if they fell into one or both of the following categories:

- species whose distribution within the RFA Region is disjunct;
- species whose representatives within the RFA Region are, or comprise a part of a population which is, disjunct from a population of the same species outside the Region.

Those records representing the disjunct populations for each species were selected and plotted and concentrations were identified using the same method as described in the endemic fauna analysis (see above). Two different levels of concentration were applied - 3-4 and 5 or more taxa recorded within a 5km radius.

Where population disjunctions appeared to be an artefact of inadequate fauna survey, these records were excluded, as were records believed to be of vagrants. Among fish, disjunct populations are only found in non-migratory species that complete their entire life cycles in fresh water (AHC & CNR 1994a).

Threshold
All species assessed as having disjunct populations in the West were considered above threshold. Only those records making up the disjunct population(s) were considered to be above threshold. The spatial analysis identifying concentrations merely provides an additional visual tool showing those areas with high species richness for this value.

Results
Twenty four taxa were identified as having disjunct populations in the RFA Region (see Table 3.9) and all disjunct population records for these species are shown on Map 22. Major concentrations of records occur in the Grampians, Otways and Angahook-Lorne State Park.

Table 3.9: Fauna taxa with disjunct populations.

Scientific Name	Common Name
Antechinus minimus	Swamp Antechinus
Cercatetus lepidus	Little Pygmy-possum
Perameles nasuta	Long-nosed Bandicoot
Petauroides volans	Greater Glider
Petaurus australis	Yellow-bellied Glider
Petrogale penicillata	Brush-tailed Rock-wallaby
Potorous tridactylus	Long-nosed Potoroo
Pseudomys fumeus	Smoky Mouse
Pseudomys novaehollandiae	New Holland Mouse
Pseudomys shortridgei	Heath Rat
Sminthopsis leucopus	White-footed Dunnart
Trichosurus caninus	Mountain Brushtail Possum
Pachycephala olivacea	Olive Whistler
Ptilonorhynchus violaceus	Satin Bowerbird
Aprasia striolata	Striped Worm-lizard
Egernia coventryi	Swamp Skink
Hemiergis peronii	Four-toed Skink
Nannoscincus maccoyi	McCoy's Skink
Niveoscincus coventryi	Coventry's Skink
Pseudemoia spenceri	Spencer's Skink
Tympanocryptus diemensis	Mountain Dragon

Scientific Name	Common Name
Geocrinia laevis	Southern Smooth Froglet
Geocrinia victoriana	Victorian Smooth Froglet
Edelia obscura	Yarra Pigmy Perch

3.4.5 Refuges from climate change

This value is used to identify places that are biogeographic refugia during periods of glaciation or climatic warming. Places that are refuges to climatic change for fauna are the same as those that are refuges for flora. This value has therefore been assessed for both flora and fauna as part of the flora assessment (see Section 3.3.6).

3.4.6 Relict primitive (Gondwanic) fauna

A large proportion of the terrestrial vertebrate fauna of the West region is of Gondwanic origin (e.g. monotremes, marsupials, several families of birds, and many reptiles and frogs – Heatwole 1987) and thus a literal application of this sub-criterion is likely to cover the entire Region. Instead, this value was considered with respect to only invertebrates, for which there are published accounts of assemblages of relict fauna in sharply defined relict environments.

Method
This value was assessed on the basis of expert information provided by invertebrate specialists.

Threshold
All records and known habitats of the taxa identified were considered to be above threshold.

Results
All species in the family Peloridiidae were identified as meeting this sub-criterion in the West (T. New, A. Yen, pers. comm.). Peloridiidae are small, flattened, cryptically coloured relict Hemiptera which for the most part live among wet moss in cool rainforests, often associated with *Nothofagus*, and form part of the "Antarctic" or Gondwanaland fauna. At least two species, *Hemiodoecus leai* and *Hemiowoodwardia wilsoni*, are known from the West RFA Region, the latter seemingly restricted to the Beech Forest area in the Otways (Evans 1982). Areas of the Cool Temperate Rainforest EVC were considered to comprise the most important stands of *Nothofagus* forest in the Region and all remaining areas of this EVC were therefore considered to be above threshold for this value. All areas of Cool Temperate Rainforest were included in the coverage created for Refugia from Climate Change (see Section 3.3.6, Map 13) and, therefore, a separate map has not been pruduced for this assessment.

Sub-criterion A2: Importance in maintaining existing processes or natural systems at the regional or national scale.

This sub-criterion is used to identify places exhibiting ongoing processes that are important for the maintenance of natural systems in their present form. Such places may represent key fauna habitats or refuges from frequent fire and drought.

3.4.7 Key fauna habitats

Places that may constitute key fauna habitats include:

- important wetlands;
- important breeding and roosting sites;
- places important for migratory species;
- key remnant habitats.

It should be noted that habitats that are important with respect to species richness or for individual threatened species are addressed separately under sub-criteria A3 and B1 respectively.

Important wetlands

Wetlands invariably support a rich array of flora and fauna, which make them important feeding, breeding and roosting sites for waterbirds and other species. They may also offer valuable refuge during times of drought.

Method
The *Directory of Important Wetlands in Australia* (ANCA 1996) (Wetland Directory) identifies wetlands of national significance. A criterion for selection includes importance as a good example of a wetland type occurring within a biogeographic region in Australia. A number of wetlands in the Wetlands Directory are also listed under the Ramsar Convention (that is, wetlands of international importance). All wetlands occurring in the West Region and listed in the Directory were identified. Information on boundaries for these wetlands was obtained from NRE data sets. Details were also obtained of wetlands intended for inclusion in the 3rd edition of the Directory.

Threshold
All West region wetlands listed (or proposed for listing) in the Directory were considered to meet the threshold of National Estate significance for this value.

Results
The nationally important wetlands identified as occurring within the West study area are listed in Table 3.10 and shown on Map 23. Twelve of these wetland areas also have Ramsar significance.

Table 3.10: Wetlands of national and international importance.

Wetland	IBRA* Region	Ramsar Listing
Heards Lake	Murray-Darling Depression	-
Saint Marys Lake	Murray-Darling Depression	-
White Lake	Murray-Darling Depression	-
Glenelg Estuary	Narracoorte Coastal Plain	-
Lindsay-Werrikoo Wetlands	Narracoorte Coastal Plain	-
Long Swamp	Narracoorte Coastal Plain	-
Mundi-Selkirk Wetlands	Narracoorte Coastal Plain	-
Lake Connewarre State Game Reserve	South East Coastal Plain	Port Phillip Bay (Western Shoreline) and Bellarine Peninsula
Lower Merri River Wetlands	South East Coastal Plain	-
Swan Bay and Swan Island	South East Coastal Plain	Port Phillip Bay (Western Shoreline) and Bellarine Peninsula
Yambuk Wetlands	South East Coastal Plain	-
Lower Aire River Wetlands	South East Highlands	-
Princetown Wetlands	South East Highlands	-
Dergholm (Youpayang) Wetlands	Victorian Midlands	-
Lake Buninjon	Victorian Midlands	-
Lake Muirhead	Victorian Midlands	-
Lake Wendouree	Victorian Midlands	-
Mt William Swamp	Victorian Midlands	-
Woorndoo-Hopkins Wetlands	Victorian Midlands	-
Banogill Network	Victorian Volcanic Plain	-
Cobden-Terang Volcanic Craters	Victorian Volcanic Plain	-
Cundare Pool/Lake Martin	Victorian Volcanic Plain	-
Kooraweera Lakes	Victorian Volcanic Plain	-
Lake Beeac	Victorian Volcanic Plain	Western District Lakes
Lake Bookaar	Victorian Volcanic Plain	Western District Lakes
Lake Colongulac	Victorian Volcanic Plain	Western District Lakes
Lake Corangamite	Victorian Volcanic Plain	Western District Lakes
Lake Cundare	Victorian Volcanic Plain	Western District Lakes
Lake Gnarpurt	Victorian Volcanic Plain	Western District Lakes
Lake Linlithgow Wetlands	Victorian Volcanic Plain	-
Lake Milangil	Victorian Volcanic Plain	Western District Lakes
Lake Murdeduke	Victorian Volcanic Plain	Western District Lakes
Lake Terangpom	Victorian Volcanic Plain	Western District Lakes
Lower Lough Calvert & Lake Thurrumbong	Victorian Volcanic Plain	-
Middle Lough Calvert	Victorian Volcanic Plain	-
Point Cook & Laverton Saltworks	Victorian Volcanic Plain	Port Phillip Bay (Western Shoreline) and Bellarine Peninsula
Red Rock Lakes & The Basins	Victorian Volcanic Plain	-
Stonyford-Bungador Wetlands	Victorian Volcanic Plain	-
Tower Hill	Victorian Volcanic Plain	-
Upper Lough Calvert	Victorian Volcanic Plain	-
Werribee-Avalon Area	Victorian Volcanic Plain	-

* *Interim Biogeographic Regionalisation of Australia* (Thackway and Cresswell 1995)

Important breeding and roosting sites

For many species the availability of suitable breeding and/or roosting sites is a key factor affecting their distribution and abundance. In particular, species that come together to breed or roost as colonies or loose aggregations are the focus of this assessment.

Method

The Atlas of Victorian Wildlife provides for the identification of roost sites (eg. bat caves) and a search of all Atlas records was undertaken for these. Results were confirmed with staff of NRE's Arthu r Rylah Institute who also provided information on new and additional sites not in the Atlas.

Wetlands in the Region identified in the Wetlands Directory and listed in the section above are considered nationally important because they meet at least one of six criteria. The criterion most relevant to important breeding sites is Criterion 3 (…*important as the habitat for animal taxa at a vulnerable stage of their life cycles.*…). A comparative assessment was made of the information provided in the Wetlands Directory on the importance of West Region wetlands as bird breeding sites. Because colonial-breeding records contained in the NRE Wetlands Database were already used to consider sites for inclusion in the Wetlands Directory, a separate search of the Database was not undertaken.

Threshold
All sites used by colonially roosting bats were considered above threshold. Sites in the Wetlands Directory were considered above threshold for breeding by waterbirds if, relative to other wetlands in the Region, they are recorded as supporting a diversity and/or large numbers of breeding waterbirds. Breeding and roosting sites relating to other taxa groups were considered above threshold if it was agreed by a majority of experts consulted that they were of national significance and if the areas could be clearly delineated.

Results
The Common Bent-wing Bat, *Miniopteris schreibersii*, and the Large-footed Mouse-eared Bat, *Myotis macropus*, are the only cave and mine dwelling bat species known to occur in the West. Nine sites (including some sea caves) are known to be used for roosting by these species in the RFA Region (see Map 23). One of these sites is the only bat breeding (maternity) site known to be in use in western Victoria, with an estimate of about 10,000 Common Bent-wing Bats using the cave (L. Lumsden, pers. comm.).

Table 3.11 provides details of wetlands considered above threshold as significant waterbird breeding sites

Table 3.11: Significant waterbird breeding sites.

Wetland	No. of waterbird species recorded breeding*	Details
Lake Connewarre State Game Reserve	5	Over 10,000 Straw-necked Ibis nesting in late 1970s
Cundare Pool/Lake Martin	10	Breeding species include Cape Barren Goose and Brolga
Lake Corangamite	11	One of few nesting colonies of Pelicans in Victoria
Lake Milangil	6	Has supported over 5% of Victoria's breeding population of Gull-billed Terns
Werribee-Avalon Area	4	Largest Victorian breeding colony of Pied Cormorants

* Source: *A Directory of Important Wetlands in Australia* (ANCA 1996)

Places important for migratory species

Places important for migratory species include regular migration routes and/or areas regularly used by such animals for feeding, breeding or roosting.

Bird and bat migration routes in the West Region are difficult to define. Longitudinal migrations are known to occur, especially for birds. Ten of the 21 native freshwater fish species recorded from the Region are known to migrate as part of their life cycle.

Wetlands provide important habitat for many migratory bird species, particularly as feeding sites during the Northern Hemisphere winter. Australia is a signatory to international agreements to protect migratory bird species and their habitats - these include the Ramsar Convention, the Japan-Australia Migratory Bird Agreement (JAMBA) and the China-Australia Migratory Bird Agreement (CAMBA).

Method
Fauna experts in Victoria were contacted to elicit information about the occurrence of migratory species in the West Region and the presence of important migratory routes and habitat used by such species.

The Wetlands Directory provides details of the number of JAMBA/CAMBA species (but not individuals) recorded at most of the nationally significant wetlands occurring in the Region. This was considered to provide a more accurate representation of the relative importance of these areas to migratory birds than would have been possible by interrogating the Wildlife Atlas.

Threshold
For migratory routes, only those that could be clearly defined were considered above threshold. Based on the spread of scores for JAMBA/CAMBA species recorded at each wetland, 15 species or more was selected as the threshold for national estate significance.

Results
The areas identified as having indicative national estate significance for migratory species are shown in Map 23. They include four wetlands important for JAMBA/CAMBA species – Lake Connewarre State Game Reserve, Lower Merri River Wetlands, Lake Murdeduke, and Point Cook and Laverton Saltworks. Other areas important for migratory species were either unable to be clearly defined, or, in the case of fish, were too difficult to separate out in terms of their importance (T. Raadik, pers. comm.).

Key remnant habitats

Private land makes up 83% of the Region, with most of this having been cleared for agriculture. A large proportion of public land in the Region has also been significantly disturbed. This value is used to identify the most important remnant habitats within the predominantly alienated portions of the Region.

Method
This value was not systematically assessed across the whole Region. Known areas of remnant habitat were largely identified by expert opinion and literature review (including review of relevant Land Conservation Council reports).

It should be noted that, while a number of significant remnant grassland and grassy woodland sites are known to exist in the West (and other Victorian regions), none are identified here. This is because a project (*Victorian Grassland Significant Site Documentation*, funded under the National Reserve System Program) to identify those sites which most efficiently contribute to biodiversity conservation in each grassland community in the State, is due for completion in early 2000. As the project includes the development of a rule system to identify priority sites, it would be inappropriate to pre-empt the outcomes of that project here. There is also a FFG Action Statement (No. 53) for the Western (Basalt) Plains Grassland Community.

Threshold
Key remnant habitats that are significant on a state or national scale were considered to be above threshold.

Results
One place, Inverleigh Flora and Fauna Reserve (1050 ha, 27 km west of Geelong), stood out as being above threshold for this value. It is surrounded by extensive areas of cleared private land and was declared a Reserve on the recommendations of the Land Conservation Council's Melbourne Area District 1 Review (LCC 1987). It supports the only viable remnant of the Region's original vegetation of Manna Gum (*Eucalyptus viminalis*) and River Red Gum (*E. camaldulensis*) woodlands. It also supports fauna species that have become restricted to remnant blocks of native vegetation that are found on the western plains (LCC 1987). A management plan has been prepared for the area, "providing a basis for the conservation and protection of the natural values that exist" there (DCNR 1993).

3.4.8 Contemporary fauna refuges

For this assessment, a fauna refuge is defined as a place that provides protection for fauna during shorter-term climatic changes and environmental disturbances such as fire. For instance, the wetter vegetation classes may provide protection for some fauna during fire, or provide food resources for some fauna during drought. Refuges from frequent fire and drought are considered to be similar for flora and fauna. Details of contemporary fauna refuges in the West are therefore provided in the earlier assessment for flora (see Section 3.3.7). Areas that are refuges from long-term climate change (i.e., the last Ice Age) are addressed under sub-criterion A1.

Sub-criterion A3: Importance in exhibiting unusual richness or diversity of fauna

3.4.9 Fauna species richness

A number of methods have been used or considered in other regional national estate assessments to define areas of high fauna species (or fauna habitat) richness. These include analysing the distribution of fauna database records, analysing the number of EVCs in 2km

grid cells (used in the Central Highlands assessment), and extending the latter method to also incorporate character terrestrial vertebrate species lists for each EVC (as used in the East Gippsland assessment). None of these methods were used for the North East national estate assessment (VicRFASC 1999a). Instead, the analysis undertaken for places of unusual flora richness in the North East was considered to be a suitable surrogate for fauna species richness.

Recent work by Dr Graham Newell (unpublished) places into question previous assumptions about links between EVC richness and fauna species richness in Victoria. Because of this, and in the absence of any other accepted methodology, no assessment of fauna species richness was done for the West Region.

Sub-criterion B1: Importance for rare, endangered or uncommon fauna

This sub-criterion recognises the importance of fauna elements that are rare or uncommon as a result of either natural or unnatural processes.

3.4.10 Rare or threatened fauna

For the purposes of this assessment, all species listed in *Threatened Vertebrate Fauna in Victoria - 1999* (NRE 1999) were considered, as were all invertebrates in *Threatened Fauna in Victoria - 1995* (CNR 1995). "Threatened" in this context denotes faunas that are critically endangered, endangered, vulnerable, rare, lower risk or insufficiently known. The status categories are based on the criteria of the International Union for the Conservation of Nature. All species listed under the Commonwealth *Endangered Species Protection Act 1992* (ESP Act) and the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act) which occur in the West are also on the above lists.

Method
All records of threatened fauna on the Victorian Wildlife Atlas reported as occurring in the study area since 1970 were plotted on a GIS. Some additional known records of colonially roosting bat sites (L. Lumsden, pers. comm.) were also included. Available resources did not permit species habitat modelling to be attempted and only points themselves were identified. Concentrations of records where also identified where they represented a number of taxa; this was done using the same methodology applied earlier for A1 fauna values (see method for assessing endemic fauna values). Three different levels of concentration were applied - 8-17, 18-27 and 28 or more taxa recorded within a 5 km radius.

Threshold
All listed threatened species and associated records of sufficient accuracy were deemed to be above threshold. The spatial analysis identifying concentrations merely provides an additional visual tool showing those areas with high species richness for this value.

Results
One hundred and thirty five threatened taxa were identified as meeting the specified threshold limits for this sub-criterion in the Region (see Map 24), including 20 species or sub-species that are nationally endangered or vulnerable. Threatened species records are scattered throughout the Region, with major concentrations in the Geelong/Werribbee and Port Fairy/Warrnambool areas, the Western District Lakes area north of Colac and in the centre of the Region near Streatham.

3.5 Other Natural Values

3.5.1 Geological and geomorphological values

Introduction

National estate assessment for geological and geomorphological values involves the identification of sites demonstrating significant aspects of regional diversity for such values. Geodiversity includes evidence for the history of the earth and a range of processes currently acting on rocks, landforms and soils. It is fundamental to broader ecological processes, contributes to the richness of the natural environment, and provides opportunities for scientific study of the earth's development.

Some elements of geodiversity are relatively robust in the face of human intervention, while others are susceptible to degradation associated with a range of land use activities. An effective approach to the conservation of geodiversity needs to include the development and implementation of management principles designed specifically to protect vulnerable features and processes, and to identify all sites of significance so that their value is assessed and recorded and considered in management decisions.

Data sources

No assessment of geodiversity for national estate values has been undertaken across the whole of the West RFA Region. Instead, this assessment restricts itself to drawing on the outcomes of the Environment Conservation Council (ECC) Box-Ironbark Forests and Woodlands Investigation (ECC 1997). The Australian Heritage Commission (AHC) partially funded the chapter on geology and geomorphology in the ECC report. The south-west of the ECC investigation area overlaps with about one third of the West RFA Region, mainly in the north-east.

It is possible that new localities will be identified over time as further research takes place. It is also recognised that additional information on sites of geological and geomorphological significance (e.g. Rosengren 1984) exists for some parts of the Region. However, this information has not yet been collated and considered in the regional context of this assessment.

Site selection and significance rating

The ECC investigation used three overlapping methodologies when selecting and assessing the level of signficance of features:

- ***Representative*** sites are examples of features typical of a region;
- ***Outstanding*** sites are excellent examples of a feature, either in a region or on a wider scale; and

- ***Rarity*** is based on the degree of replication of a feature, the extreme case being a feature that is unique.

Features were assessed on all three methodologies and given an overall significance rating of either regional significance in the Box-Ironbark investigation area, or of State, national or international significance.

While soils are described in the ECC investigation, no assessment of significance was undertaken.

National estate assessment

Consistent with an AHC commissioned report on *Sites of Geological and Geomorphological Significance in Part of North Eastern Victoria* (Rosengren & White 1997), a threshold of State significance and above was used to determine which sites were of potential national estate significance. No sites in that part of the investigation area overlapping with the West RFA Region were assessed to be in this category. In fact, there were also no sites of regional significance falling within the area of overlap.

3.5.2 Natural history sites

Sub-criterion C1: Importance for information contributing to a wider understanding of Australian natural history, by virtue of its use as a research site, teaching site, type locality, reference or benchmark site

The assessment against sub-criterion C1 was broken up into three sub-assessments: type localities for flora species; type localities for fauna species; and places important as research, teaching or benchmark/reference sites.

Type localities for flora species

The objective of this assessment was to provide a list of West Region type localities for flora known to occur in the study area. Difficulties in obtaining information for non-vascular flora limited the assessment to vascular plants.

Method
For each species identified as having its type locality in the Region, information was gathered on the collector, locality and year of collection. Localities were given a precision code according to those used by the Tasmanian Herbarium (see Table 3.12). Of the various "types" which may exist, only holotypes and lectotypes were considered (see Glossary for definitions). Data were derived largely from the *Australian Plant Name Index* (Chapman 1991). All vascular plant species recorded for the Region were considered in the assessment.

Table 3.12: Precision codes used in defining type localities.

Precision code	In distance, degrees or minutes	Relative to types of locality
1	Precise to within a 50 m radius (or nearest second)	A six-figure grid reference or GPS reading
2	Falling within a 1 km radius (or nearest minute)	A location able to be pinpointed accurately on a 1:250,000 map; a 'spot locality' (such as a hill or mountain summit with a small surface area, a stream, river or road junction, or an accurate distance from one)
3	Falling within a 10 km radius (or nearest 5 minutes)	A location equivalent to a small town, a hill or mountain with a large surface area, a smallish lake, and so on
4	Falling within a 25-km radius (or nearest 10 minutes)	A location equivalent to a large city, a mountain range, a river 10-50 km long, and so on
5	Greater than a 25 km radius (about 30 minutes or over)	A region such as a large national park, an area such as 'Northern Tasmania', or all of Tasmania

Source: Tasmanian Herbarium.

Threshold
All sites identified with a precision code of 3, 4 or 5 were considered not to meet the threshold: their locations could not be pinpointed with sufficient accuracy. Sites with a precision code of 1 or 2 (that is, precise to within a 50-metre or 1-kilometre radius respectively) were considered to meet the threshold, unless it was known that the species no longer occurred there.

Results
Thirty two flora type localities were identified as meeting the threshold criteria in the West and these are shown in Map 25. The orchid genus *Caladenia* is represented by eight species.

Type localities for fauna species

The objective of this assessment was to compile a list of West Region type localities for fauna species, encompassing all vertebrate and invertebrate terrestrial and aquatic species for which information was readily available.

Method
As for the flora type localities project, information was gathered on the collector, locality and year of collection for each species. Similarly, localities were given a precision code (see Table 3.12). Only holotypes and lectotypes were considered. The primary source of information for vertebrate species was the *Zoological Catalogue of Australia*, although this is currently incomplete for fish and birds. The CSIRO provided data on all invertebrate type locality records held by the Organisation and sourced from the study area.

Threshold
As for the flora type localities project, only sites identified with a precision code of 1 or 2 were considered to meet the threshold.

Results
Of those vertebrate species for which information was readily available, the Smoky Mouse (*Pseudomys fumeus*) was the only species found to have its type locality in the West (Otways). Eleven invertebrate sites were considered before application of the exclusion rules and of the five records above threshold, four are of Stonefly species from the same site in the Otways (see Map 25).

Research, teaching and reference/benchmark sites

The objective of this assessment was to identify sites of National Estate significance based on their contribution to a wider understanding of Australian natural history through their use as research, teaching or benchmark/reference sites.

Data sources
Data sources include the following:

- Land Conservation Council (LCC) study area reports;
- details of permits for research issued by Parks Victoria under the *National Parks Act 1975* and the *Wildlife Act 1975*; and
- consultation with scientists, researchers, academics and other staff attached to universities, museums, NRE, other organisations and survey groups with an interest in the natural sciences.

Site boundaries were determined from the literature, GIS coverages provided by NRE, and/or consultation with experts.

Method
Sites were identified as research, teaching or reference/benchmark sites according to the criteria shown in Table 3.13. Research or teaching sites were only considered if they had a long history of such use.

Table 3.13: Criteria for identifying research, teaching and reference/benchmark sites.

Research sites	Teaching sites	Benchmark/Reference sites
Places where research is taking place or has taken place. Aim of research is to increase understanding about Australian natural history. Results of research are documented and available.	Places where teaching is taking place or has taken place. Aim of teaching is to increase understanding about Australian natural history.	Places with examples of biophysical characteristics or processes in a relatively undisturbed state. Progression of natural processes can be measured and observed and compared with a more disturbed environment.

Threshold
Assessment of the national estate value of sites was based on feedback from experts and assessment by EA and NRE staff. Research, teaching and benchmark/reference sites that are significant on a state or national scale were considered to be above threshold.

Results

Reference Areas are established under the Victorian *Reference Areas Act 1978*. They are tracts of public land containing viable samples of one or more land types that are relatively undisturbed and that are reserved in perpetuity as a reference. All Reference Areas in the Region were considered above threshold for reference/benchmark value – details of sites are provided in Table 3.14 and Map 26. A number of Reference Areas in other Victorian RFA regions were already on the Register of the National Estate prior to commencement of the RFA process. No other reference/benchmark or research sites were identified as being above threshold in the West.

Table 3.14: Reference Areas in the West.

Name	Size (ha)	Name	Size (ha)
Ah Kows Gully	440	Moora Valley	510
Beear	380	Musk Creek	125
Buangor	70	Olangolah Creek	120
Calder River	155	Parker River	205
Carpendeit	415	Pyrete Range	360
Cobboboonee	384	Roseneath	2172
Cooriemungle	70	Ruths Gully	200
Crinoline Creek	340	Stony Creek	370
Durdidwarrah	125	Stony Creek (Durdidwarrah)	270
Enfield	100	The Sisters	280
Grasstree Creek	675	The Stones	400
Jilpanger	700	Tomahawk Creek	300
Keegans Bend	970	Tooan	430
Kentbruck Heath	728		

It should be noted that the LCC process has identified a number of Education Areas as areas to be set aside for the primary purpose of environmental education. A number of these occur in the West. None of these areas are identified here as teaching or educational sites with indicative national estate significance.

Chapter 4: National Estate Outcomes

4.1 National Estate Outcomes: Cultural Values

The national estate assessment of the cultural values of the West forest region was designed to achieve the best practicable understanding of the range and distribution of forest places of cultural significance within the timeframe of the CRA. The cultural assessments were based on a study of social, aesthetic and historic values. The heritage outcomes for Aboriginal values are based on establishing an agreed consultative process for heritage management with Aboriginal communities, with the development of guidelines and a sensitivity zoning.

The indicative places of national estate cultural value, identified through a heritage data audit, thematic and geographical studies, and through input from the communities of the West, fill major gaps in the understanding of national estate forest cultural values. The following are among the main outcomes from the assessment of these values:

- identification of over 125 indicative national estate forest places of particular importance to the communities of the West;
- identification of a wide range of indicative historic national estate places, including mining sites, walking tracks, railway lines, forest camp sites, plantations, sawmills and tramways that provide the community with a sense of identity and attachment to forests;
- an agreed consultative process for the management of Aboriginal heritage places involving the West Aboriginal communities; and
- a greater understanding of places that are valued by the community.

The assessments provide an account of the current state of knowledge of cultural values, regional surveys and documentation of places in heritage registers. These will be used to inform the development of conservation strategies for places of cultural significance to ensure they are considered in forest management.

4.2 Future Research: Cultural Values

There are a number of potential National Estate places of cultural value for which there was insufficient information available, or which it was not possible to visit due to access restrictions to make a final assessment. These places (noted in the relevant cultural studies) were not fully assessed and would benefit from future research to clarify their significance.

Social value
The community consultation process of returning information for comment resulted in a number of places being identified which were not researched as part of the RFA. It is

anticipated that the Community Inventory will be used as a base to encourage further research and conservation of heritage places by local communities.

Aesthetic value
Detailed investigation of all places of potential aesthetic value was not possible due to limited resources. Further investigation is therefore recommended for sites of possible national estate aesthetic value, for example during the preparation of forest management plans. This applies particularly to places in remote areas where observations by forest officers may be the only source of information on these places unless more detailed investigations are undertaken. Further investigation of a few sites in the region which had further value identified in the community review process will also be beneficial.

Historic value
The Sawmill and Tramways study (Evans, 1999) noted gap areas in the study where further research would be useful. These were the early sawmills (1850-1870), the sawmills in "Bureaucratic transition"(1907-1919) and sawmills on private properties.

As noted by Bannear (1997 a) forest activity sites do not endure and all the sites recorded date from the second World War, the sites are frequently scavenged, and generally the public are not aware of the heritage significance of these places. Making the public aware of these types of places will be a useful outcome of the study.

Several recommendations are made by Butler (1999) for future research in the region:

- further assess West Railway lines and the Great Ocean Road for contributory sites;
- integrate the heritage assessment of gold mining places, or those associated with forest activities with cultural place groups - place groups, such as the Lerderderg River gold fields;
- survey further related early stone structures around the stony rises at Mt Eccles;
- list all timber framed bridges recorded by the National Trust of Australia (Vic) but not listed in the study Preliminary List, on the basis of their evocation of forest products;
- further verify and assess the remaining places in the Preliminary List;
- use historic maps to uncover potential historic places which are not obvious today;
- use 1:25,000 topographical plans to identify further potential places in forests;
- develop the forest-related sub-themes and place categories to better reflect those identified in this study as ‘unofficial codes’ as part of the approved structure;
- consult further with rangers and forest officers (past and present) to identify a wider range of places in existing National Parks and State Forests; and
- target community sources and provide infrastructure for further place identification by community interest groups.

The West region embraces part of the Victorian Central Goldfields area. Most of the important gold mining sites have been recorded by David Bannear for NRE. There are cultural landscape areas associated with gold mining history such as Specimen Hill near Daylesford which should have further investigation and assessment.

4.3 National Estate Outcomes: Natural Values

The assessment of national estate values for the West CRA has resulted in the identification of areas of indicative national estate significance for a wide range of values. Extensive and

localised values, covering aspects of the flora and fauna as well as other features of the natural landscape (including old-growth forest and undisturbed catchments) were all examined. Much of the information required for the assessments was already available in one form or another. Collation of the data, together with additional work commissioned as part of the CRA for the Region, provided a sound basis for undertaking the various assessments. The results of the study represent a considerable enhancement of our understanding of the natural national estate in the Region.

The following are among the main outcomes of the assessment of natural values:

- identification of many hundreds of individual sites and places of significance for a range of national estate values, many of them having significance for multiple values;
- a greatly enhanced understanding of the forests of the West Region of Victoria and their natural heritage significance; and
- the creation of a profile of the current state of scientific knowledge and opinion relating to the West RFA Region natural places for use as a resource, in particular for the better appreciation and management of places of national estate significance.

4.4 Future Research: Natural Values

Another important outcome of the study is that a number of the assessment methods and their results provide very clear direction for future research. Whilst it is generally agreed that the methods adopted were 'best practice', it is recognised that some of the assumptions applied could be tested through further academic and field research.

The areas of most interest are:

Non-vascular flora
The assessment focuses predominantly on flora communities and selected vascular plant species. Given the biogeographic importance of the study area, the non-vascular flora (such as mosses, ferns, lichens) are also of interest.

Terrestrial invertebrate fauna
As for many regions of Australia, the terrestrial invertebrate fauna is inadequately known. The wide range of habitat types in the West is likely to support a very diverse and biogeographically interesting terrestrial invertebrate fauna.

Habitat modelling
Species-specific habitat models are available for only a very few taxa (such as some owls) in Victoria, therefore restricting the use of this concept to identify, for example, key fauna habitat for particular threatened species.

Fauna species richness modelling
The analysis for this national estate value was not undertaken for reasons discussed in Section 3.4.9. The development and validation of a method for identifying areas of high fauna species richness is a priority for further research.

Remnant vegetation
See point made in last paragraph of Section 3.3.8.

4.5 Management of National Estate Values

An objective of the West Regional Forest Agreement (RFA) is to provide for the conservation of environment and heritage values through the development of a framework of comprehensive, adequate and representative reserve systems, and through ecologically sustainable forest management. Fundamental to the environment and heritage objectives for the RFA is ensuring that national estate values are adequately protected within this framework. In developing the RFAs for Victoria, governments will consider the level of representation of national estate values in reserves, the recommendations of the expert advisory group on ecologically sustainable forest management, and the results of an assessment of mechanisms for the protection of national estate values.

A component of the CRA has been the assessment by an independent expert advisory group of the systems and processes for ecologically sustainable forest management. Included in this assessment was an examination of the information, policy, planning, implementation and review mechanisms for conserving heritage values. The recommendations of the group are contained in the report Victorian Statewide Assessment of Ecologically Sustainable Forest Management (VicRFASC 1997).

While some national estate values, particularly extensive values such as old-growth forests and natural landscapes, may be best protected by formal reservations, the protection of other values, particularly site values such as historic or archaeological features, may be best achieved through other mechanisms such as management prescription.

The cultural projects identified several issues concerning the management of cultural forest sites. They found the large number of very fragile sites and limited resources makes site protection difficult.

The consultation program with Aboriginal communities strongly noted the need for an on going program of participation in management of Aboriginal heritage and ongoing communication with forest managers.

A process for cultural heritage management is provided for in the report *Guidelines for the Management of Cultural Heritage Values in the Forests, Parks and Reserves of East Gippsland (NRE 1997).* This report undertaken as part of the East Gippsland RFA will form the basis for the development of statewide cultural heritage guidelines, and a project to develop the statewide guidelines is currently underway.

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Glossary

Acronyms

AAV	Aboriginal Affairs Victoria
AHC	Australian Heritage Commission
ANCA	Australian Nature Conservation Agency
ANIC	Australian National Insect Collection
ANZLIC	Australia New Zealand Land Information Council
AUSLIG	Australian Surveying and Land Information Group
BN	Biophysical Naturalness
CAMBA	China-Australia Migratory Bird Agreement
CAR	Comprehensive, Adequate and Representative
CNR	Conservation and Natural Resources, Department of
CRA	Comprehensive Regional Assessment
CSIRO	Commonwealth Scientific and Industrial Research Organisation
EA	Environment Australia
ECC	Environment Conservation Council
EVC	Ecological Vegetation Class
FIS	Flora Information System
FRI	Flora Richness Index
GIS	Geographic Information System
GRU	Geographic Representation Unit
IBRA	Interim Biogeographic Regionalisation of Australia
JAMBA	Japan-Australia Migratory Bird Agreement
JANIS	Joint Australian and New Zealand Environment and Conservation Council and Ministerial Council of Forestry, Fisheries and Aquaculture National Forest Policy Statement Implementation Subcommittee
LCC	Land Conservation Council
NRE	Natural Resources and Environment, Department of
NWI	National Wilderness Inventory
NVIS	National Vegetation Information System
Ramsar	Convention on Wetlands of International Importance
RAOU	Royal Australasian Ornithologists Union
RDI	River Disturbance Index
RFA	Regional Forest Agreement
RFASC	Regional Forest Agreement Steering Committee
ROTAP	Rare Or Threatened Australian Plants

Definitions

Action Statement A formal statement providing management prescriptions that aim to ensure the long-term conservation of a species. An Action Statement must be prepared for every plant and animal species that is listed under the Victorian *Flora and Fauna Guarantee Act 1988*.

aesthetic value The response derived from an experience of the environment or particular natural and cultural attributes within it. This response can be either to visual or non-visual elements and can embrace emotional response, sense of place, sound, smell and any other factors having a strong impact on human thoughts, feelings and attitudes.

ARC/INFO Software used to display and analyse spatially represented data.

biodiversity *see* biological diversity.

biogeographic region A region defined by a combination of biological, social and geographic criteria rather than geopolitical criteria; generally, a system of related, interconnected ecosystems.

biophysical Biophysical relates to combinations of physical features, such as climate, soils, geology and landforms, and biological features, such as flora and fauna.

bioregion see biogeographic region

complex (vegetation complex) Occurs where floristic entitities are unable to be distinguished in an area but are known to exist discretely elsewhere.

comprehensive, adequate and representative reserve system A reserve system displaying the features of comprehensiveness, adequacy and representativeness.
comprehensiveness—the degree to which the full range of ecological communities and their biological diversity is incorporated in the reserve system.
adequacy—the reserve system's ability to maintain the ecological viability and integrity of populations, species and communities.
representativeness—the extent to which areas selected for inclusion in the reserve system are capable of reflecting the known biological diversity and ecological patterns and processes of the ecological community or ecosystem concerned.

comprehensive regional assessment A joint Commonwealth–State assessment of all forest values—environmental, heritage, economic and social—leading to the establishment of a comprehensive, adequate and representative reserve system, agreements on forest management, and the signing of a regional forest agreement.

conservation The protection, maintenance, management, sustainable use, restoration and enhancement of the natural environment.

criteria The eight criteria used by the Australian Heritage Commission to determine whether places meet the requirements for listing on the Register of the National Estate. These criteria are stipulated in the *Australian Heritage Commission Act 1975* and are listed in Appendix A.

cultural heritage value Aesthetic, historic, scientific or social value for past, present or future generations.

cultural place A site, area, landscape, building, structure or combination of these, and associated contents and surrounds.

disjunct Disjunct populations are physically separated from one another, that is, there is no gene flow between the populations. They are formed over time due to the appearance of a barrier in a formerly continuous distribution. Disjunct populations often have distinctive features in an evolutionary sense from the 'parent' population, and in time may become separate species.

disturbance Any of a range of factors affecting the condition of natural areas. Disturbance may be natural or human-induced. Natural disturbance includes wildfires and rainstorms, and is part of natural ecological processes. Human-induced or 'unnatural' disturbance includes timber harvesting, agricultural clearing, mining and grazing. The factors that are important when considering disturbance are the origin, duration, and intensity of the disturbance, and its impact on the environment.

disturbance data Records of disturbances such as clearing, grazing, fire or timber harvesting that may affect themes, species or assemblages being assessed.

diversity A measure of the physical or biological complexity of a system. It refers to a range of features from artefact scatters to species presence.

ecological vegetation classes The components of a vegetation classification system. They are groupings of vegetation communities based on floristic, structural and ecological features.

ecosystem A set of normally co-occurring and interacting species associated with a particular setting in the physical environment. The aggregate of plants, animals and other organisms, and the non-living parts of the environment with which these organisms interact. A dynamic complex of plant, animal, fungal, and micro-organism communities and the associated non-living environment interacting as an ecological unit.

endemic species Species confined to a specific region or locality.

epoch A subdivision of a period in geological time. For example, the Holocene and Pleistocene epochs are subdivisions of the Quaternary period.

extensive national estate values Those national estate values that are widespread over the landscape, for example, natural landscapes (Criterion A.2).

fabric The physical material of a place. For example, the fabric of cultural places might be an artefact scatter or hut.

forest critics Forest officers and parks officers who had a sound knowledge of forest systems and particular forest areas.

geodiversity The natural range (diversity) of geological (bedrock), geomorphological (landform) and soil features, assemblages, systems and processes. Geodiversity includes evidence for the history of the earth (evidence of past life, ecosystems, and environments) and a range of processes (biological, hydrological and atmospheric) currently acting on rocks,landforms and soils.

geographic information system A system displaying spatially represented data; for example, ARC/INFO.

geographic representation units Subdivisions of the region that share broadly similar biophysical characteristics, especially in regard to landform, geology, soils and climate.

geoheritage Those components of geodiversity that are important to humans for purposes other than destructive exploitation; things we would wish to retain for present and future generations.

geological characteristics Features and structures associated with the formation of the earth's crust as well as major landform units such as mountains.

geomorphological characteristics Features associated with active landform processes such as erosion and deposition.

Gondwanic Those characteristics or features which relate to an ancient phase of the earth's development, at a time when the land masses of the southern hemisphere were joined together. This agglomeration of the southern continents is termed Gondwana, hence the adjective ‘gondwanic’.

grid cells Square grids of an appropriate scale (such as 2 km) which are laid over maps and data sets on the geographic information system to aid interpretation of data and analysis of patterns.

growth stages The forest growth stage classification system is a way to classify the life-cycle of trees. The system is based on tree structure, namely, crown form. Growth stages are the categories of this system, the main ones being mature, regrowth and senescent, or over-mature.

habitat The place or environment in which an organism naturally occurs.

heritage All those things which we have inherited from previous generations and which we value. Heritage includes places (including the National Estate places), things (movable objects) and folklore (customs, songs and sayings).

historical themes Major historical activities, such as tourism and recreation, or events, such as fire disasters.

Holocene the Recent epoch.

holotype A single specimen designated by the author of a plant or animal name, at the time of original publication, as that to which the name shall apply; the ‘voucher specimen’ of a name.

hydrological Pertaining to the science of water, its properties, movement, and distribution over the earth’s surface.

indicative national estate values Qualities of place that have been identified as having national estate importance and are awaiting formal assessment by the Australian Heritage Commission for consideration for the Register of the National Estate.

Interim Biogeographic Regionalisation of Australia A bioregional framework delineating natural regions in each State and Territory based on biophysical, environmental and

vegetation considerations—for example, climate, soils, landform, vegetation, flora and fauna, and land use—that allow cross-border regionalisation.

interim list The Australian Heritage Commission enters places on the interim National Estate list by announcing, in the press and in the *Commonwealth Government Gazette*, its intention to register those places. Once a place is on the interim list, and before it can be entered on the Register of the National Estate, there is a minimum statutory period of three months during which any person can object to the proposal in writing. If objections are received they must be given due consideration by the Commission, but uppermost consideration must be given to the National Estate significance of the place.

identified national estate value A national estate value identified by the Australian Heritage Commission.

layer The representation of each national estate value, such as endemic plant species, on a map.

lectotype A specimen selected from among those cited with the original description of a species or subspecies to serve in place of a holotype where the holotype is missing or destroyed, or where no holotype was designated.

lithology The general characteristics of rock formations, such as composition and texture, and the sequence in which the formations were laid down.

maintenance The continuous protective care of the fabric, contents or setting of a place, as distinguished from repair. Repair involves restoration or reconstruction.

metadata Information about the content, quality, condition and other characteristics of datasets.

methodology The application of the criteria and thresholds to determine national estate values within a regional context. The methodology for regional assessments is distinguished by the fact that it does not consider national estate values in isolation but attempts to place them in the context of national estate values for an entire region.

mosaic (vegetation mosaic) Consisting of discrete floristic entities (EVCs) which were unable to be distinguished in the mapping due to the scale used.

national estate Those places being components of the natural environment of Australia or the cultural environment of Australia that have aesthetic, historic, scientific or social significance or other special value for future generations and for the present community.

national estate place An area or location listed in the Register of the National Estate. A National Estate Place is the end point in the identification and assessment process.

national estate values The aesthetic, historic, scientific or social values attributed to places by the Australian Heritage Commission.

nomination Nomination of a place for consideration as a National Estate place involves informing the Australian Heritage Commission (AHC) of the place and its value. Anyone can nominate a place for listing on the Register of the National Estate. The place then undergoes detailed assessment by AHC staff and relevant outside experts. Each place is examined against specific criteria, and assessed solely on the basis of national estate values.

old-growth forest The National Forest Policy Statement defined old-growth forest as 'forest that is ecologically mature and has been subjected to negligible unnatural disturbance such as logging, roading and clearing'. For the purposes of this assessment, the proposed operational interpretation from JANIS (1997) was used; that is, 'old-growth forest is ecologically mature forest where the effects of disturbances are now negligible'.

phylogenetic Referring to the evolutionary line of descent of an individual taxon or groups of taxa.

point site A site that covers a limited area, expressed as points when mapped at a large scale.

predictive model for archaeological sites A model that predicts archaeological sites or locations inferred from existing information and usually links site density to particular landscape units.

prescription Standards specified within the Code of Forest Practices which describe acceptable management practices related especially to timber harvesting. They are regulatory rather than legislative.

principal characteristics of class The essential features which define, or are most commonly associated with a particular heritage value. The concept is sometimes expressed as representative examples.

Recovery Plan A management plan intended to ensure the long-term conservation of a species, prepared under the Commonwealth *Endangered Species Protection Act 1992* which requires recovery plans to be prepared for scheduled species.

refugia, refuges Biological communities or geographic entities that, because of their moderating structural characteristics or physical isolation, or both, provide a sanctuary to which species or groups of species have retreated or have been confined in response to threatening processes, including climatic change.

regional forest agreement An agreement, between the Commonwealth and a State or Territory government, for the long-term management and use of forests in a particular region. The purpose is to reduce uncertainty, duplication and fragmentation in government decision making by establishing a durable agreement on the management and use of forests.

Register of the National Estate The national inventory of places of natural, historic and Aboriginal heritage significance, which have been rigorously assessed by the Australian Heritage Commission and deemed to be worth conserving for present and future generations. It serves to notify all Australians, and particularly planners and decision-makers, of places of national estate significance.

richness A measure of the abundance of individual elements within a particular place. For instance, the species richness of an ecological vegetation class (EVC) is the number of species which occur within that EVC. The concept is closely related to diversity.

riparian Associated with river banks.

selective logging The logging of a selected portion of a stand of timber, usually according to pre-determined criteria relating to the intensity of the logging and the nature of the stand remaining after logging.

significance indicators Used to provide an indication of whether or not a place potentially holds national estate value.

stakeholder Established groups or organisations with an interest in the forests of the region, e.g. industry, recreation or conservation.

species A group of organisms capable of interbreeding with each other.

storylines Strong regional patterns or stories which provide links between historical themes, for example, sawmill sites and transport links in remote forest locations. Storylines are the product of people's memories and association with places. They often link places with one another.

subcriteria Components of the eight criteria used by the Australian Heritage Commission. They are useful in applying the eight criteria to specific aspects of the environment (see Appendix A).

succession The change in vegetation composition over time, one community 'succeeding' over the other. For example, wet forests in areas such as gullies that are protected from fire and other disturbance may eventually become rainforest. This occurs over a long period of time in which rainforest species first colonise the understorey and, as the emergent eucalypts die out, rainforest species become the dominant species in the canopy.

taxon (*pl.* taxa) The named classification unit to which individuals or species are assigned.

threshold The level above which a value is considered acceptable for entry on the Register of the National Estate. Thresholds are developed through scientific assessment or expertise, and an analysis of data within a regional context.

type specimen (biological/geological) The original specimen from which a new species (biological or geological) is scientifically described. The type location is the place where the original type specimen was found.

vascular plant A plant that possesses a vascular system, the conducting tissue that enables the transport of water, minerals and synthesised food materials throughout the plant and provides mechanical support.

wilderness quality A measure of differing levels of human impact on the natural environment, as part of a continuum of remote and natural conditions varying from pristine to urban. Wilderness quality is measured in terms of four variables: remoteness from access, remoteness from settlement, apparent naturalness, and biophysical naturalness.

Appendices

Appendix A: The Australian Heritage Commission Criteria for the Register of the National Estate

Without limiting the generality of sub-section (1) of the Australian Heritage Commission Act, a place that is a component of the natural or cultural environment of Australia is to be taken to be a place included in the national estate if it has significance or other special value for future generations as well as for the present community because of:

CRITERION A:
ITS IMPORTANCE IN THE COURSE, OR PATTERN, OF AUSTRALIA'S NATURAL OR CULTURAL HISTORY

A.1 Importance in the evolution of Australian flora, fauna, landscapes or climate.

A.2 Importance in maintaining existing processes or natural systems at the regional or national scale.

A.3 Importance in exhibiting unusual richness or diversity of flora, fauna, landscapes or cultural features.

A.4 Importance for association with events, developments or cultural phases which have had a significant role in the human occupation and evolution of the nation, State, region or community.

CRITERION B:
ITS POSSESSION OF UNCOMMON, RARE OR ENDANGERED ASPECTS OF AUSTRALIA'S NATURAL OR CULTURAL HISTORY

B.1 Importance for rare, endangered or uncommon flora, fauna, communities, ecosystems, natural landscapes or phenomena, or as a wilderness.

B.2 Importance in demonstrating a distinctive way of life, custom, process, land-use, function or design no longer practised, in danger of being lost, or of exceptional interest.

CRITERION C:
ITS POTENTIAL TO YIELD INFORMATION THAT WILL CONTRIBUTE TO AN UNDERSTANDING OF AUSTRALIA'S NATURAL OR CULTURAL HISTORY

C.1 Importance for information contributing to a wider understanding of Australian natural history, by virtue of its use as a research site, teaching site, type locality, reference or benchmark site.

C.2 Importance for information contributing to a wider understanding of the history of human occupation of Australia.

CRITERION D:
ITS IMPORTANCE IN DEMONSTRATING THE PRINCIPAL CHARACTERISTICS OF:
(I) A CLASS OF AUSTRALIA'S NATURAL OR CULTURAL PLACES; OR
(II) A CLASS OF AUSTRALIA'S NATURAL OR CULTURAL ENVIRONMENTS

D.1 Importance in demonstrating the principal characteristics of the range of landscapes, environments or ecosystems, the attributes of which identify them as being characteristic of their class.

D.2 Importance in demonstrating the principal characteristics of the range of human activities in the Australian environment (including way of life, custom, process, land-use, function, design or technique).

CRITERION E:
ITS IMPORTANCE IN EXHIBITING PARTICULAR AESTHETIC CHARACTERISTICS VALUED BY A COMMUNITY OR CULTURAL GROUP

E.1 Importance for a community for aesthetic characteristics held in high esteem or otherwise valued by the community.

CRITERION F:
ITS IMPORTANCE IN DEMONSTRATING A HIGH DEGREE OF CREATIVE OR TECHNICAL ACHIEVEMENT AT A PARTICULAR PERIOD

F.1 Importance for its technical, creative, design or artistic excellence, innovation or achievement.

CRITERION G:
ITS STRONG OR SPECIAL ASSOCIATIONS WITH A PARTICULAR COMMUNITY OR CULTURAL GROUP FOR SOCIAL, CULTURAL OR SPIRITUAL REASONS

G.1 Importance as a place highly valued by a community for reasons of religious, spiritual, symbolic, cultural, educational, or social associations.

CRITERION H:
ITS SPECIAL ASSOCIATION WITH THE LIFE OR WORKS OF A PERSON, OR GROUP OF PERSONS, OF IMPORTANCE IN AUSTRALIA'S NATURAL OR CULTURAL HISTORY

H.1 Importance for close associations with individuals whose activities have been significant within the history of the nation, State or region.

Appendix B: Forest Places in the Register of the National Estate

The following list is a compilation of registered national estate places relating to forests in the West region.
Map 1 shows National Estate places in the West region (some overlapping place numbers in the West coverage were deleted for clarity).
The forest places marked by an asterisk in the table below had not been incorporated into the data coverage at the time of the preparation of Map1.

Place name	Nearest town	Class code	Number	Status
*Anglesea Heath/Bald Hill Area	Anglesea	Natural	016617	Registered
Barrabool/Marma Forest Areas	Murtoa	Natural	018304	Registered
Bats Ridges State Faunal Reserve	Portland	Natural	003900	Registered
Brisbane Ranges National Park	Anakie	Natural	003521	Registered
Burchett Creek Road Bridge	Caramut	Historic	016063	Registered
Campaspe River Rail Bridge	Carlsruhe	Historic	015999	Registered
Cape Nelson Park	Portland	Natural	003905	Registered
Chatsworth Road Remnant Vegetation (Derrinallum Section)	Derrinallum	Natural	018642	Registered
Chatsworth Road Remnant Vegetation (Dundonnell Section)	Woorndoo	Natural	018180	Registered
Crawford River Road Bridge	Hotspur	Historic	016067	Registered
Discovery Bay Coastal Park	Nelson	Natural	003903	Registered
Floating Islands Lagoon Reserve (Proposed)	Pirron Yallock	Natural	003779	Registered
*Forestry Commission Nursery Office (former)	Creswick	Historic	015327	Registered
Framlingham Aboriginal Mission	Warrnambool	Aboriginal	03934	Registered
Hanging Rock	Newham	Natural	004257	Registered
Jacksons Creek Rail Bridge	Sunbury	Historic	016044	Registered
*Lady Julia Percy Island State Faunal Reserve	Yambuk	Natural	003718	Registered
Lake Bullenmerri & Catchment	Camperdown	Natural	003760	Registered
Lake Connewarre State Game Reserve	Leopold	Natural	003641	Registered
Lake Elizabeth Area	Forrest	Natural	003699	Registered
Lake Gnotuk and Catchment	Gnotuk	Natural	003759	Registered
Lake Surprise	Macarthur	Natural	003787	Registered
Lawrence Rocks State Faunal Reserve	Portland	Natural	003894	Registered
Leigh River Road Bridge	Meredith	Historic	016059	Registered
Lower Glenelg National Park	Nelson	Natural	003901	Registered
Melba Gully State Park	Lavers Hill	Natural	003697	Registered
Merri Creek Grasslands	Craigieburn	Natural	019712	Registered
*Mitre Rock Area	Mitre	Natural	017247	Registered
Motts Dummy Hut	Natimuk	Historic	004078	Registered
Mount Arapiles & Surrounds	Natimuk	Natural	004082	Registered
Mount Eccles National Park	Macarthur	Natural	003788	Registered
Mount Elephant	Derrinallum	Natural	003758	Registered
Mount Richmond National Park	Portland	Natural	003902	Registered
Otway National Park and Adjacent Areas	Apollo Bay	Natural	015057	Registered
Otway Stonefly Habitat – Maits Rest	Apollo Bay	Natural	018906	Registered
Parker River and Catchment	Apollo Bay	Natural	003691	Registered
Port Campbell National Park	Port Campbell	Natural	003778	Registered
*School of Forestry and Old Residence	Creswick	Historic	015486	Registered

The Grampians	Halls Gap	Natural	004002	Registered
The Stones State Faunal Reserve	Macarthur	Natural	003786	Registered
Tooloy & Lake Mundi Wildlife Reserve	Lake Mundi	Natural	003743	Registered
Tower Hill State Game Reserve	Koroit	Natural	015250	Registered
Trestle Railway Bridge	Timboon	Historic	003776	Registered
Urquhart Bluff Area	Aireys Inlet	Natural	019926	Registered
West Wail Flora and Fauna Reserve	Horsham	Natural	018307	Registered
Woorndoo Remnant Vegetation Sites	Woorndoo	Natural	018181	Registered

Places with Indicative Status in the Database of the Register of the National Estate. These places have not been assessed for national estate significance and are not included on Map 1. A number are under assessment as part of the RFA process.

Place name	Nearest town	Class code	Number	Status
Brewis Road Remnant Grassland	Dunkeld	Natural	019641	Indicative
Cape Sir William Grant	Portland	Natural	015249	Indicative
Chatsworth Roadside Grassland Areas	Chatsworth	Natural	019595	Indicative
Lake Bookar	Camperdown	Natural	100506	Indicative
Lake Colangulac	Camperdown	Natural	100511	Indicative
Lake Corangamite	Pirron Yallock	Natural	100504	Indicative
Lake Gnarpurt	Lismore	Natural	100505	Indicative
Lake Marma & Reserve	Murtoa	Natural	004097	Indicative
Lake Milangil	Camperdown	Natural	100510	Indicative
Lake Murdeduke	Winchelsea	Natural	100501	Indicative
Lake Terangpom	Camperdown	Natural	100509	Indicative
Lal Lal Falls	Lal Lal	Natural	100566	Indicative
Moonlight Head Coastal Wilderness	Lavers Hill	Natural	018955	Indicative
Mount Eccles Area	Macarthur	Natural	003789	Indicative
Mount Leura	Camperdown	Natural	003774	Indicative
Mount Napier and Harmans Valley	Byaduk	Natural	003736	Indicative
Mount Sugarloaf	Camperdown	Natural	003719	Indicative
Mt Mercer Road Remnant Grassland	Shelford	Natural	019710	Indicative
Nurcong Mallee	Mitre	Natural	017329	Indicative
Olangolah Forest Area	Apollo Bay	Natural	019928	Indicative
Old Adelaide Road Remnant Grassland	Cavendish	Natural	019589	Indicative
Otway to Port Fairy Coastal Area	Port Campbell	Natural	100010	Indicative
Portland to Cape Nelson coastline	Portland	Natural	015519	Indicative
Shelford – Cressy Road Remnant Grassland	Shelford	Natural	019604	Indicative
South West Wimmera Salt Lakes	Natimuk	Natural	017571	Indicative
Streatham-Woolsthorpe Road Remnant Wetland	Nerrin Nerrin	Natural	019642	Indicative
Upper Werribee Forest Area	Korweinguboor a	Natural	003941	Indicative
Vite Vite Grassland Site	Derrinallum	Natural	019640	Indicative
Western District Lakes	Camperdown	Natural	017845	Indicative
Wombat Forest Mineral Springs Recharge Area	Bullarto	Natural	100273	Indicative
You Yangs Nature Reserve	Little River	Natural	003663	Indicative
Barwon Valley Lookout	Herne Hill	Historic	018666	Indicative
Bendigo and Fryers Gold Mining Co Battery	Spring Gully	Historic	019357	Indicative
Berry Deep Leads Mine System	Creswick	Historic	100651	Indicative
Big Hill Area	Stawell	Historic	101438	Indicative
Bridgewater Lakes Landscape Area	Portland	Historic	003904	Indicative

Cape Nelson Landscape Area	Portland	Historic	015141	Indicative
Cobblers Gully Battery Site	Spring Gully	Historic	019412	Indicative
Cobblers Gully Crushing Works	Spring Gully	Historic	019410	Indicative
Cobblers Gully Mining Site	Spring Gully	Historic	019067	Indicative
Crocodile Reservoir Reef Workings	Fryerstown	Historic	019379	Indicative
Dean - Mollongghip Road Cultural Landscape Area (Including Dean	Dean	Historic	100938	Indicative
Eureka Company Battery Site	Spring Gully	Historic	019415	Indicative
Eureka Consolidated Mining Site	Spring Gully	Historic	019413	Indicative
Eureka Reef Mining Site	Spring Gully	Historic	019068	Indicative
Eureka Reef Open Cut / Stope	Spring Gully	Historic	019416	Indicative
Kerrie State School No 1290	Kerrie	Historic	006033	Indicative
Mount Rouse	Penshurst	Historic	003814	Indicative
North Creswick Mines (Australasian Area)	Creswick	Historic	100652	Indicative
North Creswick to Daylesford Railway Cultural Landscape Area	Creswick	Historic	100937	Indicative
Old Coach Road and Accommodation Paddock	Spring Gully	Historic	019407	Indicative
Park Lake and Gardens Cultural Landscape Area	Creswick	Historic	100939	Indicative
Peter Francis Points Arboretum	Coleraine	Historic	003919	Indicative
Phoenix Company Battery Site	Spring Gully	Historic	019414	Indicative
Red Hill Alluvial Mines Network Ruins and Water Race	Fryerstown	Historic	019302	Indicative
Sailors Gully Tubal Caine Mining Sites	Fryerstown	Historic	019303	Indicative
Sawpit Gully Plantation	Creswick	Historic	019948	Indicative
Sluiced Cobblers Gully	Spring Gully	Historic	019409	Indicative
Specimen Gully Reef Mining Ruins	Barkers Creek	Historic	019297	Indicative
Specimen Gully Slate Quarry	Barkers Creek	Historic	019292	Indicative
Spring Gully Central Mine	Spring Gully	Historic	019425	Indicative
Spring Gully Company Mine and Battery	Spring Gully	Historic	019417	Indicative
Spring Gully Junction Mine and Battery	Spring Gully	Historic	019420	Indicative
Spring Gully Mining Site Group	Spring Gully	Historic	019065	Indicative
Spring Gully No 1 Company Mine	Spring Gully	Historic	019418	Indicative
Spring Gully North Mine	Spring Gully	Historic	019421	Indicative
Spring Gully South Company Mine	Spring Gully	Historic	019419	Indicative
Trawool Valley	Seymour	Historic	015136	Indicative

Appendix C: Consultancy Reports Commissioned

Bannear, D. (1997). A Study of Historic Forest Activity Sites in the West Forest Region, Victoria

Bannear, D. (1997). A Study of Historic Forest Activity Sites in the Box-Ironbark, Victoria

Context Pty Ltd (1999). Community Heritage Workshops Reports

Context Pty Ltd (1999). Identification and Assessment of Community Heritage Values in the West Forest Region, Victoria: Workshop Overview Report

Context Pty Ltd (1999). Identification and Assessment of Community Heritage Values in the West Forest Region, Victoria: Social Value Assessment Report

Context Pty Ltd (1999). Identification and Assessment of Community Heritage Values in the West Forest Region, Victoria: Inventory of Community Heritage Places

Evans, P. (1999). A Study of Historic Sawmill and Tramway Sites in the West Forest Region, Victoria

Graeme Butler & Associates (1997). Historic Places in the Box-Ironbark Investigation Area

Graeme Butler & Associates (1999). A Study of Places Relating to Selected Historic Forest Themes in the West Forest Region Victoria

Keating, J. (1997). Contextual History of the Box-Ironbark Area

Marshall, B., Jones, R. and Jordan, J. (1996). Victorian Cultural Heritage Data Audit and Analysis for the RFA Regions: the Box-Ironbark and Midlands Areas

Marshall, B. and Jones, R. (1997). Victorian Cultural Heritage Data Audit and Analysis for the RFA Regions: the West

Robin Crocker & Associates (1999). Identification and Assessment of Aesthetic value in the West Forest Region Victoria

Sheehan, M. (1996). Regional Community Profiles for the Victorian Regional Forest Agreement Assessment: Box- Ironbark Area

Sheehan, M. (1996). Regional Community Profiles for the Victorian Regional Forest Agreement Assessment Process

Appendix D: Consultation with Aboriginal People and Issues raised

7 June 1999: Meeting at Goolum-Goolum Aboriginal Co-operative, Horsham

Jack Kennedy	Wotjobaluk
Eileen Harris	Wotjobaluk
Ray Marks	Wotjobaluk
Jenny Beers	Wotjobaluk
Stuart Harradine	Wotjobaluk
Anita Marks	Wotjobaluk
Peter Kennedy	Wotjobaluk
Mick Sommers	Natural Resources and Environment
Kate Challis	Environment Forest Taskforce
Juliet Ramsay	Environment Forest Taskforce
Joanna Freslov	Aboriginal Affairs Victoria

8 June 1999: Meeting at Brambuk Incorporated, Halls Gap

Shannon Collier	South West and Wimmera Cultural Heritage Officer
Damien Skurrie	Brambuk Incorporated
David Thompson	Brambuk Incorporated
Levi Lovett	Parks Victoria
Mick Sommers	Natural Resources and Environment
Kate Challis	Environment Forest Taskforce
Juliet Ramsay	Environment Forest Taskforce
Joanna Freslov	Aboriginal Affairs Victoria

9 June 1999: Meeting at Winda-Mara Aboriginal Corporation, Heywood

Denise Lovett	South West and Wimmera Cultural Heritage Officer
Daryl Rose	Winda-Mara Aboriginal Corporation
Thomas Day	Winda-Mara Aboriginal Corporation
Euphemia Day	Winda-Mara Aboriginal Corporation
Iris Gardiner-Lovett	Winda-Mara Aboriginal Corporation
Lynette Sailor	Winda-Mara Aboriginal Corporation
Wayne Bell	Winda-Mara Aboriginal Corporation
Sandra Aitkin	Winda-Mara Aboriginal Corporation
Darren Bell	Winda-Mara Aboriginal Corporation
Val Lovett	Winda-Mara Aboriginal Corporation
Brian Smith	Winda-Mara Aboriginal Corporation
Laura A Bell	Winda-Mara Aboriginal Corporation
Justin Cook	Natural Resources and Environment
Kate Challis	Environment Forest Taskforce
Juliet Ramsay	Environment Forest Taskforce
Joanna Freslov	Aboriginal Affairs Victoria

11 June 1999: Meeting at Framlingham Aboriginal Trust, Purnim

Herbie Harradine	South West and Wimmera Cultural Heritage Officer
Lionel Harradine	Framlingham Aboriginal Trust
Charlie Clarke	Framlingham Aboriginal Trust
Neil Martin	Framlingham Aboriginal Trust
Peter Tange	Natural Resources and Environment
Kate Challis	Environment Forest Taskforce
Juliet Ramsay	Environment Forest Taskforce
Joanna Freslov	Aboriginal Affairs Victoria

16 June 1999: Meeting at Ballarat District Aboriginal Co-operative, Ballarat

Jason Jackal	South West and Wimmera Cultural Heritage Officer
Tony Lovatt	Ballarat District Aboriginal Co-operative

Steve Johnston	Ballarat District Aboriginal Co-operative
Celine Clark	Ballarat District Aboriginal Co-operative
Ted Lovitt	Ballarat District Aboriginal Co-operative
Sharon Slater	Natural Resources and Environment
Kate Challis	Environment Forest Taskforce
Juliet Ramsay	Environment Forest Taskforce
Joanna Freslov	Aboriginal Affairs Victoria

17 June 1999: Meeting at Wathaurong Co-operative, Geelong

Trevor Edwards	Wathaurong Co-operative
Patrick Murphy	Wathaurong Co-operative
Gordon Black	Wathaurong Co-operative
Allan Browning	Wathaurong Co-operative
Scott Bolton	Wathaurong Co-operative
Craig Edwards	Wathaurong Co-operative
Serena O'Meley	Geelong Community Forum
Peter Tange	Natural Resources and Environment
Kate Challis	Environment Forest Taskforce
Juliet Ramsay	Environment Forest Taskforce
Joanna Freslov	Aboriginal Affairs Victoria

10 July 1999: Meeting with Dhuart –Wurrong Elders at Ballarat Community Forum

Sandra Onus	Gournditch-Mara Group
Christina Saunders	Gournditch-Mara Group
Theo Saunders	Gournditch-Mara Group
Elizabeth King	Gournditch-Mara Group
Juliet Ramsay	Environment Forest Taskforce
Lucy Gannon	Natural Resources and Environment

4 August 1999: Field trip to Otway Ranges

Gratten Couzens	Wathaurong Cooperative
Malcolm Morgan	Wathaurong Cooperative
Trevor Abrahams	South West & Wimmera Cultural Heritage Officer
Peter Tange	Natural Resources and Environment
Herbie Harradine	South West and Wimmera Cultural Heritage Officer
Lionel Harradine	Framlingham Aboriginal Trust
Charlie Clarke	Framlingham Aboriginal Trust
Joe Chatfield	South West & Wimmera Cultural Heritage Co-ordinator
Neil Martin	Framlingham Aboriginal Trust
Juliet Ramsay	Environment Forest Taskforce
Joanna Freslov	Aboriginal Affairs Victoria
Lucy Gannon	Natural Resources and Environment
David Rourke	Natural Resources and Environment
Ian Shurvell	Natural Resources and Environment

29 June 1999: Meeting with Gournditch-Mara Native Title Claimants, Portland

Sandra Onus	Gournditch-Mara
Christina Saunders	Gournditch-Mara
Mick Lovett	Gournditch-Mara
Georgina Williams	Gournditch-Mara
Theo Saunders	Gournditch-Mara
Elizabeth Saunders	Gournditch-Mara
Robert Daly	Mirimbiak Nations Aboriginal Corporation
Juliet Ramsay	Environment Forest Taskforce
Joanna Freslov	Aboriginal Affairs Victoria
Ian Miles	Natural Resources and Environment
Kylie White	Natural Resources and Environment
Pam Robinson	Community Co-ordinator RFAs, AFFA

6 September 1999: Meeting at Ballarat District Aboriginal Co-operative, Ballarat

Jason Jackal	South West & Wimmera Cultural Heritage Officer
Sharon Slater	Natural Resources and Environment
Lucy Gannon	Natural Resources and Environment
Gabrielle Brennan	Aboriginal Affairs Victoria
Joanna Freslov	Aboriginal Affairs Victoria
Juliet Ramsay	Environment Forest Taskforce
Marilyn Truscott	Environment Forest Taskforce

7 September 1999:Meeting at Goolum-Goolum Aboriginal Co-operative, Horsham

Mr. Jack Kennedy	Wotjobaluk
Jenny Beer	Wotjobaluk
Peter Kennedy	Wotjobaluk
Stuart Harradine	Wotjobaluk
Justin Cooke	Natural Resources and Environment
Joanna Freslov	Aboriginal Affairs Victoria
Juliet Ramsay	Environment Forest Taskforce
Marilyn Truscott	Environment Forest Taskforce

7 September 1999: Meeting at Brambuk Incorporated

Tim Chatfield	Chairman Brambuk Cultural Centre
Shannon Collier	South West & Wimmera Cultural Heritage Officer
David Thompson	Brambuk Incorporated
Joanna Freslov	Aboriginal Affairs Victoria
Juliet Ramsay	Environment Forest Taskforce
Marilyn Truscott	Environment Forest Taskforce
Gabrielle Brennan	Aboriginal Affairs Victoria

8 September 1999: Meeting at Winda-Mara Corporation

Denis Lovett	South West & Wimmera Cultural Heritage Officer
Euphemia Day	Winda-Mara Aboriginal Corporation
Wayne Bell	Winda-Mara Aboriginal Corporation
Val Lovett	Winda-Mara Aboriginal Corporation
John Lovett	Winda-Mara Aboriginal Corporation
Daryl Rose	Winda-Mara Aboriginal Corporation
Joanna Freslov	Aboriginal Affairs Victoria
Juliet Ramsay	Environment Forest Taskforce
Marilyn Truscott	Environment Forest Taskforce
Justin Cooke	Natural Resources and Environment

9 September 1999: Meeting at Colac Information Centre

Joe Chatfield	South West & Wimmera Cultural Heritage Coordinator
Trevor Abrahams	South West & Wimmera Cultural Heritage Officer
Joanna Freslov	Aboriginal Affairs Victoria
Juliet Ramsay	Environment Forest Taskforce
Marilyn Truscott	Environment Forest Taskforce
Peter Tange	Natural Resources and Environment
Gabrielle Brennan	Aboriginal Affairs Victoria

Appendix E: Organisations Invited to Participate in the Community Heritage Workshops

Industry Organisations – Timber/Forest Products

Castlemaine & District Woodworkers Society
Central Vic Farm Plantations
Clearwater Logging & Transport Co
CM Timber Products
Commercial Forests Midlands
Construction Forestry Mining & Energy Union (CFMEU)
Crick Bros Sawmills Pty Ltd
CSR Dartmoor
Daylesford Sawmill
Forest Protection Society
Greater Green Triangle Plantations
McVilly Timbers
Otway Logging Co Pty Ltd
Portland Pine Products
Pulp and Paper Federation
RB & DJ Beavis Sawmillers
Rushworth Eucalyptus Factory
Timber Alliance
Timber Promotion Council
Victorian Association of Forest Industries
VicTree Timber Products
WTP Timbers

Industry Organisations – Other

Barwon Water
Bendigo Tourism Centre
Byrne & Proud Tourism Consultants
Casterton District Tourist Association
Central Highlands Tourist Railway
Central Highlands Water
Cobar Drilling
Colac Otway Tourism Board
Country Victoria Tourism Council
Geelong Otway Tourism
Goulburn-Murray Water
Host Farms Association
Mountain Cattlemen's Association of Victoria
Nagambie Tourism Association
Otway & Hinterland Tourism Association
Otway Region, Barwon Water
Otway Tours
Perseverance Mining
Portland Coast Regional Water
Portland Tourist Information
Prospectors & Miners Association
Rushworth Tourism Association
Shipwreck Coast Tourism
SW Regional Development Board
Tourism Great Ocean Road Pty Ltd
Victorian Apiarists Association Resource Committee
Victorian Apiarists Association
Victorian Chamber of Mines
Victorian Farmers Federation
Victorian Farmers Federation, Casterton
Victorian Tour Operators Association
Wedderburn Tourism Inc.

Recreation Organisations

Australian Anglers Association (Victorian Division) Inc.
Australian Deer Association
Australian Motorcycle Trail Riders Association (AMTRA)
Australian Trail Horse Riders Association (Vic)
Ballarat Bushwalking Club
Ballarat Four Wheel Drive Club
Ballarat Mountain Bike Club
Bicycle Victoria
Bird Observers Club of Australia
Birds Australia (Royal Australasian Ornithologists Union)
Camperdown Bushwalking Club
Camping Association of Victoria
Clunes and Creswick Riding Club
Colac Camera Club
Colac Field and Game Club
Daylesford Walking Group
Dune Buggy Club
Federation of Victorian Walking Clubs Inc. (VICWALK)
Field and Game Clunes
Game Fishing Association of Victoria
Grampians Bushwalking Company
Guides Victoria
Heywood Angling Club
Heywood Field & Game
Heywood Golf Club
Horse Riding Clubs Association of Victoria
Kyneton Pony Club
Macarthur Angling Club
Macarthur Walking Group
Melbourne Bushwalkers
Melbourne Older Adults Recreation Network
Motorcycle & Endro Club
Murray Goulburn Bird Observers Club
Otway Four Wheel Drive Club
Outdoor Recreation Centre

Portland Field & Game
Portland Pony Club
Rushworth Field and Game
Scout Association of Victoria
Scouts Association – Glenelg region
Shepparton Adult Horse Riding Club.
Shooting Sports Council of Victoria Inc.
Ski Touring Association of Victoria
Sport & Recreation Victoria
Sporting Shooters Association of Victoria
Surrey River Venturer Unit
Victorian Association of Four Wheel Drive Clubs
Victorian Association of Photographic Societies
Victorian Canoe Association
Victorian Climbing Club
Victorian Field & Game Association
Victorian Fossickers Club
Victorian Game & Deerstalking Association
Victorian Gem Clubs Association
Victorian Metal Detector & Prospectors Association
Victorian Orienteering Association
Victorian Piscatorial Council
Victorian Recreational Fishing Peak Body (VRFISH)
Victorian Rogaining Association
Victorian Speleological Association
Warrnambool Fly Fishers
Whroo Country Golf Club
Wild Dog Trails

Environment/Conservation Organisations

Alexander Land Protection Association
Ararat Field Naturalists Club
Australian Conservation Foundation
Australian Native Orchid Society Geelong
Australian Trust for Conservation Volunteers
Bald Hills and Creswick Landcare Group
Ballarat Environment Network
Ballarat Field Naturalists
Bamganie and Meredith District Landcare Group
Barrabool Hills Landcare Group
Barwon River Care Group
Basalt Landcare Group
Bellarine Tree Group
Broadford Environmental Action
Broken Creek Field Naturalists. Club
Bushy Creek Landcare Group
Cobden Field Naturalists
Colac Field Naturalists
Combined Dundas Tablelands Landcare
Creswick Field Naturalists Club
Deep Creek Landcare Group
Dunolly Landcare group
East Moorabool Landcare Group
East Otway Land Protection Group
Elmhurst Landcare Group
Environment Victoria
Environs Australia
Field Naturalists Club of Victoria
Friends Network Committee
Friends of Angahook- Lorne State Park
Friends of Bannockburn Bush
Friends of Bendigo Box Ironbark
Friends of Box Ironbark
Friends of Eccles & Napier Inc.
Friends of Inverleigh Common
Friends of Macedon Ranges
Friends of Mt Beckworth
Friends of Otway National Park
Friends of Painkalac Creek
Friends of Queens Park Lorne
Friends of the Canadian Forest
Friends of the Earth
Friends of the Grampians
Friends of the Great South West Walk
Geelong Field Naturalists Inc
Geelong Revegetation Organisation
Glenlyon Landcare Group
Golden Point Landcare Group
Goulburn Valley Environment Group
Great Western Landcare Group
Green Connection
Greening Australia (Vic)
Guildford Landcare Group
Hamilton Field Naturalists Club
Harcourt Valley Landcare Group
Hepburn Springs Action Group
Indigenous Flora & Fauna Association
Kangderaar Catchment Landcare
Laharum Landcare
Lang Koop Landcare
Lexton Landcare Group
Loddon Shire Council
Muckleford Catchment Landcare Group
Murrandarra Landcare
Nuggety Land Protection Group
Pentland Hills Landcare Group
Port Campbell Environment Group
Portland Field Naturalists Club
Reedy Creek Landcare Group
Roadside Conservation Committee of Victoria
Rushworth Wildlife Shelter
Scarsdale Smythesdale Landcare Group
South Heathcote Action Group for Wildlife
Stawell & District Conservation Group
SW Environmental Action Group
Taradale and District Walking and Landcare Group
The Wilderness Society
Threatened Species Network
Trust for Nature
Tylden Landcare Group
Ullina Landcare Group
Upper & Lower Wimmera Waterwatch

Upper Barwon Landcare Network
Upper Hopkins Landcare Group
Upper Williamson Creek Landcare Group
Victorian National Parks Association
Wainwrights Tree Environment Resource Centre
Wedderburn Environment Protection
Wimmera Environment Group
Wimmera River Improvement
Woady Yalloak Landcare Network
World Wide Fund for Nature
Yarrowee-Leigh & Geelong Landcare Networks

Education Organisations

All Saints Primary School
Apollo Bay P-12 College
Ballarat University
Bayview College
Camperdown College
Coleraine Primary School
Derrinallum College
Geography Department, Latrobe
Glenormiston College
Goroke P-12 School
Gould League of Victoria
Heywood Secondary College
Lorne P-12 College
Monivae College
Portland Secondary College
Rushworth P-12 College
School of Ecology and Environment
School of Forestry
South West Institute of TAFE
St Marys School
Terang College
Timboon P-12 School
Victorian Association for Environmental Education
Victorian Outdoor Education Association
Warrnambool College

Aboriginal Heritage Organisations

Aboriginal Dreamtime Trails
Aboriginal Heritage Branch, Aboriginal Affairs Victoria
Mirimbiak Nations Aboriginal Corporation
Njernda Aboriginal Corporation
SW & Wimmera Cultural Heritage Program
Winda-Mara Aboriginal Corporation
Wurundjeri Tribe Land Compensation & Cultural Heritage Council

Heritage Organisations

Anglesea Historical Society
Ararat and District Historical Society
Bellarine Historical Society
Coleraine Historical Society
Creswick Historical Society
Halls Gap History Society
Hamilton History Centre
Hamilton Pastoral Museum
Heritage Victoria
Institution of Engineers, Heritage Branch
Korong Historical Society
Lexton Historical Society
Lorne Historical Society
Macarthur & District Historical Society
Midlands Historical Society
National Trust of Australia (Vic)
Newstead Historical Society
Old Timboon Line
Royal Historical Society of Victoria
Scienceworks
St Arnaud Historical Society
Stawell Historical Society

Other Organisations

Amatek
Amezdroz & Sons Pty Ltd
Angair
Anglesea Fire Brigade
Apex Heywood
Arborline Pty Ltd
Barwon Downs Fire Brigade
Beech Forest Progress Association
Bendigo Native Plant Group
Bimbi Park
Blue Pyrenees Estate
Boomerang Ranch
Brambuk Incorporated
Carlisle River Fire Brigade
Casterton Community Art & Craft Association
Cavendish Telecentre
Centre For Environmental Management
Community Centre Clunes
Corangamite Catchment Management Authority (CMA)
Corangamite Volcanic Trail Committee
Country Womens Association
Creswick and District Development Association
CWA Heywood and Heywood Garden Club
CWA Portland
Dartmoor State Emergency Service (SES)
Deans Marsh Fire Brigade
Dept. Natural Resources and Environment
Drumborg Country Fire Authority (CFA)

Dunkeld Touist Centre
Environmental Partnerships
ET & MT Murnane
Geelong Historical Records Centre
Gellibrand Fire Brigade
Gellibrand/Kawarren Progress Association
Gold Man Gold Tours
Goulburn-Broken Catchment Management Authority
Grampians Retreat Centre
Gritjurk-Wootong Vale
Hamilton Visitor Centre
Heywood Fire Brigade
Heywood State Emergency Service (SES)
Hopkins Glenelg Catchment Management Authority
Inglenook Cottage
Integra Consultants
Kowree Farm Trees Group
Land Conservation Council
Landcare Groups
LINKS
Lions Club
Lorne Fire Brigade
Marvellous Meredith Group
Midway Pty Ltd
Milltown Fire Brigade
Moonambel Landcare Group
Municipal Association of Victoria
Myamyn Country Fire Authority (CFA)
Ocean Grove Park
Otway Eco Guides
Otway Forest Industry Information Group
Otway Forum
Otway Health & Community Services
Parks Victoria
Penshurst Information Centre
Portland Apex
Portland Fire Brigade
Portland State Emergency Service (SES)
Public Land Council
RAOU
Redbank Honey
Rotary North
Rural Womens Affairs
Rushworth & District Lions Club
Rushworth Fire Brigade
SCAP
Senior Citizens Club
SGAP Otway
Stapleton Nursery
Sustainable Development Initiative
Timber Towns Victoria
Treecorp
Upper Maribyrnong Catchment group
Wimmera Catchment Authority
Woady Yallock Catchment Committee
Wood Wine & Roses
Wye River Fire Brigade

Local Government Organisations

Ballarat City Council
Buloke Shire Council
City of Greater Geelong
Colac Otway Shire
Corangamite Shire
Glenelg Shire Council
Golden Pains Shire
Greater City of Bendigo (Shire)
Greater City Of Shepparton
Hepburn Shire Council
Horsham Rural City Council
Macedon Ranges Shire
Moira Shire
Moorabool Shire
Moyne Shire Council
Mt Alexander Shire
Pyrenees Shire Council
Rural City of Ararat
Shire of Campaspe
Shire of Southern Grampians
Surfcoast Shire
Warrnambool City Council
West Wimmera Shire
Yarriambiack Shire Council

Appendix F: Participants in the Community Heritage Workshops

Attendance list – Apollo Bay Workshop

Peter Geelie	
Rosemary Vulcz	
Keith Leorke	Apollo Bay Chamber of Commerce & Tourism
Irene Newton	Apollo Bay Historical Society
Carol Wilmink	Apollo Bay Historical Society
Roger Hardley	Apollo Bay Landcare Group
Graeme Saddington	Barwon Water
Charles Robinson	Cape Otway Lighthouse Beechy Line Rail Trail
Steve Leorke	CFA Apollo Bay
Wendy Briggs	Colac Otway Shire
Ian Roberts	Consultant
Judi Forrester	Friends of Otway Park
Neil Dendle	Geelong Bushwalking Club Inc
Joan Lindros	Geelong Environment Council
Gerd Worpel	Geelong Environment Council
Neil Longmore	Gellibrand & Kawarren Progress Association
Geoff Beilby	Gellibrand CFA
Geoff Kennedy	Habcon
Susan Graham	Killala
Adrian Whitehead	Last Chance Tours
Hans Fankhanel	Lavers Hill & District Progress Association
Denise Hooke	Lavers Hill P12 College
Chris Dare	Midway
Andrew Stewart	Otway Agro Forestry Network
Doug Bartram	Otway Community Service – Senior Bush Walks
Belinda Murnane	Otway Forest Industries Information Group
Wim Bezemer	Otway Planning Association Inc.
Simon Birrell	Otway Ranges Environmental Network
John A. Phillips	Otway Ranges Walking Track Association
John Piesse	Otway Ranges Walking Track Association
Cyril Marriner	Otway Scenic Circle Association
Mark De La Warr	Otwild Adventures
Peter Burns	Parks Victoria
John James	S.G.A.P. (Colac/Otway)
Jack Holden	Southern Otway Landcare Network
David Curry	Surf Coast Tourism

Attendance list – Avoca Workshop

Tony Briody	
R Curtis	
Fay Peck	
Alan Rycroft	
Lee Murnane	Beaufort Sawmills
Norm Cameron	Central Goldfields Shire Council
Richard Stone	Central Victoria Planations Commission
Ken Gell	Central Victorian Apiarists Association
Ian Crick	Crick Bros Sawmills Pty Ltd
Paul Bates	DNRE – Forest Services

John Darbyshire	Elmhurst Landcare
Pat Kaye	Elmhurst Landcare
Ken Roberts	Finders Prospecting Supplies
John Tully	Goldfields Historical and Arts Society
Jill Hunter	Ironbark Heritage and Tourism Group
John Higgins	Maryborough Advertiser
Bill Collins	Maryborough Family History Group
Eileen Courtney	Maryborough Field Naturalists
Lyle Courtney	Maryborough Field Naturalists
Garry Cheens	Maryborough Filed Naturalists
Noel Tunks	Maryborough Regional College
Kathy Lowe	Moonambel Landcare
Russell Elliott	Natte Yallock Landcare
Kaye Harris	Northern Grampians Shire Council
Max Hobson	Progress Association
Tony Mills	Prospectors & Miners Association
Deborah Bazeley	St Arnaud Field Naturalists
John Gray	Stawell Field Naturalists
Ian McCann	Stawell Field Naturalists
David Schuppan	Timor West Landcare
Graeme Matthews	Victorian Apiarist Association
Gavin Jamieson	Victorian Apiarists Association
Rosalie Newman	Welcome Stranger Tourist Association
Dennis Newman	WSRTA

Attendance list – Camperdown Workshop

Gus Angus	
Michael Sturmfels	
Jim O'Dowd	
David Colless	Calco Timbers
Laurie Clementson	Camperdown Bush Walking Club
Murray Kelson	Camperdown Bushwalking Club
Murray McKenzie	Camperdown Fly Fishing Club
Bob Lambell	Camperdown Historical Society Corangamite Volcanic Commission
Neville Edmonds	Colac & District Gem Club Inc.
Andrew Brook	Colac Wood Turners & Wood Crafters
Arthur Grant	Colac Wood Turners & Wood Crafters
Andrew Miller	Corangamite Arts Council
Chris Harty	Corangamite Shire
Zelda Clementson	Country Women's Association
Peter Tange	DNRE
Gail Watson	Mt Leura & Sugarloaf Development Committee
Shirley Duffield	Timboon Bushland Co-operative
Helen Langley	Timboon Field Naturalists
John Edmonds	Victorian Apiarists Association SW Region Resources Committee
Jon Drohan	Victorian Association of Forest Industries
Stuart Bennett	W H Bennett & Sons P/L

Attendance list – Daylesford Workshop

Bill McCashney	
Su Dennett	
Cate Howell	
Debi O'Toole	
Barbara Baird	
Jane Holth	Ashbourne Landcare Group
Geoff Proctor	Black Forest Timbers
Don Smith	Campaspe River Beautification Working Party

Ern Perkins	Castlemaine Field Naturalists
John Slorach	Central Victorian Forestry Co.
David Endacott	Daylesford Historical Society
Sharon Slater	DNRE
Jim Dwyer	Dwyers Sawmill
Bernie Frith	E & J Frith
Paul Norquay	East Moorabool Landcare
John Corrigan	Eureka Timber Co.
Bill Wright	Farmers Arms Angling Club
Debbie Mauric	Forest Protection Society
Jessie Smith	Friends of Bald Hill
Barbara Strange	Friends of Hanging Rock
David Avery	Friends of Mt Alexander Diggings
Pamela Manning	Great Dividing Trail Association
George & Josie Milford	Harcourt Valley Landcare Group
Bob Orr	Hepburn Shire Council
Greg Falkiner	Kyneton and District Trail Riders Inc
Marita Carter	Kyneton Environmental Awareness group
Susan Trott	Kyneton Environmental Group
Jenny Spilsbury	Kyneton Pony Club
Wayde Thiele	Logging Contractors
Marcus Ward	Macedon Ranges Conservation Society
Adrian Murphy	Macedon Ranges Shire
Greg Morgan	Neighbourhood House Walking Group
Des O'Toole	O'Tooles Honey
Peter Hayes	Parks Victoria
Patrick Connor	Roadside Conservation Committee
Peter Skilbeck	Shire of Mount Alexander
Maureen Corbett	Springs Area Permaculture
Harold Suckling	TPS Timber Work
Kathie Hollis	TRATA
Susie Spence	Trentham Pony Club
Kathie Hallis	Trentham Residents & Traders Association
Ian Esmore	Victorian Mineral Water
Tim Anderson	Western Victorian Forest Network
Madeleine Bodenham	Wombat Forest

Attendance list – Hamilton Workshop

Graeme Baugh	
John Fenton	Australian Farm Agroforestry
Dawn Webb	Australian Native Plant Society
Dianne Luhrs	Bainbridge College
Duncan Robertson	Balmoral High School
Ian McCallum	Casterton Field Naturalists Club Casterton Field & Game Association
Aileen Cooper	Coleraine Tourist Centre
Trish Munro	Combined Dundas Tablelands Landcare
Justin Cook	DNRE
Kerren Collins	Dunkeld & District Historical Museum
Gaye Beveridge	Dunkeld Information Centre
Maureen Reader	Edenhope Tourism Inc
Kay Aldridge	Friends of the Eastern Barred Bandicoot Hamilton Field Naturalists Club
Dave Munro	Friends of the Grampians
Jane Rapkins	Glenthompson Catchment Group (Glenelg Water Authority)
James Scholfield	Greening Australia
Robin Jackson	Hamilton District Council, Victorian Farmers Federation
Elizabeth Fenton	Indigenous Nursery

Rod Bird	South West Victoria Conservation Committee
Roy Barrows	Southern Grampians Art Group The Hamilton Botanical Artists
W.G. Falkenberg	Victorian Apiarists Association
Hilary Turner	Wannon Conservation Society

Attendance list – Heywood Workshop

Sam Bruton	
Steve Holmes	
Wendy Dowling	Dartmoor & District Progress Association
Rob Walter	DNRE
Max Phillips	Field Naturalists
Barbara Yuill	Glenelg Shire Council
Ian Hookway	Green Triangle Enduro Club
Ruth Graney	Portland Field Naturalists Club
Carol Wilson	Scouts
Midge Gough	Smokey River Landcare
Jim Gough	Smokey River Landcare

Attendance list – Rushworth Workshop

Henry Clarke	
Stuart McLeod	
Tracee Spiby	
RT Heily	
Doris King	Akora Wildlife Shelter and Whroo Visitors Centre
Stan Pelczynski	Bendigo & District Environment Council
Bill Holsworth	Bendigo Field Naturalists Club
Greg McKenzie	City of Greater Shepparton
Jon Cuddy	DNRE
David Coxon	Eaglehawk Environment Group
Paul Peake	Environment Conservation Council
Simon Ransome	Environment Conservation Council
Bob Richardson	Forest Protection Society
Rob Stephens	Perserverance Mining
Wes Risstrom	Risstrom Sawmill
John Graham	Rushworth Historical Society
Ron Risstrom	Rushworth Lions Club
Geoff Wright	Shepparton & District Car Club
David Merrett	Shire of Campaspe
Patricia Kennedy	South Campaspe Rural Group
Jenny Shield	Spring Gully Reservoir. & Environment Group
Robert Giblin	State Emergency Service
Eileen McDonald	Victorian Apiarists' Association
Neil Laurie	Waranga Community House Bushwalking Group
Wendy Schulz	Waranga Land Protection Group
Bob Holschier	Waranga Tourism / Waranga News

Appendix G: Participants in the Forest Critics Workshops

Daylesford Workshop

Sharon Slater	Natural Resources and Environment
Lucy Gannon	Natural Resources and Environment
Kathy Gosby	Natural Resources and Environment
Robert Graham	Natural Resources and Environment
David Avery	Parks Victoria
Juliet Ramsay	Environment Forest Taskforce
Robin Crocker	Robin Crocker & Associates

Hamilton Workshop

Jusin Cook	Natural Resources & Environment
Peter Ellis	Natural Resources and Environment
Rob Walter	Natural Resources and Environment
Roger Edwards	Natural Resources and Environment
Stephen Grant	Natural Resources and Environment
Juliet Ramsay	Environment Forest Taskforce
Robin Crocker	Robin Crocker & Associates

Colac Workshop

David Rourke	Natural Resources & Environment
Laurie Armistead	Natural Resources and Environment
Ian Shurvill	Natural Resources & Environment
Steve McDougall	Natural Resources and Environment
Juliet Ramsay	Environment Forest Taskforce
Robin Crocker	Robin Crocker & Associates

Appendix H: Indicative National Estate Places of Social Value

Places meeting the threshold for National Estate Value; Criterion G1

Aire Valley Redwoods Picnic and Camping Ground
Anakie Gorge
Annya Camp Picnic Area
Bannockburn Recreation Reserve
Barham Paradise Reserve
Black Range State Park and Mount Talbot
Cape Bridgewater & Bridgewater Lakes
Cape Otway
Central Victorian Mineral Springs
Cobboboonee Forest
Creswick Koala Park
Erskine Falls
Fish Holes
Grampians National Park
Grampians Tourist Road
Great Ocean Road
Great South West Walk
Lake Daylesford and Central Springs Reserve
Lake Elizabeth
Maits Rest
Melba Gully State Park
Meredith Education Area
Mooralla Gemstone Reserve
Mount Beckworth Scenic Reserve
Mount Buninyong Scenic Reserve
Mount Cole State Forest
Mount Eccles
Mount Macedon Cross and Park
Mount Shadwell
Mount Sugarloaf and Mount Leura Reserve
Otways “Old Growth” and Rainforest
Percydale Area
Sawpit Picnic Area and Whalers Lookout
The Ink Pot
The Waterfalls Picnic Area
Turtons Track
Victoria Valley
Wild Dog Ridge
Wombat Forest
You Yangs
Zumstiens Area

Appendix I: Indicative National Estate Places of Aesthetic Value

Places meeting the threshold for National Estate Value; Criterion E1

Aire River Valley, Gt Ocean Rd to Redwoods
Black Range Walking Track
Cape Bridgewater, Bridgewater Bay
Cape Otway Lighthouse Reserve
Cumberland River, Gt Ocean Road to Falls
Discovery Bay Coastal Park
Erskine Falls, Angahook-Lorne State park
Grampians National Park
Great Ocean Road
Great South West Walk
Hepburn Regional Park
Lake Bullen Merri and Lake Gnotuk
Lake Elizabeth
Lerderderg River
Lower Glenelg National Park
Macedon Regional Park Memorial Cross
Melba Gully State Park
Mount Arapiles - Tooen State Park
Mount Bepcha, Black Range State Forest
Mount Cole State Forest, Ben Nevis
Mount Cole State Forest, South West Slopes
Mount Eccles National Park
Mount Franklin
Mount Leura (including Mt Sugarloaf)
Nigretta Falls
Otway National Park
Port Campbell National Park
Stony Rises
Tower Hill State Game Reserve
Trentham Falls
Triplet Falls
Turtons Track
Wannon Falls and Reserve
Werribee Gorge (State Park)
Werribee River Headwaters
Wild Dog Ridge
You Yangs Regional Park

Appendix J: Indicative National Estate Places of Historic Value

Places meeting the threshold for National Estate values: Criteria A3, A4, B2, D2, F1 or H1

Selected Forest Theme Places:
Firth Park and Tracks to Andersons Mill, Wombat State Forest
Great Ocean Road
Langi Ghiran Reservoir, Langi Ghiran State Park
Lower Stony Creek Reservoir and weir wall, Brisbane Ranges National Park.
Mount Franklin Aboriginal Protectorate
Naroghid-Timboon Railway Line
Old Beechy Railway Line
Old Ocean or Old Coach Road, Princetown to Moonlight Head
Portland to Heywood Tramway Remains
Tunnel Point Water Race, Wombat State Forest
Way Station, Mount Eccles National Park
Wombat State Forest, Antimony Mine

Forest Activity Places (includes places from Box Ironbark study):
Aire Valley Camp
Bennett's Dam Eucy Distillery
Borough Huts Charcoal Kilns
Bullarto South Balt Camp
Farnsworth Track Charcoal Pits
Glynwylln Alien Camp
Landsborough Rd Charcoal Kilns
North Creswick Nursery Site
Sanatorium Lake Nursery Site
Sawpit Gully Nursery Site
Snake Valley Balt Camp

Sawmill and Tramway Places (includes places from Box Ironbark study):
Barbour's / Crossley's tramways and chutes, Mount Macedon
Basin Hut sawmills site, Mount Lonarch
Christian's sawmill, East Trentham
Clark's tramway, Leonards Hill
Glut escarpment wagon track and log chute
Graves and Frasers' sawmill, Barkstead
Hall's sawmill, Blackwood
Hayden's incline, Blackwood
Hayden's sawmill, Blackwood
Kozminsky's sawmill and log chute, Mount Bungor State Park
Lyon's tramway, Trentham
McGie's sawmill, Loam Creek, Blackwood
McIvor Timber and Firewood Company tramway, Heathcote
Orde's sawmill, Ogden Brothers' sawmill, Loddon River north of Lyonville
Philipson's "Albion" sawmill, Mount Cole Forest
Telegraph (Graves') sawmill and tramway, Stony Creek
Telegraph Sawmill Company tramway, Sailors Creek
The Glut historic sawmilling precinct, Mount Cole Forest
Trial Saw Mills tramway, Buninyong
Unknown sawmill, Hickmans Creek, Mount Cole Forest
Wheeler's tramway, Coliban Road
Wheeler's tramway, Mount Wilson

Witnish's sawmill, Bunding
Witnish's sawmill, Greendale

Places identified in Sawmill and Tramway report, Evans (1999), from LCC's South-West special investigation (1996 a), recommended for addition to the Register of the National Estate:
Marchbank's sawmill, tramway and double incline (A10),
Knott's No.3 sawmill, Wylangata (A11),
Henry and Sanderson's sawmills and features, Barramunga (A12).

Places of potential National Estate significance requiring further investigation:
Rose Glen

Gold mining cultural landscapes requiring further investigation*:*

North Creswick to Daylesford Railway Cultural Landscape area	RNE Indicative status – 2/03/093/0024
Allendale Township Cultural Landscape Area	RNE Indicative status - 2/03/093/0023
Big Hill Area	RNE Indicative status – 2/04/171/0011
Specimen Hill Landscape, Daylesford	

Appendix K: Flora Species Occurring in the West RFA Region with A1 and B1 Values

Scientific Name	Common Name	Conservation Status[1]				Limit of Range	Disjunct Population/s	Endemicity[2]
		AROTS	VROTS	FFG	ESP			
Acacia brownii	Heath Wattle						✓	
Acacia deanei	Deane's Wattle		r			✓		
Acacia farinosa	Mealy Wattle		k					
Acacia genistifolia	Spreading Wattle					✓		
Acacia glandulicarpa	Hairy-pod Wattle	V	v	L	V			
Acacia howittii	Sticky Wattle	R	r				✓	
Acacia implexa	Lightwood					✓		
Acacia lanigera	Woolly Wattle					✓		
Acacia mucronata var. *longifolia*	Narrow-leaf Wattle					✓	✓	
Acacia nano-dealbata	Dwarf Silver Wattle		r					E2
Acacia obliquinervia	Mountain Hickory Wattle						✓	
Acacia pravissima	Ovens Wattle						✓	
Acacia retinodes var. *uncifolia*	Coast Wirilda		r					
Acacia rupicola	Rock Wattle		r			✓		
Acacia suaveolens	Sweet Wattle						✓	
Acacia ulicifolia	Juniper Wattle						✓	
Acacia verticillata var. *latifolia*	Broad-leaf Prickly Moses		r					
Acacia williamsonii	Williamson's Wattle	R	r	X				
Acrotriche cordata	Coast Ground-berry		r			✓		
Adriana quadripartita (pubescent form)	Coast Bitter-bush		v					
Adriana quadripartita s.s. (glabrous form)	Rare Bitter-bush		e	L				
Agrostis adamsonii	Adamson's Blown-grass	E	v	L	E			E1
Agrostis aemula var. setifolia	Gilgai Blown-grass		v					
Agrostis avenacea var. perennis	Wetland Blown-grass		k					
Agrostis billardierei var. filifolia	Gilgai Blown-grass		v	L				
Agrostis billardierei var. robusta	Plains Blown-grass		v					
Agrostis rudis	Ruddy Bent		r					
Agrostis sp. aff. hiemalis	Forest Bent						✓	
Allantodia australis	Austral Lady-fern						✓	
Allocasuarina grampiana	Grampians She-oak		r					E1
Allocasuarina littoralis	Black She-oak					✓		
Allocasuarina luehmannii	Buloke		v	L			✓	
Allocasuarina mackliniana	Western She-oak		k					
Allocasuarina mackliniana ssp. hirtilinea	Western She-oak		r					E1
Allocasuarina mackliniana ssp. xerophila	Western She-oak		k					
Allocasuarina paradoxa	Green She-oak						✓	
Allocasuarina pusilla s.l.	Dwarf She-oak					✓		
Alternanthera sp. 1 (Plains)	Plains Joyweed		k			✓		
Ammannia multiflora	Jerry-jerry		v					
Amphibromus fluitans	River Swamp Wallaby-grass	V	k	X	V			
Amphibromus pithogastrus	Plump Swamp Wallaby-grass	K	e	L				E2
Amphibromus sinuatus	Wavy Swamp Wallaby-grass		v					
Amyema linophylla ssp. orientale	Buloke Mistletoe		v					
Argentipallium blandowskianum	Woolly Everlasting						✓	
Argentipallium dealbatum	Silver Everlasting		r					
Aristida ramosa	Cane Wire-grass						✓	
Arthrochilus huntianus ssp. huntianus	Elbow Orchid						✓	
Arthropodium sp. 3 (aff. strictum)	Small Chocolate-lily		k					
Asperula charophyton	Elongate Woodruff	R	r					
Asperula gunnii	Mountain Woodruff						✓	
Asperula minima	Mossy Woodruff		r					E1
Asplenium aethiopicum	Shredded Spleenwort		v				✓	
Asplenium appendiculatum ssp.	Ground Spleenwort		r					

Scientific Name	Common Name	Conservation Status[1]				Limit of Range	Disjunct Population/s	Endemicity[2]
		AROTS	VROTS	FFG	ESP			
appendiculatum								
Asplenium flaccidum ssp. flaccidum	Weeping Spleenwort						✓	
Astelia australiana	Tall Astelia	V	v	L	V		✓	
Asterolasia asteriscophora	Lemon Star-bush						✓	
Asterolasia phebalioides	Downy Star-Bush	V	v	L	V			E2
Atriplex australasica	Native Orache		k					
Atriplex billardierei	Glistening Saltbush		v					E2
Atriplex paludosa ssp. paludosa	Marsh Saltbush		k				✓	
Atriplex stipitata	Kidney Saltbush		v				✓	
Australina pusilla ssp. pusilla	Small Shade-nettle		r					
Austrodanthonia bipartita s.s.	Leafy Wallaby-grass		k					
Austrodanthonia carphoides var. angustior	Short Wallaby-grass		k					
Austrodanthonia induta	Shiny Wallaby-grass		k			✓		
Austrodanthonia monticola	Small-flower Wallaby-grass		r			✓		
Austrodanthonia setacea var. breviseta	Short-bristle Wallaby-grass		r					
Austrodanthonia sp. (syn. Danthonia procera)	Tall Wallaby-grass		k					
Austrofestuca hookeriana	Hooker Fescue					✓		
Austrofestuca littoralis	Coast Fescue		v					
Austrostipa breviglumis	Cane Spear-grass	R	r				✓	
Austrostipa exilis	Heath Spear-grass		r				✓	
Austrostipa gibbosa	Spurred Spear-grass		r					
Austrostipa hemipogon	Half-bearded Spear-grass		r					
Austrostipa mundula	Neat Spear-grass		r					
Austrostipa oligostachya	Fine-head Spear-grass							E2
Austrostipa puberula	Fine-hairy Spear-grass		r					
Austrostipa setacea	Corkscrew Spear-grass		r					
Avicennia marina ssp. australasica	White Mangrove		r					
Baeckea ramosissima ssp. prostrata	Rosy Baeckea		r				✓	
Ballantinia antipoda	Southern Shepherd's Purse	E	e	L	E			E2
Banksia saxicola	Rock Banksia		r					E2
Bauera sessiliflora	Grampians Bauera		r					E1
Baumea laxa	Lax Twig-sedge		r					
Bedfordia arborescens	Blanket-leaf					✓		
Bertya findlayi	Mountain Bertya	R	v				✓	
Berula ? erecta	Water Parsnip		k					
Beyeria lechenaultii var. ledifolia	Pale Turpentine Bush							E1
Billardiera bignoniacea	Orange Bell-climber		r					E1
Billardiera longiflora var. longiflora	Purple Apple-berry						✓	
Blechnum cartilagineum	Gristle Fern					✓		
Blechnum fluviatile	Ray Water-fern						✓	
Blechnum patersonii ssp. patersonii	Strap Water-fern						✓	
Boronia latipinna	Grampians Boronia	R	r					E1
Boronia muelleri	Forest Boronia						✓	
Boronia nana var. pubescens	Dwarf Boronia							E2
Boronia pilosa	Hairy Boronia						✓	
Borya mirabilis	Grampians Pincushion-lily	E	e	L	V			E1
Bossiaea buxifolia	Matted Bossiaea					✓		
Bossiaea cordigera	Wiry Bossiaea		r				✓	E2
Bossiaea obcordata	Spiny Bossiaea						✓	
Bossiaea riparia	River Leafless Bossiaea		r					
Bossiaea rosmarinifolia	Grampians Bossiaea		r					E1
Bothriochloa macra	Red-leg Grass					✓		
Botrychium australe	Austral Moonwort		v			✓		
Brachyloma depressum	Spreading Brachyloma		r					E1
Brachyloma ericoides ssp. ericoides	Brush Heath					✓		
Brachyscome angustifolia	Grassland Daisy					✓		
Brachyscome chrysoglossa	Yellow-tongue Daisy		v	N		✓		
Brachyscome curvicarpa	Curved-fruit Daisy		e					
Brachyscome debilis	Weak Daisy		v					
Brachyscome diversifolia	Tall Daisy						✓	
Brachyscome multifida	Cut-leaf Daisy					✓		

Scientific Name	Common Name	Conservation Status[1]				Limit of Range	Disjunct Population/s	Endemicity[2]
		AROTS	VROTS	FFG	ESP			
Brachyscome readeri	Reader's Daisy		r					
Brachyscome scapigera	Tufted Daisy						✓	
Brachyscome sp. aff. cuneifolia	Daisy							E2
Brachyscome spathulata ssp. spathulata	Spoon Daisy						✓	
Bracteantha palustris	Swamp Everlasting	V	v	L				
Bracteantha viscosa	Shiny Everlasting					✓		
Bulbine glauca	Rock Lily						✓	
Burnettia cuneata	Lizard Orchid	R	r			✓	✓	
Caladenia alata	Fairy Caladenia		k				✓	
Caladenia alpina	Mountain Caladenia						✓	
Caladenia audasii	McIvor Spider-orchid	E	e	L	E			
Caladenia australis	Southern Spider-orchid		k					
Caladenia calcicola	Limestone Spider-orchid	V	e	L	V			E2
Caladenia carnea var. ornata	Ornate Pink Fingers	V	v					
Caladenia colorata	Small Western Spider-orchid	E	k		E			
Caladenia concolor	Crimson Spider-orchid	V	e	L	V		✓	
Caladenia dilatata s.s.	Green-comb Spider-orchid		k					
Caladenia flavovirens	Summer Spider-orchid		r					
Caladenia formosa	Elegant Spider-orchid	V	v	L	V			E2
Caladenia fragrantissima	Scented Spider-orchid		e					
Caladenia fragrantissima ssp. fragrantissima	Scented Spider-orchid	R	e					E2
Caladenia fulva	Tawny Spider-orchid	E	e	L	E			E1
Caladenia hastata	Mellblom's Spider-orchid	E	e	L	E			E1
Caladenia magnifica	Magnificent Spider-orchid	K	k	L				
Caladenia oenochila	Wine-lipped Spider-orchid	K	v					
Caladenia parva	Small Spider-orchid		k					E2
Caladenia prolata	Fertile Caladenia		k					E2
Caladenia reticulata s.s.	Veined Spider-orchid		v					
Caladenia rosella	Little Pink Spider-orchid	E	e	L	E			
Caladenia sp. (Dadswells Bridge)	Dadswells Bridge Spider-orchid		k					E1
Caladenia tensa	Rigid Spider-orchid	E	e		E			
Caladenia tentaculata	Mantis Orchid						✓	
Caladenia toxochila	Bow-lip Spider-orchid		v					
Caladenia valida	Robust Spider-orchid	R	e					E2
Caladenia venusta	Large White Spider-orchid	R	r	X				E2
Caladenia versicolor	Candy Spider-orchid	V	v		V			
Caladenia vulgaris	Slender Caladenia		k					
Caladenia xanthochila	Yellow-lip Spider-orchid	E	e	L	E			
Calandrinia volubilis	Twining Purslane						✓	
Calectasia intermedia	Blue Tinsel-lily					✓		E2
Callistemon sieberi	River Bottlebrush					✓		
Callitriche brachycarpa	Short Water-starwort	R	v					E2
Callitriche cyclocarpa	Western Water-starwort	V	v		V			
Callitriche muelleri	Round Water-starwort						✓	
Callitriche palustris	Swamp Water-starwort		k					
Callitris glaucophylla	White Cypress-pine		v					
Callitris gracilis	Slender Cypress-pine						✓	
Calochilus gracillimus	Slender Beard-orchid		k					
Calorophus elongatus	Long Rope-rush		v				✓	
Calotis scapigera	Tufted Burr-daisy						✓	
Calystegia marginata	Forest Bindweed						✓	
Calytrix alpestris	Snow Myrtle					✓		
Cardamine tenuifolia	Slender Bitter-cress		k					
Carex chlorantha	Green-top Sedge						✓	
Carex incomitata	Hillside Sedge						✓	
Carex longebrachiata	Bergalia Tussock						✓	
Carex polyantha	River Sedge					✓		
Carex tasmanica	Curly Sedge	V	v	L	V			E2
Cassinia longifolia	Shiny Cassinia						✓	
Cassinia rugata	Wrinkled Cassinia	V	v	L	V			E1
Cassytha glabella f. glabella	Slender Dodder-laurel							E1
Casuarina obesa	Swamp She-oak		e	L				
Caustis flexuosa	Curly-wig						✓	

Scientific Name	Common Name	Conservation Status[1]				Limit of Range	Disjunct Population/s	Endemicity[2]
		AROTS	VROTS	FFG	ESP			
Celmisia asteliifolia spp.agg.	Silver Daisy						✓	
Centrolepis cephaloformis ssp. cephaloformis	Cushion Centrolepis					✓		
Cheiranthera cyanea var. cyanea	Blue Finger-flower					✓		
Chenopodium desertorum ssp. virosum	Frosted Goosefoot		k					
Chiloglottis trapeziformis	Dainty Bird-orchid					✓		
Clematis aristata	Mountain Clematis					✓		
Comesperma ericinum	Heath Milkwort					✓		
Comesperma polygaloides	Small Milkwort		v	L				
Comesperma retusum	Mountain Milkwort						✓	
Conospermum mitchellii	Victorian Smoke-bush						✓	
Correa aemula	Hairy Correa		r					E1
Correa backhouseana var. backhouseana	Coast Correa		r					E1
Correa lawrenceana	Mountain Correa						✓	
Correa reflexa var. angustifolia	Grampians Correa		r					
Corybas despectans	Coast Helmet-orchid		v					
Corybas fordhamii	Swamp Helmet-orchid		r					
Corymbia maculata	Spotted Gum		v					
Craspedia canens	Grey Billy-buttons		k			✓		
Craspedia paludicola	Swamp Billy-buttons		v					
Craspedia sp. aff. variabilis (Derrinallum)	Derrinallum Billy-buttons		v					E1
Crassula exserta	Large-fruit Crassula					✓		
Cullen parvum	Small Scurf-pea	E	e	L	E			
Cullen tenax	Tough Scurf-pea		e	L				
Cuscuta tasmanica	Golden Dodder		k					
Cyathea cunninghamii	Slender Tree-fern	R	v	L			✓	
Cymbopogon refractus	Barb-wire Grass						✓	
Cyperus subulatus	Pointed Flat-sedge		v				✓	
Cyphanthera anthocercidea	Large-leaf Ray-flower	R	r					
Cyphanthera myosotidea	Small-leaf Ray-flower					✓	✓	
Dampiera stricta	Blue Dampiera					✓	✓	
Daviesia brevifolia	Leafless Bitter-pea						✓	
Daviesia genistifolia s.l.	Broom Bitter-pea		r					
Daviesia laevis	Grampians Bitter-pea	V	v		V			E1
Daviesia latifolia	Hop Bitter-pea					✓		
Daviesia mimosoides s.l.	Blunt-leaf Bitter-pea						✓	
Daviesia pectinata	Thorny Bitter-pea	R	r					
Dennstaedtia davallioides	Lacy Ground-fern						✓	
Derwentia perfoliata	Digger's Speedwell					✓		
Desmodium gunnii	Southern Tick-trefoil					✓		
Desmodium varians	Slender Tick-trefoil		k					
Deyeuxia imbricata	Bent-grass		v					E1
Deyeuxia monticola var. monticola	Mountain Bent-grass						✓	
Deyeuxia rodwayi	Tasman Bent-grass					✓		
Deyeuxia scaberula	Rough Bent-grass						✓	
Dianella callicarpa	Swamp Flax-lily		v					E1
Dianella longifolia var. grandis	Pale Flax-lily		v			✓		
Dianella tasmanica	Tasman Flax-lily					✓		
Dichelachne hirtella	Hairy Plume-grass					✓		
Dichelachne sieberiana s.l.	Plume-grass					✓		
Digitaria divaricatissima	Umbrella Grass		v					
Dillwynia oreodoxa	Grampians Parrot-pea		r					E1
Dillwynia ramosissima	Bushy Parrot-pea							E2
Dipodium campanulatum	Bell-flower Hyacinth-orchid	K	e					
Dipodium pardalinum	Spotted Hyacinth-orchid		r					E1
Discaria pubescens	Hairy Anchor Plant	R	v	L		✓		
Diuris behrii	Golden Cowslips		v					
Diuris fragrantissima	White Diuris	E	e	L	E			
Diuris palustris	Swamp Diuris		v	N				
Diuris punctata var. punctata	Purple Diuris		v	L				
Diuris sp. aff. lanceolata (Laverton)	Small Golden Moths	E	e	L	E			E2
Dodonaea procumbens	Trailing Hop-bush	V	v		V			

Scientific Name	Common Name	Conservation Status[1]				Limit of Range	Disjunct Population/s	Endemicity[2]
		AROTS	VROTS	FFG	ESP			
Drosera spatulata	Rosy Sundew						✓	
Dryopoa dives	Giant Mountain Grass						✓	
Einadia hastata	Saloop					✓		
Eleocharis pallens	Pale Spike-sedge		v				✓	
Elymus multiflorus	Short-awned Wheat-grass		k					
Epacris microphylla s.l.	Coral Heath						✓	
Epaltes australis	Spreading Nut-heads					✓		
Epilobium billardierianum ssp. hydrophilum	Robust Willow-herb					✓		
Epilobium pallidiflorum	Showy Willow-herb		v					
Eragrostis dielsii	Mallee Love-grass					✓		
Eremophila deserti	Turkey-bush		v				✓	
Eriocaulon australasicum	Southern Pipewort	E	e	L	V			
Eucalyptus aff. cypellocarpa (Anglesea)	Otway Grey Gum		v	X				E1
Eucalyptus aggregata	Black Gum		e	L				E1
Eucalyptus alaticaulis	Grampians Grey Gum		r					E1
Eucalyptus albens	White Box					✓		
Eucalyptus alpina spp. agg.	Grampians Gum							E1
Eucalyptus arenacea	Desert Stringybark					✓		
Eucalyptus aromaphloia	Scentbark							E2
Eucalyptus baueriana	Blue Box					✓		
Eucalyptus behriana	Bull Mallee						✓	
Eucalyptus brookeriana	Brooker's Gum		r					E2
Eucalyptus cypellocarpa	Mountain Grey Gum					✓		
Eucalyptus delegatensis ssp. delegatensis	Alpine Ash						✓	
Eucalyptus diversifolia ssp. megacarpa	Coast Gum		v					E2
Eucalyptus dives	Broad-leaved Peppermint					✓		
Eucalyptus dumosa	Dumosa Mallee					✓		
Eucalyptus fasciculosa	Pink Gum		v			✓		
Eucalyptus froggattii	Kamarooka Mallee	R	r	L				
Eucalyptus globulus ssp. bicostata	Eurabbie					✓	✓	
Eucalyptus globulus ssp. globulus	Southern Blue Gum		r			✓		
Eucalyptus globulus ssp. pseudoglobulus	Gippsland Blue Gum					✓	✓	
Eucalyptus kitsoniana	Bog Gum	R	r					
Eucalyptus leucoxylon ssp. connata	Yellow Gum		v	X				E2
Eucalyptus leucoxylon ssp. megalocarpa	Yellow Gum		e					E2
Eucalyptus leucoxylon ssp. stephaniae	Yellow Gum					✓		
Eucalyptus macrorhyncha	Red Stringybark					✓		
Eucalyptus melliodora	Yellow Box					✓		
Eucalyptus nortonii	Silver Bundy					✓		
Eucalyptus phenax	Green-leaf Mallee		v					
Eucalyptus polyanthemos	Red Box					✓		
Eucalyptus radiata s.l.	Narrow-leaf Peppermint					✓		
Eucalyptus radiata ssp. radiata	Narrow-leaf Peppermint					✓		
Eucalyptus regnans	Mountain Ash						✓	
Eucalyptus rubida	Candlebark					✓		
Eucalyptus serraensis	Grampians Stringybark		r					E1
Eucalyptus sieberi	Silvertop Ash						✓	
Eucalyptus tricarpa	Red Ironbark					✓		
Eucalyptus verrucata	Mt Abrupt Stringybark		r					E1
Eucalyptus victoriana	Victoria Range Stringybark		r					E1
Eucalyptus viminalis ssp. cygnetensis	Rough-barked Manna-gum		r			✓		
Eucalyptus viminalis ssp. pryoriana	Coast Manna-gum					✓		
Eucalyptus viridis ssp. wimmerensis	Wimmera Mallee-box		r			✓		
Eucalyptus yarraensis	Yarra Gum	R	k	X		✓		E2
Euphrasia collina ssp. muelleri	Purple Eyebright	E	e	N	E			
Euphrasia scabra	Rough Eyebright	K	e	L		✓		
Eurychorda complanata	Flat Cord-rush						✓	

Scientific Name	Common Name	Conservation Status[1]				Limit of Range	Disjunct Population/s	Endemicity[2]
		AROTS	VROTS	FFG	ESP			
Exocarpos syrticola	Coast Ballart		r					
Festuca asperula	Graceful Fescue					✓		
Gahnia microstachya	Slender Saw-sedge		r				✓	
Galium compactum	Compact Bedstraw		r					
Galium propinquum	Maori Bedstraw					✓		
Gastrodia vescula	Small Potato Orchid	K	k					E2
Gaultheria hispida	Snow-berry		e					E1
Genoplesium ciliatum	Fringed Midge-orchid		k					
Genoplesium despectans	Sharp Midge-orchid	K						
Genoplesium pumilum	Green Midge-orchid		r	X			✓	
Geranium homeanum	Northern Cranesbill						✓	
Geranium sp. 3	Pale-flower Cranesbill		r					E1
Geranium sp. 5	Naked Cranesbill							E1
Glycine latrobeana	Clover Glycine	V	v	L	V			
Gnephosis drummondii	Slender Cup-flower					✓		
Gompholobium huegelii	Common Wedge-pea					✓		
Gonocarpus mezianus	Hairy Raspwort		r				✓	
Gonocarpus teucrioides s.l.	Germander Raspwort						✓	
Goodenia hederacea ssp. hederacea	Ivy Goodenia					✓		
Goodenia lanata	Trailing Goodenia					✓		
Goodenia lineata	Grampians Goodenia							E1
Goodenia varia	Sticky Goodenia					✓	✓	
Goodia medicaginea	Western Golden-tip		r					
Grammitis billardierei	Common Finger-fern						✓	
Grammitis magellanica ssp. nothofageti	Beech Finger-fern		v				✓	
Gratiola pumilo	Dwarf Brooklime	K	k					
Grevillea alpina	Mountain Grevillea					✓		
Grevillea aquifolium	Variable Prickly Grevillea							E2
Grevillea bedggoodiana	Enfield Grevillea	V	v					E1
Grevillea chrysophaea	Golden Grevillea		r				✓	
Grevillea confertifolia	Grampians Grevillea	R	r					E1
Grevillea dimorpha	Flame Grevillea		r					E1
Grevillea dryophylla	Goldfields Grevillea		r			✓		
Grevillea floripendula	Drooping Grevillea	V	v	N				E1
Grevillea infecunda	Anglesea Grevillea	V	v		V			E2
Grevillea microstegia	Mt Cassell Grevillea	R	r					E1
Grevillea montis-cole	Mount Cole Grevillea	R	r					
Grevillea montis-cole ssp. brevistyla	Langi Ghiran Grevillea	V	v					E1
Grevillea montis-cole ssp. montis-cole	Mount Cole Grevillea	R	r					E1
Grevillea obtecta	Fryerstown Grevillea	R	r					
Grevillea repens	Creeping Grevillea	R	r					
Grevillea steiglitziana	Brisbane Range Grevillea	R	r					E1
Grevillea williamsonii	Mt. William Grevillea	E	e		E			E1
Haegiela tatei	Small Nut-heads	K	v					
Hakea decurrens ssp. physocarpa	Bushy Needlewood					✓		
Hakea repullulans	Western Furze Hakea							E2
Hakea sericea s.l.	Bushy Needlewood					✓		
Hakea teretifolia ssp. hirsuta	Dagger Hakea						✓	
Hakea ulicina	Furze Hakea					✓		
Haloragis exalata ssp. exalata var. exalata	Square Raspwort	V	v		V		✓	
Halosarcia halocnemoides ssp. halocnemoides	Grey Glasswort						✓	
Halosarcia syncarpa	Fused Glasswort		v					
Hedycarya angustifolia	Austral Mulberry					✓		
Helichrysum aff. rutidolepis (Lowland Swamps)	Pale Swamp Everlasting		v					E2
Hibbertia cistiflora ssp. rostrata	Rock Rose Guinea-flower		r					E1
Hibbertia humifusa	Rising Star Guinea-flower	R	r					
Hibbertia humifusa ssp. debilis	Dergholm Guinea-flower	V	v					E1
Hibbertia humifusa ssp. humifusa	Rising Star Guinea-flower	R	r					
Hibbertia sessiliflora	Heathy Guinea-flower		v					
Hovea corrickiae	Glossy Hovea	R	r				✓	
Hovea pannosa s.l.	Mountain Beauty						✓	

Scientific Name	Common Name	Conservation Status[1]				Limit of Range	Disjunct Population/s	Endemicity[2]
		AROTS	VROTS	FFG	ESP			
Howittia trilocularis	Blue Howittia						✓	
Huperzia varia	Long Clubmoss		v					
Hymenanthera sp. aff. dentata	Tangled Shrub-violet							E2
Hymenophyllum australe	Austral Filmy Fern						✓	
Hypolepis amaurorachis	Austral Ground-fern					✓	✓	
Hypolepis glandulifera	Downy Ground-fern					✓		
Hypolepis muelleri	Harsh Ground-fern					✓		
Hypoxis vaginata var. brevistigmata	Yellow Star		k					
Isoetes drummondii ssp. anomala	Plain Quillwort		k					
Isolepis australiensis	Inland Club-sedge		k			✓		
Isolepis congrua	Slender Club-sedge		v	N				
Isolepis victoriensis	Victorian Club-sedge		k			✓		
Isolepis wakefieldiana	Tufted Club-sedge		r					
Ixiolaena sp. (syn. Leptorhynchos panaetioides)	Woolly Buttons		r				✓	
Ixodia achillaeoides	Ixodia					✓		
Ixodia achillaeoides ssp. arenicola	Ixodia	V	v		V			
Joycea lepidopoda	Scaly-foot Wallaby-grass						✓	E2
Juncus antarcticus	Cushion Rush		v					
Juncus bassianus	Bass Rush		k				✓	
Juncus gregiflorus	Green Rush					✓		
Juncus psammophilus	Sand Rush		r					
Juncus revolutus	Creeping Rush		r					
Juncus semisolidus	Plains Rush					✓		
Kennedia rubicunda	Dusky Coral-pea					✓		
Kunzea ericoides	Burgan					✓		
Kunzea parvifolia	Violet Kunzea						✓	
Kunzea pomifera	Muntries						✓	
Lasiopetalum macrophyllum	Shrubby Velvet-bush						✓	
Lasiopetalum schulzenii	Drooping Velvet-bush		r			✓		
Lastreopsis hispida	Bristly Shield-fern		r					
Lemna trisulca	Ivy-leaf Duckweed		k					
Lepidium aschersonii	Spiny Pepper-cress	V	e	L	V			
Lepidium hyssopifolium	Basalt Pepper-cress	E	e	L	E			
Lepidium pseudohyssopifolium	Native Pepper-cress		k					
Lepidobolus drapetocoleus	Scale Shedder					✓		
Lepidosperma canescens	Hoary Rapier-sedge		r					
Lepidosperma carphoides	Black Rapier-sedge					✓		
Lepidosperma elatius	Tall Sword-sedge					✓		
Lepidosperma forsythii	Large-flower Rapier-sedge					✓	✓	
Lepidosperma gunnii	Slender Sword-sedge		k			✓		
Lepidosperma tortuosum	Tortuous Rapier-sedge					✓		
Lepilaena patentifolia	Spreading Water-mat		v					
Leptinella filicula	Mountain Cotula					✓	✓	
Leptomeria aphylla	Leafless Currant-bush					✓		
Leptorhynchos elongatus	Lanky Buttons		e					
Leptorhynchos gatesii	Wrinkled Buttons	V	v	N	V			E1
Leptorhynchos scabrus	Annual Buttons		e	L				
Leptorhynchos waitzia	Button Immortelle		v				✓	
Leptospermum glabrescens s.l.	Smooth Tea-tree						✓	
Leptospermum obovatum	River Tea-tree					✓		
Leptospermum scoparium	Manuka					✓		
Leptospermum turbinatum	Shiny Tea-tree		r					E1
Lepyrodia flexuosa	Twining Scale-rush							E1
Leucochrysum albicans ssp. albicans var. tricolor	Hoary Sunray				E			
Leucopogon fletcheri ssp. brevisepalus	Twin-flower Beard-heath						✓	
Leucopogon glacialis	Twisted Beard-heath							E2
Leucopogon microphyllus	Hairy Beard-heath		r				✓	
Leucopogon microphyllus var. pilibundus	Hairy Beard-heath		r				✓	
Leucopogon neurophyllus	Mount William Beard-heath	R	r					E1
Leucopogon thymifolius	Thyme Beard-heath		r					E1
Leucopogon virgatus var.	Common Beard-heath		r					

Scientific Name	Common Name	Conservation Status[1]				Limit of Range	Disjunct Population/s	Endemicity[2]
		AROTS	VROTS	FFG	ESP			
brevifolius								
Libertia pulchella	Pretty Grass-flag						✓	
Limonium australe	Yellow Sea-lavender		r				✓	
Lobelia beaugleholei	Showy Lobelia	R	r					E1
Logania ovata	Oval-leaf Logania		r			✓		
Lomandra collina	Pale Mat-rush					✓		
Lomandra juncea	Desert Mat-rush					✓		
Lomatia fraseri	Tree Lomatia						✓	
Lomatia ilicifolia	Holly Lomatia					✓		
Lotus australis	Austral Trefoil		k					
Lycopodiella serpentina	Bog Clubmoss		r					
Lyperanthus suaveolens	Brown-beaks					✓	✓	
Maireana aphylla	Leafless Bluebush		v				✓	
Maireana brevifolia	Short-leaf Bluebush						✓	
Maireana humillima	Dwarf Bluebush						✓	
Malva australiana ssp. (offshore islands)	Coast Hollyhock		v					
Marsilea mutica	Smooth Nardoo		k					
Melaleuca armillaris ssp. armillaris	Giant Honey-myrtle		r			✓		
Melaleuca brevifolia	Mallee Honey-myrtle					✓		
Melaleuca ericifolia	Swamp Paperbark						✓	
Melaleuca gibbosa	Slender Honey-myrtle					✓		
Melaleuca halmaturorum ssp. halmaturorum	Salt Paperbark		v	L				
Melaleuca parvistaminea	Rough-barked Honey-myrtle					✓		
Melichrus urceolatus	Urn Heath					✓		
Microlepidium pilosulum	Hairy Shepherd's Purse	K	v			✓		
Microtis orbicularis	Dark Mignonette-orchid		v					
Minuria integerrima	Smooth Minuria		r					
Minuria leptophylla	Minnie Daisy						✓	
Mirbelia oxylobioides	Mountain Mirbelia						✓	
Mitrasacme serpyllifolia	Thyme Mitrewort						✓	
Monotoca billawinica	Grampians Broom-heath	R	r					E1
Monotoca glauca	Currant-wood		r				✓	
Morgania glabra spp. agg.	Blue Rod					✓		
Muehlenbeckia horrida	Spiny Lignum		k					
Myosotis exarrhena	Sweet Forget-me-not					✓		
Myriocephalus stuartii	Poached-eggs Daisy						✓	
Myriophyllum porcatum	Ridged Water-milfoil	V	v		V		✓	
Nematolepis squamea	Satinwood						✓	
Nematolepis squamea ssp. squamea	Satinwood						✓	
Nertera granadensis	Matted Nertera						✓	
Neurachne alopecuroidea	Fox-tail Mulga Grass						✓	
Nicotiana suaveolens	Austral Tobacco						✓	
Notelaea ligustrina	Privet Mock-olive						✓	
Nothofagus cunninghamii	Myrtle Beech						✓	
Olearia argophylla	Musk Daisy-bush					✓		
Olearia ciliata	Fringed Daisy-bush					✓	✓	
Olearia lirata	Snow Daisy-bush					✓		
Olearia minor	Heath Daisy-bush						✓	
Olearia pannosa ssp. cardiophylla	Velvet Daisy-bush	R	v	L				
Olearia stellulata	Starry Daisy-bush		k					
Olearia suffruticosa	Clustered Daisy-bush		v			✓		
Opercularia aspera	Coarse Stinkweed						✓	
Oxalis magellanica	Snowdrop Wood-sorrel		r				✓	
Oxalis thompsoniae	Fluffy-fruit Wood-sorrel		k					
Ozothamnus rogersianus	Nunniong Everlasting		r				✓	
Panicum decompositum	Australian Millet		k				✓	
Parsonsia brownii	Twining Silkpod						✓	
Pelargonium littorale	Coast Stork's-bill		k					
Phebalium stenophyllum	Narrow-leaf Phebalium					✓		
Philotheca angustifolia ssp. montana	Narrow-leaf Wax-flower					✓		
Philotheca difformis ssp. difformis	Small-leaf Wax-flower		r					

Scientific Name	Common Name	Conservation Status[1]				Limit of Range	Disjunct Population/s	Endemicity[2]
		AROTS	VROTS	FFG	ESP			
Philotheca scabra	Rough Wax-flower						✓	
Phyllanthus hirtellus	Thyme Spurge						✓	
Picris squarrosa	Squat Picris		r					
Pimelea curviflora var. nov. aff. subglabrata	Curved Rice-flower		k					
Pimelea hewardiana	Forked Rice-flower		r					E1
Pimelea linifolia ssp. linoides	Slender Rice-flower		r				✓	
Pimelea spinescens	Spiny Rice-flower		e	L				
Pimelea spinescens ssp. spinescens	Spiny Rice-flower	V	e		V			E2
Pittosporum bicolor	Banyalla						✓	
Pittosporum undulatum	Sweet Pittosporum					✓		
Platylobium alternifolium	Victorian Flat-pea	R	r					E1
Platylobium formosum	Handsome Flat-pea					✓	✓	
Platylobium triangulare	Ivy Flat-pea		k					
Platysace lanceolata	Shrubby Platysace					✓		
Plectranthus parviflorus	Cockspur Flower						✓	
Pneumatopteris pennigera	Lime Fern		v				✓	
Poa ensiformis	Sword Tussock-grass					✓		
Poa fax	Scaly Poa		r					
Poa fordeana	Forde Poa		k					
Poa halmaturina	Dwarf Coast Tussock-grass	R	v					
Poa labillardierei (Volcanic Plains form)	Blue Prickly Tussock-grass		k					
Poa sallacustris	Salt-lake Tussock-grass	V	v		V			E1
Poa sp. aff. tenera (Red-sheath)	Red-sheath Tussock-grass		r					E1
Podolobium procumbens	Trailing Podolobium					✓		
Polyscias sambucifolia	Elderberry Panax					✓		
Pomaderris aspera	Hazel Pomaderris					✓		
Pomaderris elachophylla	Small-leaf Pomaderris					✓		
Pomaderris ferruginea	Rusty Pomaderris					✓		
Pomaderris halmaturina ssp. continentis	Glenelg Pomaderris	R	v					E2
Pomaderris lanigera	Woolly Pomaderris						✓	
Pomaderris obcordata	Pimelea Pomaderris		v				✓	
Pomaderris paniculosa ssp. paniculosa	Inland Pomaderris		v				✓	
Prasophyllum affine	Heathland Leek-orchid	E	k		E			
Prasophyllum brevilabre	Short-lip Leek-orchid						✓	
Prasophyllum constrictum s.s.	Tawny Leek-orchid		k					
Prasophyllum correctum	Gaping Leek-orchid	E	e	L	E		✓	
Prasophyllum diversiflorum	Gorae Leek-orchid	E	e	L	E			E1
Prasophyllum fitzgeraldii	Fitzgerald's Leek-orchid		e	N				
Prasophyllum frenchii	Maroon Leek-orchid	E	e	N	V			
Prasophyllum lindleyanum	Green Leek-orchid		v	X				
Prasophyllum pallidum	Pale Leek-orchid	V	e	X	V			
Prasophyllum patens	Broad-lip Leek-orchid		r					
Prasophyllum pyriforme s.s.	Silurian Leek-orchid		k					
Prasophyllum spicatum	Dense Leek-orchid	V	v					
Prasophyllum suaveolens	Fragrant Leek-orchid	E	e	N				E2
Prasophyllum subbisectum	Pomonal Leek-orchid	E	e	L	E			E1
Pratia sp. aff. pedunculata (South-west Victoria)	South-west Matted Pratia							E1
Prostanthera decussata	Dense Mint-bush		r			✓		
Prostanthera hirtula	Hairy Mint-bush					✓	✓	
Prostanthera lasianthos	Victorian Christmas-bush					✓		
Prostanthera nivea	Snowy Mint-bush					✓		
Prostanthera saxicola var. bracteolata	Slender Mint-bush					✓		
Prostanthera spinosa	Spiny Mint-bush		r					
Pseudanthus divaricatissimus	Tangled Pseudanthus	R	r			✓		
Psilotum nudum	Skeleton Fork-fern		r	X				
Pterostylis aciculiformis	Slender Ruddyhood		k					
Pterostylis alpina s.l.	Alpine Greenhood						✓	
Pterostylis basaltica	Basalt Greenhood	E	e	L	E			E1
Pterostylis bicolor	Black-tip Greenhood		k					
Pterostylis cheraphila	Floodplain Rustyhood	V	v	L				E2

Scientific Name	Common Name	Conservation Status[1]				Limit of Range	Disjunct Population/s	Endemicity[2]
		AROTS	VROTS	FFG	ESP			
Pterostylis chlorogramma	Green-striped Greenhood	V	v		V			
Pterostylis cucullata	Leafy Greenhood	V	v	L	V			
Pterostylis furcata s.s.	Small Sickle Greenhood		k					
Pterostylis planulata s.s.	Grampians Rustyhood		r					E1
Pterostylis smaragdyna	Emerald-lip Greenhood	R	r					E2
Pterostylis sp. aff. longifolia (Stawell)	Western Emerald-lip Greenhood		k					E1
Pterostylis tasmanica	Southern Bearded Greenhood		k					
Pterostylis tenuissima	Swamp Greenhood	V	v		V			
Pterostylis truncata	Brittle Greenhood		e	L				
Ptilotus erubescens	Hairy Tails			L				
Pultenaea benthamii	Bentham's Bush-pea		r				✓	
Pultenaea canaliculata	Coast Bush-pea		r					
Pultenaea costata	Ribbed Bush-pea	R	r					E1
Pultenaea daltonii	Hoary Bush-pea		r					E2
Pultenaea graveolens	Scented Bush-pea		v	L				E2
Pultenaea gunnii ssp. tuberculata	Golden Bush-pea	K	r					E1
Pultenaea juniperina s.s.	Pungent Bush-pea		r					
Pultenaea luehmannii	Thready Bush-pea	R	r					E1
Pultenaea muelleri var. reflexifolia	Mueller's Bush-pea		k					E1
Pultenaea paleacea s.l.	Chaffy Bush-pea					✓		
Pultenaea patellifolia	Mt. Byron Bush-pea	R	r					E1
Pultenaea prolifera	Otway Bush-pea		r					E2
Pultenaea subalpina	Rosy Bush-pea	R	r					E1
Pultenaea victoriensis	Victoria Range Bush-pea	R	r					E1
Pultenaea weindorferi	Swamp Bush-pea	R	r	X				
Pultenaea williamsoniana	Williamson's Bush-pea	V	v					E1
Quinetia urvillei	Quinetia		r					
Ranunculus plebeius s.l.	Forest/Hairy Buttercup						✓	
Ranunculus scapiger	Hairy Buttercup						✓	
Ranunculus undosus	Swamp Buttercup		v					
Rapanea howittiana	Muttonwood					✓		
Rhagodia parabolica	Fragrant Saltbush		r				✓	
Rhytidosporum procumbens	White Marianth					✓		
Rumohra adiantiformis	Leathery Shield-fern						✓	
Rutidosis leptorhynchoides	Button Wrinklewort	E	e	L	E			
Santalum acuminatum	Sweet Quandong		v					
Sarcochilus australis	Butterfly Orchid						✓	
Sarcocornia quinqueflora ssp. tasmanica	Beaded Glasswort		k	N				
Schoenoplectus dissachanthus	Blunt Club-sedge		e					
Schoenus breviculmis	Matted Bog-sedge						✓	
Schoenus brevifolius	Zig-zag Bog-sedge					✓		
Schoenus carsei	Wiry Bog-sedge		r					
Schoenus laevigatus	Short-leaf Bog-sedge		k					
Schoenus nanus	Tiny Bog-sedge		k					
Schoenus sculptus	Gimlet Bog-sedge		r					
Schoenus turbinatus	Top Bog-sedge		r					
Scleranthus diander	Tufted Knawel		r				✓	
Sclerolaena diacantha	Grey Copperburr						✓	
Sclerolaena muricata	Black Roly-poly						✓	
Sclerolaena muricata var. muricata	Black Roly-poly		k				✓	
Sclerolaena muricata var. villosa	Grey Roly-poly						✓	
Senecio behrianus	Stiff Groundsel	E	e	L	E			
Senecio cunninghamii var. cunninghamii	Branching Groundsel		k					
Senecio macrocarpus	Large-fruit Fireweed	V	e	L	V			
Senecio picridioides	Hawkbit Fireweed					✓		
Senecio psilocarpus	Swamp Fireweed	V	v					
Senecio vagus	Saw Groundsel						✓	
Senecio velleioides	Forest Groundsel						✓	
Senna artemisioides	Desert Cassia						✓	
Senna artemisioides ssp. petiolaris	Woody Cassia						✓	
Setaria constricta	Knottybutt Grass						✓	
Spiranthes sinensis	Austral Ladies' Tresses		v					
Sporobolus caroli	Yakka Grass		r					

Scientific Name	Common Name	Conservation Status[1]				Limit of Range	Disjunct Population/s	Endemicity[2]
		AROTS	VROTS	FFG	ESP			
Sporobolus creber	Western Rat-tail Grass		v				✓	
Spyridium cinereum	Tiny Spyridium	R	v					
Spyridium eriocephalum var. eriocephalum	Heath Spyridium						✓	
Spyridium vexilliferum var. vexilliferum	Winged Spyridium					✓		
Stackhousia aff. monogyna (Western Plains)	Plains Stackhousia							E2
Stackhousia aspericocca	Rough-nut Stackhousia		k					
Stackhousia spathulata	Coast Stackhousia		k					
Stellaria flaccida	Forest Starwort					✓	✓	
Sticherus lobatus	Spreading Fan-fern						✓	
Sticherus tener s.s.	Tasman Fan-fern		r					
Stylidium soboliferum	Grampians Trigger-plant		r					E1
Swainsona behriana	Southern Swainson-pea		r					
Swainsona brachycarpa	Slender Swainson-pea		v	L			✓	
Swainsona murrayana	Slender Darling-pea	V	e	L	V			
Swainsona swainsonioides	Downy Swainson-pea		e	N				
Taraxacum cygnorum	Coast Dandelion	V	e	L	V			
Tasmannia lanceolata	Mountain Pepper						✓	
Templetonia stenophylla	Leafy Templetonia		v					
Tetrarrhena juncea	Forest Wire-grass					✓		
Tetrarrhena turfosa	Smooth Rice-grass						✓	
Tetratheca bauerifolia	Heath Pink-bells					✓		
Tetratheca labillardierei	Glandular Pink-bells					✓		
Tetratheca stenocarpa	Long Pink-bells	R	r				✓	
Thelionema umbellatum	Clustered Lily		r					
Thelymitra azurea	Azure Sun-orchid		v					
Thelymitra benthamiana	Blotched Sun-orchid		v					
Thelymitra circumsepta	Naked Sun-orchid		v					
Thelymitra epipactoides	Metallic Sun-orchid	E	e	L	E			
Thelymitra gregaria	Basalt Sun-orchid		e	N				E1
Thelymitra hiemalis	Winter Sun-orchid		e	N				E2
Thelymitra luteocilium	Fringed Sun-orchid		r					
Thelymitra malvina	Mauve-tuft Sun-orchid		v					
Thelymitra matthewsii	Spiral Sun-orchid	V	v	L	V			
Thelymitra merraniae	Merran's Sun-orchid		e	L				
Thelymitra mucida	Plum Orchid		v					
Thelymitra sp. aff. pauciflora (Anglesea)	Anglesea Sun-orchid		v	X				E1
Thesium australe	Austral Toad-flax	V	e	L	V			
Thomasia petalocalyx	Paper Flower		r					
Thryptomene calycina	Grampians Thryptomene		r					E1
Thysanotus juncifolius	Branching Fringe-lily						✓	
Tmesipteris elongata ssp. elongata	Slender Fork-fern		v				✓	
Trachymene pilosa	Dwarf Trachymene					✓		
Triglochin minutissimum	Tiny Arrowgrass		r					
Tripogon loliiformis	Rye Beetle-grass		r					
Trymalium daltonii	Narrow-leaf Trymalium		r					E1
Trymalium X ramosissimum	Branched Trymalium	R						
Uncinia tenella	Delicate Hook-sedge					✓		
Utricularia violacea	Violet Bladderwort		r					
Veronica notabilis	Forest Speedwell						✓	
Veronica plebeia	Trailing Speedwell						✓	
Villarsia exaltata	Erect Marsh-flower						✓	
Villarsia umbricola	Lax Marsh-flower					✓		
Viola sieberiana s.s.	Tiny Violet		k					
Vittadinia cervicularis	Annual New Holland Daisy						✓	
Vittadinia muelleri	Narrow-leaf New Holland Daisy					✓		
Wahlenbergia planiflora ssp. planiflora	Bluebell					✓		
Westringia glabra	Violet Westringia						✓	
Wurmbea uniflora	One-flower Early Nancy		r					
X Calassodia tutelata	Bluebeard Waxlip Hybrid Orchid		r					

Scientific Name	Common Name	Conservation Status[1]				Limit of Range	Disjunct Population/s	Endemicity[2]
		AROTS	VROTS	FFG	ESP			
Xanthorrhoea caespitosa	Yucca		r			✓		
Xanthosia dissecta var. floribunda	Cut-leaf Xanthosia							E1
Zieria arborescens	Stinkwood						✓	
Zieria sp. (Grampians)	Grampians Zieria		r					E1
Zieria veronicea	Pink Zieria		r					

Notes:

1. AROTS = Australian Rare Or Threatened Species (based on Briggs & Leigh 1995)
   VROTS = Victorian Rare Or Threatened Species
   FFG = Victorian *Flora and Fauna Guarantee Act 1988*
   ESP = Commonwealth *Endangered Species Protection Act 1992*

2. E1 = natural distribution wholly confined to the West RFA Region
   E2 = natural Australian distribution mainly (>50%) confined to West RFA Region.

E, e = Endangered; K, k = insufficiently known; L = Listed; N = Nominated for listing, R, r = Rare; V, v = Vulnerable; X = rejected for listing,

Appendix L: Fauna Species Occurring in the West RFA Region and Showing those with A1 and B1 Values

Scientific Name	Common Name	Conservation Status			Endemicity[4]		Disjunct Population/s	Limit of Range
		TFV[1]	FFG[2]	ESP[3]	E_1	E_2		
Mammals								
Acrobates pygmaeus	Feathertail Glider							
Antechinus flavipes	Yellow-footed Antechinus							
Antechinus minimus	Swamp Antechinus	LR					✓	
Antechinus stuartii	Brown Antechinus							
Antechinus swainsonii mimetes	Dusky Antechinus							✓
Antechinus swainsonii insulans	Dusky Antechinus				✓			
Canis lupus dingo	Dingo	DD						
Cercartetus concinnus	Western Pigmy-possum							
Cercartetus lepidus	Little Pygmy-possum	LR					✓	
Cercartetus nanus	Eastern Pigmy-possum							
Chalinolobus gouldii	Gould's Wattled Bat							
Chalinolobus morio	Chocolate Wattled Bat							
Dasyurus maculatus	Tiger Quoll	E	L	V				
Dasyurus viverrinus	Eastern Quoll							
Falsistrellus tasmaniensis	Great Pipistrelle							✓
Hydromys chrysogaster	Water Rat							
Isoodon obesulus	Southern Brown Bandicoot							
Macropus fuliginosus	Western Grey Kangaroo							
Macropus giganteus	Eastern Grey Kangaroo							
Macropus rufogriseus	Red-necked Wallaby							
Macropus rufus	Red Kangaroo	LR						
Mastacomys fuscus	Broad-toothed Rat	LR						
Miniopterus schreibersii	Common Bent-wing Bat	V	L					
Mormopterus sp.	Southern Freetail Bat (Eastern form)							✓
Mormopterus sp.	Southern Freetail Bat							
Myotis macropus	Large-footed Mouse-eared Bat							
Nyctophilus geoffroyi	Lesser Long-eared Bat							
Nyctophilus gouldi	Gould's Long-eared Bat							
Ornithorhynchus anatinus	Platypus							
Perameles gunnii	Eastern Barred Bandicoot	C	L	V				
Perameles nasuta	Long-nosed Bandicoot						✓	✓
Petauroides volans	Greater Glider						✓	✓
Petaurus australis	Yellow-bellied Glider						✓	
Petaurus breviceps	Sugar Glider							
Petaurus norfolcensis	Squirrel Glider	E	L				✓	✓
Petrogale penicillata	Brush-tailed Rock-wallaby	C	L	V			✓	✓
Phascogale tapoatafa	Brush-tailed Phascogale	V	L					
Phascolarctos cinereus	Koala							
Potorous tridactylus	Long-nosed Potoroo	LR					✓	
Pseudocheirus peregrinus	Common Ringtail Possum							
Pseudomys apodemoides	Silky Mouse	LR						
Pseudomys australis	Plains Mouse							
Pseudomys fumeus	Smoky Mouse	E	N				✓	✓
Pseudomys novaehollandiae	New Holland Mouse	C	L				✓	✓
Pseudomys shortridgei	Heath Rat	LR	L	E			✓	✓
Pteropus poliocephalus	Grey-headed Flying-fox	V						
Pteropus scapulatus	Little Red Flying-fox							

Scientific Name	Common Name	Conservation Status			Endemicity[4]		Disjunct Pop[ulation/s]	Limit of Range
		TFV[1]	FFG[2]	ESP[3]	E_1	E_2		
Rattus fuscipes	Bush Rat							
Rattus lutreolus	Swamp Rat							
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V						
Scotorepens balstoni	Western Broad-nosed Bat							
Sminthopsis crassicaudata	Fat-tailed Dunnart	DD						
Sminthopsis leucopus	White-footed Dunnart						✓	✓
Sminthopsis murina	Common Dunnart	DD						
Tachyglossus aculeatus	Short-beaked Echidna							
Tadarida australis	White-striped Freetail Bat							
Trichosurus caninus	Mountain Brushtail Possum						✓	✓
Trichosurus vulpecula	Common Brushtail Possum							
Vespadelus darlingtoni	Large Forest Bat							
Vespadelus regulus	King River Eptesicus							
Vespadelus vulturnus	Little Forest Eptesicus							
Vombatus ursinus	Common Wombat							
Wallabia bicolor	Swamp Wallaby							
Birds								
Acanthagenys rufogularis	Spiny-cheeked Honeyeater							
Acanthiza apicalis	Inland Thornbill							
Acanthiza chrysorrhoa	Yellow-rumped Thornbill							
Acanthiza lineata	Striated Thornbill							
Acanthiza nana	Yellow Thornbill							
Acanthiza pusilla	Brown Thornbill							
Acanthiza reguloides	Buff-rumped Thornbill							
Acanthiza uropygialis	Chestnut-rumped Thornbill							
Acanthorhynchus tenuirostris	Eastern Spinebill							
Accipiter cirrhocephalus	Collared Sparrowhawk							
Accipiter fasciatus	Brown Goshawk							
Accipiter novaehollandiae	Grey Goshawk	LR						
Acrocephalus stentoreus	Clamorous Reed-Warbler							
Actitis hypoleucos	Common Sandpiper							
Aegotheles cristatus	Australian Owlet-nightjar							
Alauda arvensis	Skylark							
Alcedo azurea	Azure Kingfisher							✓
Alisterus scapularis	Australian King-Parrot							✓
Anas castanea	Chestnut Teal							
Anas clypeata	Northern Shoveler							
Anas gracilis	Grey Teal							
Anas querquedula	Garganey							
Anas rhynchotis	Australasian Shoveler	V						
Anas superciliosa	Pacific Black Duck							
Anhinga melanogaster	Darter							
Anseranas semipalmata	Magpie Goose	E						
Anthochaera carunculata	Red Wattlebird							
Anthochaera chrysoptera	Little Wattlebird							
Anthus novaeseelandiae	Richard's Pipit							
Aphelocephala leucopsis	Southern Whiteface							
Apus pacificus	Fork-tailed Swift							
Aquila audax	Wedge-tailed Eagle							
Ardea alba	Great Egret	E	L					
Ardea ibis	Cattle Egret							
Ardea intermedia	Intermediate Egret	C	L					
Ardea pacifica	White-necked Heron							
Ardeotis australis	Australian Bustard	C	L					
Arenaria interpres	Ruddy Turnstone							
Artamus cinereus	Black-faced Woodswallow							
Artamus cyanopterus	Dusky Woodswallow							

Scientific Name	Common Name	Conservation Status			Endemicity[4]		Disjunct Pop[ulation/s]	Limit of Range
		TFV[1]	FFG[2]	ESP[3]	E_1	E_2		
Artamus leucorynchus	White-breasted Woodswallow							
Artamus minor	Little Woodswallow							
Artamus personatus	Masked Woodswallow							
Artamus superciliosus	White-browed Woodswallow							
Aythya australis	Hardhead	V						
Barnardius barnardi	Mallee Ringneck							
Barnardius zonarius	Australian Ringneck							
Biziura lobata	Musk Duck	V						
Botaurus poiciloptilus	Australasian Bittern	E	N					
Burhinus grallarius	Bush Stone-curlew	E	L					
Cacatua galerita	Sulphur-crested Cockatoo							
Cacatua leadbeateri	Major Mitchell's Cockatoo	V	L					
Cacatua roseicapilla	Galah							
Cacatua sanguinea	Little Corella							
Cacatua tenuirostris	Long-billed Corella							
Cacomantis flabelliformis	Fan-tailed Cuckoo							
Cacomantis variolosus	Brush Cuckoo							✓
Calamanthus sp.	Fieldwren							
Calidris acuminata	Sharp-tailed Sandpiper							
Calidris alba	Sanderling							
Calidris bairdii	Baird's Sandpiper							
Calidris canutus	Red Knot							
Calidris ferruginea	Curlew Sandpiper							
Calidris fuscicollis	White-rumped Sandpiper							
Calidris melanotos	Pectoral Sandpiper	DD						
Calidris minuta	Little Stint							
Calidris paramelanotos	Cox's Sandpiper							
Calidris ruficollis	Red-necked Stint							
Calidris subminuta	Long-toed Stint	DD						
Calidris tenuirostris	Great Knot							
Callocephalon fimbriatum	Gang-gang Cockatoo							
Calmanthus sp.	Fieldwren							
Calyptorhynchus banksii graptogyne	Red-tailed Black-Cockatoo	E	L	E		✓		
Calyptorhynchus funereus	Yellow-tailed Black-Cockatoo							
Cereopsis novaehollandiae	Cape Barren Goose	V						
Certhionyx niger	Black Honeyeater							
Certhionyx variegatus	Pied Honeyeater							
Chalcophaps indica	Emerald Dove							
Charadrius australis	Inland Dotterel							
Charadrius bicinctus	Double-banded Plover							
Charadrius dubius	Little Ringed Plover							
Charadrius leschenaultii	Greater Sand Plover							
Charadrius hiaticula	Ringed Plover							
Charadrius mongolus	Lesser Sand Plover							
Charadrius ruficapillus	Red-capped Plover							
Charadrius veredus	Oriental Plover							
Chenonetta jubata	Australian Wood Duck							
Cheramoeca leucosternus	White-backed Swallow							
Chlidonias hybridus	Whiskered Tern	LR						
Chlidonias leucopterus	White-winged Black Tern							
Chrysococcyx basalis	Horsfield's Bronze-Cuckoo							
Chrysococcyx lucidus	Shining Bronze-Cuckoo							
Chrysococcyx osculans	Black-eared Cuckoo							
Chthonicola sagittata	Speckled Warbler	V						✓
Cincloramphus cruralis	Brown Songlark							
Cincloramphus mathewsi	Rufour Songlark							

Scientific Name	Common Name	Conservation Status			Endemicity[4]		Disjunct Pop[ulation/s]	Limit of Range
		TFV[1]	FFG[2]	ESP[3]	E_1	E_2		
Cinclosoma castonotus	Chestnut Quail-thrush							
Cinclosoma punctatum	Spotted Quail-thrush							
Circus approximans	Swamp Harrier							
Circus assimilis	Spotted Harrier							
Cisticola exilis	Golden-headed Cisticola							
Cladorhynchus leucocephalus	Banded Stilt							
Climacteris erythrops	Red-browed Treecreeper							✓
Climacteris picumnus	Brown Treecreeper							
Colluricincla harmonica	Grey Shrike-thrush							
Coracina maxima	Ground Cuckoo-shrike	E						
Coracina novaehollandiae	Black-faced Cuckoo-shrike							
Coracina papuensis	White-bellied Cuckoo-shrike							
Coracina tenuirostris	Cicadabird							
Corcorax melanorhamphos	White-winged Chough							
Cormobates leucophaeus	White-throated Treecreeper							
Corvus coronoides	Australian Raven							
Corvus mellori	Little Raven							
Corvus splendens	House Crow							
Corvus tasmanicus	Forest Raven							
Coturnix australis	Brown Quail							
Coturnix chinensis	King Quail	C	L					
Coturnix pectoralis	Stubble Quail							
Cracticus nigrogularis	Pied Butcherbird							
Cracticus torquatus	Grey Butcherbird							
Cuculus pallidus	Pallid Cuckoo							
Cygnus atratus	Black Swan							
Dacelo novaeguineae	Laughing Kookaburra							
Daphoenositta chrysoptera	Varied Sittella							
Dasyornis broadbenti broadbenti	Rufous Bristlebird	V	L			✓		
Dasyornis broadbenti whitei	Rufous Bristlebird	V	L					✓
Dendrocygna arcuata	Wandering Whistling-Duck							
Dendrocygna eytoni	Plumed Whistling-Duck							
Dicaeum hirundinaceum	Mistletoebird							
Dicrurus bracteatus	Spangled Drongo							
Dromaius novaehollandiae	Emu							
Drymodes brunneopygia	Southern Scrub-robin							
Egretta garzetta	Little Egret	C	L					
Egretta novaehollandiae	White-faced Heron							
Elanus axillaris	Black-shouldered Kite							
Elanus scriptus	Letter-winged Kite							
Elseyornis melanops	Black-fronted Dotterel							
Entomyzon cyanotis	Blue-faced Honeyeater							
Eopsaltria australis	Eastern Yellow Robin							
Ephippiorhynchus asiaticus	Black-necked Stork							
Epthianura albifrons	White-fronted Chat							
Epthianura aurifrons	Orange Chat							
Epthianura tricolor	Crimson Chat							
Erythrogonys cinctus	Red-kneed Dotterel							
Eurostopodus argus	Spotted Nightjar							
Eurostopodus mystacalis	White-throated Nightjar							
Eurystomus orientalis	Dollarbird							
Falco berigora	Brown Falcon							
Falco cenchroides	Nankeen Kestrel							
Falco hypoleucos	Grey Falcon	C	L					
Falco longipennis	Australian Hobby							
Falco peregrinus	Peregrine Falcon							
Falco subniger	Black Falcon	E						

Scientific Name	Common Name	Conservation Status			Endemicity[4]		Disjunct Pop[ulation/s]	Limit of Range
		TFV[1]	FFG[2]	ESP[3]	E_1	E_2		
Falcunculus frontatus	Crested Shrike-tit							
Fulica atra	Eurasian Coot							
Gallinago hardwickii	Latham's Snipe							
Gallinula tenebrosa	Dusky Moorhen							
Gallinula ventralis	Black-tailed Native-hen							
Gallirallus philippensis	Buff-banded Rail							
Geopelia cuneata	Diamond Dove	V						
Geopelia striata	Peaceful Dove							
Gerygone fusca	Western Gerygone							
Gerygone olivacea	White-throated Gerygone							
Glareola maldivarum	Oriental Pratincole							
Glossopsitta concinna	Musk Lorikeet							
Glossopsitta porphyrocephala	Purple-crowned Lorikeet							
Glossopsitta pusilla	Little Lorikeet							
Grallina cyanoleuca	Magpie-lark							
Grantiella picta	Painted Honeyeater	V	L					
Grus rubicunda	Brolga	V	L					
Gymnorhina tibicen	Australian Magpie							
Haliaeetus leucogaster	White-bellied Sea-Eagle	E	L					
Haliastur sphenurus	Whistling Kite							
Hamirostra melanosternon	Black-breasted Buzzard							
Heteroscelus brevipes	Grey-tailed Tattler							
Hieraaetus morphnoides	Little Eagle							
Himantopus himantopus	Black-winged Stilt							
Hirundapus caudacutus	White-throated Needletail							
Hirundo ariel	Fairy Martin							
Hirundo neoxena	Welcome Swallow							
Hirundo nigricans	Tree Martin							
Hylacola cauta	Shy Heathwren							
Hylacola pyrrhopygia	Chestnut-rumped Heathwren	DD						
Ixobrychus minutus	Little Bittern	E	N					
Lalage sueurii	White-winged Triller							
Larus atricalla	Laughing Gull							
Larus crassirostris	Black-tailed Gull							
Larus dominicanus	Kelp Gull	C						
Larus novaehollandiae	Silver Gull							
Larus pacificus	Pacific Gull	LR						
Lathamus discolor	Swift Parrot	E	L	V				
Leipoa ocellata	Malleefowl	E	L	V				
Leucosarcia melanoleuca	Wonga Pigeon							
Lichenostomus chrysops	Yellow-faced Honeyeater							
Lichenostomus cratitius	Purple-gaped Honeyeater							
Lichenostomus fuscus	Fuscous Honeyeater							
Lichenostomus leucotis	White-eared Honeyeater							
Lichenostomus melanops	Yellow-tufted Honeyeater							
Lichenostomus ornatus	Yellow-plumed Honeyeater							
Lichenostomus penicillatus	White-plumed Honeyeater							
Lichenostomus virescens	Singing Honeyeater							
Limicola falcinellus	Broad-billed Sandpiper							
Limnodromus semipalmatus	Asian Dowditcher							
Limosa lapponica	Bar-tailed Godwit							
Limosa limosa	Black-tailed Godwit							
Lophoictinia isura	Square-tailed Kite	E	N					
Malacorhynchus membranaceus	Pink-eared Duck							
Malurus cyaneus	Superb Fairy-wren							
Malurus lamberti	Variegated Fairy-wren							
Manorina melanocephala	Noisy Miner							

Scientific Name	Common Name	Conservation Status			Endemicity[4]		Disjunct Population/s	Limit of Range
		TFV[1]	FFG[2]	ESP[3]	E_1	E_2		
Manorina melanophrys	Bell Miner							✓
Megalurus gramineus	Little Grassbird							
Melanodryas cucullata	Hooded Robin							
Melithreptus brevirostris	Brown-headed Honeyeater							
Melithreptus gularis	Black-chinned Honeyeater							
Melithreptus lunatus	White-naped Honeyeater							
Melopsittacus undulatus	Budgerigar							
Menura novaehollandiae	Superb Lyrebird							
Merops ornatus	Rainbow Bee-eater							
Microeca fascinans	Jacky Winter							
Micropalama himantopus	Stilt Sandpiper							
Milvus migrans	Black Kite							
Mirafra javanica	Singing Bushlark							
Monarcha melanopsis	Black-faced Monarch							
Morus capensis	Cape Gannet	C						
Morus serrator	Australasian Gannet	V						
Myiagra cyanoleuca	Satin Flycatcher							
Myiagra inquieta	Restless Flycatcher							
Myiagra rubecula	Leaden Flycatcher							
Myzomela sanguinolenta	Scarlet Honeyeater							
Neochmia temporalis	Red-browed Finch							
Neophema chrysogaster	Orange-bellied Parrot	C	L	E		✓		
Neophema chrysostoma	Blue-winged Parrot							
Neophema elegans	Elegant Parrot							
Ninox connivens	Barking Owl	E	N					
Ninox novaeseelandiae	Southern Boobook							
Ninox strenua	Powerful Owl	E	L					✓
Northiella haematogaster	Blue Bonnet							
Numenius madagascariensis	Eastern Curlew	LR						
Numenius minutus	Little Curlew							
Numenius phaeopus	Whimbrel							
Nycticorax caledonicus	Nankeen Night Heron	V						
Nymphicus hollandicus	Cockatiel							
Ocyphaps lophotes	Crested Pigeon							
Oreoica gutturalis	Crested Bellbird							
Oriolus sagittatus	Olive-backed Oriole							
Oxyura australis	Blue-billed Duck	V	N					
Pachycephala inornata	Gilbert's Whistler							
Pachycephala olivacea	Olive Whistler						✓	
Pachycephala pectoralis	Golden Whistler							
Pachycephala rufiventris	Rufous Whistler							
Pachycephala rufogularis	Red-lored Whistler	V	L	V				
Pandion haliaetus	Osprey							
Pardalotus punctatus	Spotted Pardalote							
Pardalotus striatus	Striated Pardalote							
Pardalotus xanthopygus	Yellow-rumped Pardalote							
Pedionomus torquatus	Plains-wanderer	E	L	V				
Pelecanus conspicillatus	Australian Pelican							
Petroica goodenovii	Red-capped Robin							
Petroica multicolor	Scarlet Robin							
Petroica phoenicea	Flame Robin							
Petroica rodinogaster	Pink Robin							
Petroica rosea	Rose Robin							
Pezoporus wallicus	Ground Parrot	V	L					
Phalacrocorax carbo	Great Cormorant							
Phalacrocorax fuscescens	Black-faced Cormorant	V						
Phalacrocorax melanoleucos	Little Pied Cormorant							

Scientific Name	Common Name	Conservation Status			Endemicity[4]		Disjunct Pop[ulation/s]	Limit of Range
		TFV[1]	FFG[2]	ESP[3]	E_1	E_2		
Phalacrocorax sulcirostris	Little Black Cormorant							
Phalacrocorax varius	Pied Cormorant	LR						
Phalaropus fulicaria	Grey Phalarope							
Phalaropus lobatus	Red-necked Phalarope							
Phaps chalcoptera	Common Bronzewing							
Phaps elegans	Brush Bronzewing							
Philemon citreogularis	Little Friarbird							
Philemon corniculatus	Noisy Friarbird							
Philomachus pugnax	Ruff							
Phylidonyris albifrons	White-fronted Honeyeater							
Phylidonyris melanops	Tawny-crowned Honeyeater							
Phylidonyris novaehollandiae	New Holland Honeyeater							
Phylidonyris pyrrhoptera	Crescent Honeyeater							
Platalea flavipes	Yellow-billed Spoonbill							
Platalea regia	Royal Spoonbill	V						
Platycercus adscitus	Pale-headed Rosella							
Platycercus elegans	Crimson Rosella							
Platycercus elegans flaveolus	Yellow Rosella							
Platycercus eximius	Eastern Rosella							
Plectorhyncha lanceolata	Striped Honeyeater							
Plegadis falcinellus	Glossy Ibis	V						
Pluvialis fulva	Pacific Golden Plover							
Pluvialis squatarola	Grey Plover							
Podargus strigoides	Tawny Frogmouth							
Podiceps cristatus	Great Crested Grebe							
Poliocephalus poliocephalus	Hoary-headed Grebe							
Polytelis anthopeplus	Regent Parrot							
Polytelis swainsonii	Superb Parrot	E	L	V				
Pomatostomus superciliosus	White-browed Babbler							
Pomatostomus temporalis	Grey-crowned Babbler	E	L					
Porphyrio porphyrio	Purple Swamphen							
Porzana fluminea	Australian Spotted Crake							
Porzana pusilla	Baillon's Crake	V	N					
Porzana tabuensis	Spotless Crake							
Psephotus haematonotus	Red-rumped Parrot							
Psephotus varius	Mulga Parrot							
Psophodes olivaceus	Eastern Whipbird							
Ptilinopus superbus	Superb Fruit-Dove							
Ptilonorhynchus violaceus	Satin Bowerbird						✓	✓
Puffinus assimilis	Little Shearwater							
Pycnoptilus floccosus	Pilotbird							
Pygoscelis adeliae	Adelie Penguin							
Pyrrholaemus brunneus	Redthroat	C						
Rallus pectoralis	Lewin's Rail	E	N					
Recurvirostra novaehollandiae	Red-necked Avocet							
Rhipidura fuliginosa	Grey Fantail							
Rhipidura leucophrys	Willie Wagtail							
Rhipidura rufifrons	Rufous Fantail							
Rostratula benghalensis	Painted Snipe	E						
Scythrops novaehollandiae	Channel-billed Cuckoo							
Sericornis frontalis	White-browed Scrubwren							
Smicrornis brevirostris	Weebill							
Stagonopleura bella	Beautiful Firetail							
Stagonopleura guttata	Diamond Firetail							
Steganopus tricolor	Wilson's Phalarope							
Sterna albifrons	Little Tern	V	L	E				
Sterna bergii	Crested Tern	LR						

Scientific Name	Common Name	Conservation Status			Endemicity[4]		Disjunct Pop[ulation/s]	Limit of Range
		TFV[1]	FFG[2]	ESP[3]	E_1	E_2		
Sterna caspia	Caspian Tern	V						
Sterna fuscata	Sooty Tern							
Sterna hirundo	Common Tern							
Sterna nereis	Fairy Tern	V	L					
Sterna nilotica	Gull-billed Tern	E	N					
Sterna paradisaea	Arctic Tern							
Sterna striata	White-fronted Tern							
Stictonetta naevosa	Freckled Duck	E	L					
Stiltia isabella	Australian Pratincole							
Stipiturus malachurus	Southern Emu-wren							
Strepera graculina	Pied Currawong							
Strepera versicolor	Grey Currawong							
Struthidea cinerea	Apostlebird	V						
Tachybaptus novaehollandiae	Australasian Grebe							
Tadorna tadornoides	Australian Shelduck							
Taeniopygia guttata	Zebra Finch							
Thinornis rubricollis	Hooded Plover	E	L	V				
Threskiornis molucca	Australian White Ibis							
Threskiornis spinicollis	Straw-necked Ibis							
Todiramphus pyrrhopygia	Red-backed Kingfisher	V						
Todiramphus sanctus	Sacred Kingfisher							
Trichoglossus chlorolepidotus	Scaly-breasted Lorikeet							
Trichoglossus haematodus	Rainbow Lorikeet							
Tringa flavipes	Lesser Yellowlegs							
Tringa glareola	Wood Sandpiper							
Tringa nebularia	Common Greenshank							
Tringa stagnatilis	Marsh Sandpiper							
Tryngites subruficollis	Buff-breasted Sandpiper							
Turnix pyrrhothorax	Red-chested Button-quail	V						
Turnix varia	Painted Button-quail							
Turnix velox	Little Button-quail	DD						
Tyto alba	Barn Owl							
Tyto novaehollandiae	Masked Owl	E	L					
Tyto tenebricosa	Sooty Owl	V	L					
Vanellus miles	Masked Lapwing							
Vanellus tricolor	Banded Lapwing							
Xanthomyza phrygia	Regent Honeyeater	C	L	E				
Xenus cinereus	Terek Sandpiper							
Zoothera lunulata	Bassian Thrush							
Zosterops lateralis	Silvereye							
Reptiles								
Amphibolurus muricatus	Jacky Lizard							
Amphibolurus nobbi coggeri	Nobbi Dragon							
Amphibolurus norrisi	Norris's Dragon							✓
Aprasia striolata	Striped Worm-lizard	LR					✓	✓
Austrelaps superbus	Copperhead							
Bassiana duperreyi	Eastern Three-lined Skink							
Chelodina longicollis	Eastern Long-necked Tortoise							
Cryptoblepharus carnabyi	Carnaby's Wall Skink							
Ctenophorus pictus	Painted Dragon							✓
Ctenotus robustus	Striped Skink							
Ctenotus uber orientalis								
Delma impar	Striped Legless Lizard	E	L	V				
Delma inornata	Olive Legless Lizard							
Diplodactylus tessellatus	Tesselated Gecko	LR						
Drysdalia coronoides	White-lipped Snake							
Egernia coventryi	Swamp Skink	V					✓	

Scientific Name	Common Name	Conservation Status			Endemicity[4]		Disjunct Pop[ulation/s]	Limit of Range
		TFV[1]	FFG[2]	ESP[3]	E_1	E_2		
Egernia cunninghami	Cunningham's Skink							
Egernia saxatilis intermedia	Black Rock Skink							✓
Egernia whitii	White's Skink							
Emydura macquarii	Murray Turtle							
Eulamprus heatwolei (WTF)	Yellow-bellied Water Skink							
Eulamprus quoyii	Eastern Water Skink	LR						
Eulamprus tympanum (CTF)	Southern Water Skink							
Eulamprus tympanum ssp. (Corangamite)	Southern Water Skink	C	L	E				
Hemiergis decresiensis	Three-toed Skink							
Hemiergis peronii	Four-toed Skink	LR					✓	✓
Lampropholis delicata	Grass Skink							
Lampropholis guichenoti	Garden Skink							
Lerista bougainvillii	Bougainville's Skink							
Lialis burtonis	Burton's Legless Lizard							
Menetia greyii	Grey's Skink							
Morethia adelaidensis	Samphire Skink	E						
Morethia boulengeri	Boulenger's Skink							
Morethia obscura	Obscure Skink							
Nannoscincus maccoyi	McCoy's Skink						✓	✓
Nephrurus milii	Thick-tailed Gecko							
Niveoscincus coventryi	Coventry's Skink						✓	✓
Niveoscincus metallicus	Metallic Skink							✓
Notechis scutatus	Eastern Tiger Snake							
Phyllodactylus marmoratus	Marbled Gecko							
Pogona barbata	Eastern Bearded Dragon							
Pseudechis porphyriacus	Red-bellied Black Snake							
Pseudemoia entrecasteauxii	Southern Grass Skink							
Pseudemoia pagenstecheri	Tussock Skink							✓
Pseudemoia rawlinsoni	Glossy Grass Skink	LR						✓
Pseudemoia spenceri	Spencer's Skink						✓	✓
Pseudonaja textilis	Eastern Brown Snake							
Pygopus lepidopodus	Common Scaly-foot							
Ramphotyphlops nigrescens	Gray's Blind Snake							
Ramphotyphlops proximus	Woodland Blind Snake	V						
Rhinoplocephalus nigrescens	Eastern Small-eyed Snake							✓
Saproscincus mustelinus	Weasel Skink							✓
Suta flagellum	Little Whip Snake							
Tiliqua nigrolutea	Blotched Blue-tongued Lizard							
Tiliqua occipitalis	Western Blue-tongued Lizard	LR						
Tiliqua rugosa	Stumpy-tailed Lizard							
Tiliqua scincoides	Eastern Blue-tongued Lizard							
Tympanocryptis lineata pinguicolla	Lined Eared Dragon	C	L					
Tympanocryptus diemensis	Mountain Dragon	C					✓	✓
Varanus gouldii	Gould's Goanna							
Varanus varius	Lace Monitor	DD						
Amphibians								
Crinia parinsignifera	Plains Froglet							
Crinia signifera	Common Eastern Froglet							
Geocrinia laevis	Southern Smooth Froglet						✓	✓
Geocrinia laevis X victoriana	Southern Smooth Froglet							
Geocrinia victoriana	Victorian Smooth Froglet						✓	✓
Limnodynastes dumerilii	Eastern Banjo Frog							
Limnodynastes dumerilii dumerilii	Southern Bullfrog							
Limnodynastes dumerilii insularis	Southern Bullfrog							
Limnodynastes dumerilii	Southern Bullfrog							✓

Scientific Name	Common Name	Conservation Status			Endemicity[4]		Disjunct Pop[ulation/s]	Limit of Range
		TFV[1]	FFG[2]	ESP[3]	E_1	E_2		
variegatus								
Limnodynastes peronii	Brown-striped Frog							
Limnodynastes tasmaniensis	Spotted Marsh Frog							
Litoria ewingii	Brown Tree Frog							
Litoria lesueuri	Lesueur's Frog							✓
Litoria paraewingi	Plains Brown Tree Frog							
Litoria peronii	Peron's Tree Frog							
Litoria raniformis	Growling Grass Frog	V	X					
Litoria verreauxii verreauxii	Verreaux's Tree Frog							
Neobatrachus pictus	Mallee Spadefoot Toad							
Neobatrachus sudelli	Common Spadefoot Toad							
Pseudophryne bibronii	Brown Toadlet							
Pseudophryne semimarmorata	Southern Toadlet							
Fish								
Craterocephalus stercusmuscarum	Unspecked Hardyhead							
Edelia obscura	Yarra Pigmy Perch	LR	L	V		✓	✓	
Gadopsis marmoratus	River Blackfish	DD						
Galaxias brevipinnis	Broad-finned Galaxias							
Galaxias cleaveri	Australian Mudfish	E	L					✓
Galaxias olidus	Mountain Galaxias	DD						
Galaxias truttaceus	Spotted Galaxias							
Galaxiella pusilla	Dwarf Galaxias	LR	L	V				
Geotria australis	Pouched Lamprey							
Hypseleotris klunzingeri	Western Carp Gudgeon							
Maccullochella peelii	Murray Cod	V	L					
Macquaria ambigua	Golden Perch	V						
Macquaria australasica	Macquarie Perch	E	L					
Mordacia mordax	Short-headed Lamprey							
Nannoperca australis	Southern Pigmy Perch							
Nannoperca variegata	Ewens Pigmy Perch	V	L	V		✓		
Prototroctes maraena	Australin Grayling	V	L	V				
Tandanus tandanus	Freshwater Catfish	V	N					
Tasmanogobius lasti	Lagoon Goby							
Invertebrates								
Acrodipsas brisbanensis	Large Ant Blue	R	L					
Acrodipsas myrmecophila	Small Ant Blue	E	L					
Amarinus lacustris	Freshwater crab					✓		
Antipoda chaostola chares	Heath Sand-skipper Butterfly	R						✓
Archaeophylax canarus	Caddisfly	R	L					
Boekella nyoraensis	Calanoid copepod	R						
Engaeus cunicularius	Granular Burrowing Cray							✓
Engaeus fultoni	Otway Burrowing Cray				✓			
Engaeus lyelli	Upland Burrowing Cray							✓
Engaeus merosetosus	Western Burrowing Cray				✓			
Engaeus quadrimanus	Lowland Burrowing Cray							✓
Engaeus sericatus	Hairy Burrowing Cray				✓			
Engaeus strictifrons	Portland Burrowing Cray				✓			
Euastacus armatus	Murray River Crayfish	K						
Euastacus bispinosis	Glenelg River Crayfish	K				✓		
Euastacus yarraensis	Southern Victoria Spiny Cray							✓
Eusthenia nothofagi	Otway Stonefly				✓			
Fibulacamptus gracilior	Harpactacoid Copepod	K						
Geocharax falcata	Western Cray				✓			
Geocharax gracilis	Otway Cray				✓			
Gramastacus insolitus	Swamp Crayfish							
Hesperilla crypsargyra lesouefi	Silvered Skipper	R						

Scientific Name	Common Name	Conservation Status			Endemicity[4]		Disjunct Pop[ulation/s]	Limit of Range
		TFV[1]	FFG[2]	ESP[3]	E_1	E_2		
Hesperilla flavescens flavescens	Altona Skipper					✓		
Heteronympha cordace wilsoni	(Butterfly)	V						
Hyridella australis	Coastal Freshwater Mussel							✓
Hyridella drapeta	Coastal Freshwater Mussel							✓
Hyridella depressa	Coastal Freshwater Mussel							✓
Hyridella glenelgensis	Glenelg Freshwater Mussel	R			✓			
Hyridella narracanensis	Southern River Mussel							✓
Ogyris idmo halmaturia	Large Brown Azure	E						
Orphinotrichia justini	Caddisfly	K						
Plectrotarsus gravenhorstii	Caddisfly	K						
Pseudalmenus chlorinda fisheri	Chlorinda Hairsreak	V						
Synemon plana	Golden Sun Moth	E	L					
Synemon sp c.f. selene	Sun Moth	E						
Taskiria otwayensis	Caddisfly	E						
Victaphanta compacta	Otway Black Snail	V			✓			

Notes:
1. TFV = *Threatened Vertebrate Fauna in Victoria* list (NRE 1999) for vertebrate fauna, *Threatened Fauna in Victoria* list (CNR 1995) for invertebrates.
2. FFG = Victorian *Flora and Fauna Guarantee Act 1988* .
3. ESP = Commonwealth *Endangered Species Protection Act 1992.*
4. E_1 = natural distribution wholly confined to the West RFA Region
   E_2 = natural Australian distribution mainly (>50%) confined to West RFA Region.

C = Critically Endangered, DD = Data Deficient (insufficiently known), E = Endangered, K = insufficiently known, L = Listed, LR = Lower Risk, N = Nominated for listing, R = Rare, V = Vulnerable, X = rejected for listing,

Appendix M Metadata Reference

The importance of documenting key aspects of data so as to better understand, manage and use the data is being increasingly recognised. This description, or documentation, of the data is commonly referred to as 'metadata'.

As part of the CRA process, a standard approach had been used to document data consistently. The standard was developed by the Australia New Zealand Land Information Council (ANZLIC), a group formed to coordinate the collection and transfer of all land and geographic information across all levels of government. All jurisdictions are represented on ANZLIC.

The core metadata outlined in the ANZLIC standard provide basic information about the data, including descriptions of the data, their geographic extent, currency, status, accessibility and quality, and contact information. A list of attributes has also been included in the data descriptions.

The metadata inventory of datasets will be available on the CRA/RFA web site as follows: http://www.rfa.gov.au/index.html